Maple 2018.2 Integration Test Results
on the problems in "7 Inverse hyperbolic functions/7.3 Inverse hyperbolic tangent"

Test results for the 71 problems in "7.3.2 (d x)^m (a+b arctanh(c x^n))^p.txt"

Problem 3: Result more than twice size of optimal antiderivative.

$$\int \frac{a+b\,\text{arctanh}(c x)}{x}\, dx$$

Optimal(type 4, 22 leaves, 1 step):

$$a \ln(x) - \frac{b\,\text{polylog}(2, -c x)}{2} + \frac{b\,\text{polylog}(2, c x)}{2}$$

Result(type 4, 46 leaves):

$$a \ln(c x) + b \ln(c x)\,\text{arctanh}(c x) - \frac{b\,\text{dilog}(c x+1)}{2} - \frac{b \ln(c x) \ln(c x+1)}{2} - \frac{b\,\text{dilog}(c x)}{2}$$

Problem 5: Result more than twice size of optimal antiderivative.

$$\int x^3 (a+b\,\text{arctanh}(c x))^2\, dx$$

Optimal(type 3, 99 leaves, 11 steps):

$$\frac{a b x}{2 c^3} + \frac{b^2 x^2}{12 c^2} + \frac{b^2 x\,\text{arctanh}(c x)}{2 c^3} + \frac{b x^3 (a+b\,\text{arctanh}(c x))}{6 c} - \frac{(a+b\,\text{arctanh}(c x))^2}{4 c^4} + \frac{x^4 (a+b\,\text{arctanh}(c x))^2}{4} + \frac{b^2 \ln(-c^2 x^2+1)}{3 c^4}$$

Result(type 3, 277 leaves):

$$\frac{x^4 a^2}{4} + \frac{b^2 x^4\,\text{arctanh}(c x)^2}{4} + \frac{b^2\,\text{arctanh}(c x)\, x^3}{6 c} + \frac{b^2 x\,\text{arctanh}(c x)}{2 c^3} + \frac{b^2\,\text{arctanh}(c x) \ln(c x-1)}{4 c^4} - \frac{b^2\,\text{arctanh}(c x) \ln(c x+1)}{4 c^4} + \frac{b^2 \ln(c x-1)}{3 c^4}$$
$$+ \frac{b^2 \ln(c x+1)}{3 c^4} + \frac{b^2 x^2}{12 c^2} + \frac{b^2 \ln(c x-1)^2}{16 c^4} - \frac{b^2 \ln(c x-1) \ln\left(\frac{c x}{2}+\frac{1}{2}\right)}{8 c^4} + \frac{b^2 \ln(c x+1)^2}{16 c^4} - \frac{b^2 \ln\left(-\frac{c x}{2}+\frac{1}{2}\right) \ln(c x+1)}{8 c^4}$$
$$+ \frac{b^2 \ln\left(-\frac{c x}{2}+\frac{1}{2}\right) \ln\left(\frac{c x}{2}+\frac{1}{2}\right)}{8 c^4} + \frac{a b x^4\,\text{arctanh}(c x)}{2} + \frac{x^3 a b}{6 c} + \frac{a b x}{2 c^3} + \frac{a b \ln(c x-1)}{4 c^4} - \frac{a b \ln(c x+1)}{4 c^4}$$

Problem 6: Result more than twice size of optimal antiderivative.

$$\int x^2 (a+b\,\text{arctanh}(c x))^2\, dx$$

Optimal(type 4, 116 leaves, 9 steps):

$$\frac{b^2 x}{3 c^2} - \frac{b^2\,\text{arctanh}(c x)}{3 c^3} + \frac{b x^2 (a+b\,\text{arctanh}(c x))}{3 c} + \frac{(a+b\,\text{arctanh}(c x))^2}{3 c^3} + \frac{x^3 (a+b\,\text{arctanh}(c x))^2}{3} - \frac{2 b (a+b\,\text{arctanh}(c x)) \ln\left(\frac{2}{-c x+1}\right)}{3 c^3}$$

$$-\frac{b^2 \operatorname{polylog}\left(2, 1-\frac{2}{-cx+1}\right)}{3c^3}$$

Result(type 4, 269 leaves):

$$\frac{x^3 a^2}{3}+\frac{x^3 b^2 \operatorname{arctanh}(cx)^2}{3}+\frac{b^2 \operatorname{arctanh}(cx)\, x^2}{3c}+\frac{b^2 \operatorname{arctanh}(cx) \ln(cx-1)}{3c^3}+\frac{b^2 \operatorname{arctanh}(cx) \ln(cx+1)}{3c^3}+\frac{b^2 x}{3c^2}+\frac{b^2 \ln(cx-1)}{6c^3}-\frac{b^2 \ln(cx+1)}{6c^3}$$
$$+\frac{b^2 \ln(cx-1)^2}{12c^3}-\frac{b^2 \operatorname{dilog}\left(\frac{cx}{2}+\frac{1}{2}\right)}{3c^3}-\frac{b^2 \ln(cx-1) \ln\left(\frac{cx}{2}+\frac{1}{2}\right)}{6c^3}-\frac{b^2 \ln(cx+1)^2}{12c^3}+\frac{b^2 \ln\left(-\frac{cx}{2}+\frac{1}{2}\right) \ln(cx+1)}{6c^3}$$
$$-\frac{b^2 \ln\left(-\frac{cx}{2}+\frac{1}{2}\right) \ln\left(\frac{cx}{2}+\frac{1}{2}\right)}{6c^3}+\frac{2x^3 a b \operatorname{arctanh}(cx)}{3}+\frac{a b x^2}{3c}+\frac{a b \ln(cx-1)}{3c^3}+\frac{a b \ln(cx+1)}{3c^3}$$

Problem 7: Result more than twice size of optimal antiderivative.

$$\int x\,(a+b \operatorname{arctanh}(cx))^2\, dx$$

Optimal(type 3, 69 leaves, 6 steps):

$$\frac{a b x}{c}+\frac{b^2 x \operatorname{arctanh}(cx)}{c}-\frac{(a+b \operatorname{arctanh}(cx))^2}{2c^2}+\frac{x^2\,(a+b \operatorname{arctanh}(cx))^2}{2}+\frac{b^2 \ln(-c^2 x^2+1)}{2c^2}$$

Result(type 3, 238 leaves):

$$\frac{x^2 a^2}{2}+\frac{b^2 x^2 \operatorname{arctanh}(cx)^2}{2}+\frac{b^2 x \operatorname{arctanh}(cx)}{c}+\frac{b^2 \operatorname{arctanh}(cx) \ln(cx-1)}{2c^2}-\frac{b^2 \operatorname{arctanh}(cx) \ln(cx+1)}{2c^2}+\frac{b^2 \ln(cx-1)^2}{8c^2}$$
$$-\frac{b^2 \ln(cx-1) \ln\left(\frac{cx}{2}+\frac{1}{2}\right)}{4c^2}+\frac{b^2 \ln(cx-1)}{2c^2}+\frac{b^2 \ln(cx+1)}{2c^2}+\frac{b^2 \ln(cx+1)^2}{8c^2}-\frac{b^2 \ln\left(-\frac{cx}{2}+\frac{1}{2}\right) \ln(cx+1)}{4c^2}$$
$$+\frac{b^2 \ln\left(-\frac{cx}{2}+\frac{1}{2}\right) \ln\left(\frac{cx}{2}+\frac{1}{2}\right)}{4c^2}+x^2 a b \operatorname{arctanh}(cx)+\frac{a b x}{c}+\frac{a b \ln(cx-1)}{2c^2}-\frac{a b \ln(cx+1)}{2c^2}$$

Problem 9: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b \operatorname{arctanh}(cx))^2}{x}\, dx$$

Optimal(type 4, 113 leaves, 6 steps):

$$-2\,(a+b \operatorname{arctanh}(cx))^2 \operatorname{arctanh}\left(-1+\frac{2}{-cx+1}\right)-b\,(a+b \operatorname{arctanh}(cx)) \operatorname{polylog}\left(2, 1-\frac{2}{-cx+1}\right)+b\,(a+b \operatorname{arctanh}(cx)) \operatorname{polylog}\left(2, -1+\frac{2}{-cx+1}\right)$$
$$+\frac{b^2 \operatorname{polylog}\left(3, 1-\frac{2}{-cx+1}\right)}{2}-\frac{b^2 \operatorname{polylog}\left(3, -1+\frac{2}{-cx+1}\right)}{2}$$

Result(type 4, 700 leaves):

$$a^2 \ln(cx) + b^2 \ln(cx) \operatorname{arctanh}(cx)^2 - b^2 \operatorname{arctanh}(cx) \operatorname{polylog}\left(2, -\frac{(cx+1)^2}{-c^2x^2+1}\right) + \frac{b^2 \operatorname{polylog}\left(3, -\frac{(cx+1)^2}{-c^2x^2+1}\right)}{2} - b^2 \operatorname{arctanh}(cx)^2 \ln\left(\frac{(cx+1)^2}{-c^2x^2+1} - 1\right) + b^2 \operatorname{arctanh}(cx)^2 \ln\left(1 + \frac{cx+1}{\sqrt{-c^2x^2+1}}\right) + 2b^2 \operatorname{arctanh}(cx) \operatorname{polylog}\left(2, -\frac{cx+1}{\sqrt{-c^2x^2+1}}\right) - 2b^2 \operatorname{polylog}\left(3, -\frac{cx+1}{\sqrt{-c^2x^2+1}}\right) + b^2 \operatorname{arctanh}(cx)^2 \ln\left(1 - \frac{cx+1}{\sqrt{-c^2x^2+1}}\right) + 2b^2 \operatorname{arctanh}(cx) \operatorname{polylog}\left(2, \frac{cx+1}{\sqrt{-c^2x^2+1}}\right) - 2b^2 \operatorname{polylog}\left(3, \frac{cx+1}{\sqrt{-c^2x^2+1}}\right)$$

$$- \frac{I b^2 \pi \operatorname{csgn}\left(I\left(\frac{(cx+1)^2}{-c^2x^2+1} - 1\right)\right) \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1} - 1\right)}{1 + \frac{(cx+1)^2}{-c^2x^2+1}}\right)^2 \operatorname{arctanh}(cx)^2}{2} + \frac{I b^2 \pi \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1} - 1\right)}{1 + \frac{(cx+1)^2}{-c^2x^2+1}}\right)^3 \operatorname{arctanh}(cx)^2}{2}$$

$$+ \frac{I b^2 \pi \operatorname{csgn}\left(I\left(\frac{(cx+1)^2}{-c^2x^2+1} - 1\right)\right) \operatorname{csgn}\left(\frac{I}{1 + \frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1} - 1\right)}{1 + \frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{arctanh}(cx)^2}{2}$$

$$- \frac{I b^2 \pi \operatorname{csgn}\left(\frac{I}{1 + \frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1} - 1\right)}{1 + \frac{(cx+1)^2}{-c^2x^2+1}}\right)^2 \operatorname{arctanh}(cx)^2}{2} - ab \ln(cx) \ln(cx+1) + 2ab \ln(cx) \operatorname{arctanh}(cx) - ab \operatorname{dilog}(cx+1) - ab \operatorname{dilog}(cx)$$

Problem 10: Result more than twice size of optimal antiderivative.

$$\int \frac{(a + b \operatorname{arctanh}(cx))^2}{x^5} \, dx$$

Optimal(type 3, 103 leaves, 13 steps):

$$-\frac{b^2c^2}{12x^2} - \frac{bc(a + b \operatorname{arctanh}(cx))}{6x^3} - \frac{bc^3(a + b \operatorname{arctanh}(cx))}{2x} + \frac{c^4(a + b \operatorname{arctanh}(cx))^2}{4} - \frac{(a + b \operatorname{arctanh}(cx))^2}{4x^4} + \frac{2b^2c^4 \ln(x)}{3} - \frac{b^2c^4 \ln(-c^2x^2+1)}{3}$$

Result(type 3, 289 leaves):

$$-\frac{a^2}{4x^4} - \frac{b^2 \operatorname{arctanh}(cx)^2}{4x^4} - \frac{cb^2 \operatorname{arctanh}(cx)}{6x^3} - \frac{c^3b^2 \operatorname{arctanh}(cx)}{2x} + \frac{c^4b^2 \operatorname{arctanh}(cx) \ln(cx+1)}{4} - \frac{c^4b^2 \operatorname{arctanh}(cx) \ln(cx-1)}{4} - \frac{b^2c^2}{12x^2}$$

$$+\frac{2 c^4 b^2 \ln(c x)}{3}-\frac{c^4 b^2 \ln(c x+1)}{3}-\frac{c^4 b^2 \ln(c x-1)}{3}-\frac{c^4 b^2 \ln(c x-1)^2}{16}+\frac{c^4 b^2 \ln(c x-1) \ln\left(\frac{c x}{2}+\frac{1}{2}\right)}{8}-\frac{c^4 b^2 \ln(c x+1)^2}{16}$$
$$+\frac{c^4 b^2 \ln\left(-\frac{c x}{2}+\frac{1}{2}\right) \ln(c x+1)}{8}-\frac{c^4 b^2 \ln\left(-\frac{c x}{2}+\frac{1}{2}\right) \ln\left(\frac{c x}{2}+\frac{1}{2}\right)}{8}-\frac{a b \operatorname{arctanh}(c x)}{2 x^4}-\frac{c a b}{6 x^3}-\frac{c^3 a b}{2 x}+\frac{c^4 a b \ln(c x+1)}{4}$$
$$-\frac{c^4 a b \ln(c x-1)}{4}$$

Problem 11: Result more than twice size of optimal antiderivative.

$$\int (a+b \operatorname{arctanh}(c x))^3 \, dx$$

Optimal(type 4, 106 leaves, 5 steps):

$$\frac{(a+b \operatorname{arctanh}(c x))^3}{c}+x (a+b \operatorname{arctanh}(c x))^3-\frac{3 b (a+b \operatorname{arctanh}(c x))^2 \ln\left(\frac{2}{-c x+1}\right)}{c}-\frac{3 b^2 (a+b \operatorname{arctanh}(c x)) \operatorname{polylog}\left(2, 1-\frac{2}{-c x+1}\right)}{c}$$
$$+\frac{3 b^3 \operatorname{polylog}\left(3, 1-\frac{2}{-c x+1}\right)}{2 c}$$

Result(type 4, 260 leaves):

$$a^3 x+b^3 \operatorname{arctanh}(c x)^3 x+\frac{b^3 \operatorname{arctanh}(c x)^3}{c}-\frac{3 b^3 \operatorname{arctanh}(c x)^2 \ln\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}{c}-\frac{3 b^3 \operatorname{arctanh}(c x) \operatorname{polylog}\left(2, -\frac{(c x+1)^2}{-c^2 x^2+1}\right)}{c}$$
$$+\frac{3 b^3 \operatorname{polylog}\left(3, -\frac{(c x+1)^2}{-c^2 x^2+1}\right)}{2 c}+3 \operatorname{arctanh}(c x)^2 x a b^2+\frac{3 a b^2 \operatorname{arctanh}(c x)^2}{c}-\frac{6 \operatorname{arctanh}(c x) \ln\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right) a b^2}{c}$$
$$-\frac{3 \operatorname{polylog}\left(2, -\frac{(c x+1)^2}{-c^2 x^2+1}\right) a b^2}{c}+3 a^2 b \operatorname{arctanh}(c x) x+\frac{3 a^2 b \ln(-c^2 x^2+1)}{2 c}$$

Problem 15: Unable to integrate problem.

$$\int (d x)^m (a+b \operatorname{arctanh}(c x)) \, dx$$

Optimal(type 5, 70 leaves, 2 steps):

$$\frac{(d x)^{1+m} (a+b \operatorname{arctanh}(c x))}{d (1+m)}-\frac{b c (d x)^{2+m} \operatorname{hypergeom}\left(\left[1, 1+\frac{m}{2}\right], \left[2+\frac{m}{2}\right], c^2 x^2\right)}{d^2 (1+m) (2+m)}$$

Result(type 8, 16 leaves):

Problem 20: Result more than twice size of optimal antiderivative.

$$\int x^7 \left(a+b\operatorname{arctanh}(c x^2)\right)^2 dx$$

Optimal(type 3, 111 leaves, 12 steps):

$$\frac{a b x^2}{4 c^3}+\frac{b^2 x^4}{24 c^2}+\frac{b^2 x^2 \operatorname{arctanh}(c x^2)}{4 c^3}+\frac{b x^6 \left(a+b\operatorname{arctanh}(c x^2)\right)}{12 c}-\frac{\left(a+b\operatorname{arctanh}(c x^2)\right)^2}{8 c^4}+\frac{x^8 \left(a+b\operatorname{arctanh}(c x^2)\right)^2}{8}+\frac{b^2 \ln(-c^2 x^4+1)}{6 c^4}$$

Result(type 3, 297 leaves):

$$\frac{b^2 (x^8 c^4-1) \ln(c x^2+1)^2}{32 c^4}+\frac{b \left(-3 x^8 b \ln(-c x^2+1) c^4+6 a c^4 x^8+2 b c^3 x^6+6 b c x^2+3 b \ln(-c x^2+1)\right) \ln(c x^2+1)}{48 c^4}+\frac{b^2 x^8 \ln(-c x^2+1)^2}{32}$$
$$-\frac{a b x^8 \ln(-c x^2+1)}{8}+\frac{a^2 x^8}{8}-\frac{b^2 x^6 \ln(-c x^2+1)}{24 c}+\frac{a b x^6}{12 c}+\frac{b^2 x^4}{24 c^2}-\frac{b^2 x^2 \ln(-c x^2+1)}{8 c^3}+\frac{a b x^2}{4 c^3}-\frac{b^2 \ln(-c x^2+1)^2}{32 c^4}+\frac{b \ln(-c x^2+1) a}{8 c^4}$$
$$+\frac{b^2 \ln(-c x^2+1)}{6 c^4}-\frac{b \ln(-c x^2-1) a}{8 c^4}+\frac{b^2 \ln(-c x^2-1)}{6 c^4}$$

Problem 21: Unable to integrate problem.

$$\int x^5 \left(a+b\operatorname{arctanh}(c x^2)\right)^2 dx$$

Optimal(type 4, 132 leaves, 10 steps):

$$\frac{b^2 x^2}{6 c^2}-\frac{b^2 \operatorname{arctanh}(c x^2)}{6 c^3}+\frac{b x^4 \left(a+b\operatorname{arctanh}(c x^2)\right)}{6 c}+\frac{\left(a+b\operatorname{arctanh}(c x^2)\right)^2}{6 c^3}+\frac{x^6 \left(a+b\operatorname{arctanh}(c x^2)\right)^2}{6}-\frac{b \left(a+b\operatorname{arctanh}(c x^2)\right) \ln\left(\frac{2}{-c x^2+1}\right)}{3 c^3}$$
$$-\frac{b^2 \operatorname{polylog}\left(2, 1-\frac{2}{-c x^2+1}\right)}{6 c^3}$$

Result(type 8, 18 leaves):

$$\int x^5 \left(a+b\operatorname{arctanh}(c x^2)\right)^2 dx$$

Problem 22: Result more than twice size of optimal antiderivative.

$$\int x^3 \left(a+b\operatorname{arctanh}(c x^2)\right)^2 dx$$

Optimal(type 3, 81 leaves, 7 steps):

$$\frac{a b x^2}{2 c}+\frac{b^2 x^2 \operatorname{arctanh}(c x^2)}{2 c}-\frac{\left(a+b\operatorname{arctanh}(c x^2)\right)^2}{4 c^2}+\frac{x^4 \left(a+b\operatorname{arctanh}(c x^2)\right)^2}{4}+\frac{b^2 \ln(-c^2 x^4+1)}{4 c^2}$$

Result(type 3, 246 leaves):

$$\frac{b^2 (c^2 x^4 - 1) \ln(c x^2 + 1)^2}{16 c^2} + \frac{b (-b x^4 \ln(-c x^2 + 1) c^2 + 2 a c^2 x^4 + 2 b c x^2 + b \ln(-c x^2 + 1)) \ln(c x^2 + 1)}{8 c^2} + \frac{b^2 x^4 \ln(-c x^2 + 1)^2}{16} - \frac{a b x^4 \ln(-c x^2 + 1)}{4} + \frac{x^4 a^2}{4} - \frac{b^2 x^2 \ln(-c x^2 + 1)}{4 c} + \frac{a b x^2}{2 c} - \frac{b^2 \ln(-c x^2 + 1)^2}{16 c^2} + \frac{b \ln(-c x^2 + 1) a}{4 c^2} + \frac{b^2 \ln(-c x^2 + 1)}{4 c^2} - \frac{b \ln(-c x^2 - 1) a}{4 c^2} + \frac{b^2 \ln(-c x^2 - 1)}{4 c^2}$$

Problem 23: Result more than twice size of optimal antiderivative.

$$\int \frac{(a + b \operatorname{arctanh}(c x^2))^2}{x^5} \, dx$$

Optimal(type 3, 80 leaves, 9 steps):

$$-\frac{b c (a + b \operatorname{arctanh}(c x^2))}{2 x^2} + \frac{c^2 (a + b \operatorname{arctanh}(c x^2))^2}{4} - \frac{(a + b \operatorname{arctanh}(c x^2))^2}{4 x^4} + b^2 c^2 \ln(x) - \frac{b^2 c^2 \ln(-c^2 x^4 + 1)}{4}$$

Result(type 3, 256 leaves):

$$\frac{b^2 (c^2 x^4 - 1) \ln(c x^2 + 1)^2}{16 x^4} - \frac{b (b x^4 \ln(-c x^2 + 1) c^2 + 2 b c x^2 - b \ln(-c x^2 + 1) + 2 a) \ln(c x^2 + 1)}{8 x^4} - \frac{1}{16 x^4} \Big(-b^2 c^2 x^4 \ln(-c x^2 + 1)^2 + 4 b c^2 \ln(c x^2 - 1) x^4 a + 4 b^2 c^2 \ln(c x^2 - 1) x^4 - 4 b c^2 \ln(c x^2 + 1) x^4 a + 4 b^2 c^2 \ln(c x^2 + 1) x^4 - 16 b^2 c^2 \ln(x) x^4 - 4 b^2 c x^2 \ln(-c x^2 + 1) + 8 a b c x^2 + b^2 \ln(-c x^2 + 1)^2 - 4 b \ln(-c x^2 + 1) a + 4 a^2 \Big)$$

Problem 24: Unable to integrate problem.

$$\int \frac{(a + b \operatorname{arctanh}(c x^2))^3}{x^3} \, dx$$

Optimal(type 4, 115 leaves, 6 steps):

$$\frac{c (a + b \operatorname{arctanh}(c x^2))^3}{2} - \frac{(a + b \operatorname{arctanh}(c x^2))^3}{2 x^2} + \frac{3 b c (a + b \operatorname{arctanh}(c x^2))^2 \ln\left(2 - \frac{2}{c x^2 + 1}\right)}{2} - \frac{3 b^2 c (a + b \operatorname{arctanh}(c x^2)) \operatorname{polylog}\left(2, -1 + \frac{2}{c x^2 + 1}\right)}{2} - \frac{3 b^3 c \operatorname{polylog}\left(3, -1 + \frac{2}{c x^2 + 1}\right)}{4}$$

Result(type 8, 18 leaves):

$$\int \frac{(a + b \operatorname{arctanh}(c x^2))^3}{x^3} \, dx$$

Problem 25: Unable to integrate problem.

$$\int \frac{(a+b\,\mathrm{arctanh}(c\,x^2))^3}{x^5}\,dx$$

Optimal(type 4, 127 leaves, 8 steps):

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

Result(type 8, 18 leaves):

$$\int \frac{(a+b\,\mathrm{arctanh}(c\,x^2))^3}{x^5}\,dx$$

Problem 34: Result more than twice size of optimal antiderivative.

$$\int x^{11}\,(a+b\,\mathrm{arctanh}(c\,x^3))^2\,dx$$

Optimal(type 3, 111 leaves, 12 steps):

$$\frac{a\,b\,x^3}{6\,c^3}+\frac{b^2\,x^6}{36\,c^2}+\frac{b^2\,x^3\,\mathrm{arctanh}(c\,x^3)}{6\,c^3}+\frac{b\,x^9\,(a+b\,\mathrm{arctanh}(c\,x^3))}{18\,c}-\frac{(a+b\,\mathrm{arctanh}(c\,x^3))^2}{12\,c^4}+\frac{x^{12}\,(a+b\,\mathrm{arctanh}(c\,x^3))^2}{12}+\frac{b^2\ln(-c^2\,x^6+1)}{9\,c^4}$$

Result(type 3, 297 leaves):

$$\frac{b^2\,(x^{12}\,c^4-1)\ln(c\,x^3+1)^2}{48\,c^4}+\frac{b\,(-3\,x^{12}\,b\ln(-c\,x^3+1)\,c^4+6\,a\,c^4\,x^{12}+2\,b\,c^3\,x^9+6\,b\,c\,x^3+3\,b\ln(-c\,x^3+1))\ln(c\,x^3+1)}{72\,c^4}+\frac{b^2\,x^{12}\ln(-c\,x^3+1)^2}{48}$$
$$-\frac{a\,b\,x^{12}\ln(-c\,x^3+1)}{12}+\frac{a^2\,x^{12}}{12}-\frac{b^2\,x^9\ln(-c\,x^3+1)}{36\,c}+\frac{a\,b\,x^9}{18\,c}+\frac{b^2\,x^6}{36\,c^2}-\frac{b^2\,x^3\ln(-c\,x^3+1)}{12\,c^3}+\frac{a\,b\,x^3}{6\,c^3}-\frac{b^2\ln(-c\,x^3+1)^2}{48\,c^4}-\frac{b\ln(-c\,x^3-1)\,a}{12\,c^4}$$
$$+\frac{b^2\ln(-c\,x^3-1)}{9\,c^4}+\frac{b\ln(-c\,x^3+1)\,a}{12\,c^4}+\frac{b^2\ln(-c\,x^3+1)}{9\,c^4}$$

Problem 35: Unable to integrate problem.

$$\int x^8\,(a+b\,\mathrm{arctanh}(c\,x^3))^2\,dx$$

Optimal(type 4, 132 leaves, 10 steps):

$$\frac{b^2\,x^3}{9\,c^2}-\frac{b^2\,\mathrm{arctanh}(c\,x^3)}{9\,c^3}+\frac{b\,x^6\,(a+b\,\mathrm{arctanh}(c\,x^3))}{9\,c}+\frac{(a+b\,\mathrm{arctanh}(c\,x^3))^2}{9\,c^3}+\frac{x^9\,(a+b\,\mathrm{arctanh}(c\,x^3))^2}{9}-\frac{2\,b\,(a+b\,\mathrm{arctanh}(c\,x^3))\ln\left(\frac{2}{-c\,x^3+1}\right)}{9\,c^3}$$
$$-\frac{b^2\,\mathrm{polylog}\left(2,1-\frac{2}{-c\,x^3+1}\right)}{9\,c^3}$$

Result(type 8, 18 leaves):

$$\int x^8 \left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2 dx$$

Problem 37: Unable to integrate problem.

$$\int \frac{\left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2}{x^4} dx$$

Optimal(type 4, 82 leaves, 5 steps):

$$\frac{c \left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2}{3} - \frac{\left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2}{3 x^3} + \frac{2 b c \left(a + b \operatorname{arctanh}\left(c x^3\right)\right) \ln\left(2 - \frac{2}{c x^3 + 1}\right)}{3} - \frac{b^2 c \operatorname{polylog}\left(2, -1 + \frac{2}{c x^3 + 1}\right)}{3}$$

Result(type 8, 18 leaves):

$$\int \frac{\left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2}{x^4} dx$$

Problem 38: Unable to integrate problem.

$$\int \frac{\left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2}{x^{10}} dx$$

Optimal(type 4, 130 leaves, 9 steps):

$$-\frac{b^2 c^2}{9 x^3} + \frac{b^2 c^3 \operatorname{arctanh}\left(c x^3\right)}{9} - \frac{b c \left(a + b \operatorname{arctanh}\left(c x^3\right)\right)}{9 x^6} + \frac{c^3 \left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2}{9} - \frac{\left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2}{9 x^9}$$
$$+ \frac{2 b c^3 \left(a + b \operatorname{arctanh}\left(c x^3\right)\right) \ln\left(2 - \frac{2}{c x^3 + 1}\right)}{9} - \frac{b^2 c^3 \operatorname{polylog}\left(2, -1 + \frac{2}{c x^3 + 1}\right)}{9}$$

Result(type 8, 18 leaves):

$$\int \frac{\left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2}{x^{10}} dx$$

Problem 39: Unable to integrate problem.

$$\int \frac{\left(a + b \operatorname{arctanh}\left(c x^3\right)\right)^2}{x^2} dx$$

Optimal(type 1, 1 leaves, 47 steps):

$$0$$

Result(type 8, 18 leaves):

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

Problem 40: Unable to integrate problem.

$$\int x^{5} \left(a+b \operatorname{arctanh}\left(c x^{3}\right)\right)^{3} dx$$

Optimal(type 4, 129 leaves, 9 steps):

$$\frac{b \left(a+b \operatorname{arctanh}\left(c x^{3}\right)\right)^{2}}{2 c^{2}}+\frac{b x^{3} \left(a+b \operatorname{arctanh}\left(c x^{3}\right)\right)^{2}}{2 c}-\frac{\left(a+b \operatorname{arctanh}\left(c x^{3}\right)\right)^{3}}{6 c^{2}}+\frac{x^{6} \left(a+b \operatorname{arctanh}\left(c x^{3}\right)\right)^{3}}{6}-\frac{b^{2} \left(a+b \operatorname{arctanh}\left(c x^{3}\right)\right) \ln\left(\frac{2}{-c x^{3}+1}\right)}{c^{2}}$$
$$-\frac{b^{3} \operatorname{polylog}\left(2, 1-\frac{2}{-c x^{3}+1}\right)}{2 c^{2}}$$

Result(type 8, 18 leaves):

$$\int x^{5} \left(a+b \operatorname{arctanh}\left(c x^{3}\right)\right)^{3} dx$$

Problem 41: Unable to integrate problem.

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

Optimal(type 1, 1 leaves, 47 steps):

$$0$$

Result(type 8, 18 leaves):

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

Problem 44: Result more than twice size of optimal antiderivative.

$$\int \frac{a+b \operatorname{arctanh}\left(\frac{c}{x}\right)}{x} \, dx$$

Optimal(type 4, 26 leaves, 2 steps):

$$a \ln(x)+\frac{b \operatorname{polylog}\left(2, -\frac{c}{x}\right)}{2}-\frac{b \operatorname{polylog}\left(2, \frac{c}{x}\right)}{2}$$

Result(type 4, 62 leaves):

$$-a \ln\left(\frac{c}{x}\right) - b \ln\left(\frac{c}{x}\right) \operatorname{arctanh}\left(\frac{c}{x}\right) + \frac{b \operatorname{dilog}\left(1 + \frac{c}{x}\right)}{2} + \frac{b \ln\left(\frac{c}{x}\right) \ln\left(1 + \frac{c}{x}\right)}{2} + \frac{b \operatorname{dilog}\left(\frac{c}{x}\right)}{2}$$

Problem 46: Result more than twice size of optimal antiderivative.

$$\int x^3 \left(a + b \operatorname{arctanh}\left(\frac{c}{x}\right)\right)^2 dx$$

Optimal(type 3, 109 leaves, 14 steps):

$$\frac{b^2 c^2 x^2}{12} + \frac{b c^3 x \left(a + b \operatorname{arccoth}\left(\frac{x}{c}\right)\right)}{2} + \frac{b c x^3 \left(a + b \operatorname{arccoth}\left(\frac{x}{c}\right)\right)}{6} - \frac{c^4 \left(a + b \operatorname{arccoth}\left(\frac{x}{c}\right)\right)^2}{4} + \frac{x^4 \left(a + b \operatorname{arccoth}\left(\frac{x}{c}\right)\right)^2}{4} + \frac{b^2 c^4 \ln\left(1 - \frac{c^2}{x^2}\right)}{3} + \frac{2 b^2 c^4 \ln(x)}{3}$$

Result(type 3, 327 leaves):

$$\frac{x^4 a^2}{4} + \frac{b^2 x^4 \operatorname{arctanh}\left(\frac{c}{x}\right)^2}{4} + \frac{c b^2 \operatorname{arctanh}\left(\frac{c}{x}\right) x^3}{6} + \frac{c^3 b^2 \operatorname{arctanh}\left(\frac{c}{x}\right) x}{2} - \frac{c^4 b^2 \operatorname{arctanh}\left(\frac{c}{x}\right) \ln\left(1 + \frac{c}{x}\right)}{4} + \frac{c^4 b^2 \operatorname{arctanh}\left(\frac{c}{x}\right) \ln\left(\frac{c}{x} - 1\right)}{4} + \frac{b^2 c^2 x^2}{12} - \frac{2 c^4 b^2 \ln\left(\frac{c}{x}\right)}{3} + \frac{c^4 b^2 \ln\left(1 + \frac{c}{x}\right)}{3} + \frac{c^4 b^2 \ln\left(\frac{c}{x} - 1\right)}{3} + \frac{c^4 b^2 \ln\left(\frac{c}{x} - 1\right)^2}{16} - \frac{c^4 b^2 \ln\left(\frac{c}{x} - 1\right) \ln\left(\frac{c}{2x} + \frac{1}{2}\right)}{8} + \frac{c^4 b^2 \ln\left(1 + \frac{c}{x}\right)^2}{16} - \frac{c^4 b^2 \ln\left(-\frac{c}{2x} + \frac{1}{2}\right) \ln\left(1 + \frac{c}{x}\right)}{8} + \frac{c^4 b^2 \ln\left(-\frac{c}{2x} + \frac{1}{2}\right) \ln\left(\frac{c}{2x} + \frac{1}{2}\right)}{8} + \frac{a b x^4 \operatorname{arctanh}\left(\frac{c}{x}\right)}{2} + \frac{a b c x^3}{6} + \frac{c^3 a b x}{2} - \frac{c^4 a b \ln\left(1 + \frac{c}{x}\right)}{4} + \frac{c^4 a b \ln\left(\frac{c}{x} - 1\right)}{4}$$

Problem 47: Result more than twice size of optimal antiderivative.

$$\int x \left(a + b \operatorname{arctanh}\left(\frac{c}{x}\right)\right)^3 dx$$

Optimal(type 4, 125 leaves, 8 steps):

$$-\frac{3 b c^2 \left(a + b \operatorname{arccoth}\left(\frac{x}{c}\right)\right)^2}{2} + \frac{3 b c x \left(a + b \operatorname{arccoth}\left(\frac{x}{c}\right)\right)^2}{2} - \frac{c^2 \left(a + b \operatorname{arccoth}\left(\frac{x}{c}\right)\right)^3}{2} + \frac{x^2 \left(a + b \operatorname{arccoth}\left(\frac{x}{c}\right)\right)^3}{2} - 3 b^2 c^2 \left(a\right.$$

$$+ b\,\mathrm{arccoth}\left(\frac{x}{c}\right)\Big) \ln\left(2 - \frac{2}{1+\frac{c}{x}}\right) + \frac{3 b^3 c^2 \,\mathrm{polylog}\left(2, -1 + \frac{2}{1+\frac{c}{x}}\right)}{2}$$

Result(type ?, 5589 leaves): Display of huge result suppressed!

Problem 48: Result more than twice size of optimal antiderivative.

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

Optimal(type 4, 196 leaves, 9 steps):

$$2\left(a + b\,\mathrm{arccoth}\left(\frac{x}{c}\right)\right)^3 \mathrm{arctanh}\left(-1 + \frac{2}{1-\frac{c}{x}}\right) + \frac{3 b \left(a + b\,\mathrm{arccoth}\left(\frac{x}{c}\right)\right)^2 \mathrm{polylog}\left(2, 1 - \frac{2}{1-\frac{c}{x}}\right)}{2}$$
$$- \frac{3 b \left(a + b\,\mathrm{arccoth}\left(\frac{x}{c}\right)\right)^2 \mathrm{polylog}\left(2, -1 + \frac{2}{1-\frac{c}{x}}\right)}{2} - \frac{3 b^2 \left(a + b\,\mathrm{arccoth}\left(\frac{x}{c}\right)\right) \mathrm{polylog}\left(3, 1 - \frac{2}{1-\frac{c}{x}}\right)}{2}$$
$$+ \frac{3 b^2 \left(a + b\,\mathrm{arccoth}\left(\frac{x}{c}\right)\right) \mathrm{polylog}\left(3, -1 + \frac{2}{1-\frac{c}{x}}\right)}{2} + \frac{3 b^3 \,\mathrm{polylog}\left(4, 1 - \frac{2}{1-\frac{c}{x}}\right)}{4} - \frac{3 b^3 \,\mathrm{polylog}\left(4, -1 + \frac{2}{1-\frac{c}{x}}\right)}{4}$$

Result(type 4, 1630 leaves):

$$-b^3 \ln\left(\frac{c}{x}\right) \mathrm{arctanh}\left(\frac{c}{x}\right)^3 + b^3 \mathrm{arctanh}\left(\frac{c}{x}\right)^3 \ln\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}} - 1\right) + \frac{3 b^3 \mathrm{arctanh}\left(\frac{c}{x}\right)^2 \mathrm{polylog}\left(2, -\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}\right)}{2}$$
$$- \frac{3 b^3 \mathrm{arctanh}\left(\frac{c}{x}\right) \mathrm{polylog}\left(3, -\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}\right)}{2} - b^3 \mathrm{arctanh}\left(\frac{c}{x}\right)^3 \ln\left(1 + \frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right) - 3 b^3 \mathrm{arctanh}\left(\frac{c}{x}\right)^2 \mathrm{polylog}\left(2, -\frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right)$$

$$+ 6 b^3 \operatorname{arctanh}\left(\frac{c}{x}\right) \operatorname{polylog}\left(3, -\frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right) - b^3 \operatorname{arctanh}\left(\frac{c}{x}\right)^3 \ln\left(1 - \frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right) - 3 b^3 \operatorname{arctanh}\left(\frac{c}{x}\right)^2 \operatorname{polylog}\left(2, \frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right)$$

$$+ 6 b^3 \operatorname{arctanh}\left(\frac{c}{x}\right) \operatorname{polylog}\left(3, \frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right) - \frac{3 a b^2 \operatorname{polylog}\left(3, -\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}\right)}{2} + 6 a b^2 \operatorname{polylog}\left(3, -\frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right) + 6 a b^2 \operatorname{polylog}\left(3, \frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right)$$

$$+ \frac{3 a^2 b \operatorname{dilog}\left(1+\frac{c}{x}\right)}{2} + \frac{3 a^2 b \operatorname{dilog}\left(\frac{c}{x}\right)}{2} - 3 a b^2 \ln\left(\frac{c}{x}\right) \operatorname{arctanh}\left(\frac{c}{x}\right)^2 + 3 a b^2 \operatorname{arctanh}\left(\frac{c}{x}\right) \operatorname{polylog}\left(2, -\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}\right)$$

$$+ 3 a b^2 \operatorname{arctanh}\left(\frac{c}{x}\right)^2 \ln\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}} - 1\right) - 3 a b^2 \operatorname{arctanh}\left(\frac{c}{x}\right)^2 \ln\left(1 + \frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right) - 6 a b^2 \operatorname{arctanh}\left(\frac{c}{x}\right) \operatorname{polylog}\left(2, -\frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right)$$

$$- 3 a b^2 \operatorname{arctanh}\left(\frac{c}{x}\right)^2 \ln\left(1 - \frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right) - 6 a b^2 \operatorname{arctanh}\left(\frac{c}{x}\right) \operatorname{polylog}\left(2, \frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right) - 3 a^2 b \ln\left(\frac{c}{x}\right) \operatorname{arctanh}\left(\frac{c}{x}\right) + \frac{3 a^2 b \ln\left(\frac{c}{x}\right) \ln\left(1+\frac{c}{x}\right)}{2}$$

$$- \frac{I b^3 \pi \operatorname{csgn}\left(\frac{I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}} - 1\right)}{1 + \frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right)^3 \operatorname{arctanh}\left(\frac{c}{x}\right)^3}{2}$$

$$-\frac{I b^3 \pi \operatorname{csgn}\left(I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)\right) \operatorname{csgn}\left(\frac{I}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right) \operatorname{arctanh}\left(\frac{c}{x}\right)^3}{2}$$

$$+\frac{3 I a b^2 \pi \operatorname{csgn}\left(I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)\right) \operatorname{csgn}\left(\frac{I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right)^2 \operatorname{arctanh}\left(\frac{c}{x}\right)^2}{2}$$

$$+\frac{3 I a b^2 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right)^2 \operatorname{arctanh}\left(\frac{c}{x}\right)^2}{2}+\frac{3 b^3 \operatorname{polylog}\left(4,-\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}\right)}{4}-6 b^3 \operatorname{polylog}\left(4,-\frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right)$$

$$-6 b^3 \operatorname{polylog}\left(4,\frac{1+\frac{c}{x}}{\sqrt{1-\frac{c^2}{x^2}}}\right)-a^3 \ln\left(\frac{c}{x}\right)$$

$$-\frac{3 I a b^2 \pi \operatorname{csgn}\left(I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)\right) \operatorname{csgn}\left(\frac{I}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right) \operatorname{arctanh}\left(\frac{c}{x}\right)^2}{2}$$

$$+\frac{I b^3 \pi \operatorname{csgn}\left(I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)\right) \operatorname{csgn}\left(\frac{I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right)^2 \operatorname{arctanh}\left(\frac{c}{x}\right)^3}{2}$$

$$+\frac{I b^3 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right)^2 \operatorname{arctanh}\left(\frac{c}{x}\right)^3}{2}-\frac{3 I a b^2 \pi \operatorname{csgn}\left(\frac{I\left(\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}-1\right)}{1+\frac{\left(1+\frac{c}{x}\right)^2}{1-\frac{c^2}{x^2}}}\right)^3 \operatorname{arctanh}\left(\frac{c}{x}\right)^2}{2}$$

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Problem 49: Attempted integration timed out after 120 seconds.
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$$\int \frac{\left(a+b \operatorname{arctanh}\left(\frac{c}{x^2}\right)\right)^2}{x^5} \, dx$$

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Optimal(type 3, 87 leaves, 7 steps):
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$$-\frac{a b}{2 c x^2}-\frac{b^2 \operatorname{arccoth}\left(\frac{x^2}{c}\right)}{2 c x^2}+\frac{\left(a+b \operatorname{arccoth}\left(\frac{x^2}{c}\right)\right)^2}{4 c^2}-\frac{\left(a+b \operatorname{arccoth}\left(\frac{x^2}{c}\right)\right)^2}{4 x^4}-\frac{b^2 \ln\left(1-\frac{c^2}{x^4}\right)}{4 c^2}$$

Result(type 1, 1 leaves):???

Problem 50: Unable to integrate problem.

$$\int x^2 \left(a + b \operatorname{arctanh}\left(\frac{c}{x^2}\right)\right)^2 dx$$

Optimal(type 4, 895 leaves, 80 steps):

$$\frac{I b^2 c^{3/2} \operatorname{polylog}\left(2, -1 + \frac{2\sqrt{c}}{-I x + \sqrt{c}}\right)}{3} + \frac{I b^2 c^{3/2} \operatorname{polylog}\left(2, 1 - \frac{(1+I)\left(-x + \sqrt{c}\right)}{-I x + \sqrt{c}}\right)}{6} + \frac{2 b^2 c x \ln\left(1 + \frac{c}{x^2}\right)}{3} + \frac{a b x^3 \ln\left(1 + \frac{c}{x^2}\right)}{3}$$
$$- \frac{b^2 c^{3/2} \arctan\left(\frac{x}{\sqrt{c}}\right) \ln\left(1 + \frac{c}{x^2}\right)}{3} - \frac{b^2 c^{3/2} \operatorname{arctanh}\left(\frac{x}{\sqrt{c}}\right) \ln\left(1 + \frac{c}{x^2}\right)}{3} - \frac{b^2 x^3 \ln\left(1 - \frac{c}{x^2}\right) \ln\left(1 + \frac{c}{x^2}\right)}{6}$$
$$+ \frac{2 b^2 c^{3/2} \arctan\left(\frac{x}{\sqrt{c}}\right) \ln\left(\frac{2\sqrt{c}}{-I x + \sqrt{c}}\right)}{3} - \frac{b^2 c^{3/2} \arctan\left(\frac{x}{\sqrt{c}}\right) \ln\left(\frac{(1+I)\left(-x + \sqrt{c}\right)}{-I x + \sqrt{c}}\right)}{3} - \frac{2 b^2 c^{3/2} \operatorname{arctanh}\left(\frac{x}{\sqrt{c}}\right) \ln\left(\frac{2\sqrt{c}}{x + \sqrt{c}}\right)}{3}$$
$$+ \frac{b^2 c^{3/2} \operatorname{arctanh}\left(\frac{x}{\sqrt{c}}\right) \ln\left(\frac{2\left(-x + \sqrt{-c}\right)\sqrt{c}}{\left(\sqrt{-c} - \sqrt{c}\right)\left(x + \sqrt{c}\right)}\right)}{3} - \frac{b^2 c^{3/2} \arctan\left(\frac{x}{\sqrt{c}}\right) \ln\left(\frac{(1-I)\left(x + \sqrt{c}\right)}{-I x + \sqrt{c}}\right)}{3}$$
$$+ \frac{b^2 c^{3/2} \operatorname{arctanh}\left(\frac{x}{\sqrt{c}}\right) \ln\left(\frac{2\left(x + \sqrt{-c}\right)\sqrt{c}}{\left(x + \sqrt{c}\right)\left(\sqrt{-c} + \sqrt{c}\right)}\right)}{3} - \frac{2 b^2 c^{3/2} \arctan\left(\frac{x}{\sqrt{c}}\right) \ln\left(2 - \frac{2\sqrt{c}}{-I x + \sqrt{c}}\right)}{3}$$
$$+ \frac{2 b^2 c^{3/2} \operatorname{arctanh}\left(\frac{x}{\sqrt{c}}\right) \ln\left(2 - \frac{2\sqrt{c}}{x + \sqrt{c}}\right)}{3} - \frac{I b^2 c^{3/2} \operatorname{polylog}\left(2, \frac{I x}{\sqrt{c}}\right)}{3} - \frac{I b^2 c^{3/2} \operatorname{polylog}\left(2, 1 - \frac{2\sqrt{c}}{-I x + \sqrt{c}}\right)}{3} - \frac{2 a b c^{3/2} \arctan\left(\frac{x}{\sqrt{c}}\right)}{3}$$
$$- \frac{2 b^2 c x \ln\left(1 - \frac{c}{x^2}\right)}{3} + \frac{b^2 c^{3/2} \arctan\left(\frac{x}{\sqrt{c}}\right) \ln\left(1 - \frac{c}{x^2}\right)}{3} - \frac{b c^{3/2} \operatorname{arctanh}\left(\frac{x}{\sqrt{c}}\right)\left(2a - b\ln\left(1 - \frac{c}{x^2}\right)\right)}{3} + \frac{4 b^2 c^{3/2} \arctan\left(\frac{x}{\sqrt{c}}\right)}{3}$$
$$- \frac{4 b^2 c^{3/2} \operatorname{arctanh}\left(\frac{x}{\sqrt{c}}\right)}{3} + \frac{b^2 c^{3/2} \operatorname{arctanh}\left(\frac{x}{\sqrt{c}}\right)^2}{3} + \frac{b^2 x^3 \ln\left(1 + \frac{c}{x^2}\right)^2}{12} + \frac{b^2 c^{3/2} \operatorname{polylog}\left(2, -\frac{x}{\sqrt{c}}\right)}{3} - \frac{b^2 c^{3/2} \operatorname{polylog}\left(2, \frac{x}{\sqrt{c}}\right)}{3}$$
$$+ \frac{b^2 c^{3/2} \operatorname{polylog}\left(2, 1 - \frac{2\sqrt{c}}{x + \sqrt{c}}\right)}{3} - \frac{b^2 c^{3/2} \operatorname{polylog}\left(2, -1 + \frac{2\sqrt{c}}{x + \sqrt{c}}\right)}{3} - \frac{b^2 c^{3/2} \operatorname{polylog}\left(2, 1 - \frac{2\left(-x + \sqrt{-c}\right)\sqrt{c}}{\left(\sqrt{-c} - \sqrt{c}\right)\left(x + \sqrt{c}\right)}\right)}{6}$$
$$- \frac{b^2 c^{3/2} \operatorname{polylog}\left(2, 1 - \frac{2\left(x + \sqrt{-c}\right)\sqrt{c}}{\left(x + \sqrt{c}\right)\left(\sqrt{-c} + \sqrt{c}\right)}\right)}{6} + \frac{x^3 \left(2a - b\ln\left(1 - \frac{c}{x^2}\right)\right)^2}{12} + \frac{I b^2 c^{3/2} \operatorname{polylog}\left(2, 1 + \frac{(-1+I)\left(x + \sqrt{c}\right)}{-I x + \sqrt{c}}\right)}{6}$$

$$+\frac{I b^2 c^{3/2} \arctan\left(\frac{x}{\sqrt{c}}\right)^2}{3}+\frac{I b^2 c^{3/2} \operatorname{polylog}\left(2, \frac{-I x}{\sqrt{c}}\right)}{3}+\frac{4 a b c x}{3}$$

Result(type 8, 18 leaves):

$$\int x^2 \left(a+b \operatorname{arctanh}\left(\frac{c}{x^2}\right)\right)^2 dx$$

Problem 51: Unable to integrate problem.

$$\int (d x)^m \left(a+b \operatorname{arctanh}\left(\frac{c}{x^2}\right)\right) dx$$

Optimal(type 5, 69 leaves, 3 steps):

$$\frac{(d x)^{1+m} \left(a+b \operatorname{arctanh}\left(\frac{c}{x^2}\right)\right)}{d (1+m)}-\frac{2 b c d (d x)^{-1+m} \operatorname{hypergeom}\left(\left[1, \frac{1}{4}-\frac{m}{4}\right], \left[\frac{5}{4}-\frac{m}{4}\right], \frac{c^2}{x^4}\right)}{-m^2+1}$$

Result(type 8, 18 leaves):

$$\int (d x)^m \left(a+b \operatorname{arctanh}\left(\frac{c}{x^2}\right)\right) dx$$

Problem 55: Result more than twice size of optimal antiderivative.

$$\int x^3 \left(a+b \operatorname{arctanh}(c \sqrt{x})\right)^2 dx$$

Optimal(type 3, 167 leaves, 22 steps):

$$\frac{71 b^2 x}{420 c^6}+\frac{3 b^2 x^2}{70 c^4}+\frac{b^2 x^3}{84 c^2}+\frac{b x^{3/2} \left(a+b \operatorname{arctanh}(c \sqrt{x})\right)}{6 c^5}+\frac{b x^{5/2} \left(a+b \operatorname{arctanh}(c \sqrt{x})\right)}{10 c^3}+\frac{b x^{7/2} \left(a+b \operatorname{arctanh}(c \sqrt{x})\right)}{14 c}$$
$$-\frac{\left(a+b \operatorname{arctanh}(c \sqrt{x})\right)^2}{4 c^8}+\frac{x^4 \left(a+b \operatorname{arctanh}(c \sqrt{x})\right)^2}{4}+\frac{44 b^2 \ln(-c^2 x+1)}{105 c^8}+\frac{a b \sqrt{x}}{2 c^7}+\frac{b^2 \operatorname{arctanh}(c \sqrt{x}) \sqrt{x}}{2 c^7}$$

Result(type 3, 395 leaves):

$$\frac{x^4 a^2}{4}+\frac{a b \sqrt{x}}{2 c^7}+\frac{b^2 \operatorname{arctanh}(c \sqrt{x}) \sqrt{x}}{2 c^7}+\frac{71 b^2 x}{420 c^6}+\frac{3 b^2 x^2}{70 c^4}+\frac{b^2 x^3}{84 c^2}+\frac{x^{3/2} a b}{6 c^5}+\frac{b^2 \operatorname{arctanh}(c \sqrt{x}) x^{3/2}}{6 c^5}+\frac{b^2 x^{7/2} \operatorname{arctanh}(c \sqrt{x})}{14 c}$$
$$+\frac{b^2 \operatorname{arctanh}(c \sqrt{x}) x^{5/2}}{10 c^3}+\frac{a b \ln(c \sqrt{x}-1)}{4 c^8}-\frac{a b \ln(1+c \sqrt{x})}{4 c^8}-\frac{b^2 \operatorname{arctanh}(c \sqrt{x}) \ln(1+c \sqrt{x})}{4 c^8}-\frac{b^2 \ln(c \sqrt{x}-1) \ln\left(\frac{c \sqrt{x}}{2}+\frac{1}{2}\right)}{8 c^8}$$
$$-\frac{b^2 \ln\left(-\frac{c \sqrt{x}}{2}+\frac{1}{2}\right) \ln(1+c \sqrt{x})}{8 c^8}+\frac{b^2 \ln\left(-\frac{c \sqrt{x}}{2}+\frac{1}{2}\right) \ln\left(\frac{c \sqrt{x}}{2}+\frac{1}{2}\right)}{8 c^8}+\frac{b^2 \operatorname{arctanh}(c \sqrt{x}) \ln(c \sqrt{x}-1)}{4 c^8}+\frac{a b x^{5/2}}{10 c^3}+\frac{x^{7/2} a b}{14 c}$$

$$+\frac{a b x^4 \operatorname{arctanh}(c\sqrt{x})}{2}+\frac{b^2 x^4 \operatorname{arctanh}(c\sqrt{x})^2}{4}+\frac{44 b^2 \ln(c\sqrt{x}-1)}{105 c^8}+\frac{44 b^2 \ln(1+c\sqrt{x})}{105 c^8}+\frac{b^2 \ln(c\sqrt{x}-1)^2}{16 c^8}+\frac{b^2 \ln(1+c\sqrt{x})^2}{16 c^8}$$

Problem 56: Result more than twice size of optimal antiderivative.

$$\int x\left(a+b \operatorname{arctanh}(c\sqrt{x})\right)^3 dx$$

Optimal(type 4, 194 leaves, 19 steps):

$$-\frac{b^3 \operatorname{arctanh}(c\sqrt{x})}{2 c^4}+\frac{b^2 x\left(a+b \operatorname{arctanh}(c\sqrt{x})\right)}{2 c^2}+\frac{2 b\left(a+b \operatorname{arctanh}(c\sqrt{x})\right)^2}{c^4}+\frac{b x^{3/2}\left(a+b \operatorname{arctanh}(c\sqrt{x})\right)^2}{2 c}-\frac{\left(a+b \operatorname{arctanh}(c\sqrt{x})\right)^3}{2 c^4}$$
$$+\frac{x^2\left(a+b \operatorname{arctanh}(c\sqrt{x})\right)^3}{2}-\frac{4 b^2\left(a+b \operatorname{arctanh}(c\sqrt{x})\right) \ln\left(\frac{2}{1-c\sqrt{x}}\right)}{c^4}-\frac{2 b^3 \operatorname{polylog}\left(2, 1-\frac{2}{1-c\sqrt{x}}\right)}{c^4}+\frac{b^3\sqrt{x}}{2 c^3}$$
$$+\frac{3 b\left(a+b \operatorname{arctanh}(c\sqrt{x})\right)^2\sqrt{x}}{2 c^3}$$

Result(type 4, 1347 leaves):

$$-\frac{3 a b^2 \ln(c\sqrt{x}-1) \ln\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)}{4 c^4}+\frac{3 a b^2 \ln\left(-\frac{c\sqrt{x}}{2}+\frac{1}{2}\right) \ln\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)}{4 c^4}-\frac{3 a b^2 \ln\left(-\frac{c\sqrt{x}}{2}+\frac{1}{2}\right) \ln(1+c\sqrt{x})}{4 c^4}+\frac{3 a b^2 \operatorname{arctanh}(c\sqrt{x})\sqrt{x}}{c^3}$$
$$+\frac{a b^2 x^{3/2} \operatorname{arctanh}(c\sqrt{x})}{c}-\frac{3 I b^3 \pi \operatorname{arctanh}(c\sqrt{x})^2}{4 c^4}+\frac{3 a b^2 \operatorname{arctanh}(c\sqrt{x}) \ln(c\sqrt{x}-1)}{2 c^4}-\frac{3 a b^2 \operatorname{arctanh}(c\sqrt{x}) \ln(1+c\sqrt{x})}{2 c^4}$$
$$-\frac{b^3 \operatorname{arctanh}(c\sqrt{x})^3}{2 c^4}-\frac{4 b^3 \operatorname{dilog}\left(1-\frac{I(1+c\sqrt{x})}{\sqrt{-c^2 x+1}}\right)}{c^4}-\frac{4 b^3 \operatorname{dilog}\left(1+\frac{I(1+c\sqrt{x})}{\sqrt{-c^2 x+1}}\right)}{c^4}+\frac{2 b^3 \operatorname{arctanh}(c\sqrt{x})^2}{c^4}+\frac{b^3 x^2 \operatorname{arctanh}(c\sqrt{x})^3}{2}$$
$$+\frac{b^3\sqrt{x}}{2 c^3}-\frac{b^3 \operatorname{arctanh}(c\sqrt{x})}{2 c^4}-\frac{b^3}{2 c^4}$$
$$-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})^2}{-c^2 x+1}\right) \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})^2}{(-c^2 x+1)\left(1+\frac{(1+c\sqrt{x})^2}{-c^2 x+1}\right)}\right) \operatorname{csgn}\left(\frac{I}{1+\frac{(1+c\sqrt{x})^2}{-c^2 x+1}}\right) \operatorname{arctanh}(c\sqrt{x})^2}{8 c^4}-\frac{3 a^2 b \ln(1+c\sqrt{x})}{4 c^4}$$
$$+\frac{3 a b^2 \ln(c\sqrt{x}-1)^2}{8 c^4}+\frac{2 a b^2 \ln(1+c\sqrt{x})}{c^4}+\frac{a^2 b x^{3/2}}{2 c}+\frac{3 a^2 b\sqrt{x}}{2 c^3}+\frac{3 b^3\sqrt{x} \operatorname{arctanh}(c\sqrt{x})^2}{2 c^3}+\frac{b^3 x^{3/2} \operatorname{arctanh}(c\sqrt{x})^2}{2 c}$$
$$+\frac{b^3 \operatorname{arctanh}(c\sqrt{x})\, x}{2 c^2}+\frac{a b^2 x}{2 c^2}+\frac{3 a^2 b x^2 \operatorname{arctanh}(c\sqrt{x})}{2}+\frac{3 a b^2 x^2 \operatorname{arctanh}(c\sqrt{x})^2}{2}+\frac{2 a b^2 \ln(c\sqrt{x}-1)}{c^4}+\frac{3 a b^2 \ln(1+c\sqrt{x})^2}{8 c^4}$$

$$+\frac{3 a^2 b \ln\left(c\sqrt{x}-1\right)}{4 c^4}-\frac{4 b^3 \operatorname{arctanh}\left(c\sqrt{x}\right) \ln\left(1-\frac{I\left(1+c\sqrt{x}\right)}{\sqrt{-c^2 x+1}}\right)}{c^4}-\frac{4 b^3 \operatorname{arctanh}\left(c\sqrt{x}\right) \ln\left(1+\frac{I\left(1+c\sqrt{x}\right)}{\sqrt{-c^2 x+1}}\right)}{c^4}$$

$$+\frac{3 b^3 \operatorname{arctanh}\left(c\sqrt{x}\right)^2 \ln\left(\frac{1+c\sqrt{x}}{\sqrt{-c^2 x+1}}\right)}{2 c^4}-\frac{3 b^3 \operatorname{arctanh}\left(c\sqrt{x}\right)^2 \ln\left(1+c\sqrt{x}\right)}{4 c^4}+\frac{3 b^3 \operatorname{arctanh}\left(c\sqrt{x}\right)^2 \ln\left(c\sqrt{x}-1\right)}{4 c^4}+\frac{a^3 x^2}{2}$$

$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)^2}{\left(-c^2 x+1\right)\left(1+\frac{\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}\right)}\right)^2 \operatorname{csgn}\left(\frac{I}{1+\frac{\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}}\right) \operatorname{arctanh}\left(c\sqrt{x}\right)^2}{8 c^4}$$

$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)}{\sqrt{-c^2 x+1}}\right) \operatorname{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}\right)^2 \operatorname{arctanh}\left(c\sqrt{x}\right)^2}{4 c^4}-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)}{\sqrt{-c^2 x+1}}\right)^2 \operatorname{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}\right) \operatorname{arctanh}\left(c\sqrt{x}\right)^2}{8 c^4}$$

$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}\right) \operatorname{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)^2}{\left(-c^2 x+1\right)\left(1+\frac{\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}\right)}\right)^2 \operatorname{arctanh}\left(c\sqrt{x}\right)^2}{8 c^4}$$

$$-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)^2}{\left(-c^2 x+1\right)\left(1+\frac{\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}\right)}\right)^3 \operatorname{arctanh}\left(c\sqrt{x}\right)^2}{8 c^4}-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}}\right)^3 \operatorname{arctanh}\left(c\sqrt{x}\right)^2}{4 c^4}$$

$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}}\right)^2 \operatorname{arctanh}\left(c\sqrt{x}\right)^2}{4 c^4}-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)^2}{-c^2 x+1}\right)^3 \operatorname{arctanh}\left(c\sqrt{x}\right)^2}{8 c^4}$$

Problem 57: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b \operatorname{arctanh}\left(c\sqrt{x}\right)\right)^3}{x^2}\, dx$$

Optimal(type 4, 126 leaves, 8 steps):

$$3\,b\,c^2\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^2+c^2\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^3-\frac{\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^3}{x}+6\,b^2c^2\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)\ln\left(2-\frac{2}{1+c\sqrt{x}}\right)$$
$$-3\,b^3c^2\,\mathrm{polylog}\left(2,-1+\frac{2}{1+c\sqrt{x}}\right)-\frac{3\,b\,c\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^2}{\sqrt{x}}$$

Result(type ?, 5252 leaves): Display of huge result suppressed!

Problem 58: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^3}{x^3}\,dx$$

Optimal(type 4, 194 leaves, 17 steps):

$$\frac{b^3c^4\,\mathrm{arctanh}\left(c\sqrt{x}\right)}{2}-\frac{b^2c^2\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)}{2\,x}+2\,b\,c^4\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^2-\frac{b\,c\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^2}{2\,x^{3/2}}+\frac{c^4\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^3}{2}$$
$$-\frac{\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^3}{2\,x^2}+4\,b^2c^4\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)\ln\left(2-\frac{2}{1+c\sqrt{x}}\right)-2\,b^3c^4\,\mathrm{polylog}\left(2,-1+\frac{2}{1+c\sqrt{x}}\right)-\frac{b^3c^3}{2\sqrt{x}}$$
$$-\frac{3\,b\,c^3\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^2}{2\sqrt{x}}$$

Result(type 4, 1373 leaves):

$$\frac{b^3c^4\,\mathrm{arctanh}\left(c\sqrt{x}\right)}{2}-\frac{a^3}{2\,x^2}-\frac{b^3\,\mathrm{arctanh}\left(c\sqrt{x}\right)^3}{2\,x^2}+\frac{c^4b^3\,\mathrm{arctanh}\left(c\sqrt{x}\right)^3}{2}-2\,c^4b^3\,\mathrm{arctanh}\left(c\sqrt{x}\right)^2+4\,c^4b^3\,\mathrm{dilog}\left(1+\frac{1+c\sqrt{x}}{\sqrt{-c^2x+1}}\right)$$
$$-4\,c^4b^3\,\mathrm{dilog}\left(\frac{1+c\sqrt{x}}{\sqrt{-c^2x+1}}\right)$$
$$+\frac{3\,I\,c^4b^3\,\pi\,\mathrm{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)^2}{-c^2x+1}\right)\mathrm{csgn}\left(\frac{I\left(1+c\sqrt{x}\right)^2}{\left(-c^2x+1\right)\left(1+\frac{\left(1+c\sqrt{x}\right)^2}{-c^2x+1}\right)}\right)\mathrm{csgn}\left(\frac{I}{1+\frac{\left(1+c\sqrt{x}\right)^2}{-c^2x+1}}\right)\mathrm{arctanh}\left(c\sqrt{x}\right)^2}{8}+\frac{3\,c^4a^2b\ln\left(1+c\sqrt{x}\right)}{4}$$
$$-\frac{3\,c^4a\,b^2\ln\left(c\sqrt{x}-1\right)^2}{8}-2\,c^4a\,b^2\ln\left(1+c\sqrt{x}\right)-\frac{3\,c^3b^3\,\mathrm{arctanh}\left(c\sqrt{x}\right)^2}{2\sqrt{x}}-\frac{3\,c^3a^2b}{2\sqrt{x}}-\frac{c^4b^3\sqrt{-c^2x+1}}{2\left(-\sqrt{-c^2x+1}+c\sqrt{x}+1\right)}$$
$$+\frac{c^4b^3\sqrt{-c^2x+1}}{2\left(\sqrt{-c^2x+1}+c\sqrt{x}+1\right)}-\frac{c\,a^2b}{2\,x^{3/2}}-\frac{c\,b^3\,\mathrm{arctanh}\left(c\sqrt{x}\right)^2}{2\,x^{3/2}}-\frac{c^2b^3\,\mathrm{arctanh}\left(c\sqrt{x}\right)}{2\,x}-\frac{3\,a^2b\,\mathrm{arctanh}\left(c\sqrt{x}\right)}{2\,x^2}-\frac{3\,a\,b^2\,\mathrm{arctanh}\left(c\sqrt{x}\right)^2}{2\,x^2}-\frac{c^2a\,b^2}{2\,x}$$
$$+4\,c^4b^3\,\mathrm{arctanh}\left(c\sqrt{x}\right)\ln\left(1+\frac{1+c\sqrt{x}}{\sqrt{-c^2x+1}}\right)+4\,c^4a\,b^2\ln\left(c\sqrt{x}\right)-2\,c^4a\,b^2\ln\left(c\sqrt{x}-1\right)-\frac{3\,c^4a\,b^2\ln\left(1+c\sqrt{x}\right)^2}{8}-\frac{3\,c^4a^2b\ln\left(c\sqrt{x}-1\right)}{4}$$

$$- \frac{3 c^4 b^3 \operatorname{arctanh}(c\sqrt{x})^2 \ln\left(\frac{1+c\sqrt{x}}{\sqrt{-c^2 x+1}}\right)}{2} + \frac{3 c^4 b^3 \operatorname{arctanh}(c\sqrt{x})^2 \ln(1+c\sqrt{x})}{4} - \frac{3 c^4 b^3 \operatorname{arctanh}(c\sqrt{x})^2 \ln(c\sqrt{x}-1)}{4}$$

$$- \frac{3 I c^4 b^3 \pi \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})^2}{(-c^2 x+1)\left(1+\frac{(1+c\sqrt{x})^2}{-c^2 x+1}\right)}\right)^2 \operatorname{csgn}\left(\frac{I}{1+\frac{(1+c\sqrt{x})^2}{-c^2 x+1}}\right) \operatorname{arctanh}(c\sqrt{x})^2}{8}$$

$$- \frac{3 I c^4 b^3 \pi \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})}{\sqrt{-c^2 x+1}}\right) \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})^2}{-c^2 x+1}\right)^2 \operatorname{arctanh}(c\sqrt{x})^2}{4} - \frac{3 c^3 a b^2 \operatorname{arctanh}(c\sqrt{x})}{\sqrt{x}} + \frac{3 c^4 a b^2 \operatorname{arctanh}(c\sqrt{x}) \ln(1+c\sqrt{x})}{2}$$

$$- \frac{3 c^4 a b^2 \operatorname{arctanh}(c\sqrt{x}) \ln(c\sqrt{x}-1)}{2} + \frac{3 c^4 a b^2 \ln(c\sqrt{x}-1) \ln\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)}{4} - \frac{3 c^4 a b^2 \ln\left(-\frac{c\sqrt{x}}{2}+\frac{1}{2}\right) \ln\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)}{4}$$

$$+ \frac{3 c^4 a b^2 \ln\left(-\frac{c\sqrt{x}}{2}+\frac{1}{2}\right) \ln(1+c\sqrt{x})}{4} - \frac{c a b^2 \operatorname{arctanh}(c\sqrt{x})}{x^{3/2}} + \frac{3 I c^4 b^3 \pi \operatorname{arctanh}(c\sqrt{x})^2}{4}$$

$$+ \frac{3 I c^4 b^3 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(1+c\sqrt{x})^2}{-c^2 x+1}}\right)^3 \operatorname{arctanh}(c\sqrt{x})^2}{4} - \frac{3 I c^4 b^3 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(1+c\sqrt{x})^2}{-c^2 x+1}}\right)^2 \operatorname{arctanh}(c\sqrt{x})^2}{4}$$

$$+ \frac{3 I c^4 b^3 \pi \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})^2}{-c^2 x+1}\right)^3 \operatorname{arctanh}(c\sqrt{x})^2}{8} + \frac{3 I c^4 b^3 \pi \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})^2}{(-c^2 x+1)\left(1+\frac{(1+c\sqrt{x})^2}{-c^2 x+1}\right)}\right)^3 \operatorname{arctanh}(c\sqrt{x})^2}{8}$$

$$+ \frac{3 I c^4 b^3 \pi \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})}{\sqrt{-c^2 x+1}}\right)^2 \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})^2}{-c^2 x+1}\right) \operatorname{arctanh}(c\sqrt{x})^2}{8}$$

$$- \frac{3 I c^4 b^3 \pi \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})^2}{-c^2 x+1}\right) \operatorname{csgn}\left(\frac{I(1+c\sqrt{x})^2}{(-c^2 x+1)\left(1+\frac{(1+c\sqrt{x})^2}{-c^2 x+1}\right)}\right)^2 \operatorname{arctanh}(c\sqrt{x})^2}{8}$$

Problem 61: Result more than twice size of optimal antiderivative.

$$\int \frac{a+b\,\text{arctanh}(c x^{3/2})}{x}\,dx$$

Optimal(type 4, 26 leaves, 2 steps):

$$a\ln(x)-\frac{b\,\text{polylog}(2,-c x^{3/2})}{3}+\frac{b\,\text{polylog}(2,c x^{3/2})}{3}$$

Result(type 4, 62 leaves):

$$\frac{2a\ln(c x^{3/2})}{3}+\frac{2b\ln(c x^{3/2})\,\text{arctanh}(c x^{3/2})}{3}-\frac{b\,\text{dilog}(1+c x^{3/2})}{3}-\frac{b\ln(c x^{3/2})\ln(1+c x^{3/2})}{3}-\frac{b\,\text{dilog}(c x^{3/2})}{3}$$

Problem 64: Unable to integrate problem.

$$\int \text{arctanh}(c x^{3/2})^2\,dx$$

Optimal(type 4, 2622 leaves, 200 steps):

$$-\frac{(-1)^{2/3}\ln\left(\frac{(-1)^{2/3}(1+c^{1/3}\sqrt{x})}{1+(-1)^{2/3}}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}-\frac{(-1)^{2/3}\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{1}{2}+\frac{(-1)^{2/3}c^{1/3}\sqrt{x}}{2}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{2/3}\ln(1-c x^{3/2})\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}-\frac{(-1)^{2/3}\ln(1+c x^{3/2})\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{2/3}\ln\left(\frac{(-1)^{2/3}(1-c^{1/3}\sqrt{x})}{1+(-1)^{2/3}}\right)\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}+\frac{(-1)^{2/3}\ln\left(-\frac{(-1)^{2/3}(1+c^{1/3}\sqrt{x})}{1-(-1)^{2/3}}\right)\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{2/3}\ln\left(-(-1)^{2/3}+c^{1/3}\sqrt{x}\right)\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}-\frac{(-1)^{2/3}\ln\left(\frac{1}{2}-\frac{(-1)^{2/3}c^{1/3}\sqrt{x}}{2}\right)\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{2/3}\ln\left(\frac{(-1)^{1/3}-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{2/3}\ln\left(\frac{(-1)^{1/3}-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)\ln\left(\frac{1+(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{1/3}\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)\ln\left(-\frac{(-1)^{2/3}(1+(-1)^{2/3}c^{1/3}\sqrt{x})}{1-(-1)^{2/3}}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{2/3}\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{1/3}+(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{2/3}\ln\left(\frac{1-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)\ln\left(\frac{(-1)^{1/3}+(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}}-\frac{(-1)^{1/3}\ln(1-cx^{3/2})\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{1/3}\ln(1+cx^{3/2})\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}+\frac{(-1)^{1/3}\ln\left(-\frac{(-1)^{1/3}\left(1-c^{1/3}\sqrt{x}\right)}{1-(-1)^{1/3}}\right)\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{1/3}\ln\left(\frac{(-1)^{1/3}\left(1+c^{1/3}\sqrt{x}\right)}{1+(-1)^{1/3}}\right)\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}+\frac{(-1)^{1/3}\ln\left((-1)^{1/3}+c^{1/3}\sqrt{x}\right)\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{1/3}\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{1}{2}+\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)}{2c^{2/3}}+\frac{(-1)^{1/3}\ln(1-cx^{3/2})\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{1/3}\ln(1+cx^{3/2})\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}-\frac{(-1)^{1/3}\ln\left(\frac{(-1)^{1/3}\left(1-c^{1/3}\sqrt{x}\right)}{1+(-1)^{1/3}}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{1/3}\ln\left((-1)^{1/3}-c^{1/3}\sqrt{x}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}+\frac{(-1)^{1/3}\ln\left(-\frac{(-1)^{1/3}\left(1+c^{1/3}\sqrt{x}\right)}{1-(-1)^{1/3}}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{1/3}\ln\left(-\frac{(-1)^{1/3}\left((-1)^{1/3}+c^{1/3}\sqrt{x}\right)}{1-(-1)^{2/3}}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{1/3}\ln\left(\frac{1}{2}-\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}-\frac{(-1)^{2/3}\ln(1-cx^{3/2})\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{2/3}\ln(1+cx^{3/2})\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}+\frac{(-1)^{2/3}\ln\left(-\frac{(-1)^{2/3}\left(1-c^{1/3}\sqrt{x}\right)}{1-(-1)^{2/3}}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{2/3}\ln\left(-(-1)^{2/3}-c^{1/3}\sqrt{x}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2c^{2/3}}+\frac{(-1)^{1/3}\operatorname{polylog}\left(2,\frac{1}{2}-\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{1/3}\operatorname{polylog}\left(2, \frac{1-(-1)^{1/3}c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2c^{2/3}} - \frac{(-1)^{1/3}\operatorname{polylog}\left(2, \frac{1-(-1)^{1/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{1/3}\operatorname{polylog}\left(2, \frac{1-(-1)^{1/3}c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2c^{2/3}} + \frac{(-1)^{1/3}\operatorname{polylog}\left(2, \frac{1}{2}+\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{1/3}\operatorname{polylog}\left(2, \frac{1+(-1)^{1/3}c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2c^{2/3}} - \frac{(-1)^{1/3}\operatorname{polylog}\left(2, \frac{1+(-1)^{1/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{1/3}\operatorname{polylog}\left(2, \frac{1+(-1)^{1/3}c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2c^{2/3}} - \frac{(-1)^{2/3}\operatorname{polylog}\left(2, \frac{1}{2}-\frac{(-1)^{2/3}c^{1/3}\sqrt{x}}{2}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{2/3}\operatorname{polylog}\left(2, \frac{1-(-1)^{2/3}c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2c^{2/3}} - \frac{(-1)^{2/3}\operatorname{polylog}\left(2, \frac{1-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{2/3}\operatorname{polylog}\left(2, \frac{(-1)^{1/3}-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}} - \frac{(-1)^{2/3}\operatorname{polylog}\left(2, \frac{1}{2}+\frac{(-1)^{2/3}c^{1/3}\sqrt{x}}{2}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{2/3}\operatorname{polylog}\left(2, \frac{1+(-1)^{2/3}c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2c^{2/3}} + \frac{(-1)^{2/3}\operatorname{polylog}\left(2, \frac{1+(-1)^{2/3}c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2c^{2/3}}$$

$$-\frac{(-1)^{2/3}\operatorname{polylog}\left(2, \frac{1+(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2c^{2/3}} - \frac{(-1)^{2/3}\operatorname{polylog}\left(2, \frac{(-1)^{1/3}+(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}} - \frac{x\ln(1-cx^{3/2})\ln(1+cx^{3/2})}{2}$$

$$-\frac{\ln(1-cx^{3/2})\ln\left(1-c^{1/3}\sqrt{x}\right)}{2c^{2/3}} + \frac{\ln(1+cx^{3/2})\ln\left(1-c^{1/3}\sqrt{x}\right)}{2c^{2/3}} - \frac{\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{-(-1)^{1/3}+c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2c^{2/3}}$$

$$+\frac{\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{-(-1)^{2/3}+c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2c^{2/3}} - \frac{\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{1}{2}+\frac{c^{1/3}\sqrt{x}}{2}\right)}{2c^{2/3}} + \frac{\ln(1-cx^{3/2})\ln\left(1+c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$-\frac{\ln(1+cx^{3/2})\ln\left(1+c^{1/3}\sqrt{x}\right)}{2c^{2/3}} - \frac{\ln\left(\frac{1}{2}-\frac{c^{1/3}\sqrt{x}}{2}\right)\ln\left(1+c^{1/3}\sqrt{x}\right)}{2c^{2/3}} + \frac{\ln\left(\frac{(-1)^{1/3}-c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)\ln\left(1+c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$-\frac{\ln\left(\frac{(-1)^{2/3}-c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)\ln\left(1+c^{1/3}\sqrt{x}\right)}{2c^{2/3}}-\frac{\ln\left(1+c^{1/3}\sqrt{x}\right)\ln\left(\frac{-(-1)^{1/3}-c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2c^{2/3}}+\frac{\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{1/3}+c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}}$$

$$+\frac{\ln\left(1+c^{1/3}\sqrt{x}\right)\ln\left(\frac{-(-1)^{2/3}-c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2c^{2/3}}-\frac{\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{2/3}+c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2c^{2/3}}-\frac{(-1)^{1/3}\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)^2}{4c^{2/3}}$$

$$-\frac{(-1)^{1/3}\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)^2}{4c^{2/3}}+\frac{(-1)^{2/3}\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)^2}{4c^{2/3}}+\frac{(-1)^{2/3}\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)^2}{4c^{2/3}}$$

$$+\frac{(-1)^{1/3}\operatorname{polylog}\left(2,\frac{1}{1+(-1)^{2/3}}-c^{1/3}\sqrt{x}\right)}{2c^{2/3}}-\frac{(-1)^{2/3}\operatorname{polylog}\left(2,\frac{1}{1-(-1)^{1/3}}+c^{1/3}\sqrt{x}\right)}{2c^{2/3}}$$

$$+\frac{(-1)^{1/3}\operatorname{polylog}\left(2,\frac{1}{1+(-1)^{2/3}}+c^{1/3}\sqrt{x}\right)}{2c^{2/3}}+\frac{x\ln\left(1-cx^{3/2}\right)^2}{4}+\frac{x\ln\left(1+cx^{3/2}\right)^2}{4}+\frac{\ln\left(1-c^{1/3}\sqrt{x}\right)^2}{4c^{2/3}}+\frac{\ln\left(1+c^{1/3}\sqrt{x}\right)^2}{4c^{2/3}}$$

$$-\frac{\operatorname{polylog}\left(2,\frac{1}{2}-\frac{c^{1/3}\sqrt{x}}{2}\right)}{2c^{2/3}}-\frac{\operatorname{polylog}\left(2,\frac{1-c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2c^{2/3}}+\frac{\operatorname{polylog}\left(2,\frac{1-c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}}+\frac{\operatorname{polylog}\left(2,\frac{1-c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2c^{2/3}}$$

$$-\frac{\operatorname{polylog}\left(2,\frac{1-c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2c^{2/3}}-\frac{\operatorname{polylog}\left(2,\frac{1}{2}+\frac{c^{1/3}\sqrt{x}}{2}\right)}{2c^{2/3}}-\frac{\operatorname{polylog}\left(2,\frac{1+c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2c^{2/3}}+\frac{\operatorname{polylog}\left(2,\frac{1+c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2c^{2/3}}$$

$$+\frac{\operatorname{polylog}\left(2,\frac{1+c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2c^{2/3}}-\frac{\operatorname{polylog}\left(2,\frac{1+c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2c^{2/3}}$$

Result(type 8, 10 leaves):

$$\int \operatorname{arctanh}\left(cx^{3/2}\right)^2\,dx$$

Problem 65: Unable to integrate problem.

$$\int \frac{\operatorname{arctanh}\left(cx^{3/2}\right)^2}{x^3}\,dx$$

Optimal(type 4, 2777 leaves, 196 steps):

$$-\frac{\ln\left(1-cx^{3/2}\right)^2}{8x^2}-\frac{\ln\left(1+cx^{3/2}\right)^2}{8x^2}-\frac{3c^{4/3}\ln\left(1-c^{1/3}\sqrt{x}\right)}{2}-\frac{c^{4/3}\ln\left(1-c^{1/3}\sqrt{x}\right)^2}{8}+\frac{3c^{4/3}\ln\left(1+c^{2/3}x-c^{1/3}\sqrt{x}\right)}{4}$$

$$- \frac{3 c^{4/3} \ln\left(1 + c^{1/3} \sqrt{x}\right)}{2} - \frac{c^{4/3} \ln\left(1 + c^{1/3} \sqrt{x}\right)^2}{8} + \frac{3 c^{4/3} \ln\left(1 + c^{2/3} x + c^{1/3} \sqrt{x}\right)}{4} + \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1}{2} - \frac{c^{1/3} \sqrt{x}}{2}\right)}{4}$$

$$+ \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1 - c^{1/3}\sqrt{x}}{1 - (-1)^{1/3}}\right)}{4} - \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1 - c^{1/3}\sqrt{x}}{1 + (-1)^{1/3}}\right)}{4} - \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1 - c^{1/3}\sqrt{x}}{1 - (-1)^{2/3}}\right)}{4} + \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1 - c^{1/3}\sqrt{x}}{1 + (-1)^{2/3}}\right)}{4}$$

$$+ \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1}{2} + \frac{c^{1/3}\sqrt{x}}{2}\right)}{4} + \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1 + c^{1/3}\sqrt{x}}{1 - (-1)^{1/3}}\right)}{4} - \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1 + c^{1/3}\sqrt{x}}{1 + (-1)^{1/3}}\right)}{4} - \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1 + c^{1/3}\sqrt{x}}{1 - (-1)^{2/3}}\right)}{4}$$

$$+ \frac{c^{4/3} \operatorname{polylog}\left(2, \frac{1 + c^{1/3}\sqrt{x}}{1 + (-1)^{2/3}}\right)}{4} + \frac{(-1)^{2/3} c^{4/3} \ln\left(\frac{(-1)^{2/3}\left(1 - c^{1/3}\sqrt{x}\right)}{1 + (-1)^{2/3}}\right) \ln\left(1 + (-1)^{2/3} c^{1/3}\sqrt{x}\right)}{4}$$

$$- \frac{(-1)^{2/3} c^{4/3} \ln\left(-\frac{(-1)^{2/3}\left(1 + c^{1/3}\sqrt{x}\right)}{1 - (-1)^{2/3}}\right) \ln\left(1 + (-1)^{2/3} c^{1/3}\sqrt{x}\right)}{4}$$

$$+ \frac{(-1)^{2/3} c^{4/3} \ln\left(-(-1)^{2/3} + c^{1/3}\sqrt{x}\right) \ln\left(1 + (-1)^{2/3} c^{1/3}\sqrt{x}\right)}{4}$$

$$+ \frac{(-1)^{2/3} c^{4/3} \ln\left(\frac{1}{2} - \frac{(-1)^{2/3} c^{1/3}\sqrt{x}}{2}\right) \ln\left(1 + (-1)^{2/3} c^{1/3}\sqrt{x}\right)}{4}$$

$$- \frac{(-1)^{2/3} c^{4/3} \ln\left(\frac{(-1)^{1/3} - (-1)^{2/3} c^{1/3}\sqrt{x}}{1 + (-1)^{1/3}}\right) \ln\left(1 + (-1)^{2/3} c^{1/3}\sqrt{x}\right)}{4}$$

$$+ \frac{(-1)^{2/3} c^{4/3} \ln\left(\frac{(-1)^{1/3} - (-1)^{2/3} c^{1/3}\sqrt{x}}{1 + (-1)^{1/3}}\right) \ln\left(\frac{1 + (-1)^{2/3} c^{1/3}\sqrt{x}}{1 + (-1)^{1/3}}\right)}{4}$$

$$+ \frac{(-1)^{1/3} c^{4/3} \ln\left(1 - (-1)^{1/3} c^{1/3}\sqrt{x}\right) \ln\left(-\frac{(-1)^{2/3}\left(1 + (-1)^{2/3} c^{1/3}\sqrt{x}\right)}{1 - (-1)^{2/3}}\right)}{4}$$

$$- \frac{(-1)^{2/3} c^{4/3} \ln\left(1 - (-1)^{2/3} c^{1/3}\sqrt{x}\right) \ln\left(\frac{(-1)^{1/3} + (-1)^{2/3} c^{1/3}\sqrt{x}}{1 + (-1)^{1/3}}\right)}{4}$$

$$+ \frac{(-1)^{2/3} c^{4/3} \ln\left(\frac{1 - (-1)^{2/3} c^{1/3}\sqrt{x}}{1 + (-1)^{1/3}}\right) \ln\left(\frac{(-1)^{1/3} + (-1)^{2/3} c^{1/3}\sqrt{x}}{1 + (-1)^{1/3}}\right)}{4} + \frac{(-1)^{1/3} c^{4/3} \ln\left(1 - c x^{3/2}\right) \ln\left(1 - (-1)^{1/3} c^{1/3}\sqrt{x}\right)}{4}$$

$$-\frac{(-1)^{1/3}c^{4/3}\ln\left(1+cx^{3/2}\right)\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}-\frac{(-1)^{1/3}c^{4/3}\ln\left(-\frac{(-1)^{1/3}\left(1-c^{1/3}\sqrt{x}\right)}{1-(-1)^{1/3}}\right)\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$+\frac{(-1)^{1/3}c^{4/3}\ln\left(\frac{(-1)^{1/3}\left(1+c^{1/3}\sqrt{x}\right)}{1+(-1)^{1/3}}\right)\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$-\frac{(-1)^{1/3}c^{4/3}\ln\left((-1)^{1/3}+c^{1/3}\sqrt{x}\right)\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}-\frac{(-1)^{1/3}c^{4/3}\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{1}{2}+\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)}{4}$$

$$-\frac{(-1)^{1/3}c^{4/3}\ln\left(1-cx^{3/2}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}+\frac{(-1)^{1/3}c^{4/3}\ln\left(1+cx^{3/2}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$+\frac{(-1)^{1/3}c^{4/3}\ln\left(\frac{(-1)^{1/3}\left(1-c^{1/3}\sqrt{x}\right)}{1+(-1)^{1/3}}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$-\frac{(-1)^{1/3}c^{4/3}\ln\left((-1)^{1/3}-c^{1/3}\sqrt{x}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$-\frac{(-1)^{1/3}c^{4/3}\ln\left(-\frac{(-1)^{1/3}\left(1+c^{1/3}\sqrt{x}\right)}{1-(-1)^{1/3}}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$+\frac{(-1)^{1/3}c^{4/3}\ln\left(-\frac{(-1)^{1/3}\left((-1)^{1/3}+c^{1/3}\sqrt{x}\right)}{1-(-1)^{2/3}}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$-\frac{(-1)^{1/3}c^{4/3}\ln\left(\frac{1}{2}-\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{4}+\frac{(-1)^{2/3}c^{4/3}\ln\left(1-cx^{3/2}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$-\frac{(-1)^{2/3}c^{4/3}\ln\left(1+cx^{3/2}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{4}-\frac{(-1)^{2/3}c^{4/3}\ln\left(-\frac{(-1)^{2/3}\left(1-c^{1/3}\sqrt{x}\right)}{1-(-1)^{2/3}}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$+\frac{(-1)^{2/3}c^{4/3}\ln\left(-(-1)^{2/3}-c^{1/3}\sqrt{x}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$+\frac{(-1)^{2/3}c^{4/3}\ln\left(\frac{(-1)^{2/3}\left(1+c^{1/3}\sqrt{x}\right)}{1+(-1)^{2/3}}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$+\frac{(-1)^{2/3}c^{4/3}\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{1}{2}+\frac{(-1)^{2/3}c^{1/3}\sqrt{x}}{2}\right)}{4}-\frac{(-1)^{2/3}c^{4/3}\ln\left(1-cx^{3/2}\right)\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{4}$$

$$+\frac{(-1)^{2/3}c^{4/3}\ln(1+cx^{3/2})\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{4}-\frac{c^{4/3}\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{1/3}+c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{4}$$

$$-\frac{c^{4/3}\ln\left(1+c^{1/3}\sqrt{x}\right)\ln\left(\frac{-(-1)^{2/3}-c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{4}+\frac{c^{4/3}\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{2/3}+c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{4}$$

$$+\frac{(-1)^{1/3}c^{4/3}\ln\left(1-(-1)^{1/3}c^{1/3}\sqrt{x}\right)^2}{8}+\frac{(-1)^{1/3}c^{4/3}\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)^2}{8}-\frac{(-1)^{2/3}c^{4/3}\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)^2}{8}$$

$$-\frac{(-1)^{2/3}c^{4/3}\ln\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)^2}{8}-\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1}{1+(-1)^{2/3}}-c^{1/3}\sqrt{x}\right)}{4}$$

$$+\frac{(-1)^{2/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1}{1-(-1)^{1/3}}+c^{1/3}\sqrt{x}\right)}{4}-\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1}{1+(-1)^{2/3}}+c^{1/3}\sqrt{x}\right)}{4}$$

$$-\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1}{2}-\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)}{4}-\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1-(-1)^{1/3}c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{4}$$

$$+\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1-(-1)^{1/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{4}+\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1-(-1)^{1/3}c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{4}$$

$$-\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1}{2}+\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)}{4}-\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1+(-1)^{1/3}c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{4}$$

$$+\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1+(-1)^{1/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{4}+\frac{(-1)^{1/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1+(-1)^{1/3}c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{4}$$

$$+\frac{(-1)^{2/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1}{2}-\frac{(-1)^{2/3}c^{1/3}\sqrt{x}}{2}\right)}{4}-\frac{(-1)^{2/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1-(-1)^{2/3}c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{4}$$

$$+\frac{(-1)^{2/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{4}+\frac{(-1)^{2/3}c^{4/3}\operatorname{polylog}\left(2,\frac{(-1)^{1/3}-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{4}$$

$$+\frac{(-1)^{2/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1}{2}+\frac{(-1)^{2/3}c^{1/3}\sqrt{x}}{2}\right)}{4}+\frac{(-1)^{2/3}c^{4/3}\operatorname{polylog}\left(2,\frac{1+(-1)^{2/3}c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{4}$$

$$-\frac{(-1)^{2/3} c^{4/3} \operatorname{polylog}\left(2, \frac{1+(-1)^{2/3} c^{1/3} \sqrt{x}}{1-(-1)^{2/3}}\right)}{4}+\frac{(-1)^{2/3} c^{4/3} \operatorname{polylog}\left(2, \frac{1+(-1)^{2/3} c^{1/3} \sqrt{x}}{1+(-1)^{2/3}}\right)}{4}$$

$$+\frac{(-1)^{2/3} c^{4/3} \operatorname{polylog}\left(2, \frac{(-1)^{1/3}+(-1)^{2/3} c^{1/3} \sqrt{x}}{1+(-1)^{1/3}}\right)}{4}-\frac{3 c^{4/3} \arctan\left(\frac{\left(1-2 c^{1/3} \sqrt{x}\right) \sqrt{3}}{3}\right) \sqrt{3}}{2}$$

$$-\frac{3 c^{4/3} \arctan\left(\frac{\left(1+2 c^{1/3} \sqrt{x}\right) \sqrt{3}}{3}\right) \sqrt{3}}{2}+\frac{3 c \ln(1-c x^{3/2})}{2 \sqrt{x}}-\frac{3 c \ln(1+c x^{3/2})}{2 \sqrt{x}}+\frac{\ln(1-c x^{3/2}) \ln(1+c x^{3/2})}{4 x^2}$$

$$+\frac{c^{4/3} \ln(1-c x^{3/2}) \ln\left(1-c^{1/3} \sqrt{x}\right)}{4}-\frac{c^{4/3} \ln(1+c x^{3/2}) \ln\left(1-c^{1/3} \sqrt{x}\right)}{4}+\frac{c^{4/3} \ln\left(1-c^{1/3} \sqrt{x}\right) \ln\left(\frac{-(-1)^{1/3}+c^{1/3} \sqrt{x}}{1-(-1)^{1/3}}\right)}{4}$$

$$-\frac{c^{4/3} \ln\left(1-c^{1/3} \sqrt{x}\right) \ln\left(\frac{-(-1)^{2/3}+c^{1/3} \sqrt{x}}{1-(-1)^{2/3}}\right)}{4}+\frac{c^{4/3} \ln\left(1-c^{1/3} \sqrt{x}\right) \ln\left(\frac{1}{2}+\frac{c^{1/3} \sqrt{x}}{2}\right)}{4}-\frac{c^{4/3} \ln(1-c x^{3/2}) \ln\left(1+c^{1/3} \sqrt{x}\right)}{4}$$

$$+\frac{c^{4/3} \ln(1+c x^{3/2}) \ln\left(1+c^{1/3} \sqrt{x}\right)}{4}+\frac{c^{4/3} \ln\left(\frac{1}{2}-\frac{c^{1/3} \sqrt{x}}{2}\right) \ln\left(1+c^{1/3} \sqrt{x}\right)}{4}-\frac{c^{4/3} \ln\left(\frac{(-1)^{1/3}-c^{1/3} \sqrt{x}}{1+(-1)^{1/3}}\right) \ln\left(1+c^{1/3} \sqrt{x}\right)}{4}$$

$$+\frac{c^{4/3} \ln\left(\frac{(-1)^{2/3}-c^{1/3} \sqrt{x}}{1+(-1)^{2/3}}\right) \ln\left(1+c^{1/3} \sqrt{x}\right)}{4}+\frac{c^{4/3} \ln\left(1+c^{1/3} \sqrt{x}\right) \ln\left(\frac{-(-1)^{1/3}-c^{1/3} \sqrt{x}}{1-(-1)^{1/3}}\right)}{4}$$

Result(type 8, 14 leaves):

$$\int \frac{\operatorname{arctanh}(c x^{3/2})^2}{x^3}\, dx$$

Problem 66: Unable to integrate problem.

$$\int \frac{\operatorname{arctanh}(c x^{3/2})^2}{x^2}\, dx$$

Optimal(type 4, 2632 leaves, 160 steps):

$$\frac{c^{2/3} \operatorname{polylog}\left(2, \frac{1+c^{1/3} \sqrt{x}}{1+(-1)^{2/3}}\right)}{2}-\frac{\ln(1-c x^{3/2})^2}{4 x}-\frac{\ln(1+c x^{3/2})^2}{4 x}-\frac{c^{2/3} \ln\left(-1-c^{1/3} \sqrt{x}\right)^2}{4}-\frac{c^{2/3} \ln\left(1-c^{1/3} \sqrt{x}\right)^2}{4}$$

$$+\frac{c^{2/3} \operatorname{polylog}\left(2, \frac{1}{2}-\frac{c^{1/3} \sqrt{x}}{2}\right)}{2}+\frac{c^{2/3} \operatorname{polylog}\left(2, \frac{1-c^{1/3} \sqrt{x}}{1-(-1)^{1/3}}\right)}{2}-\frac{c^{2/3} \operatorname{polylog}\left(2, \frac{1-c^{1/3} \sqrt{x}}{1+(-1)^{1/3}}\right)}{2}-\frac{c^{2/3} \operatorname{polylog}\left(2, \frac{1-c^{1/3} \sqrt{x}}{1-(-1)^{2/3}}\right)}{2}$$

$$+\frac{c^{2/3}\operatorname{polylog}\left(2, \frac{1-c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2}+\frac{c^{2/3}\operatorname{polylog}\left(2, \frac{1}{2}+\frac{c^{1/3}\sqrt{x}}{2}\right)}{2}+\frac{c^{2/3}\operatorname{polylog}\left(2, \frac{1+c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2}-\frac{c^{2/3}\operatorname{polylog}\left(2, \frac{1+c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2}$$

$$-\frac{c^{2/3}\operatorname{polylog}\left(2, \frac{1+c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2}+\frac{(-1)^{1/3}c^{2/3}\ln(1-cx^{3/2})\ln\left(-1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$-\frac{(-1)^{1/3}c^{2/3}\ln(1+cx^{3/2})\ln\left(-1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}-\frac{(-1)^{1/3}c^{2/3}\ln\left(\frac{(-1)^{2/3}\left(1-c^{1/3}\sqrt{x}\right)}{1+(-1)^{2/3}}\right)\ln\left(-1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$+\frac{(-1)^{1/3}c^{2/3}\ln\left(-\frac{(-1)^{2/3}\left(1+c^{1/3}\sqrt{x}\right)}{1-(-1)^{2/3}}\right)\ln\left(-1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$-\frac{(-1)^{1/3}c^{2/3}\ln\left(-(-1)^{2/3}+c^{1/3}\sqrt{x}\right)\ln\left(-1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$-\frac{(-1)^{1/3}c^{2/3}\ln\left(-1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{1}{2}-\frac{(-1)^{2/3}c^{1/3}\sqrt{x}}{2}\right)}{2}-\frac{(-1)^{1/3}c^{2/3}\ln(1-cx^{3/2})\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$+\frac{(-1)^{1/3}c^{2/3}\ln(1+cx^{3/2})\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}+\frac{(-1)^{1/3}c^{2/3}\ln\left(-\frac{(-1)^{2/3}\left(1-c^{1/3}\sqrt{x}\right)}{1-(-1)^{2/3}}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$-\frac{(-1)^{1/3}c^{2/3}\ln\left(-(-1)^{2/3}-c^{1/3}\sqrt{x}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$-\frac{(-1)^{1/3}c^{2/3}\ln\left(\frac{(-1)^{2/3}\left(1+c^{1/3}\sqrt{x}\right)}{1+(-1)^{2/3}}\right)\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$+\frac{(-1)^{1/3}c^{2/3}\ln\left(-1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{1/3}-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2}$$

$$-\frac{(-1)^{1/3}c^{2/3}\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{1}{2}+\frac{(-1)^{2/3}c^{1/3}\sqrt{x}}{2}\right)}{2}$$

$$-\frac{(-1)^{1/3}c^{2/3}\ln\left(\frac{(-1)^{1/3}-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)\ln\left(\frac{1+(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2}$$

$$- \frac{(-1)^{2/3} c^{2/3} \ln\left(-1+(-1)^{1/3}c^{1/3}\sqrt{x}\right) \ln\left(-\frac{(-1)^{2/3}\left(1+(-1)^{2/3}c^{1/3}\sqrt{x}\right)}{1-(-1)^{2/3}}\right)}{2}$$

$$+ \frac{(-1)^{1/3}c^{2/3}\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{1/3}+(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2}$$

$$- \frac{(-1)^{1/3}c^{2/3}\ln\left(\frac{1-(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)\ln\left(\frac{(-1)^{1/3}+(-1)^{2/3}c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2} - \frac{(-1)^{2/3}c^{2/3}\ln\left(1-cx^{3/2}\right)\ln\left(-1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$+ \frac{(-1)^{2/3}c^{2/3}\ln\left(1+cx^{3/2}\right)\ln\left(-1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2} + \frac{(-1)^{2/3}c^{2/3}\ln\left(-\frac{(-1)^{1/3}\left(1-c^{1/3}\sqrt{x}\right)}{1-(-1)^{1/3}}\right)\ln\left(-1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$- \frac{(-1)^{2/3}c^{2/3}\ln\left(\frac{(-1)^{1/3}\left(1+c^{1/3}\sqrt{x}\right)}{1+(-1)^{1/3}}\right)\ln\left(-1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$+ \frac{(-1)^{2/3}c^{2/3}\ln\left((-1)^{1/3}+c^{1/3}\sqrt{x}\right)\ln\left(-1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$+ \frac{(-1)^{2/3}c^{2/3}\ln\left(-1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)\ln\left(\frac{1}{2}+\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)}{2} + \frac{(-1)^{2/3}c^{2/3}\ln\left(1-cx^{3/2}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$- \frac{(-1)^{2/3}c^{2/3}\ln\left(1+cx^{3/2}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2} - \frac{(-1)^{2/3}c^{2/3}\ln\left(\frac{(-1)^{1/3}\left(1-c^{1/3}\sqrt{x}\right)}{1+(-1)^{1/3}}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$+ \frac{(-1)^{2/3}c^{2/3}\ln\left((-1)^{1/3}-c^{1/3}\sqrt{x}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$+ \frac{(-1)^{2/3}c^{2/3}\ln\left(-\frac{(-1)^{1/3}\left(1+c^{1/3}\sqrt{x}\right)}{1-(-1)^{1/3}}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$- \frac{(-1)^{2/3}c^{2/3}\ln\left(-\frac{(-1)^{1/3}\left((-1)^{1/3}+c^{1/3}\sqrt{x}\right)}{1-(-1)^{2/3}}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2}$$

$$+ \frac{(-1)^{2/3}c^{2/3}\ln\left(\frac{1}{2}-\frac{(-1)^{1/3}c^{1/3}\sqrt{x}}{2}\right)\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)}{2} - \frac{(-1)^{2/3}c^{2/3}\ln\left(1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)^{2}}{4}$$

$$+ \frac{(-1)^{1/3}c^{2/3}\ln\left(-1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)^{2}}{4} + \frac{(-1)^{1/3}c^{2/3}\ln\left(1-(-1)^{2/3}c^{1/3}\sqrt{x}\right)^{2}}{4}$$

$$- \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1}{1-(-1)^{1/3}} - c^{1/3}\sqrt{x}\right)}{2} + \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1}{1+(-1)^{2/3}} - c^{1/3}\sqrt{x}\right)}{2}$$

$$- \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1}{1-(-1)^{1/3}} + c^{1/3}\sqrt{x}\right)}{2} + \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1}{1+(-1)^{2/3}} + c^{1/3}\sqrt{x}\right)}{2}$$

$$+ \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1}{2} - \frac{(-1)^{1/3} c^{1/3}\sqrt{x}}{2}\right)}{2} + \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1-(-1)^{1/3} c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2}$$

$$- \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1-(-1)^{1/3} c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2} - \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1-(-1)^{1/3} c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2}$$

$$+ \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1}{2} + \frac{(-1)^{1/3} c^{1/3}\sqrt{x}}{2}\right)}{2} + \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1+(-1)^{1/3} c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2}$$

$$- \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1+(-1)^{1/3} c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2} - \frac{(-1)^{2/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1+(-1)^{1/3} c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2}$$

$$- \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1}{2} - \frac{(-1)^{2/3} c^{1/3}\sqrt{x}}{2}\right)}{2} + \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1-(-1)^{2/3} c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2}$$

$$- \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1-(-1)^{2/3} c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2} - \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{(-1)^{1/3}-(-1)^{2/3} c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2}$$

$$- \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1}{2} + \frac{(-1)^{2/3} c^{1/3}\sqrt{x}}{2}\right)}{2} + \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1+(-1)^{2/3} c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2}$$

$$- \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{1+(-1)^{2/3} c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2} - \frac{(-1)^{1/3} c^{2/3} \operatorname{polylog}\left(2, \frac{(-1)^{1/3}+(-1)^{2/3} c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2}$$

$$+ \frac{\ln(1-c x^{3/2}) \ln(1+c x^{3/2})}{2x} - \frac{c^{2/3} \ln(1-c x^{3/2}) \ln\left(-1-c^{1/3}\sqrt{x}\right)}{2} + \frac{c^{2/3} \ln(1+c x^{3/2}) \ln\left(-1-c^{1/3}\sqrt{x}\right)}{2}$$

$$+ \frac{c^{2/3} \ln\left(-1-c^{1/3}\sqrt{x}\right) \ln\left(\frac{1}{2} - \frac{c^{1/3}\sqrt{x}}{2}\right)}{2} + \frac{c^{2/3} \ln(1-c x^{3/2}) \ln\left(1-c^{1/3}\sqrt{x}\right)}{2} - \frac{c^{2/3} \ln(1+c x^{3/2}) \ln\left(1-c^{1/3}\sqrt{x}\right)}{2}$$

$$+\frac{c^{2/3}\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{-(-1)^{1/3}+c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2}-\frac{c^{2/3}\ln\left(-1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{1/3}-c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2}$$

$$-\frac{c^{2/3}\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{-(-1)^{2/3}+c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2}+\frac{c^{2/3}\ln\left(-1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{2/3}-c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2}$$

$$+\frac{c^{2/3}\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{1}{2}+\frac{c^{1/3}\sqrt{x}}{2}\right)}{2}+\frac{c^{2/3}\ln\left(-1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{-(-1)^{1/3}-c^{1/3}\sqrt{x}}{1-(-1)^{1/3}}\right)}{2}$$

$$-\frac{c^{2/3}\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{1/3}+c^{1/3}\sqrt{x}}{1+(-1)^{1/3}}\right)}{2}-\frac{c^{2/3}\ln\left(-1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{-(-1)^{2/3}-c^{1/3}\sqrt{x}}{1-(-1)^{2/3}}\right)}{2}$$

$$+\frac{c^{2/3}\ln\left(1-c^{1/3}\sqrt{x}\right)\ln\left(\frac{(-1)^{2/3}+c^{1/3}\sqrt{x}}{1+(-1)^{2/3}}\right)}{2}-\frac{(-1)^{2/3}c^{2/3}\ln\left(-1+(-1)^{1/3}c^{1/3}\sqrt{x}\right)^{2}}{4}$$

Result(type 8, 14 leaves):

$$\int\frac{\operatorname{arctanh}\left(c\,x^{3/2}\right)^{2}}{x^{2}}\,dx$$

Problem 67: Unable to integrate problem.

$$\int x^{2}\left(a+b\operatorname{arctanh}\left(c\,x^{n}\right)\right)dx$$

Optimal(type 5, 60 leaves, 2 steps):

$$\frac{x^{3}\left(a+b\operatorname{arctanh}\left(c\,x^{n}\right)\right)}{3}-\frac{b\,c\,n\,x^{3+n}\operatorname{hypergeom}\left(\left[1,\frac{3+n}{2\,n}\right],\left[\frac{3\,(1+n)}{2\,n}\right],c^{2}x^{2\,n}\right)}{3\,(3+n)}$$

Result(type 8, 16 leaves):

$$\int x^{2}\left(a+b\operatorname{arctanh}\left(c\,x^{n}\right)\right)dx$$

Problem 68: Unable to integrate problem.

$$\int\frac{a+b\operatorname{arctanh}\left(c\,x^{n}\right)}{x^{2}}\,dx$$

Optimal(type 5, 63 leaves, 2 steps):

$$\frac{-a-b\operatorname{arctanh}\left(c\,x^{n}\right)}{x}-\frac{b\,c\,n\,x^{-1+n}\operatorname{hypergeom}\left(\left[1,\frac{-1+n}{2\,n}\right],\left[\frac{3}{2}-\frac{1}{2\,n}\right],c^{2}x^{2\,n}\right)}{1-n}$$

Result(type 8, 16 leaves):

$$\int \frac{a+b\,\mathrm{arctanh}(c\,x^n)}{x^2}\,dx$$

Test results for the 17 problems in "7.3.3 (d+e x)^m (a+b arctanh(c x^n))^p.txt"

Problem 1: Result more than twice size of optimal antiderivative.

$$\int (e x+d)^4\,(a+b\,\mathrm{arctanh}(c x))\,dx$$

Optimal(type 3, 137 leaves, 6 steps):

$$\frac{b\,d\,e\,(2\,c^2\,d^2+e^2)\,x}{c^3}+\frac{b\,e^2\,(10\,c^2\,d^2+e^2)\,x^2}{10\,c^3}+\frac{b\,d\,e^3\,x^3}{3\,c}+\frac{b\,e^4\,x^4}{20\,c}+\frac{(e x+d)^5\,(a+b\,\mathrm{arctanh}(c x))}{5\,e}+\frac{b\,(d c+e)^5\ln(-c x+1)}{10\,c^5\,e}-\frac{b\,(d c-e)^5\ln(c x+1)}{10\,c^5\,e}$$

Result(type 3, 394 leaves):

$$\frac{a\,d^5}{5\,e}+\frac{b\,e^4\,x^2}{10\,c^3}+\frac{b\,e^4\ln(c x+1)}{10\,c^5}+\frac{b\,e^4\ln(c x-1)}{10\,c^5}+\frac{b\ln(c x+1)\,d^4}{2\,c}+\frac{b\ln(c x-1)\,d^4}{2\,c}+\frac{b\,e^4\,\mathrm{arctanh}(c x)\,x^5}{5}+\frac{b\ln(c x-1)\,d^5}{10\,e}+\frac{b\,\mathrm{arctanh}(c x)\,d^5}{5\,e}-\frac{b\ln(c x+1)\,d^5}{10\,e}+b\,\mathrm{arctanh}(c x)\,x\,d^4+a\,e^3\,x^4\,d+2\,a\,e^2\,x^3\,d^2+2\,a\,e\,x^2\,d^3+\frac{a\,e^4\,x^5}{5}+a\,x\,d^4+\frac{b\,e^2\,x^2\,d^2}{c}-\frac{b\,e^3\ln(c x+1)\,d}{2\,c^4}+\frac{b\,e\ln(c x-1)\,d^3}{c^2}+\frac{b\,e^2\ln(c x-1)\,d^2}{c^3}+\frac{b\,e^3\ln(c x-1)\,d}{2\,c^4}-\frac{b\,e\ln(c x+1)\,d^3}{c^2}+\frac{b\,e^2\ln(c x+1)\,d^2}{c^3}+b\,e^3\,\mathrm{arctanh}(c x)\,x^4\,d+2\,b\,e^2\,\mathrm{arctanh}(c x)\,x^3\,d^2+2\,b\,e\,\mathrm{arctanh}(c x)\,x^2\,d^3+\frac{2\,b\,e\,d^3\,x}{c}+\frac{b\,e^3\,d\,x}{c^3}+\frac{b\,d\,e^3\,x^3}{3\,c}+\frac{b\,e^4\,x^4}{20\,c}$$

Problem 2: Result more than twice size of optimal antiderivative.

$$\int (e x+d)^2\,(a+b\,\mathrm{arctanh}(c x))\,dx$$

Optimal(type 3, 88 leaves, 6 steps):

$$\frac{b\,d\,e\,x}{c}+\frac{b\,e^2\,x^2}{6\,c}+\frac{(e x+d)^3\,(a+b\,\mathrm{arctanh}(c x))}{3\,e}+\frac{b\,(d c+e)^3\ln(-c x+1)}{6\,c^3\,e}-\frac{b\,(d c-e)^3\ln(c x+1)}{6\,c^3\,e}$$

Result(type 3, 217 leaves):

$$\frac{a\,e^2\,x^3}{3}+a\,e\,x^2\,d+a\,x\,d^2+\frac{a\,d^3}{3\,e}+\frac{b\,e^2\,\mathrm{arctanh}(c x)\,x^3}{3}+b\,e\,\mathrm{arctanh}(c x)\,x^2\,d+b\,\mathrm{arctanh}(c x)\,x\,d^2+\frac{b\,\mathrm{arctanh}(c x)\,d^3}{3\,e}+\frac{b\,e^2\,x^2}{6\,c}+\frac{b\,d\,e\,x}{c}+\frac{b\ln(c x-1)\,d^3}{6\,e}+\frac{b\ln(c x-1)\,d^2}{2\,c}+\frac{b\,e\ln(c x-1)\,d}{2\,c^2}+\frac{b\,e^2\ln(c x-1)}{6\,c^3}-\frac{b\ln(c x+1)\,d^3}{6\,e}+\frac{b\ln(c x+1)\,d^2}{2\,c}-\frac{b\,e\ln(c x+1)\,d}{2\,c^2}+\frac{b\,e^2\ln(c x+1)}{6\,c^3}$$

Problem 4: Result more than twice size of optimal antiderivative.

$$\int (e x + d)^2 (a + b \operatorname{arctanh}(c x))^2 \, dx$$

Optimal(type 4, 241 leaves, 15 steps):

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

Result(type 4, 1049 leaves):

$$\frac{2 a b d e x}{c} + \frac{2 b^2 d e x \operatorname{arctanh}(c x)}{c} - \frac{b^2 e d \ln\left(-\frac{c x}{2} + \frac{1}{2}\right) \ln(c x + 1)}{2 c^2} + \frac{b^2 e \operatorname{arctanh}(c x) \ln(c x - 1) d}{c^2} - \frac{b^2 e \operatorname{arctanh}(c x) \ln(c x + 1) d}{c^2} + \frac{a b e \ln(c x - 1) d}{c^2} - \frac{a b e \ln(c x + 1) d}{c^2} - \frac{b^2 e d \ln(c x - 1) \ln\left(\frac{c x}{2} + \frac{1}{2}\right)}{2 c^2} + \frac{b^2 e d \ln\left(-\frac{c x}{2} + \frac{1}{2}\right) \ln\left(\frac{c x}{2} + \frac{1}{2}\right)}{2 c^2} + 2 a b e \operatorname{arctanh}(c x) x^2 d + \frac{b^2 \operatorname{arctanh}(c x) \ln(c x + 1) d^2}{c} + \frac{a b \ln(c x - 1) d^2}{c} + \frac{a b \ln(c x + 1) d^2}{c} + \frac{a b e^2 x^2}{3 c} - \frac{b^2 d^3 \ln(c x - 1) \ln\left(\frac{c x}{2} + \frac{1}{2}\right)}{6 e} + \frac{b^2 d^3 \ln\left(-\frac{c x}{2} + \frac{1}{2}\right) \ln\left(\frac{c x}{2} + \frac{1}{2}\right)}{6 e} - \frac{b^2 d^3 \ln\left(-\frac{c x}{2} + \frac{1}{2}\right) \ln(c x + 1)}{6 e} + \frac{b^2 \operatorname{arctanh}(c x) \ln(c x - 1) d^3}{3 e} - \frac{b^2 \operatorname{arctanh}(c x) \ln(c x + 1) d^3}{3 e} + \frac{2 a b e^2 \operatorname{arctanh}(c x) x^3}{3} + b^2 e \operatorname{arctanh}(c x)^2 x^2 d - \frac{a b \ln(c x + 1) d^3}{3 e} + \frac{2 a b \operatorname{arctanh}(c x) d^3}{3 e} + \frac{a b \ln(c x - 1) d^3}{3 e} - \frac{b^2 e^2 \ln(c x - 1) \ln\left(\frac{c x}{2} + \frac{1}{2}\right)}{6 c^3} - \frac{b^2 e^2 \ln\left(-\frac{c x}{2} + \frac{1}{2}\right) \ln\left(\frac{c x}{2} + \frac{1}{2}\right)}{6 c^3} + \frac{b^2 e^2 \ln\left(-\frac{c x}{2} + \frac{1}{2}\right) \ln(c x + 1)}{6 c^3} + \frac{b^2 e^2 \operatorname{arctanh}(c x) \ln(c x - 1)}{3 c^3} + \frac{b^2 e^2 \operatorname{arctanh}(c x) \ln(c x + 1)}{3 c^3} + \frac{a b e^2 \ln(c x - 1)}{3 c^3} + \frac{a b e^2 \ln(c x + 1)}{3 c^3} + \frac{b^2 e \ln(c x + 1) d}{c^2} + \frac{b^2 e \ln(c x - 1) d}{c^2} + \frac{b^2 e d \ln(c x + 1)^2}{4 c^2} + \frac{b^2 e d \ln(c x - 1)^2}{4 c^2} + \frac{b^2 e^2 \operatorname{arctanh}(c x) x^2}{3 c} - \frac{b^2 d^2 \ln(c x - 1) \ln\left(\frac{c x}{2} + \frac{1}{2}\right)}{2 c} - \frac{b^2 d^2 \ln\left(-\frac{c x}{2} + \frac{1}{2}\right) \ln\left(\frac{c x}{2} + \frac{1}{2}\right)}{2 c} + \frac{b^2 d^2 \ln\left(-\frac{c x}{2} + \frac{1}{2}\right) \ln(c x + 1)}{2 c} + \frac{b^2 \operatorname{arctanh}(c x) \ln(c x - 1) d^2}{c} + 2 a b \operatorname{arctanh}(c x) x d^2 + a^2 e x^2 d + \frac{b^2 e^2 \operatorname{arctanh}(c x)^2 x^3}{3} - \frac{b^2 e^2 \ln(c x + 1)}{6 c^3} + \frac{b^2 e^2 \ln(c x - 1)^2}{12 c^3} - \frac{b^2 e^2 \operatorname{dilog}\left(\frac{c x}{2} + \frac{1}{2}\right)}{3 c^3} - \frac{b^2 e^2 \ln(c x + 1)^2}{12 c^3}$$

$$+\frac{b^2 e^2 \ln(cx-1)}{6c^3}-\frac{b^2 d^2 \operatorname{dilog}\left(\frac{cx}{2}+\frac{1}{2}\right)}{c}-\frac{b^2 d^2 \ln(cx+1)^2}{4c}+\frac{b^2 d^2 \ln(cx-1)^2}{4c}+b^2 \operatorname{arctanh}(cx)^2 x d^2+\frac{b^2 d^3 \ln(cx+1)^2}{12e}$$
$$+\frac{b^2 \operatorname{arctanh}(cx)^2 d^3}{3e}+\frac{b^2 d^3 \ln(cx-1)^2}{12e}+\frac{a^2 d^3}{3e}+\frac{b^2 e^2 x}{3c^2}+a^2 x d^2+\frac{a^2 e^2 x^3}{3}$$

Problem 5: Result more than twice size of optimal antiderivative.

$$\int (ex+d)^3 (a+b\operatorname{arctanh}(cx))^3 \, dx$$

Optimal(type 4, 580 leaves, 29 steps):

$$\frac{3ab^2 d e^2 x}{c^2}+\frac{b^3 e^3 x}{4c^3}-\frac{b^3 e^3 \operatorname{arctanh}(cx)}{4c^4}+\frac{3b^3 d e^2 x \operatorname{arctanh}(cx)}{c^2}+\frac{b^2 e^3 x^2 (a+b\operatorname{arctanh}(cx))}{4c^2}-\frac{3bde^2 (a+b\operatorname{arctanh}(cx))^2}{2c^3}$$
$$+\frac{be^3 (a+b\operatorname{arctanh}(cx))^2}{4c^4}+\frac{3be(6c^2d^2+e^2)(a+b\operatorname{arctanh}(cx))^2}{4c^4}+\frac{3be(6c^2d^2+e^2)x(a+b\operatorname{arctanh}(cx))^2}{4c^3}$$
$$+\frac{3bde^2x^2(a+b\operatorname{arctanh}(cx))^2}{2c}+\frac{be^3x^3(a+b\operatorname{arctanh}(cx))^2}{4c}+\frac{d(c^2d^2+e^2)(a+b\operatorname{arctanh}(cx))^3}{c^3}$$
$$-\frac{(c^4d^4+6c^2d^2e^2+e^4)(a+b\operatorname{arctanh}(cx))^3}{4c^4 e}+\frac{(ex+d)^4(a+b\operatorname{arctanh}(cx))^3}{4e}-\frac{b^2e^3(a+b\operatorname{arctanh}(cx))\ln\left(\frac{2}{-cx+1}\right)}{2c^4}$$
$$-\frac{3b^2e(6c^2d^2+e^2)(a+b\operatorname{arctanh}(cx))\ln\left(\frac{2}{-cx+1}\right)}{2c^4}-\frac{3bd(c^2d^2+e^2)(a+b\operatorname{arctanh}(cx))^2\ln\left(\frac{2}{-cx+1}\right)}{c^3}+\frac{3b^3de^2\ln(-c^2x^2+1)}{2c^3}$$
$$-\frac{b^3e^3\operatorname{polylog}\left(2,1-\frac{2}{-cx+1}\right)}{4c^4}-\frac{3b^3e(6c^2d^2+e^2)\operatorname{polylog}\left(2,1-\frac{2}{-cx+1}\right)}{4c^4}$$
$$-\frac{3b^2d(c^2d^2+e^2)(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,1-\frac{2}{-cx+1}\right)}{c^3}+\frac{3b^3d(c^2d^2+e^2)\operatorname{polylog}\left(3,1-\frac{2}{-cx+1}\right)}{2c^3}$$

Result(type ?, 6148 leaves): Display of huge result suppressed!

Problem 6: Result more than twice size of optimal antiderivative.

$$\int (ex+d)^2 (a+b\operatorname{arctanh}(cx))^3 \, dx$$

Optimal(type 4, 373 leaves, 20 steps):

$$\frac{ab^2e^2x}{c^2}+\frac{b^3e^2x\operatorname{arctanh}(cx)}{c^2}+\frac{3bde(a+b\operatorname{arctanh}(cx))^2}{c^2}-\frac{be^2(a+b\operatorname{arctanh}(cx))^2}{2c^3}+\frac{3bdex(a+b\operatorname{arctanh}(cx))^2}{c}$$

$$+\frac{b e^2 x^2 (a+b\operatorname{arctanh}(cx))^2}{2c}+\frac{(3c^2d^2+e^2)(a+b\operatorname{arctanh}(cx))^3}{3c^3}-\frac{d\left(d^2+\frac{3e^2}{c^2}\right)(a+b\operatorname{arctanh}(cx))^3}{3e}+\frac{(ex+d)^3(a+b\operatorname{arctanh}(cx))^3}{3e}$$

$$-\frac{6b^2de(a+b\operatorname{arctanh}(cx))\ln\left(\frac{2}{-cx+1}\right)}{c^2}-\frac{b(3c^2d^2+e^2)(a+b\operatorname{arctanh}(cx))^2\ln\left(\frac{2}{-cx+1}\right)}{c^3}+\frac{b^3e^2\ln(-c^2x^2+1)}{2c^3}$$

$$-\frac{3b^3de\operatorname{polylog}\left(2,1-\frac{2}{-cx+1}\right)}{c^2}-\frac{b^2(3c^2d^2+e^2)(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,1-\frac{2}{-cx+1}\right)}{c^3}+\frac{b^3(3c^2d^2+e^2)\operatorname{polylog}\left(3,1-\frac{2}{-cx+1}\right)}{2c^3}$$

Result(type ?, 4635 leaves): Display of huge result suppressed!

Problem 7: Result more than twice size of optimal antiderivative.

$$\int (ex+d)(a+b\operatorname{arctanh}(cx))^3\,dx$$

Optimal(type 4, 232 leaves, 14 steps):

$$\frac{3be(a+b\operatorname{arctanh}(cx))^2}{2c^2}+\frac{3bex(a+b\operatorname{arctanh}(cx))^2}{2c}+\frac{d(a+b\operatorname{arctanh}(cx))^3}{c}-\frac{\left(d^2+\frac{e^2}{c^2}\right)(a+b\operatorname{arctanh}(cx))^3}{2e}$$

$$+\frac{(ex+d)^2(a+b\operatorname{arctanh}(cx))^3}{2e}-\frac{3b^2e(a+b\operatorname{arctanh}(cx))\ln\left(\frac{2}{-cx+1}\right)}{c^2}-\frac{3bd(a+b\operatorname{arctanh}(cx))^2\ln\left(\frac{2}{-cx+1}\right)}{c}$$

$$-\frac{3b^3e\operatorname{polylog}\left(2,1-\frac{2}{-cx+1}\right)}{2c^2}-\frac{3b^2d(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,1-\frac{2}{-cx+1}\right)}{c}+\frac{3b^3d\operatorname{polylog}\left(3,1-\frac{2}{-cx+1}\right)}{2c}$$

Result(type ?, 12529 leaves): Display of huge result suppressed!

Problem 8: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\operatorname{arctanh}(cx))^3}{ex+d}\,dx$$

Optimal(type 4, 260 leaves, 1 step):

$$-\frac{(a+b\operatorname{arctanh}(cx))^3\ln\left(\frac{2}{cx+1}\right)}{e}+\frac{(a+b\operatorname{arctanh}(cx))^3\ln\left(\frac{2c(ex+d)}{(dc+e)(cx+1)}\right)}{e}+\frac{3b(a+b\operatorname{arctanh}(cx))^2\operatorname{polylog}\left(2,1-\frac{2}{cx+1}\right)}{2e}$$

$$-\frac{3b(a+b\operatorname{arctanh}(cx))^2\operatorname{polylog}\left(2,1-\frac{2c(ex+d)}{(dc+e)(cx+1)}\right)}{2e}+\frac{3b^2(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(3,1-\frac{2}{cx+1}\right)}{2e}$$

$$-\frac{3b^2(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(3,1-\frac{2c(ex+d)}{(dc+e)(cx+1)}\right)}{2e}+\frac{3b^3\operatorname{polylog}\left(4,1-\frac{2}{cx+1}\right)}{4e}-\frac{3b^3\operatorname{polylog}\left(4,1-\frac{2c(ex+d)}{(dc+e)(cx+1)}\right)}{4e}$$

Result(type ?, 2366 leaves): Display of huge result suppressed!

Problem 9: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\operatorname{arctanh}(cx))^3}{(ex+d)^2}\,dx$$

Optimal(type 4, 501 leaves, 9 steps):

$$-\frac{(a+b\operatorname{arctanh}(cx))^3}{e(ex+d)}+\frac{3bc(a+b\operatorname{arctanh}(cx))^2\ln\left(\frac{2}{-cx+1}\right)}{2e(dc+e)}-\frac{3bc(a+b\operatorname{arctanh}(cx))^2\ln\left(\frac{2}{cx+1}\right)}{2(dc-e)e}+\frac{3bc(a+b\operatorname{arctanh}(cx))^2\ln\left(\frac{2}{cx+1}\right)}{c^2d^2-e^2}$$
$$-\frac{3bc(a+b\operatorname{arctanh}(cx))^2\ln\left(\frac{2c(ex+d)}{(dc+e)(cx+1)}\right)}{c^2d^2-e^2}+\frac{3b^2c(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,1-\frac{2}{-cx+1}\right)}{2e(dc+e)}$$
$$+\frac{3b^2c(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,1-\frac{2}{cx+1}\right)}{2(dc-e)e}-\frac{3b^2c(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,1-\frac{2}{cx+1}\right)}{c^2d^2-e^2}$$
$$+\frac{3b^2c(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,1-\frac{2c(ex+d)}{(dc+e)(cx+1)}\right)}{c^2d^2-e^2}-\frac{3b^3c\operatorname{polylog}\left(3,1-\frac{2}{-cx+1}\right)}{4e(dc+e)}+\frac{3b^3c\operatorname{polylog}\left(3,1-\frac{2}{cx+1}\right)}{4(dc-e)e}$$
$$-\frac{3b^3c\operatorname{polylog}\left(3,1-\frac{2}{cx+1}\right)}{2(c^2d^2-e^2)}+\frac{3b^3c\operatorname{polylog}\left(3,1-\frac{2c(ex+d)}{(dc+e)(cx+1)}\right)}{2(c^2d^2-e^2)}$$

Result(type ?, 3719 leaves): Display of huge result suppressed!

Problem 11: Unable to integrate problem.

$$\int (ex+d)\left(a+b\operatorname{arctanh}(cx^2)\right)^2\,dx$$

Optimal(type 4, 900 leaves, 77 steps):

$$\frac{e\left(a+b\operatorname{arctanh}(cx^2)\right)^2}{2c}+\frac{ex^2\left(a+b\operatorname{arctanh}(cx^2)\right)^2}{2}-\frac{I b^2 d\operatorname{polylog}\left(2,1-\frac{(1+I)\left(1-x\sqrt{c}\right)}{1-Ix\sqrt{c}}\right)}{2\sqrt{c}}-\frac{I b^2 d\operatorname{polylog}\left(2,1+\frac{(-1+I)\left(1+x\sqrt{c}\right)}{1-Ix\sqrt{c}}\right)}{2\sqrt{c}}$$
$$-\frac{b^2dx\ln(-cx^2+1)\ln(cx^2+1)}{2}+\frac{2abd\arctan\left(x\sqrt{c}\right)}{\sqrt{c}}-\frac{2abd\operatorname{arctanh}\left(x\sqrt{c}\right)}{\sqrt{c}}+\frac{2b^2d\operatorname{arctanh}\left(x\sqrt{c}\right)\ln\left(\frac{2}{1-x\sqrt{c}}\right)}{\sqrt{c}}$$
$$-\frac{2b^2d\arctan\left(x\sqrt{c}\right)\ln\left(\frac{2}{1-Ix\sqrt{c}}\right)}{\sqrt{c}}+\frac{2b^2d\arctan\left(x\sqrt{c}\right)\ln\left(\frac{2}{1+Ix\sqrt{c}}\right)}{\sqrt{c}}-\frac{2b^2d\operatorname{arctanh}\left(x\sqrt{c}\right)\ln\left(\frac{2}{1+x\sqrt{c}}\right)}{\sqrt{c}}$$
$$-\frac{b^2d\arctan\left(x\sqrt{c}\right)\ln(-cx^2+1)}{\sqrt{c}}+\frac{b^2d\operatorname{arctanh}\left(x\sqrt{c}\right)\ln(-cx^2+1)}{\sqrt{c}}+\frac{b^2d\arctan\left(x\sqrt{c}\right)\ln(cx^2+1)}{\sqrt{c}}-\frac{b^2d\operatorname{arctanh}\left(x\sqrt{c}\right)\ln(cx^2+1)}{\sqrt{c}}$$

$$+\frac{b^2 d \arctan\left(x\sqrt{c}\right)\ln\left(\frac{(1+I)\left(1-x\sqrt{c}\right)}{1-Ix\sqrt{c}}\right)}{\sqrt{c}}+\frac{b^2 d\,\mathrm{arctanh}\left(x\sqrt{c}\right)\ln\left(-\frac{2\left(1-x\sqrt{-c}\right)\sqrt{c}}{\left(\sqrt{-c}-\sqrt{c}\right)\left(1+x\sqrt{c}\right)}\right)}{\sqrt{c}}$$

$$+\frac{b^2 d\,\mathrm{arctanh}\left(x\sqrt{c}\right)\ln\left(\frac{2\left(1+x\sqrt{-c}\right)\sqrt{c}}{\left(\sqrt{-c}+\sqrt{c}\right)\left(1+x\sqrt{c}\right)}\right)}{\sqrt{c}}+\frac{b^2 d \arctan\left(x\sqrt{c}\right)\ln\left(\frac{(1-I)\left(1+x\sqrt{c}\right)}{1-Ix\sqrt{c}}\right)}{\sqrt{c}}+\frac{I b^2 d\,\mathrm{polylog}\left(2,1-\frac{2}{1-Ix\sqrt{c}}\right)}{\sqrt{c}}$$

$$+\frac{I b^2 d\,\mathrm{polylog}\left(2,1-\frac{2}{1+Ix\sqrt{c}}\right)}{\sqrt{c}}-\frac{b e\left(a+b\,\mathrm{arctanh}(c x^2)\right)\ln\left(\frac{2}{-c x^2+1}\right)}{c}-a b d x\ln(-c x^2+1)+a b d x\ln(c x^2+1)+\frac{I b^2 d\arctan\left(x\sqrt{c}\right)^2}{\sqrt{c}}$$

$$+\frac{b^2 d x\ln(-c x^2+1)^2}{4}+\frac{b^2 d x\ln(c x^2+1)^2}{4}-\frac{b^2 d\,\mathrm{polylog}\left(2,1+\frac{2\left(1-x\sqrt{-c}\right)\sqrt{c}}{\left(\sqrt{-c}-\sqrt{c}\right)\left(1+x\sqrt{c}\right)}\right)}{2\sqrt{c}}$$

$$-\frac{b^2 d\,\mathrm{polylog}\left(2,1-\frac{2\left(1+x\sqrt{-c}\right)\sqrt{c}}{\left(\sqrt{-c}+\sqrt{c}\right)\left(1+x\sqrt{c}\right)}\right)}{2\sqrt{c}}-\frac{b^2 d\,\mathrm{arctanh}\left(x\sqrt{c}\right)^2}{\sqrt{c}}+\frac{b^2 d\,\mathrm{polylog}\left(2,1-\frac{2}{1-x\sqrt{c}}\right)}{\sqrt{c}}+\frac{b^2 d\,\mathrm{polylog}\left(2,1-\frac{2}{1+x\sqrt{c}}\right)}{\sqrt{c}}$$

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

Result(type 8, 20 leaves):

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

Problem 13: Result more than twice size of optimal antiderivative.

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

Optimal(type 4, 70 leaves, 5 steps):

$$-\frac{\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)^2}{b c^2}+\frac{2\left(a+b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\right)\ln\left(\frac{2}{1-c\sqrt{x}}\right)}{c^2}+\frac{b\,\mathrm{polylog}\left(2,1-\frac{2}{1-c\sqrt{x}}\right)}{c^2}$$

Result(type 4, 185 leaves):

$$-\frac{a\ln\left(c\sqrt{x}-1\right)}{c^2}-\frac{a\ln\left(1+c\sqrt{x}\right)}{c^2}-\frac{b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\ln\left(c\sqrt{x}-1\right)}{c^2}-\frac{b\,\mathrm{arctanh}\left(c\sqrt{x}\right)\ln\left(1+c\sqrt{x}\right)}{c^2}-\frac{b\ln\left(c\sqrt{x}-1\right)^2}{4c^2}+\frac{b\,\mathrm{dilog}\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)}{c^2}$$

$$+\frac{b\ln\left(c\sqrt{x}-1\right)\ln\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)}{2c^2}+\frac{b\ln\left(1+c\sqrt{x}\right)^2}{4c^2}+\frac{b\ln\left(-\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)\ln\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)}{2c^2}-\frac{b\ln\left(-\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)\ln\left(1+c\sqrt{x}\right)}{2c^2}$$

Problem 14: Result more than twice size of optimal antiderivative.

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

Optimal(type 4, 105 leaves, 9 steps):

$$b\,c^2\operatorname{arctanh}\left(c\sqrt{x}\right)+\frac{-a-b\operatorname{arctanh}\left(c\sqrt{x}\right)}{x}+\frac{c^2\left(a+b\operatorname{arctanh}\left(c\sqrt{x}\right)\right)^2}{b}+2c^2\left(a+b\operatorname{arctanh}\left(c\sqrt{x}\right)\right)\ln\left(2-\frac{2}{1+c\sqrt{x}}\right)-b\,c^2\operatorname{polylog}\left(2,-1+\frac{2}{1+c\sqrt{x}}\right)-\frac{b\,c}{\sqrt{x}}$$

Result(type 4, 314 leaves):

$$-\frac{a}{x}+2c^2a\ln\left(c\sqrt{x}\right)-c^2a\ln\left(1+c\sqrt{x}\right)-c^2a\ln\left(c\sqrt{x}-1\right)-\frac{b\operatorname{arctanh}\left(c\sqrt{x}\right)}{x}+2c^2b\ln\left(c\sqrt{x}\right)\operatorname{arctanh}\left(c\sqrt{x}\right)-c^2b\operatorname{arctanh}\left(c\sqrt{x}\right)\ln\left(1+c\sqrt{x}\right)$$
$$-c^2b\operatorname{arctanh}\left(c\sqrt{x}\right)\ln\left(c\sqrt{x}-1\right)+\frac{c^2b\ln\left(1+c\sqrt{x}\right)}{2}-\frac{c^2b\ln\left(c\sqrt{x}-1\right)}{2}-\frac{b\,c}{\sqrt{x}}-c^2b\operatorname{dilog}\left(1+c\sqrt{x}\right)-c^2b\ln\left(c\sqrt{x}\right)\ln\left(1+c\sqrt{x}\right)$$
$$-c^2b\operatorname{dilog}\left(c\sqrt{x}\right)-\frac{c^2b\ln\left(c\sqrt{x}-1\right)^2}{4}+c^2b\operatorname{dilog}\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)+\frac{c^2b\ln\left(c\sqrt{x}-1\right)\ln\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)}{2}+\frac{c^2b\ln\left(1+c\sqrt{x}\right)^2}{4}$$
$$+\frac{c^2b\ln\left(-\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)\ln\left(\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)}{2}-\frac{c^2b\ln\left(-\frac{c\sqrt{x}}{2}+\frac{1}{2}\right)\ln\left(1+c\sqrt{x}\right)}{2}$$

Test results for the 143 problems in "7.3.4 u (a+b arctanh(c x))^p.txt"

Problem 10: Result more than twice size of optimal antiderivative.

$$\int(d\,x\,c+d)^3\left(a+b\operatorname{arctanh}(c\,x)\right)dx$$

Optimal(type 3, 78 leaves, 4 steps):

$$b\,d^3x+\frac{b\,d^3\left(c\,x+1\right)^2}{4c}+\frac{b\,d^3\left(c\,x+1\right)^3}{12c}+\frac{d^3\left(c\,x+1\right)^4\left(a+b\operatorname{arctanh}(c\,x)\right)}{4c}+\frac{2\,b\,d^3\ln(-c\,x+1)}{c}$$

Result(type 3, 161 leaves):

$$\frac{c^3x^4a\,d^3}{4}+c^2x^3a\,d^3+\frac{3\,c\,x^2a\,d^3}{2}+a\,x\,d^3+\frac{d^3a}{4c}+\frac{c^3b\,d^3\operatorname{arctanh}(c\,x)\,x^4}{4}+c^2b\,d^3x^3\operatorname{arctanh}(c\,x)+\frac{3\,c\,b\,d^3\operatorname{arctanh}(c\,x)\,x^2}{2}+b\,d^3x\operatorname{arctanh}(c\,x)$$

$$+\frac{b\,d^3 \operatorname{arctanh}(c\,x)}{4\,c}+\frac{c^2\,b\,d^3\,x^3}{12}+\frac{c\,b\,d^3\,x^2}{2}+\frac{7\,b\,d^3\,x}{4}+\frac{2\,b\,d^3 \ln(c\,x-1)}{c}$$

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Problem 16: Result more than twice size of optimal antiderivative.
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$$\int \frac{a+b \operatorname{arctanh}(c\,x)}{x\,(d\,x\,c+d)}\,dx$$

```
Optimal(type 4, 44 leaves, 2 steps):
```

$$\frac{(a+b \operatorname{arctanh}(c\,x)) \ln\left(2-\frac{2}{c\,x+1}\right)}{d}-\frac{b \operatorname{polylog}\left(2,-1+\frac{2}{c\,x+1}\right)}{2\,d}$$

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Result(type 4, 155 leaves):
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$$\frac{a \ln(c\,x)}{d}-\frac{a \ln(c\,x+1)}{d}+\frac{b \operatorname{arctanh}(c\,x) \ln(c\,x)}{d}-\frac{b \operatorname{arctanh}(c\,x) \ln(c\,x+1)}{d}+\frac{b \ln(c\,x+1)^2}{4\,d}+\frac{b \ln\left(-\frac{c\,x}{2}+\frac{1}{2}\right) \ln\left(\frac{c\,x}{2}+\frac{1}{2}\right)}{2\,d}$$
$$-\frac{b \ln\left(-\frac{c\,x}{2}+\frac{1}{2}\right) \ln(c\,x+1)}{2\,d}+\frac{b \operatorname{dilog}\left(\frac{c\,x}{2}+\frac{1}{2}\right)}{2\,d}-\frac{b \operatorname{dilog}(c\,x+1)}{2\,d}-\frac{b \ln(c\,x) \ln(c\,x+1)}{2\,d}-\frac{b \operatorname{dilog}(c\,x)}{2\,d}$$

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Problem 17: Result more than twice size of optimal antiderivative.
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$$\int \frac{a+b \operatorname{arctanh}(c\,x)}{x^3\,(d\,x\,c+d)}\,dx$$

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Optimal(type 4, 139 leaves, 12 steps):
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$$-\frac{b\,c}{2\,d\,x}+\frac{b\,c^2 \operatorname{arctanh}(c\,x)}{2\,d}+\frac{-a-b \operatorname{arctanh}(c\,x)}{2\,x^2\,d}+\frac{c\,(a+b \operatorname{arctanh}(c\,x))}{d\,x}-\frac{b\,c^2 \ln(x)}{d}+\frac{b\,c^2 \ln(-c^2\,x^2+1)}{2\,d}+\frac{c^2\,(a+b \operatorname{arctanh}(c\,x)) \ln\left(2-\frac{2}{c\,x+1}\right)}{d}$$
$$-\frac{b\,c^2 \operatorname{polylog}\left(2,-1+\frac{2}{c\,x+1}\right)}{2\,d}$$

```
Result(type 4, 285 leaves):
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$$-\frac{a}{2\,d\,x^2}+\frac{c^2\,a \ln(c\,x)}{d}+\frac{c\,a}{d\,x}-\frac{c^2\,a \ln(c\,x+1)}{d}-\frac{b \operatorname{arctanh}(c\,x)}{2\,d\,x^2}+\frac{c^2\,b \operatorname{arctanh}(c\,x) \ln(c\,x)}{d}+\frac{c\,b \operatorname{arctanh}(c\,x)}{d\,x}-\frac{c^2\,b \operatorname{arctanh}(c\,x) \ln(c\,x+1)}{d}$$
$$+\frac{3\,c^2\,b \ln(c\,x+1)}{4\,d}+\frac{c^2\,b \ln(c\,x-1)}{4\,d}-\frac{b\,c}{2\,d\,x}-\frac{c^2\,b \ln(c\,x)}{d}-\frac{c^2\,b \operatorname{dilog}(c\,x+1)}{2\,d}-\frac{c^2\,b \ln(c\,x) \ln(c\,x+1)}{2\,d}-\frac{c^2\,b \operatorname{dilog}(c\,x)}{2\,d}+\frac{c^2\,b \ln(c\,x+1)^2}{4\,d}$$
$$+\frac{c^2\,b \ln\left(-\frac{c\,x}{2}+\frac{1}{2}\right) \ln\left(\frac{c\,x}{2}+\frac{1}{2}\right)}{2\,d}-\frac{c^2\,b \ln\left(-\frac{c\,x}{2}+\frac{1}{2}\right) \ln(c\,x+1)}{2\,d}+\frac{c^2\,b \operatorname{dilog}\left(\frac{c\,x}{2}+\frac{1}{2}\right)}{2\,d}$$

Problem 24: Result more than twice size of optimal antiderivative.

$$\int \frac{(d x c+d)^2 (a+b \operatorname{arctanh}(c x))^2}{x} \, dx$$

Optimal(type 4, 268 leaves, 19 steps):

$$a b c d^2 x+b^2 c d^2 x \operatorname{arctanh}(c x)+\frac{3 d^2 (a+b \operatorname{arctanh}(c x))^2}{2}+2 c d^2 x (a+b \operatorname{arctanh}(c x))^2+\frac{c^2 d^2 x^2 (a+b \operatorname{arctanh}(c x))^2}{2}-2 d^2 (a+b \operatorname{arctanh}(c x))^2 \operatorname{arctanh}\left(-1+\frac{2}{-c x+1}\right)-4 b d^2 (a+b \operatorname{arctanh}(c x)) \ln\left(\frac{2}{-c x+1}\right)+\frac{b^2 d^2 \ln(-c^2 x^2+1)}{2}-2 b^2 d^2 \operatorname{polylog}\left(2, 1-\frac{2}{-c x+1}\right)-b d^2 (a+b \operatorname{arctanh}(c x)) \operatorname{polylog}\left(2, 1-\frac{2}{-c x+1}\right)+b d^2 (a+b \operatorname{arctanh}(c x)) \operatorname{polylog}\left(2, -1+\frac{2}{-c x+1}\right)+\frac{b^2 d^2 \operatorname{polylog}\left(3, 1-\frac{2}{-c x+1}\right)}{2}-\frac{b^2 d^2 \operatorname{polylog}\left(3, -1+\frac{2}{-c x+1}\right)}{2}$$

Result(type 4, 1081 leaves):

$$\frac{d^2 a^2 c^2 x^2}{2}+d^2 b^2 \operatorname{arctanh}(c x)^2 \ln(c x)-d^2 b^2 \operatorname{arctanh}(c x)^2 \ln\left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right)+d^2 b^2 \operatorname{arctanh}(c x)^2 \ln\left(1+\frac{c x+1}{\sqrt{-c^2 x^2+1}}\right)+2 d^2 b^2 \operatorname{arctanh}(c x) \operatorname{polylog}\left(2, -\frac{c x+1}{\sqrt{-c^2 x^2+1}}\right)+d^2 b^2 \operatorname{arctanh}(c x)^2 \ln\left(1-\frac{c x+1}{\sqrt{-c^2 x^2+1}}\right)+2 d^2 b^2 \operatorname{arctanh}(c x) \operatorname{polylog}\left(2, \frac{c x+1}{\sqrt{-c^2 x^2+1}}\right)-d^2 b^2 \operatorname{arctanh}(c x) \operatorname{polylog}\left(2, -\frac{(c x+1)^2}{-c^2 x^2+1}\right)-4 d^2 b^2 \operatorname{arctanh}(c x) \ln\left(1+\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right)-4 d^2 b^2 \operatorname{arctanh}(c x) \ln\left(1-\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right)-d^2 a b \operatorname{dilog}(c x+1)-d^2 a b \operatorname{dilog}(c x)+\frac{5 a b \ln(c x-1) d^2}{2}+\frac{3 a b \ln(c x+1) d^2}{2}+2 a^2 c x d^2-\frac{I d^2 b^2 \pi \operatorname{csgn}\left(I \left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right)\right) \operatorname{csgn}\left(\frac{I \left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right)}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^2 \operatorname{arctanh}(c x)^2}{2}-\frac{I d^2 b^2 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right) \operatorname{csgn}\left(\frac{I \left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right)}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^2 \operatorname{arctanh}(c x)^2}{2}+2 d^2 a b \operatorname{arctanh}(c x) \ln(c x)$$

$$+\frac{I d^2 b^2 \pi \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)^3 \operatorname{arctanh}(cx)^2}{2} + d^2 a b \operatorname{arctanh}(cx)\, c^2 x^2 + 4 a b \operatorname{arctanh}(cx)\, c x d^2 - d^2 a b \ln(cx) \ln(cx+1)$$

$$+ \frac{d^2 b^2 \operatorname{arctanh}(cx)^2 c^2 x^2}{2} + 2 b^2 \operatorname{arctanh}(cx)^2 c x d^2 + a b c d^2 x + b^2 c d^2 x \operatorname{arctanh}(cx)$$

$$+ \frac{I d^2 b^2 \pi \operatorname{csgn}\left(I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)\right) \operatorname{csgn}\left(\frac{I}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{arctanh}(cx)^2}{2} + d^2 a^2 \ln(cx) - 2 d^2 b^2 \operatorname{polylog}\Bigg(3,$$

$$-\frac{cx+1}{\sqrt{-c^2x^2+1}}\Bigg) - 2 d^2 b^2 \operatorname{polylog}\left(3, \frac{cx+1}{\sqrt{-c^2x^2+1}}\right) + \frac{d^2 b^2 \operatorname{polylog}\left(3, -\frac{(cx+1)^2}{-c^2x^2+1}\right)}{2} + \frac{3 d^2 b^2 \operatorname{arctanh}(cx)^2}{2} - 4 d^2 b^2 \operatorname{dilog}\left(1 + \frac{I(cx+1)}{\sqrt{-c^2x^2+1}}\right)$$

$$- 4 d^2 b^2 \operatorname{dilog}\left(1 - \frac{I(cx+1)}{\sqrt{-c^2x^2+1}}\right) + d^2 b^2 \operatorname{arctanh}(cx) - d^2 b^2 \ln\left(1 + \frac{(cx+1)^2}{-c^2x^2+1}\right)$$

Problem 25: Result more than twice size of optimal antiderivative.

$$\int \frac{(cdx+d)^2 (a+b\operatorname{arctanh}(cx))^2}{x^2}\, dx$$

Optimal(type 4, 283 leaves, 17 steps):

$$2 c d^2 (a+b\operatorname{arctanh}(cx))^2 - \frac{d^2 (a+b\operatorname{arctanh}(cx))^2}{x} + c^2 d^2 x (a+b\operatorname{arctanh}(cx))^2 - 4 c d^2 (a+b\operatorname{arctanh}(cx))^2 \operatorname{arctanh}\left(-1+\frac{2}{-cx+1}\right) - 2 b c d^2 (a$$

$$+ b\operatorname{arctanh}(cx)) \ln\left(\frac{2}{-cx+1}\right) + 2 b c d^2 (a+b\operatorname{arctanh}(cx)) \ln\left(2-\frac{2}{cx+1}\right) - b^2 c d^2 \operatorname{polylog}\left(2, 1-\frac{2}{-cx+1}\right) - 2 b c d^2 (a$$

$$+ b\operatorname{arctanh}(cx)) \operatorname{polylog}\left(2, 1-\frac{2}{-cx+1}\right) + 2 b c d^2 (a+b\operatorname{arctanh}(cx)) \operatorname{polylog}\left(2, -1+\frac{2}{-cx+1}\right) - b^2 c d^2 \operatorname{polylog}\left(2, -1+\frac{2}{cx+1}\right)$$

$$+ b^2 c d^2 \operatorname{polylog}\left(3, 1-\frac{2}{-cx+1}\right) - b^2 c d^2 \operatorname{polylog}\left(3, -1+\frac{2}{-cx+1}\right)$$

Result(type ?, 6038 leaves): Display of huge result suppressed!

Problem 26: Result more than twice size of optimal antiderivative.

$$\int \frac{(cdx+d)^3 (a+b\operatorname{arctanh}(cx))^2}{x^4}\, dx$$

Optimal(type 4, 374 leaves, 28 steps):

$$-\frac{b^2 c^2 d^3}{3x}+\frac{b^2 c^3 d^3 \operatorname{arctanh}(cx)}{3}-\frac{b c d^3 (a+b\operatorname{arctanh}(cx))}{3x^2}-\frac{3 b c^2 d^3 (a+b\operatorname{arctanh}(cx))}{x}+\frac{29 c^3 d^3 (a+b\operatorname{arctanh}(cx))^2}{6}$$
$$-\frac{d^3 (a+b\operatorname{arctanh}(cx))^2}{3x^3}-\frac{3 c d^3 (a+b\operatorname{arctanh}(cx))^2}{2x^2}-\frac{3 c^2 d^3 (a+b\operatorname{arctanh}(cx))^2}{x}-2 c^3 d^3 (a+b\operatorname{arctanh}(cx))^2 \operatorname{arctanh}\left(-1+\frac{2}{-cx+1}\right)$$
$$+3 b^2 c^3 d^3 \ln(x)-\frac{3 b^2 c^3 d^3 \ln(-c^2x^2+1)}{2}+\frac{20 b c^3 d^3 (a+b\operatorname{arctanh}(cx)) \ln\left(2-\frac{2}{cx+1}\right)}{3}-b c^3 d^3 (a+b\operatorname{arctanh}(cx)) \operatorname{polylog}\left(2, 1-\frac{2}{-cx+1}\right)$$
$$+b c^3 d^3 (a+b\operatorname{arctanh}(cx)) \operatorname{polylog}\left(2, -1+\frac{2}{-cx+1}\right)-\frac{10 b^2 c^3 d^3 \operatorname{polylog}\left(2, -1+\frac{2}{cx+1}\right)}{3}+\frac{b^2 c^3 d^3 \operatorname{polylog}\left(3, 1-\frac{2}{-cx+1}\right)}{2}$$
$$-\frac{b^2 c^3 d^3 \operatorname{polylog}\left(3, -1+\frac{2}{-cx+1}\right)}{2}$$

Result(type 4, 1336 leaves):

$$-\frac{I c^3 d^3 b^2 \pi \operatorname{csgn}\left(I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)\right) \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)^2 \operatorname{arctanh}(cx)^2}{2}$$
$$-\frac{I c^3 d^3 b^2 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)^2 \operatorname{arctanh}(cx)^2}{2}-\frac{3 c^2 d^3 a b}{x}-\frac{c d^3 a b}{3x^2}-\frac{3 c d^3 b^2 \operatorname{arctanh}(cx)^2}{2x^2}$$
$$-\frac{c d^3 b^2 \operatorname{arctanh}(cx)}{3x^2}-\frac{3 c^2 d^3 b^2 \operatorname{arctanh}(cx)}{x}-\frac{3 c^2 d^3 b^2 \operatorname{arctanh}(cx)^2}{x}+2 c^3 d^3 b^2 \operatorname{arctanh}(cx) \operatorname{polylog}\left(2, -\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)$$
$$+c^3 d^3 b^2 \operatorname{arctanh}(cx)^2 \ln\left(1-\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)-c^3 d^3 a b \operatorname{dilog}(cx)+\frac{20 c^3 d^3 b^2 \operatorname{arctanh}(cx) \ln\left(1+\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{3}-\frac{c^3 d^3 b^2 \sqrt{-c^2x^2+1}}{3\left(-\sqrt{-c^2x^2+1}+cx+1\right)}$$
$$+\frac{c^3 d^3 b^2 \sqrt{-c^2x^2+1}}{3\left(\sqrt{-c^2x^2+1}+cx+1\right)}+c^3 d^3 b^2 \ln(cx) \operatorname{arctanh}(cx)^2+c^3 d^3 b^2 \operatorname{arctanh}(cx)^2 \ln\left(1+\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)-c^3 d^3 b^2 \operatorname{arctanh}(cx) \operatorname{polylog}\Bigg(2,$$
$$-\frac{(cx+1)^2}{-c^2x^2+1}\Bigg)-c^3 d^3 b^2 \operatorname{arctanh}(cx)^2 \ln\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)+2 c^3 d^3 b^2 \operatorname{arctanh}(cx) \operatorname{polylog}\left(2, \frac{cx+1}{\sqrt{-c^2x^2+1}}\right)+\frac{20 c^3 d^3 a b \ln(cx)}{3}$$
$$-\frac{11 c^3 d^3 a b \ln(cx+1)}{6}-\frac{29 c^3 d^3 a b \ln(cx-1)}{6}-c^3 d^3 a b \operatorname{dilog}(cx+1)-\frac{2 d^3 a b \operatorname{arctanh}(cx)}{3x^3}$$

$$+\frac{I c^3 d^3 b^2 \pi \operatorname{csgn}\left(I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)\right) \operatorname{csgn}\left(\frac{I}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{arctanh}(cx)^2}{2}$$

$$+\frac{I c^3 d^3 b^2 \pi \operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)^3 \operatorname{arctanh}(cx)^2}{2} - \frac{3 c d^3 a^2}{2x^2} - \frac{3 c^2 d^3 a^2}{x} - \frac{d^3 b^2 \operatorname{arctanh}(cx)^2}{3x^3} + 3 c^3 d^3 b^2 \ln\left(1+\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)$$

$$-2 c^3 d^3 b^2 \operatorname{polylog}\left(3, -\frac{cx+1}{\sqrt{-c^2x^2+1}}\right) + \frac{c^3 d^3 b^2 \operatorname{polylog}\left(3, -\frac{(cx+1)^2}{-c^2x^2+1}\right)}{2} - 2 c^3 d^3 b^2 \operatorname{polylog}\left(3, \frac{cx+1}{\sqrt{-c^2x^2+1}}\right) - \frac{20 c^3 d^3 b^2 \operatorname{dilog}\left(\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{3}$$

$$+\frac{20 c^3 d^3 b^2 \operatorname{dilog}\left(1+\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{3} + 3 c^3 d^3 b^2 \ln\left(\frac{cx+1}{\sqrt{-c^2x^2+1}}-1\right) - \frac{11 c^3 d^3 b^2 \operatorname{arctanh}(cx)^2}{6} + c^3 d^3 a^2 \ln(cx) - \frac{d^3 a^2}{3x^3}$$

$$+2 c^3 d^3 a b \ln(cx) \operatorname{arctanh}(cx) - c^3 d^3 a b \ln(cx) \ln(cx+1) - \frac{3 c d^3 a b \operatorname{arctanh}(cx)}{x^2} - \frac{6 c^2 d^3 a b \operatorname{arctanh}(cx)}{x} - \frac{8 b^2 c^3 d^3 \operatorname{arctanh}(cx)}{3}$$

Problem 27: Result more than twice size of optimal antiderivative.

$$\int \frac{(c d x + d)^3 (a + b \operatorname{arctanh}(cx))^2}{x^5}\, dx$$

Optimal(type 4, 259 leaves, 18 steps):

$$-\frac{b^2 c^2 d^3}{12 x^2} - \frac{b^2 c^3 d^3}{x} + b^2 c^4 d^3 \operatorname{arctanh}(cx) - \frac{b c d^3 (a + b \operatorname{arctanh}(cx))}{6x^3} - \frac{b c^2 d^3 (a + b \operatorname{arctanh}(cx))}{x^2} - \frac{7 b c^3 d^3 (a + b \operatorname{arctanh}(cx))}{2x}$$

$$-\frac{d^3 (cx+1)^4 (a + b \operatorname{arctanh}(cx))^2}{4x^4} + 4 a b c^4 d^3 \ln(x) + \frac{11 b^2 c^4 d^3 \ln(x)}{3} + 4 b c^4 d^3 (a + b \operatorname{arctanh}(cx)) \ln\left(\frac{2}{-cx+1}\right) - \frac{11 b^2 c^4 d^3 \ln(-c^2x^2+1)}{6}$$

$$-2 b^2 c^4 d^3 \operatorname{polylog}(2, -cx) + 2 b^2 c^4 d^3 \operatorname{polylog}(2, cx) + 2 b^2 c^4 d^3 \operatorname{polylog}\left(2, 1-\frac{2}{-cx+1}\right)$$

Result(type 4, 645 leaves):

$$-\frac{c d^3 a b}{6x^3} - \frac{7 c^3 d^3 a b}{2x} - \frac{c^2 d^3 a b}{x^2} - \frac{c d^3 b^2 \operatorname{arctanh}(cx)}{6x^3} - \frac{3 c^2 d^3 b^2 \operatorname{arctanh}(cx)^2}{2x^2} - \frac{c^2 d^3 b^2 \operatorname{arctanh}(cx)}{x^2} - \frac{7 c^3 d^3 b^2 \operatorname{arctanh}(cx)}{2x} - \frac{c^3 d^3 b^2 \operatorname{arctanh}(cx)^2}{x}$$

$$-\frac{c d^3 b^2 \operatorname{arctanh}(cx)^2}{x^3} + 4 c^4 d^3 b^2 \ln(cx) \operatorname{arctanh}(cx) - \frac{c^4 d^3 b^2 \operatorname{arctanh}(cx) \ln(cx+1)}{4} - \frac{15 c^4 d^3 b^2 \operatorname{arctanh}(cx) \ln(cx-1)}{4} - 2 c^4 d^3 b^2 \ln(cx) \ln(cx$$

$$+1) + \frac{15 c^4 d^3 b^2 \ln(cx-1) \ln\left(\frac{cx}{2}+\frac{1}{2}\right)}{8} - \frac{c^4 d^3 b^2 \ln\left(-\frac{cx}{2}+\frac{1}{2}\right) \ln(cx+1)}{8} + \frac{c^4 d^3 b^2 \ln\left(-\frac{cx}{2}+\frac{1}{2}\right) \ln\left(\frac{cx}{2}+\frac{1}{2}\right)}{8} + 4 c^4 d^3 a b \ln(cx)$$

$$- \frac{c^4 d^3 a b \ln(cx+1)}{4} - \frac{15 c^4 d^3 a b \ln(cx-1)}{4} - \frac{d^3 a b \operatorname{arctanh}(cx)}{2 x^4} - \frac{d^3 a^2}{4 x^4} - \frac{7 c^4 d^3 b^2 \ln(cx-1)}{3} - 2 c^4 d^3 b^2 \operatorname{dilog}(cx+1) - 2 c^4 d^3 b^2 \operatorname{dilog}(cx)$$

$$- \frac{15 c^4 d^3 b^2 \ln(cx-1)^2}{16} + 2 c^4 d^3 b^2 \operatorname{dilog}\left(\frac{cx}{2}+\frac{1}{2}\right) + \frac{c^4 d^3 b^2 \ln(cx+1)^2}{16} - \frac{c d^3 a^2}{x^3} - \frac{3 c^2 d^3 a^2}{2 x^2} - \frac{c^3 d^3 a^2}{x} - \frac{d^3 b^2 \operatorname{arctanh}(cx)^2}{4 x^4}$$

$$+ \frac{11 c^4 d^3 b^2 \ln(cx)}{3} - \frac{4 c^4 d^3 b^2 \ln(cx+1)}{3} - \frac{2 c d^3 a b \operatorname{arctanh}(cx)}{x^3} - \frac{3 c^2 d^3 a b \operatorname{arctanh}(cx)}{x^2} - \frac{2 c^3 d^3 a b \operatorname{arctanh}(cx)}{x} - \frac{b^2 c^2 d^3}{12 x^2} - \frac{b^2 c^3 d^3}{x}$$

Problem 28: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b \operatorname{arctanh}(cx))^2}{x^2 (c d x + d)} \, dx$$

Optimal(type 4, 160 leaves, 8 steps):

$$\frac{c (a+b \operatorname{arctanh}(cx))^2}{d} - \frac{(a+b \operatorname{arctanh}(cx))^2}{d x} + \frac{2 b c (a+b \operatorname{arctanh}(cx)) \ln\left(2-\frac{2}{cx+1}\right)}{d} - \frac{c (a+b \operatorname{arctanh}(cx))^2 \ln\left(2-\frac{2}{cx+1}\right)}{d}$$

$$- \frac{b^2 c \operatorname{polylog}\left(2, -1+\frac{2}{cx+1}\right)}{d} + \frac{b c (a+b \operatorname{arctanh}(cx)) \operatorname{polylog}\left(2, -1+\frac{2}{cx+1}\right)}{d} + \frac{b^2 c \operatorname{polylog}\left(3, -1+\frac{2}{cx+1}\right)}{2 d}$$

Result(type ?, 7285 leaves): Display of huge result suppressed!

Problem 29: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b \operatorname{arctanh}(cx))^2}{x^3 (c d x + d)} \, dx$$

Optimal(type 4, 242 leaves, 17 steps):

$$-\frac{b c (a+b \operatorname{arctanh}(cx))}{d x} - \frac{c^2 (a+b \operatorname{arctanh}(cx))^2}{2 d} - \frac{(a+b \operatorname{arctanh}(cx))^2}{2 x^2 d} + \frac{c (a+b \operatorname{arctanh}(cx))^2}{d x} + \frac{b^2 c^2 \ln(x)}{d} - \frac{b^2 c^2 \ln(-c^2 x^2+1)}{2 d}$$

$$- \frac{2 b c^2 (a+b \operatorname{arctanh}(cx)) \ln\left(2-\frac{2}{cx+1}\right)}{d} + \frac{c^2 (a+b \operatorname{arctanh}(cx))^2 \ln\left(2-\frac{2}{cx+1}\right)}{d} + \frac{b^2 c^2 \operatorname{polylog}\left(2, -1+\frac{2}{cx+1}\right)}{d}$$

$$- \frac{b c^2 (a+b \operatorname{arctanh}(cx)) \operatorname{polylog}\left(2, -1+\frac{2}{cx+1}\right)}{d} - \frac{b^2 c^2 \operatorname{polylog}\left(3, -1+\frac{2}{cx+1}\right)}{2 d}$$

Result(type 4, 1849 leaves):

$$-\frac{\mathrm{I}\, c^2 b^2 \pi \operatorname{csgn}\left(\frac{\mathrm{I}\,(cx+1)^2}{-c^2x^2+1}\right)^3 \operatorname{arctanh}(cx)^2}{2d} - \frac{\mathrm{I}\, c^2 b^2 \pi \operatorname{csgn}\left(\frac{\mathrm{I}\,(cx+1)^2}{(-c^2x^2+1)\left(1+\frac{(cx+1)^2}{-c^2x^2+1}\right)}\right)^3 \operatorname{arctanh}(cx)^2}{2d}$$

$$+\frac{\mathrm{I}\, c^2 b^2 \pi \operatorname{csgn}\left(\frac{\mathrm{I}\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)^3 \operatorname{arctanh}(cx)^2}{2d} + \frac{\mathrm{I}\, c^2 b^2 \pi \operatorname{csgn}\left(\frac{\mathrm{I}\,(cx+1)}{\sqrt{-c^2x^2+1}}\right) \operatorname{csgn}\left(\frac{\mathrm{I}\,(cx+1)^2}{-c^2x^2+1}\right)^2 \operatorname{arctanh}(cx)^2}{d} - \frac{a^2}{2dx^2} - \frac{cab}{dx}$$

$$+\frac{\mathrm{I}\, c^2 b^2 \pi \operatorname{csgn}\left(\frac{\mathrm{I}\,(cx+1)^2}{(-c^2x^2+1)\left(1+\frac{(cx+1)^2}{-c^2x^2+1}\right)}\right)^2 \operatorname{csgn}\left(\frac{\mathrm{I}}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{arctanh}(cx)^2}{2d}$$

$$-\frac{\mathrm{I}\, c^2 b^2 \pi \operatorname{csgn}\left(\mathrm{I}\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)\right) \operatorname{csgn}\left(\frac{\mathrm{I}\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)^2 \operatorname{arctanh}(cx)^2}{2d}$$

$$+\frac{\mathrm{I}\, c^2 b^2 \pi \operatorname{csgn}\left(\frac{\mathrm{I}\,(cx+1)^2}{-c^2x^2+1}\right) \operatorname{csgn}\left(\frac{\mathrm{I}\,(cx+1)^2}{(-c^2x^2+1)\left(1+\frac{(cx+1)^2}{-c^2x^2+1}\right)}\right)^2 \operatorname{arctanh}(cx)^2}{2d}$$

$$-\frac{\mathrm{I}\, c^2 b^2 \pi \operatorname{csgn}\left(\frac{\mathrm{I}\,(cx+1)}{\sqrt{-c^2x^2+1}}\right)^2 \operatorname{csgn}\left(\frac{\mathrm{I}\,(cx+1)^2}{-c^2x^2+1}\right) \operatorname{arctanh}(cx)^2}{2d} - \frac{\mathrm{I}\, c^2 b^2 \pi \operatorname{csgn}\left(\frac{\mathrm{I}}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right) \operatorname{csgn}\left(\frac{\mathrm{I}\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)^2 \operatorname{arctanh}(cx)^2}{2d}$$

$$+\frac{c a^2}{dx} - \frac{b^2 \operatorname{arctanh}(cx)^2}{2dx^2} - \frac{2c^2b^2 \operatorname{polylog}\left(3, -\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d} - \frac{2c^2b^2 \operatorname{polylog}\left(3, \frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d} + \frac{2c^2b^2 \operatorname{dilog}\left(\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d}$$

$$-\frac{2c^2b^2 \operatorname{dilog}\left(1+\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d} + \frac{3c^2b^2 \operatorname{arctanh}(cx)^2}{2d} - \frac{2c^2b^2 \operatorname{arctanh}(cx)^3}{3d} + \frac{c^2a^2 \ln(cx)}{d} - \frac{c^2a^2 \ln(cx+1)}{d} + \frac{c^2b^2 \ln\left(\frac{cx+1}{\sqrt{-c^2x^2+1}}-1\right)}{d}$$

$$+\frac{c^2b^2 \ln\left(1+\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d} - \frac{c^2b^2 \operatorname{arctanh}(cx)}{d} - \frac{cb^2 \operatorname{arctanh}(cx)}{dx} + \frac{cb^2 \operatorname{arctanh}(cx)^2}{dx} - \frac{c^2ab \operatorname{dilog}(cx+1)}{d} - \frac{c^2ab \operatorname{dilog}(cx)}{d}$$

$$+\frac{c^2 a b \ln(cx+1)^2}{2d}+\frac{c^2 a b \operatorname{dilog}\left(\frac{cx}{2}+\frac{1}{2}\right)}{d}+\frac{c^2 b^2 \ln(cx)\operatorname{arctanh}(cx)^2}{d}+\frac{c^2 b^2 \operatorname{arctanh}(cx)^2 \ln\left(1+\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d}$$

$$-\frac{c^2 b^2 \operatorname{arctanh}(cx)^2 \ln\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{d}+\frac{2c^2 b^2 \operatorname{arctanh}(cx)\operatorname{polylog}\left(2,\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d}+\frac{2c^2 b^2 \operatorname{arctanh}(cx)\operatorname{polylog}\left(2,-\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d}$$

$$+\frac{c^2 b^2 \operatorname{arctanh}(cx)^2 \ln\left(1-\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d}-\frac{2c^2 b^2 \operatorname{arctanh}(cx)\ln\left(1+\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d}-\frac{c^2 b^2 \operatorname{arctanh}(cx)^2 \ln(cx+1)}{d}$$

$$+\frac{2c^2 b^2 \operatorname{arctanh}(cx)^2 \ln\left(\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{d}+\frac{c^2 b^2 \ln(2)\operatorname{arctanh}(cx)^2}{d}-\frac{2c^2 a b \ln(cx)}{d}+\frac{3c^2 a b \ln(cx+1)}{2d}+\frac{c^2 a b \ln(cx-1)}{2d}-\frac{a b \operatorname{arctanh}(cx)}{d x^2}$$

$$+\frac{I c^2 b^2 \pi \operatorname{csgn}\left(I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)\right)\operatorname{csgn}\left(\frac{I}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)\operatorname{csgn}\left(\frac{I\left(\frac{(cx+1)^2}{-c^2x^2+1}-1\right)}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)\operatorname{arctanh}(cx)^2}{2d}$$

$$-\frac{I c^2 b^2 \pi \operatorname{csgn}\left(\frac{I(cx+1)^2}{-c^2x^2+1}\right)\operatorname{csgn}\left(\frac{I(cx+1)^2}{(-c^2x^2+1)\left(1+\frac{(cx+1)^2}{-c^2x^2+1}\right)}\right)\operatorname{csgn}\left(\frac{I}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)\operatorname{arctanh}(cx)^2}{2d}-\frac{2c^2 a b \operatorname{arctanh}(cx)\ln(cx+1)}{d}$$

$$-\frac{c^2 a b \ln(cx)\ln(cx+1)}{d}-\frac{c^2 a b \ln\left(-\frac{cx}{2}+\frac{1}{2}\right)\ln(cx+1)}{d}+\frac{c^2 a b \ln\left(-\frac{cx}{2}+\frac{1}{2}\right)\ln\left(\frac{cx}{2}+\frac{1}{2}\right)}{d}+\frac{2c^2 a b \ln(cx)\operatorname{arctanh}(cx)}{d}$$

$$+\frac{2 c a b \operatorname{arctanh}(cx)}{d x}$$

Problem 30: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\operatorname{arctanh}(cx))^2}{x^4(c d x+d)}\,dx$$

Optimal(type 4, 314 leaves, 26 steps):

$$-\frac{b^2c^2}{3dx}+\frac{b^2c^3\operatorname{arctanh}(cx)}{3d}-\frac{bc(a+b\operatorname{arctanh}(cx))}{3x^2d}+\frac{bc^2(a+b\operatorname{arctanh}(cx))}{dx}+\frac{5c^3(a+b\operatorname{arctanh}(cx))^2}{6d}-\frac{(a+b\operatorname{arctanh}(cx))^2}{3x^3d}$$

$$+\frac{c(a+b\operatorname{arctanh}(cx))^2}{2x^2d}-\frac{c^2(a+b\operatorname{arctanh}(cx))^2}{dx}-\frac{b^2c^3\ln(x)}{d}+\frac{b^2c^3\ln(-c^2x^2+1)}{2d}+\frac{8bc^3(a+b\operatorname{arctanh}(cx))\ln\left(2-\frac{2}{cx+1}\right)}{3d}$$

$$-\frac{c^3 (a+b\,\text{arctanh}(cx))^2 \ln\left(2-\frac{2}{cx+1}\right)}{d}-\frac{4 b^2 c^3 \,\text{polylog}\left(2,-1+\frac{2}{cx+1}\right)}{3d}+\frac{b c^3 (a+b\,\text{arctanh}(cx))\,\text{polylog}\left(2,-1+\frac{2}{cx+1}\right)}{d}$$
$$+\frac{b^2 c^3\,\text{polylog}\left(3,-1+\frac{2}{cx+1}\right)}{2d}$$

Result(type ?, 2018 leaves): Display of huge result suppressed!

Problem 31: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2 (a+b\,\text{arctanh}(cx))^2}{(cdx+d)^3}\,dx$$

Optimal(type 4, 249 leaves, 26 steps):

$$-\frac{b^2}{16 c^3 d^3 (cx+1)^2}+\frac{13 b^2}{16 c^3 d^3 (cx+1)}-\frac{13 b^2 \,\text{arctanh}(cx)}{16 d^3 c^3}-\frac{b (a+b\,\text{arctanh}(cx))}{4 c^3 d^3 (cx+1)^2}+\frac{7 b (a+b\,\text{arctanh}(cx))}{4 c^3 d^3 (cx+1)}-\frac{7 (a+b\,\text{arctanh}(cx))^2}{8 d^3 c^3}$$
$$-\frac{(a+b\,\text{arctanh}(cx))^2}{2 c^3 d^3 (cx+1)^2}+\frac{2 (a+b\,\text{arctanh}(cx))^2}{c^3 d^3 (cx+1)}-\frac{(a+b\,\text{arctanh}(cx))^2 \ln\left(\frac{2}{cx+1}\right)}{d^3 c^3}+\frac{b (a+b\,\text{arctanh}(cx))\,\text{polylog}\left(2,1-\frac{2}{cx+1}\right)}{d^3 c^3}$$
$$+\frac{b^2\,\text{polylog}\left(3,1-\frac{2}{cx+1}\right)}{2 d^3 c^3}$$

Result(type 4, 1249 leaves):

$$-\frac{I b^2 \pi\,\text{csgn}\left(\frac{I (cx+1)}{\sqrt{-c^2x^2+1}}\right)\text{csgn}\left(\frac{I (cx+1)^2}{-c^2x^2+1}\right)^2 \text{arctanh}(cx)^2}{c^3 d^3}-\frac{I b^2 \pi\,\text{csgn}\left(\frac{I (cx+1)^2}{(-c^2x^2+1)\left(1+\frac{(cx+1)^2}{-c^2x^2+1}\right)}\right)^2 \text{csgn}\left(\frac{I}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)\text{arctanh}(cx)^2}{2 c^3 d^3}$$
$$-\frac{I b^2 \pi\,\text{csgn}\left(\frac{I (cx+1)^2}{-c^2x^2+1}\right)\text{csgn}\left(\frac{I (cx+1)^2}{(-c^2x^2+1)\left(1+\frac{(cx+1)^2}{-c^2x^2+1}\right)}\right)^2 \text{arctanh}(cx)^2}{2 c^3 d^3}-\frac{a^2}{2 c^3 d^3 (cx+1)^2}+\frac{2 a^2}{c^3 d^3 (cx+1)}+\frac{a^2 \ln(cx+1)}{c^3 d^3}$$
$$+\frac{b^2\,\text{polylog}\left(3,-\frac{(cx+1)^2}{-c^2x^2+1}\right)}{2 c^3 d^3}-\frac{7 b^2 \,\text{arctanh}(cx)^2}{8 c^3 d^3}+\frac{2 b^2 \,\text{arctanh}(cx)^3}{3 c^3 d^3}$$
$$+\frac{I b^2 \pi\,\text{csgn}\left(\frac{I (cx+1)^2}{-c^2x^2+1}\right)\text{csgn}\left(\frac{I (cx+1)^2}{(-c^2x^2+1)\left(1+\frac{(cx+1)^2}{-c^2x^2+1}\right)}\right)\text{csgn}\left(\frac{I}{1+\frac{(cx+1)^2}{-c^2x^2+1}}\right)\text{arctanh}(cx)^2}{2 c^3 d^3}$$

$$+\frac{I b^2 \pi \operatorname{csgn}\left(\frac{I (cx+1)^2}{(-c^2x^2+1)\left(1+\frac{(cx+1)^2}{-c^2x^2+1}\right)}\right)^3 \operatorname{arctanh}(cx)^2}{2c^3d^3}+\frac{I b^2 \pi \operatorname{csgn}\left(\frac{I (cx+1)^2}{-c^2x^2+1}\right)^3 \operatorname{arctanh}(cx)^2}{2c^3d^3}-\frac{b^2 \operatorname{arctanh}(cx)\, x^2}{16 c d^3 (cx+1)^2}+\frac{b^2 \operatorname{arctanh}(cx)\, x}{8c^2d^3(cx+1)^2}$$

$$-\frac{3b^2 \operatorname{arctanh}(cx)\, x}{4c^2d^3(cx+1)}-\frac{a b \operatorname{arctanh}(cx)}{c^3d^3(cx+1)^2}+\frac{4 a b \operatorname{arctanh}(cx)}{c^3d^3(cx+1)}+\frac{a b \ln\left(-\frac{cx}{2}+\frac{1}{2}\right)\ln(cx+1)}{c^3d^3}-\frac{a b \ln\left(-\frac{cx}{2}+\frac{1}{2}\right)\ln\left(\frac{cx}{2}+\frac{1}{2}\right)}{c^3d^3}$$

$$+\frac{2 a b \operatorname{arctanh}(cx)\ln(cx+1)}{c^3d^3}+\frac{I b^2\pi \operatorname{csgn}\left(\frac{I(cx+1)}{\sqrt{-c^2x^2+1}}\right)^2 \operatorname{csgn}\left(\frac{I(cx+1)^2}{-c^2x^2+1}\right)\operatorname{arctanh}(cx)^2}{2c^3d^3}-\frac{b^2}{64c^3d^3(cx+1)^2}+\frac{3b^2}{8c^3d^3(cx+1)}$$

$$+\frac{7ab}{4c^3d^3(cx+1)}-\frac{3b^2x}{8c^2d^3(cx+1)}-\frac{b^2x^2}{64cd^3(cx+1)^2}+\frac{b^2x}{32c^2d^3(cx+1)^2}+\frac{b^2\operatorname{arctanh}(cx)^2\ln(cx+1)}{c^3d^3}$$

$$-\frac{b^2\operatorname{arctanh}(cx)\operatorname{polylog}\left(2,-\frac{(cx+1)^2}{-c^2x^2+1}\right)}{c^3d^3}-\frac{2b^2\operatorname{arctanh}(cx)^2\ln\left(\frac{cx+1}{\sqrt{-c^2x^2+1}}\right)}{c^3d^3}-\frac{b^2\operatorname{arctanh}(cx)^2}{2c^3d^3(cx+1)^2}+\frac{2b^2\operatorname{arctanh}(cx)^2}{c^3d^3(cx+1)}-\frac{b^2\operatorname{arctanh}(cx)}{16c^3d^3(cx+1)^2}$$

$$+\frac{3b^2\operatorname{arctanh}(cx)}{4c^3d^3(cx+1)}+\frac{7ab\ln(cx-1)}{8c^3d^3}-\frac{7ab\ln(cx+1)}{8c^3d^3}-\frac{ab\ln(cx+1)^2}{2c^3d^3}-\frac{ab\operatorname{dilog}\left(\frac{cx}{2}+\frac{1}{2}\right)}{c^3d^3}-\frac{b^2\ln(2)\operatorname{arctanh}(cx)^2}{c^3d^3}-\frac{ab}{4c^3d^3(cx+1)^2}$$

Problem 32: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\operatorname{arctanh}(cx))^2}{x^2(cdx+d)^3}\,dx$$

Optimal(type 4, 428 leaves, 36 steps):

$$-\frac{b^2c}{16d^3(cx+1)^2}-\frac{19b^2c}{16d^3(cx+1)}+\frac{19b^2c\operatorname{arctanh}(cx)}{16d^3}-\frac{bc(a+b\operatorname{arctanh}(cx))}{4d^3(cx+1)^2}-\frac{9bc(a+b\operatorname{arctanh}(cx))}{4d^3(cx+1)}+\frac{17c(a+b\operatorname{arctanh}(cx))^2}{8d^3}$$

$$-\frac{(a+b\operatorname{arctanh}(cx))^2}{xd^3}-\frac{c(a+b\operatorname{arctanh}(cx))^2}{2d^3(cx+1)^2}-\frac{2c(a+b\operatorname{arctanh}(cx))^2}{d^3(cx+1)}+\frac{6c(a+b\operatorname{arctanh}(cx))^2\operatorname{arctanh}\left(-1+\frac{2}{-cx+1}\right)}{d^3}$$

$$-\frac{3c(a+b\operatorname{arctanh}(cx))^2\ln\left(\frac{2}{cx+1}\right)}{d^3}+\frac{2bc(a+b\operatorname{arctanh}(cx))\ln\left(2-\frac{2}{cx+1}\right)}{d^3}+\frac{3bc(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,1-\frac{2}{-cx+1}\right)}{d^3}$$

$$-\frac{3bc(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,-1+\frac{2}{-cx+1}\right)}{d^3}+\frac{3bc(a+b\operatorname{arctanh}(cx))\operatorname{polylog}\left(2,1-\frac{2}{cx+1}\right)}{d^3}-\frac{b^2c\operatorname{polylog}\left(2,-1+\frac{2}{cx+1}\right)}{d^3}$$

$$-\frac{3 b^2 c \operatorname{polylog}\left(3, 1-\frac{2}{-c x+1}\right)}{2 d^3}+\frac{3 b^2 c \operatorname{polylog}\left(3, -1+\frac{2}{-c x+1}\right)}{2 d^3}+\frac{3 b^2 c \operatorname{polylog}\left(3, 1-\frac{2}{c x+1}\right)}{2 d^3}$$

Result(type ?, 7646 leaves): Display of huge result suppressed!

Problem 33: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b \operatorname{arctanh}(c x))^2}{(c x+1)^4}\, dx$$

Optimal(type 3, 158 leaves, 18 steps):

$$-\frac{b^2}{54 c (c x+1)^3}-\frac{5 b^2}{144 c (c x+1)^2}-\frac{11 b^2}{144 c (c x+1)}+\frac{11 b^2 \operatorname{arctanh}(c x)}{144 c}-\frac{b (a+b \operatorname{arctanh}(c x))}{9 c (c x+1)^3}-\frac{b (a+b \operatorname{arctanh}(c x))}{12 c (c x+1)^2}-\frac{b (a+b \operatorname{arctanh}(c x))}{12 c (c x+1)}+\frac{(a+b \operatorname{arctanh}(c x))^2}{24 c}-\frac{(a+b \operatorname{arctanh}(c x))^2}{3 c (c x+1)^3}$$

Result(type 3, 385 leaves):

$$-\frac{a^2}{3 c (c x+1)^3}-\frac{b^2 \operatorname{arctanh}(c x)^2}{3 c (c x+1)^3}-\frac{b^2 \operatorname{arctanh}(c x)}{9 c (c x+1)^3}-\frac{b^2 \operatorname{arctanh}(c x)}{12 c (c x+1)^2}-\frac{b^2 \operatorname{arctanh}(c x)}{12 c (c x+1)}+\frac{b^2 \operatorname{arctanh}(c x) \ln(c x+1)}{24 c}-\frac{b^2 \operatorname{arctanh}(c x) \ln(c x-1)}{24 c}$$
$$-\frac{b^2 \ln\left(-\frac{c x}{2}+\frac{1}{2}\right) \ln\left(\frac{c x}{2}+\frac{1}{2}\right)}{48 c}+\frac{b^2 \ln\left(-\frac{c x}{2}+\frac{1}{2}\right) \ln(c x+1)}{48 c}+\frac{b^2 \ln(c x-1) \ln\left(\frac{c x}{2}+\frac{1}{2}\right)}{48 c}-\frac{b^2 \ln(c x+1)^2}{96 c}-\frac{b^2 \ln(c x-1)^2}{96 c}$$
$$+\frac{11 b^2 \ln(c x+1)}{288 c}-\frac{11 b^2 \ln(c x-1)}{288 c}-\frac{11 b^2}{144 c (c x+1)}-\frac{5 b^2}{144 c (c x+1)^2}-\frac{b^2}{54 c (c x+1)^3}-\frac{2 a b \operatorname{arctanh}(c x)}{3 c (c x+1)^3}-\frac{a b}{9 c (c x+1)^3}$$
$$-\frac{a b}{12 c (c x+1)^2}-\frac{a b}{12 c (c x+1)}+\frac{a b \ln(c x+1)}{24 c}-\frac{a b \ln(c x-1)}{24 c}$$

Problem 34: Result more than twice size of optimal antiderivative.

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

Optimal(type 4, 65 leaves, 4 steps):

$$\frac{\operatorname{arctanh}(a x)^2 \ln\left(2-\frac{2}{-a x+1}\right)}{c}+\frac{\operatorname{arctanh}(a x) \operatorname{polylog}\left(2, -1+\frac{2}{-a x+1}\right)}{c}-\frac{\operatorname{polylog}\left(3, -1+\frac{2}{-a x+1}\right)}{2 c}$$

Result(type 4, 716 leaves):

$$\frac{\operatorname{arctanh}(a x)^2 \ln(a x)}{c}-\frac{\operatorname{arctanh}(a x)^2 \ln(a x-1)}{c}-\frac{\operatorname{arctanh}(a x)^2 \ln\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{c}+\frac{\operatorname{arctanh}(a x)^2 \ln\left(1+\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}$$

$$+\frac{2\,\mathrm{arctanh}(a x)\,\mathrm{polylog}\left(2, -\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c} - \frac{2\,\mathrm{polylog}\left(3, -\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c} + \frac{\mathrm{arctanh}(a x)^2 \ln\left(1-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}$$

$$+\frac{2\,\mathrm{arctanh}(a x)\,\mathrm{polylog}\left(2, \frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c} - \frac{2\,\mathrm{polylog}\left(3, \frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c} + \frac{I\pi\,\mathrm{arctanh}(a x)^2}{c}$$

$$-\frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)\mathrm{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2 \pi\,\mathrm{arctanh}(a x)^2}{2 c} - \frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2 \pi\,\mathrm{arctanh}(a x)^2}{c}$$

$$+\frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^3 \pi\,\mathrm{arctanh}(a x)^2}{c} + \frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)\mathrm{csgn}\left(I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)\right)\mathrm{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)\pi\,\mathrm{arctanh}(a x)^2}{2 c}$$

$$+\frac{I\,\mathrm{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^3 \pi\,\mathrm{arctanh}(a x)^2}{2 c} - \frac{I\,\mathrm{csgn}\left(I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)\right)\mathrm{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2 \pi\,\mathrm{arctanh}(a x)^2}{2 c}$$

$$+\frac{\ln(2)\,\mathrm{arctanh}(a x)^2}{c}$$

Problem 35: Result more than twice size of optimal antiderivative.

$$\int (c x+1)^3 \,(a+b\,\mathrm{arctanh}(c x))^3\, dx$$

Optimal(type 4, 288 leaves, 26 steps):

$$3 a b^2 x + \frac{b^3 x}{4} - \frac{b^3\,\mathrm{arctanh}(c x)}{4 c} + 3 b^3 x\,\mathrm{arctanh}(c x) + \frac{b^2 c x^2 (a+b\,\mathrm{arctanh}(c x))}{4} + \frac{4 b (a+b\,\mathrm{arctanh}(c x))^2}{c} + \frac{21 b x (a+b\,\mathrm{arctanh}(c x))^2}{4}$$

$$+\frac{3 b c x^2 (a+b\,\mathrm{arctanh}(c x))^2}{2} + \frac{b c^2 x^3 (a+b\,\mathrm{arctanh}(c x))^2}{4} + \frac{(c x+1)^4 (a+b\,\mathrm{arctanh}(c x))^3}{4 c} - \frac{11 b^2 (a+b\,\mathrm{arctanh}(c x)) \ln\left(\frac{2}{-c x+1}\right)}{c}$$

$$-\frac{6 b (a+b\,\mathrm{arctanh}(c x))^2 \ln\left(\frac{2}{-c x+1}\right)}{c} + \frac{3 b^3 \ln(-c^2 x^2+1)}{2 c} - \frac{11 b^3\,\mathrm{polylog}\left(2, 1-\frac{2}{-c x+1}\right)}{2 c}$$

$$-\frac{6 b^2 (a+b\,\mathrm{arctanh}(c x))\,\mathrm{polylog}\left(2, 1-\frac{2}{-c x+1}\right)}{c}+\frac{3 b^3\,\mathrm{polylog}\left(3, 1-\frac{2}{-c x+1}\right)}{c}$$

Result(type 4, 962 leaves):

$$-\frac{6 a b^2 \ln(c x-1) \ln\left(\frac{c x}{2}+\frac{1}{2}\right)}{c}+\frac{c^2 a b^2 x^3 \,\mathrm{arctanh}(c x)}{2}+\frac{9 c a^2 b\,\mathrm{arctanh}(c x) x^2}{2}+\frac{9 c a b^2 \,\mathrm{arctanh}(c x)^2 x^2}{2}+3 c a b^2\,\mathrm{arctanh}(c x) x^2$$
$$+3 c^2 x^3 a b^2\,\mathrm{arctanh}(c x)^2+3 c^2 x^3 a^2 b\,\mathrm{arctanh}(c x)+\frac{3 c^3 a^2 b x^4\,\mathrm{arctanh}(c x)}{4}+\frac{3 c^3 a b^2 x^4\,\mathrm{arctanh}(c x)^2}{4}-\frac{6 I b^3 \pi\,\mathrm{arctanh}(c x)^2}{c}$$
$$+\frac{12 a b^2\,\mathrm{arctanh}(c x) \ln(c x-1)}{c}+c^2 x^3 a^3+\frac{3 c x^2 a^3}{2}+\frac{c^3 x^4 a^3}{4}+\frac{4 b^3\,\mathrm{arctanh}(c x)^2}{c}-\frac{3 b^3 \ln\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}{c}+\frac{b^3\,\mathrm{arctanh}(c x)^3}{4 c}$$
$$+\frac{3 b^3\,\mathrm{polylog}\left(3, -\frac{(c x+1)^2}{-c^2 x^2+1}\right)}{c}-\frac{11 b^3\,\mathrm{dilog}\left(1-\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right)}{c}-\frac{11 b^3\,\mathrm{dilog}\left(1+\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right)}{c}+\frac{21 b^3 x\,\mathrm{arctanh}(c x)^2}{4}+b^3\,\mathrm{arctanh}(c x)^3 x$$
$$+\frac{21 a^2 b x}{4}-\frac{13 a b^2}{4 c}-\frac{b^3}{4 c}+\frac{3 c a^2 b x^2}{2}+\frac{c^2 a^2 b x^3}{4}+\frac{c a b^2 x^2}{4}+\frac{21 a b^2\,\mathrm{arctanh}(c x) x}{2}+3 a^2 b\,\mathrm{arctanh}(c x) x+3\,\mathrm{arctanh}(c x)^2 x a b^2$$
$$+\frac{6 b^3\,\mathrm{arctanh}(c x)^2 \ln(c x-1)}{c}-\frac{6 b^3\,\mathrm{arctanh}(c x)\,\mathrm{polylog}\left(2, -\frac{(c x+1)^2}{-c^2 x^2+1}\right)}{c}-\frac{11 b^3\,\mathrm{arctanh}(c x) \ln\left(1-\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right)}{c}$$
$$-\frac{11 b^3\,\mathrm{arctanh}(c x) \ln\left(1+\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right)}{c}+\frac{3 a b^2\,\mathrm{arctanh}(c x)^2}{4 c}+\frac{3 a^2 b\,\mathrm{arctanh}(c x)}{4 c}-\frac{6 a b^2\,\mathrm{dilog}\left(\frac{c x}{2}+\frac{1}{2}\right)}{c}-\frac{6 b^3 \ln(2)\,\mathrm{arctanh}(c x)^2}{c}$$
$$+\frac{6 a^2 b \ln(c x-1)}{c}+\frac{3 a b^2 \ln(c x-1)^2}{c}+\frac{4 a b^2 \ln(c x+1)}{c}+\frac{7 a b^2 \ln(c x-1)}{c}+c^2 x^3 b^3\,\mathrm{arctanh}(c x)^3+\frac{c^2 b^3 x^3\,\mathrm{arctanh}(c x)^2}{4}$$
$$+\frac{c^3 b^3 x^4\,\mathrm{arctanh}(c x)^3}{4}+\frac{c b^3\,\mathrm{arctanh}(c x) x^2}{4}+\frac{3 c b^3\,\mathrm{arctanh}(c x)^2 x^2}{2}+\frac{3 c b^3\,\mathrm{arctanh}(c x)^3 x^2}{2}+\frac{a^3}{4 c}+a^3 x$$
$$-\frac{6 I b^3 \pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^3 \mathrm{arctanh}(c x)^2}{c}+\frac{6 I b^3 \pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^2 \mathrm{arctanh}(c x)^2}{c}+3 a b^2 x+\frac{11 b^3\,\mathrm{arctanh}(c x)}{4 c}+3 b^3 x\,\mathrm{arctanh}(c x)$$
$$+\frac{b^3 x}{4}$$

Problem 36: Result more than twice size of optimal antiderivative.

$$\int (c x+1) (a+b\,\mathrm{arctanh}(c x))^3\,dx$$

Optimal(type 4, 181 leaves, 11 steps):

$$\frac{3 b (a+b \operatorname{arctanh}(c x))^2}{2 c}+\frac{3 b x (a+b \operatorname{arctanh}(c x))^2}{2}+\frac{(c x+1)^2 (a+b \operatorname{arctanh}(c x))^3}{2 c}-\frac{3 b^2 (a+b \operatorname{arctanh}(c x)) \ln\left(\frac{2}{-c x+1}\right)}{c}$$
$$-\frac{3 b (a+b \operatorname{arctanh}(c x))^2 \ln\left(\frac{2}{-c x+1}\right)}{c}-\frac{3 b^3 \operatorname{polylog}\left(2, 1-\frac{2}{-c x+1}\right)}{2 c}-\frac{3 b^2 (a+b \operatorname{arctanh}(c x)) \operatorname{polylog}\left(2, 1-\frac{2}{-c x+1}\right)}{c}$$
$$+\frac{3 b^3 \operatorname{polylog}\left(3, 1-\frac{2}{-c x+1}\right)}{2 c}$$

Result(type ?, 6502 leaves): Display of huge result suppressed!

Problem 37: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b \operatorname{arctanh}(c x))^3}{(c x+1)^2}\, dx$$

Optimal(type 3, 127 leaves, 11 steps):

$$-\frac{3 b^3}{4 c (c x+1)}+\frac{3 b^3 \operatorname{arctanh}(c x)}{4 c}-\frac{3 b^2 (a+b \operatorname{arctanh}(c x))}{2 c (c x+1)}+\frac{3 b (a+b \operatorname{arctanh}(c x))^2}{4 c}-\frac{3 b (a+b \operatorname{arctanh}(c x))^2}{2 c (c x+1)}+\frac{(a+b \operatorname{arctanh}(c x))^3}{2 c}$$
$$-\frac{(a+b \operatorname{arctanh}(c x))^3}{c (c x+1)}$$

Result(type 3, 1912 leaves):

$$-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{(-c^2 x^2+1)\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}\right)^2 \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right) \operatorname{arctanh}(c x)^2 x}{8 (c x+1)}+\frac{3 a b^2 \ln(c x-1) \ln\left(\frac{c x}{2}+\frac{1}{2}\right)}{4 c}$$
$$-\frac{3 a b^2 \operatorname{arctanh}(c x) \ln(c x-1)}{2 c}-\frac{3 b^3 \operatorname{arctanh}(c x)^2 \ln(c x-1)}{4 c}-\frac{3 a^2 b \ln(c x-1)}{4 c}-\frac{3 a b^2 \ln(c x-1)^2}{8 c}+\frac{3 a b^2 \ln(c x+1)}{4 c}-\frac{3 a b^2 \ln(c x-1)}{4 c}$$
$$-\frac{3 b^3 \operatorname{arctanh}(c x)^2 \ln\left(\frac{c x+1}{\sqrt{-c^2 x^2+1}}\right)}{2 c}+\frac{3 b^3 \operatorname{arctanh}(c x)^2 \ln(c x+1)}{4 c}+\frac{3 a^2 b \ln(c x+1)}{4 c}-\frac{3 a b^2 \ln(c x+1)^2}{8 c}$$
$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right) \operatorname{csgn}\left(\frac{I (c x+1)^2}{(-c^2 x^2+1)\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}\right) \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right) \operatorname{arctanh}(c x)^2}{8 c (c x+1)}$$
$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right) \operatorname{csgn}\left(\frac{I (c x+1)^2}{(-c^2 x^2+1)\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}\right) \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right) \operatorname{arctanh}(c x)^2 x}{8 (c x+1)}-\frac{3 a b^2}{2 c (c x+1)}-\frac{3 a^2 b}{2 c (c x+1)}$$

$$-\frac{3 b^3 \operatorname{arctanh}(c x)}{4 c (c x+1)}-\frac{3 b^3 \operatorname{arctanh}(c x)^2}{4 c (c x+1)}-\frac{b^3 \operatorname{arctanh}(c x)^3}{2 c (c x+1)}+\frac{b^3 \operatorname{arctanh}(c x)^3 x}{2 (c x+1)}+\frac{3 b^3 \operatorname{arctanh}(c x)^2 x}{4 (c x+1)}+\frac{3 b^3 \operatorname{arctanh}(c x) x}{4 (c x+1)}$$

$$+\frac{3 a b^2 \operatorname{arctanh}(c x) \ln(c x+1)}{2 c}-\frac{3 a b^2 \ln\left(-\frac{c x}{2}+\frac{1}{2}\right) \ln\left(\frac{c x}{2}+\frac{1}{2}\right)}{4 c}+\frac{3 a b^2 \ln\left(-\frac{c x}{2}+\frac{1}{2}\right) \ln(c x+1)}{4 c}$$

$$-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right) \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right)^2 \operatorname{arctanh}(c x)^2 x}{4 (c x+1)}$$

$$-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right) \operatorname{csgn}\left(\frac{I (c x+1)^2}{(-c^2 x^2+1)\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}\right)^2 \operatorname{arctanh}(c x)^2 x}{8 (c x+1)}$$

$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right)^2 \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right) \operatorname{arctanh}(c x)^2 x}{8 (c x+1)}-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right) \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right)^2 \operatorname{arctanh}(c x)^2}{4 c (c x+1)}$$

$$-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right) \operatorname{csgn}\left(\frac{I (c x+1)^2}{(-c^2 x^2+1)\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}\right)^2 \operatorname{arctanh}(c x)^2}{8 c (c x+1)}$$

$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)}{\sqrt{-c^2 x^2+1}}\right)^2 \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right) \operatorname{arctanh}(c x)^2}{8 c (c x+1)}$$

$$-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{(-c^2 x^2+1)\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}\right)^2 \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right) \operatorname{arctanh}(c x)^2}{8 c (c x+1)}-\frac{3 b^3}{8 c (c x+1)}-\frac{3 a b^2 \operatorname{arctanh}(c x)}{c (c x+1)}-\frac{3 a^2 b \operatorname{arctanh}(c x)}{c (c x+1)}$$

$$-\frac{3 a b^2 \operatorname{arctanh}(c x)^2}{c (c x+1)}+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^3 \operatorname{arctanh}(c x)^2 x}{4 (c x+1)}+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right)^3 \operatorname{arctanh}(c x)^2 x}{8 (c x+1)}$$

$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{(-c^2 x^2+1)\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}\right)^3 \operatorname{arctanh}(c x)^2 x}{8 (c x+1)}-\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^2 \operatorname{arctanh}(c x)^2 x}{4 (c x+1)}$$

$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{(-c^2 x^2+1)\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)}\right)^3 \operatorname{arctanh}(c x)^2}{8 c (c x+1)} - \frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^2 \operatorname{arctanh}(c x)^2}{4 c (c x+1)}$$

$$+\frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^3 \operatorname{arctanh}(c x)^2}{4 c (c x+1)} + \frac{3 I b^3 \pi \operatorname{csgn}\left(\frac{I (c x+1)^2}{-c^2 x^2+1}\right)^3 \operatorname{arctanh}(c x)^2}{8 c (c x+1)} + \frac{3 I b^3 \pi \operatorname{arctanh}(c x)^2 x}{4 (c x+1)} + \frac{3 I b^3 \pi \operatorname{arctanh}(c x)^2}{4 c (c x+1)}$$

$$-\frac{a^3}{c (c x+1)} + \frac{3 b^3 x}{8 (c x+1)}$$

Problem 38: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b \operatorname{arctanh}(c x))^3}{(c x+1)^4}\, dx$$

Optimal(type 3, 249 leaves, 42 steps):

$$-\frac{b^3}{108 c (c x+1)^3} - \frac{19 b^3}{576 c (c x+1)^2} - \frac{85 b^3}{576 c (c x+1)} + \frac{85 b^3 \operatorname{arctanh}(c x)}{576 c} - \frac{b^2 (a+b \operatorname{arctanh}(c x))}{18 c (c x+1)^3} - \frac{5 b^2 (a+b \operatorname{arctanh}(c x))}{48 c (c x+1)^2}$$

$$-\frac{11 b^2 (a+b \operatorname{arctanh}(c x))}{48 c (c x+1)} + \frac{11 b (a+b \operatorname{arctanh}(c x))^2}{96 c} - \frac{b (a+b \operatorname{arctanh}(c x))^2}{6 c (c x+1)^3} - \frac{b (a+b \operatorname{arctanh}(c x))^2}{8 c (c x+1)^2} - \frac{b (a+b \operatorname{arctanh}(c x))^2}{8 c (c x+1)}$$

$$+\frac{(a+b \operatorname{arctanh}(c x))^3}{24 c} - \frac{(a+b \operatorname{arctanh}(c x))^3}{3 c (c x+1)^3}$$

Result(type ?, 3672 leaves): Display of huge result suppressed!

Problem 39: Result more than twice size of optimal antiderivative.

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

Optimal(type 4, 87 leaves, 5 steps):

$$\frac{\operatorname{arctanh}(a x)^3 \ln\left(2-\frac{2}{a x+1}\right)}{c} - \frac{3 \operatorname{arctanh}(a x)^2 \operatorname{polylog}\left(2, -1+\frac{2}{a x+1}\right)}{2 c} - \frac{3 \operatorname{arctanh}(a x) \operatorname{polylog}\left(3, -1+\frac{2}{a x+1}\right)}{2 c} - \frac{3 \operatorname{polylog}\left(4, -1+\frac{2}{a x+1}\right)}{4 c}$$

Result(type 4, 1225 leaves):

$$-\frac{I \operatorname{arctanh}(a x)^3 \pi \operatorname{csgn}\left(\frac{I (a x+1)^2}{(-x^2 a^2+1)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^3}{2 c} + \frac{I \pi \operatorname{csgn}\left(\frac{I \left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^3 \operatorname{arctanh}(a x)^3}{2 c} - \frac{I \operatorname{arctanh}(a x)^3 \pi \operatorname{csgn}\left(\frac{I (a x+1)^2}{-x^2 a^2+1}\right)^3}{2 c}$$

$$+\frac{\operatorname{arctanh}(a x)^3 \ln(a x)}{c}+\frac{I \operatorname{arctanh}(a x)^3 \pi \operatorname{csgn}\left(\frac{I(a x+1)}{\sqrt{-x^2 a^2+1}}\right) \operatorname{csgn}\left(\frac{I(a x+1)^2}{-x^2 a^2+1}\right)^2}{c}$$

$$-\frac{I \pi \operatorname{csgn}\left(I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)\right) \operatorname{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2 \operatorname{arctanh}(a x)^3}{2 c}$$

$$+\frac{I \operatorname{arctanh}(a x)^3 \pi \operatorname{csgn}\left(\frac{I(a x+1)^2}{-x^2 a^2+1}\right) \operatorname{csgn}\left(\frac{I(a x+1)^2}{\left(-x^2 a^2+1\right)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^2}{2 c}$$

$$+\frac{I \operatorname{arctanh}(a x)^3 \pi \operatorname{csgn}\left(\frac{I(a x+1)^2}{\left(-x^2 a^2+1\right)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^2 \operatorname{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)}{2 c}-\frac{I \operatorname{arctanh}(a x)^3 \pi \operatorname{csgn}\left(\frac{I(a x+1)}{\sqrt{-x^2 a^2+1}}\right)^2 \operatorname{csgn}\left(\frac{I(a x+1)^2}{-x^2 a^2+1}\right)}{2 c}$$

$$-\frac{I \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2 \operatorname{arctanh}(a x)^3}{2 c}-\frac{\operatorname{arctanh}(a x)^3 \ln(a x+1)}{c}+\frac{\operatorname{arctanh}(a x)^3 \ln\left(1+\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}$$

$$+\frac{3 \operatorname{arctanh}(a x)^2 \operatorname{polylog}\left(2,-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}-\frac{6 \operatorname{arctanh}(a x) \operatorname{polylog}\left(3,-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}+\frac{\operatorname{arctanh}(a x)^3 \ln\left(1-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}$$

$$+\frac{3 \operatorname{arctanh}(a x)^2 \operatorname{polylog}\left(2,\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}-\frac{6 \operatorname{arctanh}(a x) \operatorname{polylog}\left(3,\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}-\frac{\operatorname{arctanh}(a x)^3 \ln\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{c}$$

$$+\frac{2 \operatorname{arctanh}(a x)^3 \ln\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}+\frac{\operatorname{arctanh}(a x)^3 \ln(2)}{c}-\frac{\operatorname{arctanh}(a x)^4}{2 c}+\frac{6 \operatorname{polylog}\left(4,\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}+\frac{6 \operatorname{polylog}\left(4,-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}$$

$$-\frac{I \operatorname{arctanh}(a x)^3 \pi \operatorname{csgn}\left(\frac{I(a x+1)^2}{-x^2 a^2+1}\right) \operatorname{csgn}\left(\frac{I(a x+1)^2}{\left(-x^2 a^2+1\right)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right) \operatorname{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)}{2 c}$$

$$+\frac{I\pi\,\mathrm{csgn}\left(I\left(\frac{(ax+1)^2}{-x^2a^2+1}-1\right)\right)\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{csgn}\left(\frac{I\left(\frac{(ax+1)^2}{-x^2a^2+1}-1\right)}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{arctanh}(ax)^3}{2c}$$

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Problem 40: Result more than twice size of optimal antiderivative.
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$$\int \frac{\mathrm{arctanh}(ax)^3}{x^3\,(acx+c)}\,dx$$

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Optimal(type 4, 287 leaves, 18 steps):
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$$\frac{3a^2\,\mathrm{arctanh}(ax)^2}{2c}-\frac{3a\,\mathrm{arctanh}(ax)^2}{2cx}-\frac{a^2\,\mathrm{arctanh}(ax)^3}{2c}-\frac{\mathrm{arctanh}(ax)^3}{2cx^2}+\frac{a\,\mathrm{arctanh}(ax)^3}{cx}+\frac{3a^2\,\mathrm{arctanh}(ax)\ln\left(2-\frac{2}{ax+1}\right)}{c}$$
$$-\frac{3a^2\,\mathrm{arctanh}(ax)^2\ln\left(2-\frac{2}{ax+1}\right)}{c}+\frac{a^2\,\mathrm{arctanh}(ax)^3\ln\left(2-\frac{2}{ax+1}\right)}{c}-\frac{3a^2\,\mathrm{polylog}\left(2,-1+\frac{2}{ax+1}\right)}{2c}$$
$$+\frac{3a^2\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(2,-1+\frac{2}{ax+1}\right)}{c}-\frac{3a^2\,\mathrm{arctanh}(ax)^2\,\mathrm{polylog}\left(2,-1+\frac{2}{ax+1}\right)}{2c}+\frac{3a^2\,\mathrm{polylog}\left(3,-1+\frac{2}{ax+1}\right)}{2c}$$
$$-\frac{3a^2\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(3,-1+\frac{2}{ax+1}\right)}{2c}-\frac{3a^2\,\mathrm{polylog}\left(4,-1+\frac{2}{ax+1}\right)}{4c}$$

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Result(type 4, 663 leaves):
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$$-\frac{3a^2\,\mathrm{arctanh}(ax)^2\ln\left(1+\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}-\frac{6a^2\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(2,-\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}-\frac{3a^2\,\mathrm{arctanh}(ax)^2\ln\left(1-\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}$$
$$-\frac{6a^2\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(2,\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}+\frac{6a^2\,\mathrm{polylog}\left(3,-\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}+\frac{6a^2\,\mathrm{polylog}\left(3,\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}$$
$$+\frac{a^2\,\mathrm{arctanh}(ax)^3\ln\left(1+\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}+\frac{3a^2\,\mathrm{arctanh}(ax)^2\,\mathrm{polylog}\left(2,-\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}-\frac{6a^2\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(3,-\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}$$
$$+\frac{a^2\,\mathrm{arctanh}(ax)^3\ln\left(1-\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}+\frac{3a^2\,\mathrm{arctanh}(ax)^2\,\mathrm{polylog}\left(2,\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}-\frac{6a^2\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(3,\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{c}$$

$$-\frac{a^2 \operatorname{arctanh}(a x)^4}{2 c}+\frac{6 a^2 \operatorname{polylog}\left(4, \frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}+\frac{6 a^2 \operatorname{polylog}\left(4, -\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}+\frac{a \operatorname{arctanh}(a x)^3}{c x}-\frac{3 a \operatorname{arctanh}(a x)^2}{2 c x}-\frac{\operatorname{arctanh}(a x)^3}{2 c x^2}$$

$$-\frac{3 a^2 \operatorname{arctanh}(a x)^2}{2 c}+\frac{3 a^2 \operatorname{polylog}\left(2, \frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}+\frac{3 a^2 \operatorname{polylog}\left(2, -\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}+\frac{3 a^2 \operatorname{arctanh}(a x)^3}{2 c}$$

$$+\frac{3 a^2 \operatorname{arctanh}(a x) \ln\left(1-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}+\frac{3 a^2 \operatorname{arctanh}(a x) \ln\left(1+\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{c}$$

Problem 45: Result more than twice size of optimal antiderivative.

$$\int \frac{x (a+b \operatorname{arctanh}(c x))^2}{e x+d}\, dx$$

Optimal(type 4, 275 leaves, 8 steps):

$$\frac{(a+b \operatorname{arctanh}(c x))^2}{e c}+\frac{x (a+b \operatorname{arctanh}(c x))^2}{e}-\frac{2 b (a+b \operatorname{arctanh}(c x)) \ln\left(\frac{2}{-c x+1}\right)}{e c}+\frac{d (a+b \operatorname{arctanh}(c x))^2 \ln\left(\frac{2}{c x+1}\right)}{e^2}$$

$$-\frac{d (a+b \operatorname{arctanh}(c x))^2 \ln\left(\frac{2 c (e x+d)}{(d c+e) (c x+1)}\right)}{e^2}-\frac{b^2 \operatorname{polylog}\left(2, 1-\frac{2}{-c x+1}\right)}{e c}-\frac{b d (a+b \operatorname{arctanh}(c x)) \operatorname{polylog}\left(2, 1-\frac{2}{c x+1}\right)}{e^2}$$

$$+\frac{b d (a+b \operatorname{arctanh}(c x)) \operatorname{polylog}\left(2, 1-\frac{2 c (e x+d)}{(d c+e) (c x+1)}\right)}{e^2}-\frac{b^2 d \operatorname{polylog}\left(3, 1-\frac{2}{c x+1}\right)}{2 e^2}+\frac{b^2 d \operatorname{polylog}\left(3, 1-\frac{2 c (e x+d)}{(d c+e) (c x+1)}\right)}{2 e^2}$$

Result(type ?, 13911 leaves): Display of huge result suppressed!

Problem 46: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b \operatorname{arctanh}(c x))^2}{e x+d}\, dx$$

Optimal(type 4, 184 leaves, 1 step):

$$-\frac{(a+b \operatorname{arctanh}(c x))^2 \ln\left(\frac{2}{c x+1}\right)}{e}+\frac{(a+b \operatorname{arctanh}(c x))^2 \ln\left(\frac{2 c (e x+d)}{(d c+e) (c x+1)}\right)}{e}+\frac{b (a+b \operatorname{arctanh}(c x)) \operatorname{polylog}\left(2, 1-\frac{2}{c x+1}\right)}{e}$$

$$-\frac{b (a+b \operatorname{arctanh}(c x)) \operatorname{polylog}\left(2, 1-\frac{2 c (e x+d)}{(d c+e) (c x+1)}\right)}{e}+\frac{b^2 \operatorname{polylog}\left(3, 1-\frac{2}{c x+1}\right)}{2 e}-\frac{b^2 \operatorname{polylog}\left(3, 1-\frac{2 c (e x+d)}{(d c+e) (c x+1)}\right)}{2 e}$$

Result(type 4, 1169 leaves):

$$\frac{a^2 \ln(c e x+d c)}{e}+\frac{b^2 \ln(c e x+d c) \operatorname{arctanh}(c x)^2}{e}-\frac{b^2 \operatorname{arctanh}(c x)^2 \ln\left(\left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right) e+d c\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)\right)}{e}$$

$$-\frac{b^2 \operatorname{arctanh}(c x) \operatorname{polylog}\left(2,-\frac{(c x+1)^2}{-c^2 x^2+1}\right)}{e}+\frac{b^2 \operatorname{polylog}\left(3,-\frac{(c x+1)^2}{-c^2 x^2+1}\right)}{2 e}$$

$$+\frac{I b^2 \operatorname{arctanh}(c x)^2 \pi \operatorname{csgn}\left(\frac{I\left(\left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right) e+d c\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)\right)}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^3}{2 e}$$

$$-\frac{I b^2 \operatorname{arctanh}(c x)^2 \pi \operatorname{csgn}\left(\frac{I\left(\left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right) e+d c\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)\right)}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^2 \operatorname{csgn}\left(I\left(\left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right) e+d c\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)\right)\right)}{2 e}$$

$$+\frac{1}{2 e}\left(I b^2 \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right) \operatorname{arctanh}(c x)^2 \pi \operatorname{csgn}\left(\frac{I\left(\left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right) e+d c\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)\right)}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right) \operatorname{csgn}\left(I\left(\left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right) e+d c\left(1\right.\right.\right.\right.$$

$$\left.\left.\left.\left.+\frac{(c x+1)^2}{-c^2 x^2+1}\right)\right)\right)\right)-\frac{I b^2 \operatorname{csgn}\left(\frac{I}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right) \operatorname{arctanh}(c x)^2 \pi \operatorname{csgn}\left(\frac{I\left(\left(\frac{(c x+1)^2}{-c^2 x^2+1}-1\right) e+d c\left(1+\frac{(c x+1)^2}{-c^2 x^2+1}\right)\right)}{1+\frac{(c x+1)^2}{-c^2 x^2+1}}\right)^2}{2 e}$$

$$+\frac{b^2 \operatorname{arctanh}(c x)^2 \ln\left(1-\frac{(d c+e)(c x+1)^2}{(-c^2 x^2+1)(-d c+e)}\right)}{d c+e}+\frac{b^2 \operatorname{arctanh}(c x) \operatorname{polylog}\left(2,\frac{(d c+e)(c x+1)^2}{(-c^2 x^2+1)(-d c+e)}\right)}{d c+e}$$

$$-\frac{b^2 \operatorname{polylog}\left(3,\frac{(d c+e)(c x+1)^2}{(-c^2 x^2+1)(-d c+e)}\right)}{2(d c+e)}+\frac{c b^2 d \operatorname{arctanh}(c x)^2 \ln\left(1-\frac{(d c+e)(c x+1)^2}{(-c^2 x^2+1)(-d c+e)}\right)}{e(d c+e)}$$

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

$$+\frac{a b \ln(c e x + d c) \ln\left(\frac{c e x - e}{-d c - e}\right)}{e} + \frac{a b \operatorname{dilog}\left(\frac{c e x - e}{-d c - e}\right)}{e} - \frac{a b \ln(c e x + d c) \ln\left(\frac{c e x + e}{-d c + e}\right)}{e} - \frac{a b \operatorname{dilog}\left(\frac{c e x + e}{-d c + e}\right)}{e}$$

Problem 55: Result more than twice size of optimal antiderivative.

$$\int \frac{(-x^2 a^2 + 1)^2 \operatorname{arctanh}(a x)^2}{x} \, dx$$

Optimal(type 4, 170 leaves, 23 steps):

$$\frac{x^2 a^2}{12} - \frac{3 a x \operatorname{arctanh}(a x)}{2} + \frac{a^3 x^3 \operatorname{arctanh}(a x)}{6} + \frac{3 \operatorname{arctanh}(a x)^2}{4} - a^2 x^2 \operatorname{arctanh}(a x)^2 + \frac{a^4 x^4 \operatorname{arctanh}(a x)^2}{4} - 2 \operatorname{arctanh}(a x)^2 \operatorname{arctanh}\left(-1 + \frac{2}{-a x + 1}\right) - \frac{2 \ln(-x^2 a^2 + 1)}{3} - \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, 1 - \frac{2}{-a x + 1}\right) + \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, -1 + \frac{2}{-a x + 1}\right) + \frac{\operatorname{polylog}\left(3, 1 - \frac{2}{-a x + 1}\right)}{2} - \frac{\operatorname{polylog}\left(3, -1 + \frac{2}{-a x + 1}\right)}{2}$$

Result(type 4, 727 leaves):

$$\frac{(a x - 3) (a x + 1) \operatorname{arctanh}(a x)}{2} + \frac{(x^2 a^2 - 4 a x + 7) (a x + 1) \operatorname{arctanh}(a x)}{6} - \frac{I \pi \operatorname{csgn}\left(I \left(\frac{(a x + 1)^2}{-x^2 a^2 + 1} - 1\right)\right) \operatorname{csgn}\left(\frac{I \left(\frac{(a x + 1)^2}{-x^2 a^2 + 1} - 1\right)}{1 + \frac{(a x + 1)^2}{-x^2 a^2 + 1}}\right)^2 \operatorname{arctanh}(a x)^2}{2} + \frac{I \pi \operatorname{csgn}\left(\frac{I \left(\frac{(a x + 1)^2}{-x^2 a^2 + 1} - 1\right)}{1 + \frac{(a x + 1)^2}{-x^2 a^2 + 1}}\right)^3 \operatorname{arctanh}(a x)^2}{2} - 2 \operatorname{polylog}\left(3, -\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right) - 2 \operatorname{polylog}\left(3, \frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right) - \operatorname{arctanh}(a x)^2 \ln\left(\frac{(a x + 1)^2}{-x^2 a^2 + 1} - 1\right) + \operatorname{arctanh}(a x)^2 \ln\left(1 + \frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right) + 2 \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, -\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right) + \operatorname{arctanh}(a x)^2 \ln\left(1 - \frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right) + 2 \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, \frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right) + \frac{x^2 a^2}{12} - (a x + 1) \operatorname{arctanh}(a x) + \ln(a x) \operatorname{arctanh}(a x)^2 - \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, -\frac{(a x + 1)^2}{-x^2 a^2 + 1}\right) - \frac{1}{12} - \frac{I \pi \operatorname{csgn}\left(\frac{I}{1 + \frac{(a x + 1)^2}{-x^2 a^2 + 1}}\right) \operatorname{csgn}\left(\frac{I \left(\frac{(a x + 1)^2}{-x^2 a^2 + 1} - 1\right)}{1 + \frac{(a x + 1)^2}{-x^2 a^2 + 1}}\right)^2 \operatorname{arctanh}(a x)^2}{2} + \frac{3 \operatorname{arctanh}(a x)^2}{4} + \frac{4 \ln\left(1 + \frac{(a x + 1)^2}{-x^2 a^2 + 1}\right)}{3} + \frac{\operatorname{polylog}\left(3, -\frac{(a x + 1)^2}{-x^2 a^2 + 1}\right)}{2}$$

$$- a^2 x^2 \operatorname{arctanh}(a x)^2 + \frac{a^4 x^4 \operatorname{arctanh}(a x)^2}{4} + \frac{I \pi \operatorname{csgn}\left(I \left(\frac{(a x+1)^2}{-x^2 a^2+1} - 1\right)\right) \operatorname{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right) \operatorname{csgn}\left(\frac{I \left(\frac{(a x+1)^2}{-x^2 a^2+1} - 1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right) \operatorname{arctanh}(a x)^2}{2}$$

Problem 56: Result more than twice size of optimal antiderivative.

$$\int \left(-x^2 a^2+1\right)^2 \operatorname{arctanh}(a x)^3 \, dx$$

Optimal(type 4, 223 leaves, 12 steps):

$$\frac{x^2 a^2-1}{20 a} - x \operatorname{arctanh}(a x) - \frac{x \left(-x^2 a^2+1\right) \operatorname{arctanh}(a x)}{10} + \frac{2 \left(-x^2 a^2+1\right) \operatorname{arctanh}(a x)^2}{5 a} + \frac{3 \left(-x^2 a^2+1\right)^2 \operatorname{arctanh}(a x)^2}{20 a} + \frac{8 \operatorname{arctanh}(a x)^3}{15 a}$$
$$+ \frac{8 x \operatorname{arctanh}(a x)^3}{15} + \frac{4 x \left(-x^2 a^2+1\right) \operatorname{arctanh}(a x)^3}{15} + \frac{x \left(-x^2 a^2+1\right)^2 \operatorname{arctanh}(a x)^3}{5} - \frac{8 \operatorname{arctanh}(a x)^2 \ln\left(\frac{2}{-a x+1}\right)}{5 a} - \frac{\ln\left(-x^2 a^2+1\right)}{2 a}$$
$$- \frac{8 \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, 1 - \frac{2}{-a x+1}\right)}{5 a} + \frac{4 \operatorname{polylog}\left(3, 1 - \frac{2}{-a x+1}\right)}{5 a}$$

Result(type 4, 891 leaves):

$$-\frac{1}{20 a} + \frac{2 I \operatorname{arctanh}(a x)^2 \pi \operatorname{csgn}\left(\frac{I (a x+1)^2}{\left(-x^2 a^2+1\right)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^3}{5 a} + \frac{4 I \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2 \operatorname{arctanh}(a x)^2}{5 a} - \frac{7 a x^2 \operatorname{arctanh}(a x)^2}{10}$$
$$- \frac{2 a^2 x^3 \operatorname{arctanh}(a x)^3}{3} + \frac{3 a^3 x^4 \operatorname{arctanh}(a x)^2}{20} + \frac{a^4 \operatorname{arctanh}(a x)^3 x^5}{5} + \frac{a^2 x^3 \operatorname{arctanh}(a x)}{10} + \frac{\ln\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}{a} + \frac{4 \operatorname{polylog}\left(3, -\frac{(a x+1)^2}{-x^2 a^2+1}\right)}{5 a}$$
$$- \frac{4 I \operatorname{arctanh}(a x)^2 \pi \operatorname{csgn}\left(\frac{I (a x+1)^2}{-x^2 a^2+1}\right)^2 \operatorname{csgn}\left(\frac{I (a x+1)}{\sqrt{-x^2 a^2+1}}\right)}{5 a} + \frac{2 I \operatorname{arctanh}(a x)^2 \pi \operatorname{csgn}\left(\frac{I (a x+1)^2}{-x^2 a^2+1}\right) \operatorname{csgn}\left(\frac{I (a x+1)}{\sqrt{-x^2 a^2+1}}\right)^2}{5 a}$$
$$- \frac{2 I \operatorname{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right) \operatorname{arctanh}(a x)^2 \pi \operatorname{csgn}\left(\frac{I (a x+1)^2}{\left(-x^2 a^2+1\right)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^2}{5 a}$$
$$- \frac{2 I \operatorname{arctanh}(a x)^2 \pi \operatorname{csgn}\left(\frac{I (a x+1)^2}{-x^2 a^2+1}\right) \operatorname{csgn}\left(\frac{I (a x+1)^2}{\left(-x^2 a^2+1\right)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^2}{5 a} + \frac{2 I \operatorname{arctanh}(a x)^2 \pi \operatorname{csgn}\left(\frac{I (a x+1)^2}{-x^2 a^2+1}\right)^3}{5 a}$$

$$-\frac{4 I \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^3 \operatorname{arctanh}(a x)^2}{5 a}$$

$$+\frac{2 I \operatorname{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right) \operatorname{arctanh}(a x)^2 \pi \operatorname{csgn}\left(\frac{I(a x+1)^2}{-x^2 a^2+1}\right) \operatorname{csgn}\left(\frac{I(a x+1)^2}{(-x^2 a^2+1)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)}{5 a}-\frac{\operatorname{arctanh}(a x)}{a}-\frac{4 I \pi \operatorname{arctanh}(a x)^2}{5 a}$$

$$-\frac{8 \ln(2) \operatorname{arctanh}(a x)^2}{5 a}-\frac{8 \operatorname{arctanh}(a x) \operatorname{polylog}\left(2,-\frac{(a x+1)^2}{-x^2 a^2+1}\right)}{5 a}+\frac{4 \operatorname{arctanh}(a x)^2 \ln(a x+1)}{5 a}+\frac{4 \operatorname{arctanh}(a x)^2 \ln(a x-1)}{5 a}$$

$$-\frac{8 \operatorname{arctanh}(a x)^2 \ln\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{5 a}+\frac{a x^2}{20}-\frac{11 x \operatorname{arctanh}(a x)}{10}+\frac{11 \operatorname{arctanh}(a x)^2}{20 a}+\frac{8 \operatorname{arctanh}(a x)^3}{15 a}+x \operatorname{arctanh}(a x)^3$$

Problem 60: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2 \operatorname{arctanh}(a x)}{-x^2 a^2+1}\, dx$$

Optimal(type 3, 38 leaves, 4 steps):

$$-\frac{x \operatorname{arctanh}(a x)}{a^2}+\frac{\operatorname{arctanh}(a x)^2}{2 a^3}-\frac{\ln(-x^2 a^2+1)}{2 a^3}$$

Result(type 3, 144 leaves):

$$-\frac{x \operatorname{arctanh}(a x)}{a^2}-\frac{\operatorname{arctanh}(a x) \ln(a x-1)}{2 a^3}+\frac{\operatorname{arctanh}(a x) \ln(a x+1)}{2 a^3}-\frac{\ln(a x-1)^2}{8 a^3}+\frac{\ln(a x-1) \ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{4 a^3}-\frac{\ln(a x-1)}{2 a^3}-\frac{\ln(a x+1)}{2 a^3}$$

$$-\frac{\ln(a x+1)^2}{8 a^3}-\frac{\ln\left(-\frac{a x}{2}+\frac{1}{2}\right) \ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{4 a^3}+\frac{\ln\left(-\frac{a x}{2}+\frac{1}{2}\right) \ln(a x+1)}{4 a^3}$$

Problem 62: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{arctanh}(a x)}{x(-x^2 a^2+1)}\, dx$$

Optimal(type 4, 41 leaves, 3 steps):

$$\frac{\operatorname{arctanh}(a x)^2}{2}+\operatorname{arctanh}(a x) \ln\left(2-\frac{2}{a x+1}\right)-\frac{\operatorname{polylog}\left(2,-1+\frac{2}{a x+1}\right)}{2}$$

Result(type 4, 129 leaves):

$$\ln(a x) \operatorname{arctanh}(a x)-\frac{\operatorname{arctanh}(a x) \ln(a x+1)}{2}-\frac{\operatorname{arctanh}(a x) \ln(a x-1)}{2}-\frac{\ln(a x-1)^2}{8}+\frac{\operatorname{dilog}\left(\frac{a x}{2}+\frac{1}{2}\right)}{2}+\frac{\ln(a x-1) \ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{4}+\frac{\ln(a x+1)^2}{8}-\frac{\left(\ln(a x+1)-\ln\left(\frac{a x}{2}+\frac{1}{2}\right)\right) \ln\left(-\frac{a x}{2}+\frac{1}{2}\right)}{4}-\frac{\operatorname{dilog}(a x+1)}{2}-\frac{\ln(a x) \ln(a x+1)}{2}-\frac{\operatorname{dilog}(a x)}{2}$$

Problem 63: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{arctanh}(a x)}{x^3\left(-x^2 a^2+1\right)}\, dx$$

Optimal(type 4, 74 leaves, 7 steps):

$$-\frac{a}{2 x}+\frac{a^2 \operatorname{arctanh}(a x)}{2}-\frac{\operatorname{arctanh}(a x)}{2 x^2}+\frac{a^2 \operatorname{arctanh}(a x)^2}{2}+a^2 \operatorname{arctanh}(a x) \ln\left(2-\frac{2}{a x+1}\right)-\frac{a^2 \operatorname{polylog}\left(2,-1+\frac{2}{a x+1}\right)}{2}$$

Result(type 4, 208 leaves):

$$-\frac{\operatorname{arctanh}(a x)}{2 x^2}+a^2 \ln(a x) \operatorname{arctanh}(a x)-\frac{a^2 \operatorname{arctanh}(a x) \ln(a x+1)}{2}-\frac{a^2 \operatorname{arctanh}(a x) \ln(a x-1)}{2}+\frac{a^2 \ln(a x+1)}{4}-\frac{a^2 \ln(a x-1)}{4}-\frac{a}{2 x}-\frac{a^2 \ln(a x-1)^2}{8}+\frac{a^2 \operatorname{dilog}\left(\frac{a x}{2}+\frac{1}{2}\right)}{2}+\frac{a^2 \ln(a x-1) \ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{4}+\frac{a^2 \ln(a x+1)^2}{8}+\frac{a^2 \ln\left(-\frac{a x}{2}+\frac{1}{2}\right) \ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{4}-\frac{a^2 \ln\left(-\frac{a x}{2}+\frac{1}{2}\right) \ln(a x+1)}{4}-\frac{a^2 \operatorname{dilog}(a x+1)}{2}-\frac{a^2 \ln(a x) \ln(a x+1)}{2}-\frac{a^2 \operatorname{dilog}(a x)}{2}$$

Problem 64: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{arctanh}(a x)^2}{x\left(-x^2 a^2+1\right)}\, dx$$

Optimal(type 4, 62 leaves, 4 steps):

$$\frac{\operatorname{arctanh}(a x)^3}{3}+\operatorname{arctanh}(a x)^2 \ln\left(2-\frac{2}{a x+1}\right)-\operatorname{arctanh}(a x) \operatorname{polylog}\left(2,-1+\frac{2}{a x+1}\right)-\frac{\operatorname{polylog}\left(3,-1+\frac{2}{a x+1}\right)}{2}$$

Result(type 4, 1196 leaves):

$$-\frac{I \pi \operatorname{csgn}\left(I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)\right) \operatorname{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2 \operatorname{arctanh}(a x)^2}{2}-\frac{I \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2 \operatorname{arctanh}(a x)^2}{2}$$

$$- 2\,\mathrm{polylog}\left(3, -\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right) - 2\,\mathrm{polylog}\left(3, \frac{a x+1}{\sqrt{-x^2 a^2+1}}\right) + \mathrm{arctanh}(a x)^2 \ln\left(1+\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right) + 2\,\mathrm{arctanh}(a x)\,\mathrm{polylog}\left(2, -\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)$$

$$+ \mathrm{arctanh}(a x)^2 \ln\left(1-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right) + 2\,\mathrm{arctanh}(a x)\,\mathrm{polylog}\left(2, \frac{a x+1}{\sqrt{-x^2 a^2+1}}\right) + \ln(a x)\,\mathrm{arctanh}(a x)^2 - \mathrm{arctanh}(a x)^2 \ln\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)$$

$$+ \frac{I \pi\,\mathrm{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^3 \mathrm{arctanh}(a x)^2}{2} + \ln(2)\,\mathrm{arctanh}(a x)^2 - \frac{\mathrm{arctanh}(a x)^2 \ln(a x+1)}{2} - \frac{\mathrm{arctanh}(a x)^2 \ln(a x-1)}{2}$$

$$+ \mathrm{arctanh}(a x)^2 \ln\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right) + \frac{I \pi\,\mathrm{arctanh}(a x)^2}{2} + \frac{I \pi\,\mathrm{csgn}\left(\frac{I (a x+1)^2}{-x^2 a^2+1}\right) \mathrm{csgn}\left(\frac{I (a x+1)^2}{\left(-x^2 a^2+1\right)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^2 \mathrm{arctanh}(a x)^2}{4}$$

$$+ \frac{I \pi\,\mathrm{csgn}\left(\frac{I (a x+1)^2}{\left(-x^2 a^2+1\right)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^2 \mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right) \mathrm{arctanh}(a x)^2}{4} - \frac{I \pi\,\mathrm{csgn}\left(\frac{I (a x+1)}{\sqrt{-x^2 a^2+1}}\right)^2 \mathrm{csgn}\left(\frac{I (a x+1)^2}{-x^2 a^2+1}\right) \mathrm{arctanh}(a x)^2}{4}$$

$$+ \frac{I \pi\,\mathrm{csgn}\left(\frac{I (a x+1)}{\sqrt{-x^2 a^2+1}}\right) \mathrm{csgn}\left(\frac{I (a x+1)^2}{-x^2 a^2+1}\right)^2 \mathrm{arctanh}(a x)^2}{2}$$

$$+ \frac{I \pi\,\mathrm{csgn}\left(I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)\right) \mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right) \mathrm{csgn}\left(\frac{I\left(\frac{(a x+1)^2}{-x^2 a^2+1}-1\right)}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right) \mathrm{arctanh}(a x)^2}{2} - \frac{I \pi\,\mathrm{csgn}\left(\frac{I (a x+1)^2}{-x^2 a^2+1}\right)^3 \mathrm{arctanh}(a x)^2}{4}$$

$$- \frac{I \pi\,\mathrm{csgn}\left(\frac{I (a x+1)^2}{\left(-x^2 a^2+1\right)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^3 \mathrm{arctanh}(a x)^2}{4} - \frac{I \pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2 \mathrm{arctanh}(a x)^2}{2}$$

$$+ \frac{I \pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^3 \mathrm{arctanh}(a x)^2}{2} - \frac{\mathrm{arctanh}(a x)^3}{3}$$

$$-\frac{I\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{arctanh}(ax)^2}{4}$$

Problem 65: Result more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{arctanh}(ax)^2}{x^2(-x^2a^2+1)}\,dx$$

Optimal(type 4, 64 leaves, 6 steps):

$$a\,\mathrm{arctanh}(ax)^2-\frac{\mathrm{arctanh}(ax)^2}{x}+\frac{a\,\mathrm{arctanh}(ax)^3}{3}+2a\,\mathrm{arctanh}(ax)\ln\left(2-\frac{2}{ax+1}\right)-a\,\mathrm{polylog}\left(2,-1+\frac{2}{ax+1}\right)$$

Result(type ?, 4502 leaves): Display of huge result suppressed!

Problem 66: Result more than twice size of optimal antiderivative.

$$\int\frac{x^2\,\mathrm{arctanh}(ax)^3}{-x^2a^2+1}\,dx$$

Optimal(type 4, 99 leaves, 7 steps):

$$-\frac{\mathrm{arctanh}(ax)^3}{a^3}-\frac{x\,\mathrm{arctanh}(ax)^3}{a^2}+\frac{\mathrm{arctanh}(ax)^4}{4a^3}+\frac{3\,\mathrm{arctanh}(ax)^2\ln\left(\frac{2}{-ax+1}\right)}{a^3}+\frac{3\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(2,1-\frac{2}{-ax+1}\right)}{a^3}$$
$$-\frac{3\,\mathrm{polylog}\left(3,1-\frac{2}{-ax+1}\right)}{2a^3}$$

Result(type 4, 796 leaves):

$$-\frac{x\,\mathrm{arctanh}(ax)^3}{a^2}-\frac{\mathrm{arctanh}(ax)^3\ln(ax-1)}{2a^3}+\frac{\mathrm{arctanh}(ax)^3\ln(ax+1)}{2a^3}-\frac{\mathrm{arctanh}(ax)^3\ln\left(\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{a^3}+\frac{\mathrm{arctanh}(ax)^4}{4a^3}-\frac{\mathrm{arctanh}(ax)^3}{a^3}$$
$$-\frac{I\,\mathrm{arctanh}(ax)^3\pi\,\mathrm{csgn}\left(\frac{I(ax+1)}{\sqrt{-x^2a^2+1}}\right)\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)^2}{2a^3}+\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^3\mathrm{arctanh}(ax)^3}{2a^3}$$
$$-\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^2\mathrm{arctanh}(ax)^3}{2a^3}+\frac{I\,\mathrm{arctanh}(ax)^3\pi\,\mathrm{csgn}\left(\frac{I(ax+1)}{\sqrt{-x^2a^2+1}}\right)^2\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)}{4a^3}$$

$$+\frac{I\operatorname{arctanh}(ax)^3\pi\operatorname{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^3}{4a^3}+\frac{I\operatorname{arctanh}(ax)^3\pi\operatorname{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)^3}{4a^3}$$

$$-\frac{I\operatorname{arctanh}(ax)^3\pi\operatorname{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^2\operatorname{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)}{4a^3}$$

$$+\frac{I\operatorname{arctanh}(ax)^3\pi\operatorname{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\operatorname{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)\operatorname{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)}{4a^3}$$

$$-\frac{I\operatorname{arctanh}(ax)^3\pi\operatorname{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\operatorname{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^2}{4a^3}+\frac{I\pi\operatorname{arctanh}(ax)^3}{2a^3}+\frac{3\operatorname{arctanh}(ax)^2\ln\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}{a^3}$$

$$+\frac{3\operatorname{arctanh}(ax)\operatorname{polylog}\left(2,-\frac{(ax+1)^2}{-x^2a^2+1}\right)}{a^3}-\frac{3\operatorname{polylog}\left(3,-\frac{(ax+1)^2}{-x^2a^2+1}\right)}{2a^3}$$

Problem 67: Result more than twice size of optimal antiderivative.

$$\int\frac{x\operatorname{arctanh}(ax)^3}{-x^2a^2+1}\,dx$$

Optimal(type 4, 100 leaves, 5 steps):

$$-\frac{\operatorname{arctanh}(ax)^4}{4a^2}+\frac{\operatorname{arctanh}(ax)^3\ln\left(\frac{2}{-ax+1}\right)}{a^2}+\frac{3\operatorname{arctanh}(ax)^2\operatorname{polylog}\left(2,1-\frac{2}{-ax+1}\right)}{2a^2}-\frac{3\operatorname{arctanh}(ax)\operatorname{polylog}\left(3,1-\frac{2}{-ax+1}\right)}{2a^2}$$

$$+\frac{3\operatorname{polylog}\left(4,1-\frac{2}{-ax+1}\right)}{4a^2}$$

Result(type 4, 784 leaves):

$$-\frac{\operatorname{arctanh}(ax)^3\ln(ax-1)}{2a^2}-\frac{\operatorname{arctanh}(ax)^3\ln(ax+1)}{2a^2}+\frac{\operatorname{arctanh}(ax)^3\ln\left(\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)}{a^2}-\frac{\operatorname{arctanh}(ax)^4}{4a^2}-\frac{I\pi\operatorname{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^2\operatorname{arctanh}(ax)^3}{2a^2}$$

$$+\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^3\mathrm{arctanh}(ax)^3}{2a^2}-\frac{I\,\mathrm{arctanh}(ax)^3\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^3}{4a^2}$$

$$-\frac{I\,\mathrm{arctanh}(ax)^3\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)}{4a^2}+\frac{I\pi\,\mathrm{arctanh}(ax)^3}{2a^2}$$

$$-\frac{I\,\mathrm{arctanh}(ax)^3\pi\,\mathrm{csgn}\left(\frac{I(ax+1)}{\sqrt{-x^2a^2+1}}\right)^2\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)}{4a^2}-\frac{I\,\mathrm{arctanh}(ax)^3\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)^3}{4a^2}$$

$$+\frac{I\,\mathrm{arctanh}(ax)^3\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^2}{4a^2}$$

$$+\frac{I\,\mathrm{arctanh}(ax)^3\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^2\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)}{4a^2}+\frac{I\,\mathrm{arctanh}(ax)^3\pi\,\mathrm{csgn}\left(\frac{I(ax+1)}{\sqrt{-x^2a^2+1}}\right)\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)^2}{2a^2}$$

$$+\frac{\mathrm{arctanh}(ax)^3\ln(2)}{a^2}+\frac{3\,\mathrm{arctanh}(ax)^2\,\mathrm{polylog}\left(2,-\frac{(ax+1)^2}{-x^2a^2+1}\right)}{2a^2}-\frac{3\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(3,-\frac{(ax+1)^2}{-x^2a^2+1}\right)}{2a^2}+\frac{3\,\mathrm{polylog}\left(4,-\frac{(ax+1)^2}{-x^2a^2+1}\right)}{4a^2}$$

Problem 68: Result more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{arctanh}(ax)^3}{x^3(-x^2a^2+1)}\,dx$$

Optimal(type 4, 182 leaves, 13 steps):

$$\frac{3a^2\,\mathrm{arctanh}(ax)^2}{2}-\frac{3a\,\mathrm{arctanh}(ax)^2}{2x}+\frac{a^2\,\mathrm{arctanh}(ax)^3}{2}-\frac{\mathrm{arctanh}(ax)^3}{2x^2}+\frac{a^2\,\mathrm{arctanh}(ax)^4}{4}+3a^2\,\mathrm{arctanh}(ax)\ln\left(2-\frac{2}{ax+1}\right)+a^2\,\mathrm{arctanh}(ax)^3\ln\left(2-\frac{2}{ax+1}\right)-\frac{3a^2\,\mathrm{polylog}\left(2,-1+\frac{2}{ax+1}\right)}{2}-\frac{3a^2\,\mathrm{arctanh}(ax)^2\,\mathrm{polylog}\left(2,-1+\frac{2}{ax+1}\right)}{2}-\frac{3a^2\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(3,-1+\frac{2}{ax+1}\right)}{2}-\frac{3a^2\,\mathrm{polylog}\left(4,-1+\frac{2}{ax+1}\right)}{4}$$

Result(type 4, 405 leaves):

$$-\frac{a^2 \operatorname{arctanh}(a x)^4}{4}+\frac{a^2 \operatorname{arctanh}(a x)^3}{2}-\frac{3 a^2 \operatorname{arctanh}(a x)^2}{2}-\frac{3 a \operatorname{arctanh}(a x)^2}{2 x}-\frac{\operatorname{arctanh}(a x)^3}{2 x^2}+a^2 \operatorname{arctanh}(a x)^3 \ln\left(1+\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)$$
$$+3 a^2 \operatorname{arctanh}(a x)^2 \operatorname{polylog}\left(2,-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)-6 a^2 \operatorname{arctanh}(a x) \operatorname{polylog}\left(3,-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)+6 a^2 \operatorname{polylog}\left(4,-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)$$
$$+a^2 \operatorname{arctanh}(a x)^3 \ln\left(1-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)+3 a^2 \operatorname{arctanh}(a x)^2 \operatorname{polylog}\left(2,\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)-6 a^2 \operatorname{arctanh}(a x) \operatorname{polylog}\left(3,\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)$$
$$+6 a^2 \operatorname{polylog}\left(4,\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)+3 a^2 \operatorname{arctanh}(a x) \ln\left(1-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)+3 a^2 \operatorname{polylog}\left(2,\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)+3 a^2 \operatorname{arctanh}(a x) \ln\left(1+\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)$$
$$+3 a^2 \operatorname{polylog}\left(2,-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)$$

Problem 71: Result more than twice size of optimal antiderivative.

$$\int \frac{x^3 \operatorname{arctanh}(a x)}{(-x^2 a^2+1)^2}\, dx$$

Optimal(type 4, 99 leaves, 8 steps):

$$-\frac{x}{4 a^3 (-x^2 a^2+1)}-\frac{\operatorname{arctanh}(a x)}{4 a^4}+\frac{\operatorname{arctanh}(a x)}{2 a^4 (-x^2 a^2+1)}+\frac{\operatorname{arctanh}(a x)^2}{2 a^4}-\frac{\operatorname{arctanh}(a x) \ln\left(\frac{2}{-a x+1}\right)}{a^4}-\frac{\operatorname{polylog}\left(2,1-\frac{2}{-a x+1}\right)}{2 a^4}$$

Result(type 4, 202 leaves):

$$\frac{\operatorname{arctanh}(a x)}{4 a^4 (a x+1)}+\frac{\operatorname{arctanh}(a x) \ln(a x+1)}{2 a^4}-\frac{\operatorname{arctanh}(a x)}{4 a^4 (a x-1)}+\frac{\operatorname{arctanh}(a x) \ln(a x-1)}{2 a^4}+\frac{1}{8 a^4 (a x+1)}-\frac{\ln(a x+1)}{8 a^4}+\frac{1}{8 a^4 (a x-1)}+\frac{\ln(a x-1)}{8 a^4}$$
$$+\frac{\ln(a x-1)^2}{8 a^4}-\frac{\operatorname{dilog}\left(\frac{a x}{2}+\frac{1}{2}\right)}{2 a^4}-\frac{\ln(a x-1) \ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{4 a^4}-\frac{\ln\left(-\frac{a x}{2}+\frac{1}{2}\right) \ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{4 a^4}+\frac{\ln\left(-\frac{a x}{2}+\frac{1}{2}\right) \ln(a x+1)}{4 a^4}-\frac{\ln(a x+1)^2}{8 a^4}$$

Problem 72: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{arctanh}(a x)}{x^2 (-x^2 a^2+1)^2}\, dx$$

Optimal(type 3, 74 leaves, 10 steps):

$$-\frac{a}{4 (-x^2 a^2+1)}-\frac{\operatorname{arctanh}(a x)}{x}+\frac{a^2 x \operatorname{arctanh}(a x)}{2 (-x^2 a^2+1)}+\frac{3 a \operatorname{arctanh}(a x)^2}{4}+a \ln(x)-\frac{a \ln(-x^2 a^2+1)}{2}$$

Result(type 3, 179 leaves):

$$-\frac{\operatorname{arctanh}(a x)}{x}-\frac{a \operatorname{arctanh}(a x)}{4 (a x+1)}+\frac{3 a \operatorname{arctanh}(a x) \ln(a x+1)}{4}-\frac{a \operatorname{arctanh}(a x)}{4 (a x-1)}-\frac{3 a \operatorname{arctanh}(a x) \ln(a x-1)}{4}+a \ln(a x)-\frac{a}{8 (a x+1)}-\frac{a \ln(a x+1)}{2}$$

$$+\frac{a}{8\,(a x-1)}-\frac{a\ln(a x-1)}{2}-\frac{3\,a\ln(a x-1)^2}{16}+\frac{3\,a\ln(a x-1)\ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{8}-\frac{3\,a\ln\left(-\frac{a x}{2}+\frac{1}{2}\right)\ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{8}$$
$$+\frac{3\,a\ln\left(-\frac{a x}{2}+\frac{1}{2}\right)\ln(a x+1)}{8}-\frac{3\,a\ln(a x+1)^2}{16}$$

Problem 73: Result more than twice size of optimal antiderivative.

$$\int\frac{x^2\,\mathrm{arctanh}(a x)^2}{(-x^2 a^2+1)^2}\,dx$$

Optimal(type 3, 84 leaves, 4 steps):

$$\frac{x}{4\,a^2\,(-x^2 a^2+1)}+\frac{\mathrm{arctanh}(a x)}{4\,a^3}-\frac{\mathrm{arctanh}(a x)}{2\,a^3\,(-x^2 a^2+1)}+\frac{x\,\mathrm{arctanh}(a x)^2}{2\,a^2\,(-x^2 a^2+1)}-\frac{\mathrm{arctanh}(a x)^3}{6\,a^3}$$

Result(type 3, 1739 leaves):

$$-\frac{I\,\mathrm{arctanh}(a x)^2\,\pi\,x^2}{4\,a\,(a x-1)\,(a x+1)}+\frac{I\,\pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^3\mathrm{arctanh}(a x)^2}{4\,a^3\,(a x-1)\,(a x+1)}+\frac{I\,\mathrm{arctanh}(a x)^2\,\pi\,\mathrm{csgn}\left(\frac{I\,(a x+1)^2}{-x^2 a^2+1}\right)^3}{8\,a^3\,(a x-1)\,(a x+1)}$$
$$+\frac{I\,\mathrm{arctanh}(a x)^2\,\pi\,\mathrm{csgn}\left(\frac{I\,(a x+1)^2}{(-x^2 a^2+1)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^3}{8\,a^3\,(a x-1)\,(a x+1)}-\frac{I\,\pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)^2\mathrm{arctanh}(a x)^2}{4\,a^3\,(a x-1)\,(a x+1)}-\frac{\mathrm{arctanh}(a x)^2\ln(a x+1)}{4\,a^3}$$
$$+\frac{\mathrm{arctanh}(a x)^2\ln(a x-1)}{4\,a^3}+\frac{\mathrm{arctanh}(a x)^2\ln\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)}{2\,a^3}-\frac{\mathrm{arctanh}(a x)^2}{4\,a^3\,(a x+1)}-\frac{\mathrm{arctanh}(a x)^2}{4\,a^3\,(a x-1)}$$
$$+\frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(a x+1)^2}{-x^2 a^2+1}}\right)\mathrm{arctanh}(a x)^2\,\pi\,\mathrm{csgn}\left(\frac{I\,(a x+1)^2}{(-x^2 a^2+1)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^2 x^2}{8\,a\,(a x-1)\,(a x+1)}$$
$$+\frac{I\,\mathrm{arctanh}(a x)^2\,\pi\,\mathrm{csgn}\left(\frac{I\,(a x+1)^2}{-x^2 a^2+1}\right)^2\mathrm{csgn}\left(\frac{I\,(a x+1)}{\sqrt{-x^2 a^2+1}}\right)x^2}{4\,a\,(a x-1)\,(a x+1)}+\frac{I\,\mathrm{arctanh}(a x)^2\,\pi\,\mathrm{csgn}\left(\frac{I\,(a x+1)^2}{-x^2 a^2+1}\right)\mathrm{csgn}\left(\frac{I\,(a x+1)^2}{(-x^2 a^2+1)\left(1+\frac{(a x+1)^2}{-x^2 a^2+1}\right)}\right)^2 x^2}{8\,a\,(a x-1)\,(a x+1)}$$
$$-\frac{I\,\mathrm{arctanh}(a x)^2\,\pi\,\mathrm{csgn}\left(\frac{I\,(a x+1)^2}{-x^2 a^2+1}\right)\mathrm{csgn}\left(\frac{I\,(a x+1)}{\sqrt{-x^2 a^2+1}}\right)^2 x^2}{8\,a\,(a x-1)\,(a x+1)}$$

$$+\frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{arctanh}(ax)^2\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)}{8a^3(ax-1)(ax+1)}+\frac{I\pi\,\mathrm{arctanh}(ax)^2}{4a^3(ax-1)(ax+1)}$$

$$-\frac{\mathrm{arctanh}(ax)^3x^2}{6a(ax-1)(ax+1)}-\frac{I\,\mathrm{arctanh}(ax)^2\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^3x^2}{8a(ax-1)(ax+1)}+\frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^2\mathrm{arctanh}(ax)^2\pi x^2}{4a(ax-1)(ax+1)}$$

$$-\frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{arctanh}(ax)^2\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^2}{8a^3(ax-1)(ax+1)}-\frac{I\,\mathrm{arctanh}(ax)^2\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)^2\mathrm{csgn}\left(\frac{I(ax+1)}{\sqrt{-x^2a^2+1}}\right)}{4a^3(ax-1)(ax+1)}$$

$$-\frac{I\,\mathrm{arctanh}(ax)^2\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^2}{8a^3(ax-1)(ax+1)}+\frac{I\,\mathrm{arctanh}(ax)^2\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\mathrm{csgn}\left(\frac{I(ax+1)}{\sqrt{-x^2a^2+1}}\right)^2}{8a^3(ax-1)(ax+1)}$$

$$-\frac{I\,\mathrm{arctanh}(ax)^2\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)^3x^2}{8a(ax-1)(ax+1)}-\frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^3\mathrm{arctanh}(ax)^2\pi x^2}{4a(ax-1)(ax+1)}-\frac{x}{4a^2(ax-1)(ax+1)}+\frac{\mathrm{arctanh}(ax)^3}{6a^3(ax-1)(ax+1)}$$

$$+\frac{\mathrm{arctanh}(ax)}{4a^3(ax-1)(ax+1)}+\frac{\mathrm{arctanh}(ax)\,x^2}{4a(ax-1)(ax+1)}$$

$$-\frac{I\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{arctanh}(ax)^2\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)x^2}{8a(ax-1)(ax+1)}$$

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Problem 74: Result more than twice size of optimal antiderivative.
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$$\int\frac{\mathrm{arctanh}(ax)^3}{x^2(-x^2a^2+1)^2}\,dx$$

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Optimal(type 4, 177 leaves, 12 steps):
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$$-\frac{3a}{8(-x^2a^2+1)}+\frac{3a^2x\,\mathrm{arctanh}(ax)}{4(-x^2a^2+1)}+\frac{3a\,\mathrm{arctanh}(ax)^2}{8}-\frac{3a\,\mathrm{arctanh}(ax)^2}{4(-x^2a^2+1)}+a\,\mathrm{arctanh}(ax)^3-\frac{\mathrm{arctanh}(ax)^3}{x}+\frac{a^2x\,\mathrm{arctanh}(ax)^3}{2(-x^2a^2+1)}+\frac{3a\,\mathrm{arctanh}(ax)^4}{8}$$

$$+3a\,\mathrm{arctanh}(ax)^2\ln\left(2-\frac{2}{ax+1}\right)-3a\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(2,-1+\frac{2}{ax+1}\right)-\frac{3a\,\mathrm{polylog}\left(3,-1+\frac{2}{ax+1}\right)}{2}$$

Result(type 4, 441 leaves):

$$-\frac{3 a}{32 (a x+1)}+\frac{3 a}{32 (a x-1)}-\frac{\operatorname{arctanh}(a x)^3 a^2 x}{8 (a x-1)}+\frac{3 a^2 x \operatorname{arctanh}(a x)^2}{16 (a x-1)}-\frac{3 \operatorname{arctanh}(a x) a^2 x}{16 (a x-1)}+\frac{\operatorname{arctanh}(a x)^3 a^2 x}{8 (a x+1)}+\frac{3 a^2 x \operatorname{arctanh}(a x)^2}{16 (a x+1)}$$
$$+\frac{3 \operatorname{arctanh}(a x) a^2 x}{16 (a x+1)}-6 a \operatorname{polylog}\left(3, \frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)-6 a \operatorname{polylog}\left(3,-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)-\frac{3 a \operatorname{arctanh}(a x)}{16 (a x+1)}-\frac{3 a \operatorname{arctanh}(a x)}{16 (a x-1)}+\frac{3 a^2 x}{32 (a x-1)}$$
$$+\frac{3 a^2 x}{32 (a x+1)}+3 a \operatorname{arctanh}(a x)^2 \ln\left(1-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)+3 a \operatorname{arctanh}(a x)^2 \ln\left(1+\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)+6 a \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, \frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)$$
$$+6 a \operatorname{arctanh}(a x) \operatorname{polylog}\left(2,-\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)-\frac{a \operatorname{arctanh}(a x)^3}{8 (a x-1)}-\frac{a \operatorname{arctanh}(a x)^3}{8 (a x+1)}-\frac{3 a \operatorname{arctanh}(a x)^2}{16 (a x+1)}+\frac{3 a \operatorname{arctanh}(a x)^2}{16 (a x-1)}-a \operatorname{arctanh}(a x)^3$$
$$+\frac{3 a \operatorname{arctanh}(a x)^4}{8}-\frac{\operatorname{arctanh}(a x)^3}{x}$$

Problem 82: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2 \operatorname{arctanh}(a x)^2}{(-x^2 a^2+1)^3} \, dx$$

Optimal(type 3, 147 leaves, 13 steps):

$$\frac{x}{32 a^2 (-x^2 a^2+1)^2}-\frac{x}{64 a^2 (-x^2 a^2+1)}-\frac{\operatorname{arctanh}(a x)}{64 a^3}-\frac{\operatorname{arctanh}(a x)}{8 a^3 (-x^2 a^2+1)^2}+\frac{\operatorname{arctanh}(a x)}{8 a^3 (-x^2 a^2+1)}+\frac{x \operatorname{arctanh}(a x)^2}{4 a^2 (-x^2 a^2+1)^2}-\frac{x \operatorname{arctanh}(a x)^2}{8 a^2 (-x^2 a^2+1)}$$
$$-\frac{\operatorname{arctanh}(a x)^3}{24 a^3}$$

Result(type ?, 2597 leaves): Display of huge result suppressed!

Problem 83: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{arctanh}(a x)^2}{x (-x^2 a^2+1)^3} \, dx$$

Optimal(type 4, 178 leaves, 13 steps):

$$\frac{1}{32 (-x^2 a^2+1)^2}+\frac{11}{32 (-x^2 a^2+1)}-\frac{a x \operatorname{arctanh}(a x)}{8 (-x^2 a^2+1)^2}-\frac{11 a x \operatorname{arctanh}(a x)}{16 (-x^2 a^2+1)}-\frac{11 \operatorname{arctanh}(a x)^2}{32}+\frac{\operatorname{arctanh}(a x)^2}{4 (-x^2 a^2+1)^2}+\frac{\operatorname{arctanh}(a x)^2}{2 (-x^2 a^2+1)}+\frac{\operatorname{arctanh}(a x)^3}{3}$$
$$+\operatorname{arctanh}(a x)^2 \ln\left(2-\frac{2}{a x+1}\right)-\operatorname{arctanh}(a x) \operatorname{polylog}\left(2,-1+\frac{2}{a x+1}\right)-\frac{\operatorname{polylog}\left(3,-1+\frac{2}{a x+1}\right)}{2}$$

Result(type 4, 1400 leaves):

$$
-\frac{I\pi\,\mathrm{csgn}\left(I\left(\frac{(ax+1)^2}{-x^2a^2+1}-1\right)\right)\mathrm{csgn}\left(\frac{I\left(\frac{(ax+1)^2}{-x^2a^2+1}-1\right)}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^2\mathrm{arctanh}(ax)^2}{2}-\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{csgn}\left(\frac{I\left(\frac{(ax+1)^2}{-x^2a^2+1}-1\right)}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^2\mathrm{arctanh}(ax)^2}{2}
$$

$$
-2\,\mathrm{polylog}\left(3,-\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)-2\,\mathrm{polylog}\left(3,\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)+\mathrm{arctanh}(ax)^2\ln\left(1+\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)+2\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(2,-\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)
$$

$$
+\mathrm{arctanh}(ax)^2\ln\left(1-\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)+2\,\mathrm{arctanh}(ax)\,\mathrm{polylog}\left(2,\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)+\ln(ax)\,\mathrm{arctanh}(ax)^2-\mathrm{arctanh}(ax)^2\ln\left(\frac{(ax+1)^2}{-x^2a^2+1}-1\right)
$$

$$
+\frac{I\pi\,\mathrm{csgn}\left(\frac{I\left(\frac{(ax+1)^2}{-x^2a^2+1}-1\right)}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^3\mathrm{arctanh}(ax)^2}{2}+\frac{\mathrm{arctanh}(ax)^2}{16\,(ax-1)^2}+\ln(2)\,\mathrm{arctanh}(ax)^2-\frac{\mathrm{arctanh}(ax)^2\ln(ax+1)}{2}-\frac{\mathrm{arctanh}(ax)^2\ln(ax-1)}{2}
$$

$$
+\mathrm{arctanh}(ax)^2\ln\left(\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)+\frac{I\pi\,\mathrm{arctanh}(ax)^2}{2}-\frac{5\,\mathrm{arctanh}(ax)^2}{16\,(ax-1)}
$$

$$
+\frac{I\pi\,\mathrm{csgn}\left(\frac{I\,(ax+1)^2}{-x^2a^2+1}\right)\mathrm{csgn}\left(\frac{I\,(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^2\mathrm{arctanh}(ax)^2}{4}
$$

$$
+\frac{I\pi\,\mathrm{csgn}\left(\frac{I\,(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^2\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{arctanh}(ax)^2}{4}-\frac{I\pi\,\mathrm{csgn}\left(\frac{I\,(ax+1)}{\sqrt{-x^2a^2+1}}\right)^2\mathrm{csgn}\left(\frac{I\,(ax+1)^2}{-x^2a^2+1}\right)\mathrm{arctanh}(ax)^2}{4}
$$

$$
+\frac{I\pi\,\mathrm{csgn}\left(\frac{I\,(ax+1)}{\sqrt{-x^2a^2+1}}\right)\mathrm{csgn}\left(\frac{I\,(ax+1)^2}{-x^2a^2+1}\right)^2\mathrm{arctanh}(ax)^2}{2}+\frac{\mathrm{arctanh}(ax)^2}{16\,(ax+1)^2}
$$

$$
+\frac{I\pi\,\mathrm{csgn}\left(I\left(\frac{(ax+1)^2}{-x^2a^2+1}-1\right)\right)\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{csgn}\left(\frac{I\left(\frac{(ax+1)^2}{-x^2a^2+1}-1\right)}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{arctanh}(ax)^2}{2}+\frac{5\,\mathrm{arctanh}(ax)^2}{16\,(ax+1)}
$$

$$-\frac{I\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)^3\mathrm{arctanh}(ax)^2}{4}-\frac{I\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)^3\mathrm{arctanh}(ax)^2}{4}-\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^2\mathrm{arctanh}(ax)^2}{2}$$

$$+\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)^3\mathrm{arctanh}(ax)^2}{2}+\frac{(ax+1)^2}{512(ax-1)^2}-\frac{3(ax+1)}{32(ax-1)}-\frac{3(ax-1)}{32(ax+1)}+\frac{(ax-1)^2}{512(ax+1)^2}-\frac{3\,\mathrm{arctanh}(ax)(ax-1)}{16(ax+1)}$$

$$+\frac{\mathrm{arctanh}(ax)(ax-1)^2}{128(ax+1)^2}+\frac{3(ax+1)\mathrm{arctanh}(ax)}{16(ax-1)}-\frac{\mathrm{arctanh}(ax)(ax+1)^2}{128(ax-1)^2}-\frac{11\,\mathrm{arctanh}(ax)^2}{32}-\frac{\mathrm{arctanh}(ax)^3}{3}$$

$$-\frac{I\pi\,\mathrm{csgn}\left(\frac{I(ax+1)^2}{-x^2a^2+1}\right)\mathrm{csgn}\left(\frac{I(ax+1)^2}{(-x^2a^2+1)\left(1+\frac{(ax+1)^2}{-x^2a^2+1}\right)}\right)\mathrm{csgn}\left(\frac{I}{1+\frac{(ax+1)^2}{-x^2a^2+1}}\right)\mathrm{arctanh}(ax)^2}{4}$$

Problem 84: Result more than twice size of optimal antiderivative.

$$\int\frac{x\,\mathrm{arctanh}(ax)^3}{(-x^2a^2+1)^3}\,dx$$

Optimal(type 3, 170 leaves, 9 steps):

$$-\frac{3x}{128a(-x^2a^2+1)^2}-\frac{45x}{256a(-x^2a^2+1)}-\frac{45\,\mathrm{arctanh}(ax)}{256a^2}+\frac{3\,\mathrm{arctanh}(ax)}{32a^2(-x^2a^2+1)^2}+\frac{9\,\mathrm{arctanh}(ax)}{32a^2(-x^2a^2+1)}-\frac{3x\,\mathrm{arctanh}(ax)^2}{16a(-x^2a^2+1)^2}-\frac{9x\,\mathrm{arctanh}(ax)^2}{32a(-x^2a^2+1)}$$

$$-\frac{3\,\mathrm{arctanh}(ax)^3}{32a^2}+\frac{\mathrm{arctanh}(ax)^3}{4a^2(-x^2a^2+1)^2}$$

Result(type ?, 2608 leaves): Display of huge result suppressed!

Problem 93: Result more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{arctanh}(ax)}{(-x^2a^2+1)^4}\,dx$$

Optimal(type 3, 120 leaves, 4 steps):

$$-\frac{1}{36a(-x^2a^2+1)^3}-\frac{5}{96a(-x^2a^2+1)^2}-\frac{5}{32a(-x^2a^2+1)}+\frac{x\,\mathrm{arctanh}(ax)}{6(-x^2a^2+1)^3}+\frac{5x\,\mathrm{arctanh}(ax)}{24(-x^2a^2+1)^2}+\frac{5x\,\mathrm{arctanh}(ax)}{16(-x^2a^2+1)}+\frac{5\,\mathrm{arctanh}(ax)^2}{32a}$$

Result(type 3, 280 leaves):

$$-\frac{\mathrm{arctanh}(ax)}{48a(ax+1)^3}-\frac{\mathrm{arctanh}(ax)}{16a(ax+1)^2}-\frac{5\,\mathrm{arctanh}(ax)}{32a(ax+1)}+\frac{5\,\mathrm{arctanh}(ax)\ln(ax+1)}{32a}-\frac{\mathrm{arctanh}(ax)}{48a(ax-1)^3}+\frac{\mathrm{arctanh}(ax)}{16a(ax-1)^2}-\frac{5\,\mathrm{arctanh}(ax)}{32a(ax-1)}$$

$$-\frac{5\,\text{arctanh}(a x)\,\ln(a x-1)}{32 a}-\frac{5\ln\left(-\frac{a x}{2}+\frac{1}{2}\right)\ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{64 a}+\frac{5\ln\left(-\frac{a x}{2}+\frac{1}{2}\right)\ln(a x+1)}{64 a}+\frac{5\ln(a x-1)\ln\left(\frac{a x}{2}+\frac{1}{2}\right)}{64 a}-\frac{5\ln(a x+1)^2}{128 a}$$
$$-\frac{5\ln(a x-1)^2}{128 a}-\frac{37}{384 a (a x+1)}+\frac{37}{384 a (a x-1)}+\frac{1}{288 a (a x-1)^3}-\frac{7}{384 a (a x+1)^2}-\frac{1}{288 a (a x+1)^3}-\frac{7}{384 a (a x-1)^2}$$

Problem 94: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{arctanh}(a x)^3}{(-x^2 a^2+1)^4}\,dx$$

Optimal(type 3, 263 leaves, 13 steps):

$$-\frac{1}{216 a (-x^2 a^2+1)^3}-\frac{65}{2304 a (-x^2 a^2+1)^2}-\frac{245}{768 a (-x^2 a^2+1)}+\frac{x\,\text{arctanh}(a x)}{36 (-x^2 a^2+1)^3}+\frac{65 x\,\text{arctanh}(a x)}{576 (-x^2 a^2+1)^2}+\frac{245 x\,\text{arctanh}(a x)}{384 (-x^2 a^2+1)}+\frac{245\,\text{arctanh}(a x)^2}{768 a}$$
$$-\frac{\text{arctanh}(a x)^2}{12 a (-x^2 a^2+1)^3}-\frac{5\,\text{arctanh}(a x)^2}{32 a (-x^2 a^2+1)^2}-\frac{15\,\text{arctanh}(a x)^2}{32 a (-x^2 a^2+1)}+\frac{x\,\text{arctanh}(a x)^3}{6 (-x^2 a^2+1)^3}+\frac{5 x\,\text{arctanh}(a x)^3}{24 (-x^2 a^2+1)^2}+\frac{5 x\,\text{arctanh}(a x)^3}{16 (-x^2 a^2+1)}+\frac{5\,\text{arctanh}(a x)^4}{64 a}$$

Result(type ?, 3585 leaves): Display of huge result suppressed!

Problem 95: Unable to integrate problem.

$$\int \frac{\sqrt{\text{arctanh}(a x)}}{(-x^2 a^2+1)^4}\,dx$$

Optimal(type 4, 188 leaves, 21 steps):

$$\frac{5\,\text{arctanh}(a x)^{3/2}}{24 a}+\frac{\text{erf}\left(\sqrt{6}\sqrt{\text{arctanh}(a x)}\right)\sqrt{6}\sqrt{\pi}}{4608 a}-\frac{\text{erfi}\left(\sqrt{6}\sqrt{\text{arctanh}(a x)}\right)\sqrt{6}\sqrt{\pi}}{4608 a}+\frac{15\,\text{erf}\left(\sqrt{2}\sqrt{\text{arctanh}(a x)}\right)\sqrt{2}\sqrt{\pi}}{512 a}$$
$$-\frac{15\,\text{erfi}\left(\sqrt{2}\sqrt{\text{arctanh}(a x)}\right)\sqrt{2}\sqrt{\pi}}{512 a}+\frac{3\,\text{erf}\left(2\sqrt{\text{arctanh}(a x)}\right)\sqrt{\pi}}{512 a}-\frac{3\,\text{erfi}\left(2\sqrt{\text{arctanh}(a x)}\right)\sqrt{\pi}}{512 a}+\frac{15\sinh(2\,\text{arctanh}(a x))\sqrt{\text{arctanh}(a x)}}{64 a}$$
$$+\frac{3\sinh(4\,\text{arctanh}(a x))\sqrt{\text{arctanh}(a x)}}{64 a}+\frac{\sinh(6\,\text{arctanh}(a x))\sqrt{\text{arctanh}(a x)}}{192 a}$$

Result(type 8, 21 leaves):

$$\int \frac{\sqrt{\text{arctanh}(a x)}}{(-x^2 a^2+1)^4}\,dx$$

Problem 100: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{arctanh}(a x)}{\sqrt{-x^2 a^2+1}}\,dx$$

Optimal(type 4, 79 leaves, 1 step):

$$-\frac{2\arctan\left(\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}\right)\operatorname{arctanh}(ax)}{a}-\frac{I\,\mathrm{polylog}\left(2,\frac{-I\sqrt{-ax+1}}{\sqrt{ax+1}}\right)}{a}+\frac{I\,\mathrm{polylog}\left(2,\frac{I\sqrt{-ax+1}}{\sqrt{ax+1}}\right)}{a}$$

Result(type 4, 365 leaves):

$$\frac{I\operatorname{arctanh}(ax)\ln\left(-\frac{I}{\sqrt{-x^2a^2+1}}-\frac{Iax}{\sqrt{-x^2a^2+1}}\right)}{2a}-\frac{I\ln\left((1-I)\cosh\left(\frac{\operatorname{arctanh}(ax)}{2}\right)+(1+I)\sinh\left(\frac{\operatorname{arctanh}(ax)}{2}\right)\right)\operatorname{arctanh}(ax)}{a}$$
$$-\frac{I\operatorname{arctanh}(ax)\ln\left(\frac{I}{\sqrt{-x^2a^2+1}}+\frac{Iax}{\sqrt{-x^2a^2+1}}\right)}{2a}+\frac{I\ln\left((1+I)\cosh\left(\frac{\operatorname{arctanh}(ax)}{2}\right)+(1-I)\sinh\left(\frac{\operatorname{arctanh}(ax)}{2}\right)\right)\operatorname{arctanh}(ax)}{a}$$
$$+\frac{I\ln\left((1-I)\cosh\left(\frac{\operatorname{arctanh}(ax)}{2}\right)+(1+I)\sinh\left(\frac{\operatorname{arctanh}(ax)}{2}\right)\right)\ln\left(-\frac{I}{\sqrt{-x^2a^2+1}}-\frac{Iax}{\sqrt{-x^2a^2+1}}\right)}{a}$$
$$-\frac{I\ln\left((1+I)\cosh\left(\frac{\operatorname{arctanh}(ax)}{2}\right)+(1-I)\sinh\left(\frac{\operatorname{arctanh}(ax)}{2}\right)\right)\ln\left(\frac{I}{\sqrt{-x^2a^2+1}}+\frac{Iax}{\sqrt{-x^2a^2+1}}\right)}{a}$$
$$+\frac{I\,\mathrm{dilog}\left(-\frac{I}{\sqrt{-x^2a^2+1}}-\frac{Iax}{\sqrt{-x^2a^2+1}}\right)}{a}-\frac{I\,\mathrm{dilog}\left(\frac{I}{\sqrt{-x^2a^2+1}}+\frac{Iax}{\sqrt{-x^2a^2+1}}\right)}{a}$$

Problem 102: Unable to integrate problem.

$$\int\frac{x^3\operatorname{arctanh}(ax)^3}{\sqrt{-x^2a^2+1}}\,dx$$

Optimal(type 4, 253 leaves, 21 steps):

$$\frac{\arcsin(ax)}{a^4}+\frac{5\arctan\left(\frac{ax+1}{\sqrt{-x^2a^2+1}}\right)\operatorname{arctanh}(ax)^2}{a^4}-\frac{5I\operatorname{arctanh}(ax)\,\mathrm{polylog}\left(2,\frac{-I(ax+1)}{\sqrt{-x^2a^2+1}}\right)}{a^4}+\frac{5I\operatorname{arctanh}(ax)\,\mathrm{polylog}\left(2,\frac{I(ax+1)}{\sqrt{-x^2a^2+1}}\right)}{a^4}$$
$$+\frac{5I\,\mathrm{polylog}\left(3,\frac{-I(ax+1)}{\sqrt{-x^2a^2+1}}\right)}{a^4}-\frac{5I\,\mathrm{polylog}\left(3,\frac{I(ax+1)}{\sqrt{-x^2a^2+1}}\right)}{a^4}-\frac{\operatorname{arctanh}(ax)\sqrt{-x^2a^2+1}}{a^4}-\frac{x\operatorname{arctanh}(ax)^2\sqrt{-x^2a^2+1}}{2a^3}$$
$$-\frac{2\operatorname{arctanh}(ax)^3\sqrt{-x^2a^2+1}}{3a^4}-\frac{x^2\operatorname{arctanh}(ax)^3\sqrt{-x^2a^2+1}}{3a^2}$$

Result(type 8, 24 leaves):

$$\int \frac{x^3 \operatorname{arctanh}(a x)^3}{\sqrt{-x^2 a^2 + 1}}\, dx$$

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Problem 103: Unable to integrate problem.
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$$\int \frac{x \operatorname{arctanh}(a x)^3}{\sqrt{-x^2 a^2 + 1}}\, dx$$

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Optimal(type 4, 174 leaves, 9 steps):
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$$\frac{6 \arctan\left(\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right) \operatorname{arctanh}(a x)^2}{a^2} - \frac{6 I \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, \frac{-I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a^2} + \frac{6 I \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, \frac{I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a^2} + \frac{6 I \operatorname{polylog}\left(3, \frac{-I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a^2} - \frac{6 I \operatorname{polylog}\left(3, \frac{I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a^2} - \frac{\operatorname{arctanh}(a x)^3 \sqrt{-x^2 a^2 + 1}}{a^2}$$

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Result(type 8, 22 leaves):
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$$\int \frac{x \operatorname{arctanh}(a x)^3}{\sqrt{-x^2 a^2 + 1}}\, dx$$

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Problem 104: Unable to integrate problem.
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$$\int \frac{\operatorname{arctanh}(a x)^3}{\sqrt{-x^2 a^2 + 1}}\, dx$$

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Optimal(type 4, 219 leaves, 10 steps):
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$$\frac{2 \arctan\left(\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right) \operatorname{arctanh}(a x)^3}{a} - \frac{3 I \operatorname{arctanh}(a x)^2 \operatorname{polylog}\left(2, \frac{-I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a} + \frac{3 I \operatorname{arctanh}(a x)^2 \operatorname{polylog}\left(2, \frac{I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a} + \frac{6 I \operatorname{arctanh}(a x) \operatorname{polylog}\left(3, \frac{-I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a} - \frac{6 I \operatorname{arctanh}(a x) \operatorname{polylog}\left(3, \frac{I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a} - \frac{6 I \operatorname{polylog}\left(4, \frac{-I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a} + \frac{6 I \operatorname{polylog}\left(4, \frac{I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right)}{a}$$

```
Result(type 8, 21 leaves):
```

$$\int \frac{\operatorname{arctanh}(a x)^3}{\sqrt{-x^2 a^2 + 1}}\, dx$$

Problem 105: Result more than twice size of optimal antiderivative.

$$\int \frac{x^3 \operatorname{arctanh}(a x)}{(-x^2 a^2 + 1)^{3/2}}\, dx$$

Optimal(type 3, 68 leaves, 5 steps):

$$-\frac{\arcsin(a x)}{a^4} - \frac{x}{a^3 \sqrt{-x^2 a^2 + 1}} + \frac{\operatorname{arctanh}(a x)}{a^4 \sqrt{-x^2 a^2 + 1}} + \frac{\operatorname{arctanh}(a x) \sqrt{-x^2 a^2 + 1}}{a^4}$$

Result(type 3, 143 leaves):

$$-\frac{(\operatorname{arctanh}(a x) - 1) \sqrt{-(a x - 1) (a x + 1)}}{2 a^4 (a x - 1)} + \frac{(\operatorname{arctanh}(a x) + 1) \sqrt{-(a x - 1) (a x + 1)}}{2 a^4 (a x + 1)} + \frac{\operatorname{arctanh}(a x) \sqrt{-(a x - 1) (a x + 1)}}{a^4} + \frac{I \ln\left(\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}} - I\right)}{a^4} - \frac{I \ln\left(\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}} + I\right)}{a^4}$$

Problem 120: Unable to integrate problem.

$$\int \frac{\operatorname{arctanh}(a x)^2 \sqrt{-x^2 a^2 + 1}}{x^2}\, dx$$

Optimal(type 4, 231 leaves, 11 steps):

$$-2 a \arctan\left(\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right) \operatorname{arctanh}(a x)^2 - 4 a \operatorname{arctanh}(a x) \operatorname{arctanh}\left(\frac{\sqrt{-a x + 1}}{\sqrt{a x + 1}}\right) + 2 I a \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, \frac{-I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right) - 2 I a \operatorname{arctanh}(a x) \operatorname{polylog}\left(2, \frac{I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right) + 2 a \operatorname{polylog}\left(2, -\frac{\sqrt{-a x + 1}}{\sqrt{a x + 1}}\right) - 2 a \operatorname{polylog}\left(2, \frac{\sqrt{-a x + 1}}{\sqrt{a x + 1}}\right) - 2 I a \operatorname{polylog}\left(3, \frac{-I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right) + 2 I a \operatorname{polylog}\left(3, \frac{I (a x + 1)}{\sqrt{-x^2 a^2 + 1}}\right) - \frac{\operatorname{arctanh}(a x)^2 \sqrt{-x^2 a^2 + 1}}{x}$$

Result(type 8, 24 leaves):

$$\int \frac{\operatorname{arctanh}(a x)^2 \sqrt{-x^2 a^2 + 1}}{x^2}\, dx$$

Problem 129: Unable to integrate problem.

$$\int \sqrt{-x^2 a^2 + 1}\, \operatorname{arctanh}(a x)^2\, dx$$

Optimal(type 4, 200 leaves, 10 steps):

$$-\frac{\arcsin(a x)}{a}+\frac{\arctan\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)\operatorname{arctanh}(a x)^2}{a}-\frac{I \operatorname{arctanh}(a x)\operatorname{polylog}\left(2, \frac{-I(a x+1)}{\sqrt{-x^2 a^2+1}}\right)}{a}+\frac{I \operatorname{arctanh}(a x)\operatorname{polylog}\left(2, \frac{I(a x+1)}{\sqrt{-x^2 a^2+1}}\right)}{a}$$
$$+\frac{I \operatorname{polylog}\left(3, \frac{-I(a x+1)}{\sqrt{-x^2 a^2+1}}\right)}{a}-\frac{I \operatorname{polylog}\left(3, \frac{I(a x+1)}{\sqrt{-x^2 a^2+1}}\right)}{a}+\frac{\operatorname{arctanh}(a x)\sqrt{-x^2 a^2+1}}{a}+\frac{x \operatorname{arctanh}(a x)^2\sqrt{-x^2 a^2+1}}{2}$$

Result(type 8, 21 leaves):

$$\int \sqrt{-x^2 a^2+1}\,\operatorname{arctanh}(a x)^2\,dx$$

Problem 136: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(-x^2 a^2+1)^{5/2}\operatorname{arctanh}(a x)^3}\,dx$$

Optimal(type 4, 67 leaves, 12 steps):

$$-\frac{1}{2 a(-x^2 a^2+1)^{3/2}\operatorname{arctanh}(a x)^2}-\frac{3 x}{2(-x^2 a^2+1)^{3/2}\operatorname{arctanh}(a x)}+\frac{3 \operatorname{Chi}(\operatorname{arctanh}(a x))}{8 a}+\frac{9 \operatorname{Chi}(3 \operatorname{arctanh}(a x))}{8 a}$$

Result(type 4, 179 leaves):

$$\frac{1}{8 a(x^2 a^2-1)\operatorname{arctanh}(a x)^2}\Big(3 \operatorname{arctanh}(a x)^2 \operatorname{Chi}(\operatorname{arctanh}(a x)) x^2 a^2+9 \operatorname{arctanh}(a x)^2 \operatorname{Chi}(3 \operatorname{arctanh}(a x)) x^2 a^2-3 \operatorname{arctanh}(a x)\sinh(3 \operatorname{arctanh}(a x)) x^2 a^2$$
$$-\cosh(3 \operatorname{arctanh}(a x)) x^2 a^2+3\sqrt{-x^2 a^2+1}\operatorname{arctanh}(a x) a x-3 \operatorname{Chi}(\operatorname{arctanh}(a x))\operatorname{arctanh}(a x)^2-9 \operatorname{Chi}(3 \operatorname{arctanh}(a x))\operatorname{arctanh}(a x)^2$$
$$+3\sinh(3 \operatorname{arctanh}(a x))\operatorname{arctanh}(a x)+3\sqrt{-x^2 a^2+1}+\cosh(3 \operatorname{arctanh}(a x))\Big)$$

Problem 138: Result is not expressed in closed-form.

$$\int \frac{\operatorname{arctanh}(x)}{b x^2+a}\,dx$$

Optimal(type 4, 293 leaves, 17 steps):

$$-\frac{\ln(1-x)\ln\left(\frac{\sqrt{-a}-x\sqrt{b}}{\sqrt{-a}-\sqrt{b}}\right)}{4\sqrt{-a}\sqrt{b}}+\frac{\ln(1+x)\ln\left(\frac{\sqrt{-a}-x\sqrt{b}}{\sqrt{-a}+\sqrt{b}}\right)}{4\sqrt{-a}\sqrt{b}}-\frac{\ln(1+x)\ln\left(\frac{\sqrt{-a}+x\sqrt{b}}{\sqrt{-a}-\sqrt{b}}\right)}{4\sqrt{-a}\sqrt{b}}+\frac{\ln(1-x)\ln\left(\frac{\sqrt{-a}+x\sqrt{b}}{\sqrt{-a}+\sqrt{b}}\right)}{4\sqrt{-a}\sqrt{b}}$$
$$-\frac{\operatorname{polylog}\left(2, -\frac{(1-x)\sqrt{b}}{\sqrt{-a}-\sqrt{b}}\right)}{4\sqrt{-a}\sqrt{b}}-\frac{\operatorname{polylog}\left(2, -\frac{(1+x)\sqrt{b}}{\sqrt{-a}-\sqrt{b}}\right)}{4\sqrt{-a}\sqrt{b}}+\frac{\operatorname{polylog}\left(2, \frac{(1-x)\sqrt{b}}{\sqrt{-a}+\sqrt{b}}\right)}{4\sqrt{-a}\sqrt{b}}+\frac{\operatorname{polylog}\left(2, \frac{(1+x)\sqrt{b}}{\sqrt{-a}+\sqrt{b}}\right)}{4\sqrt{-a}\sqrt{b}}$$

Result(type 7, 89 leaves):

$$\sum_{\_R1 = RootOf\left((a+b)\,\_Z^4 + (2a-2b)\,\_Z^2 + a + b\right)} \frac{\operatorname{arctanh}(x)\ln\left(\frac{\_R1 - \frac{1+x}{\sqrt{-x^2+1}}}{\_R1}\right) + \operatorname{dilog}\left(\frac{\_R1 - \frac{1+x}{\sqrt{-x^2+1}}}{\_R1}\right)}{\_R1^2 a + \_R1^2 b + a - b}$$

Problem 139: Unable to integrate problem.

$$\int \frac{\operatorname{arctanh}(a x)}{(d x^2 + c)^{9/2}}\, dx$$

Optimal(type 3, 247 leaves, 8 steps):

$$\frac{a}{35 c (a^2 c + d) (d x^2 + c)^{5/2}} + \frac{a (11 a^2 c + 6 d)}{105 c^2 (a^2 c + d)^2 (d x^2 + c)^{3/2}} + \frac{x \operatorname{arctanh}(a x)}{7 c (d x^2 + c)^{7/2}} + \frac{6 x \operatorname{arctanh}(a x)}{35 c^2 (d x^2 + c)^{5/2}} + \frac{8 x \operatorname{arctanh}(a x)}{35 c^3 (d x^2 + c)^{3/2}}$$
$$- \frac{(35 a^6 c^3 + 70 a^4 c^2 d + 56 a^2 c d^2 + 16 d^3) \operatorname{arctanh}\left(\frac{a \sqrt{d x^2 + c}}{\sqrt{a^2 c + d}}\right)}{35 c^4 (a^2 c + d)^{7/2}} + \frac{a (19 a^4 c^2 + 22 a^2 c d + 8 d^2)}{35 c^3 (a^2 c + d)^3 \sqrt{d x^2 + c}} + \frac{16 x \operatorname{arctanh}(a x)}{35 c^4 \sqrt{d x^2 + c}}$$

Result(type 8, 16 leaves):

$$\int \frac{\operatorname{arctanh}(a x)}{(d x^2 + c)^{9/2}}\, dx$$

Problem 140: Result more than twice size of optimal antiderivative.

$$\int x^3 (a + b \operatorname{arctanh}(c x)) (d + e \ln(-c^2 x^2 + 1))\, dx$$

Optimal(type 3, 201 leaves, 14 steps):

$$\frac{b (2 d - 3 e) x}{8 c^3} - \frac{2 b e x}{3 c^3} + \frac{b (2 d - e) x^3}{24 c} - \frac{b e x^3}{18 c} - \frac{b (2 d - 3 e) \operatorname{arctanh}(c x)}{8 c^4} + \frac{2 b e \operatorname{arctanh}(c x)}{3 c^4} - \frac{e x^2 (a + b \operatorname{arctanh}(c x))}{4 c^2}$$
$$- \frac{e x^4 (a + b \operatorname{arctanh}(c x))}{8} + \frac{b e x \ln(-c^2 x^2 + 1)}{4 c^3} + \frac{b e x^3 \ln(-c^2 x^2 + 1)}{12 c} - \frac{e (a + b \operatorname{arctanh}(c x)) \ln(-c^2 x^2 + 1)}{4 c^4}$$
$$+ \frac{x^4 (a + b \operatorname{arctanh}(c x)) (d + e \ln(-c^2 x^2 + 1))}{4}$$

Result(type ?, 3783 leaves): Display of huge result suppressed!

Problem 141: Maple result simpler than optimal antiderivative, IF it can be verified!

$$\int \frac{(a + b \operatorname{arctanh}(c x)) (d + e \ln(-c^2 x^2 + 1))}{x^2}\, dx$$

Optimal(type 4, 101 leaves, 6 steps):

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

Result(type 3, 63 leaves):

$$-\frac{\left(a-\frac{I b \pi}{2}\right) e\ln\left(-c^2x^2+1\right)}{x}+\frac{\left(a-\frac{I b\pi}{2}\right)(c e\ln(-c x+1) x-c e\ln(-c x-1) x-d)}{x}$$

Problem 142: Maple result simpler than optimal antiderivative, IF it can be verified!

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

Optimal(type 4, 183 leaves, 15 steps):

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

Result(type 3, 81 leaves):

$$-\frac{\left(a-\frac{I b\pi}{2}\right) e\ln\left(-c^2x^2+1\right)}{3 x^3}+\frac{\left(a-\frac{I b\pi}{2}\right)\left(c^3 e\ln(-c x+1) x^3-c^3 e\ln(-c x-1) x^3+2 e c^2 x^2-d\right)}{3 x^3}$$

Problem 143: Unable to integrate problem.

$$\int\frac{(a+b\,\mathrm{arctanh}(c x))\left(d+e\ln\left(g x^2+f\right)\right)}{x^2}\,dx$$

Optimal(type 4, 493 leaves, 28 steps):

$$-\frac{(a+b\,\mathrm{arctanh}(c x))\left(d+e\ln\left(g x^2+f\right)\right)}{x}+\frac{b c\ln\left(-\frac{g x^2}{f}\right)\left(d+e\ln\left(g x^2+f\right)\right)}{2}-\frac{b c\ln\left(\frac{g\left(-c^2x^2+1\right)}{f c^2+g}\right)\left(d+e\ln\left(g x^2+f\right)\right)}{2}$$
$$-\frac{b c e\,\mathrm{polylog}\left(2,\frac{c^2\left(g x^2+f\right)}{f c^2+g}\right)}{2}+\frac{b c e\,\mathrm{polylog}\left(2,1+\frac{g x^2}{f}\right)}{2}-\frac{b e\ln(-c x+1)\ln\left(\frac{c\left(\sqrt{-f}-x\sqrt{g}\right)}{c\sqrt{-f}-\sqrt{g}}\right)\sqrt{g}}{2\sqrt{-f}}$$

$$+\frac{b e \ln(c x+1) \ln\left(\frac{c\left(\sqrt{-f}-x\sqrt{g}\right)}{c\sqrt{-f}+\sqrt{g}}\right)\sqrt{g}}{2\sqrt{-f}}-\frac{b e \ln(c x+1) \ln\left(\frac{c\left(\sqrt{-f}+x\sqrt{g}\right)}{c\sqrt{-f}-\sqrt{g}}\right)\sqrt{g}}{2\sqrt{-f}}+\frac{b e \ln(-c x+1) \ln\left(\frac{c\left(\sqrt{-f}+x\sqrt{g}\right)}{c\sqrt{-f}+\sqrt{g}}\right)\sqrt{g}}{2\sqrt{-f}}$$

$$-\frac{b e \operatorname{polylog}\left(2, -\frac{(-c x+1)\sqrt{g}}{c\sqrt{-f}-\sqrt{g}}\right)\sqrt{g}}{2\sqrt{-f}}-\frac{b e \operatorname{polylog}\left(2, -\frac{(c x+1)\sqrt{g}}{c\sqrt{-f}-\sqrt{g}}\right)\sqrt{g}}{2\sqrt{-f}}+\frac{b e \operatorname{polylog}\left(2, \frac{(-c x+1)\sqrt{g}}{c\sqrt{-f}+\sqrt{g}}\right)\sqrt{g}}{2\sqrt{-f}}$$

$$+\frac{b e \operatorname{polylog}\left(2, \frac{(c x+1)\sqrt{g}}{c\sqrt{-f}+\sqrt{g}}\right)\sqrt{g}}{2\sqrt{-f}}+\frac{2 a e \arctan\left(\frac{x\sqrt{g}}{\sqrt{f}}\right)\sqrt{g}}{\sqrt{f}}$$

Result(type 8, 26 leaves):

$$\int \frac{(a+b\operatorname{arctanh}(c x))\left(d+e\ln\left(g x^2+f\right)\right)}{x^2}\, dx$$

Test results for the 19 problems in "7.3.5 u (a+b arctanh(c+d x))^p.txt"

Problem 1: Result more than twice size of optimal antiderivative.

$$\int x^3 \operatorname{arctanh}(b x+a)^2\, dx$$

Optimal(type 4, 251 leaves, 19 steps):

$$-\frac{a x}{b^3}+\frac{(b x+a)^2}{12 b^4}+\frac{a \operatorname{arctanh}(b x+a)}{b^4}+\frac{\left(6 a^2+1\right)(b x+a)\operatorname{arctanh}(b x+a)}{2 b^4}-\frac{a (b x+a)^2\operatorname{arctanh}(b x+a)}{b^4}+\frac{(b x+a)^3\operatorname{arctanh}(b x+a)}{6 b^4}$$

$$-\frac{a\left(a^2+1\right)\operatorname{arctanh}(b x+a)^2}{b^4}-\frac{\left(a^4+6 a^2+1\right)\operatorname{arctanh}(b x+a)^2}{4 b^4}+\frac{x^4\operatorname{arctanh}(b x+a)^2}{4}+\frac{2 a\left(a^2+1\right)\operatorname{arctanh}(b x+a)\ln\left(\frac{2}{-b x-a+1}\right)}{b^4}$$

$$+\frac{\ln\left(1-(b x+a)^2\right)}{12 b^4}+\frac{\left(6 a^2+1\right)\ln\left(1-(b x+a)^2\right)}{4 b^4}+\frac{a\left(a^2+1\right)\operatorname{polylog}\left(2, \frac{-b x-a-1}{-b x-a+1}\right)}{b^4}$$

Result(type 4, 966 leaves):

$$-\frac{11 a^2}{12 b^4}+\frac{x^2}{12 b^2}+\frac{\ln(b x+a-1)}{3 b^4}+\frac{\ln(b x+a+1)}{3 b^4}+\frac{\ln(b x+a+1)^2}{16 b^4}+\frac{\ln(b x+a-1)^2}{16 b^4}-\frac{\ln\left(-\frac{b x}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln(b x+a+1)}{8 b^4}$$

$$+\frac{\ln\left(-\frac{b x}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln\left(\frac{b x}{2}+\frac{a}{2}+\frac{1}{2}\right)}{8 b^4}+\frac{13\operatorname{arctanh}(b x+a)\, a^3}{6 b^4}+\frac{\operatorname{arctanh}(b x+a)\, x}{2 b^3}+\frac{\operatorname{arctanh}(b x+a)\, x^3}{6 b}+\frac{3 a^2\ln(b x+a-1)^2}{8 b^4}$$

$$-\frac{a^3\ln(b x+a-1)^2}{4 b^4}+\frac{a^3\operatorname{dilog}\left(\frac{b x}{2}+\frac{a}{2}+\frac{1}{2}\right)}{b^4}+\frac{a^4\ln(b x+a-1)^2}{16 b^4}+\frac{x^4\operatorname{arctanh}(b x+a)^2}{4}+\frac{3 a^2\ln(b x+a+1)^2}{8 b^4}+\frac{a^3\ln(b x+a+1)^2}{4 b^4}$$

$$- \frac{a \ln(b x + a - 1)}{2 b^4} + \frac{a \ln(b x + a + 1)}{2 b^4} + \frac{3 \ln(b x + a + 1) a^2}{2 b^4} + \frac{3 \ln(b x + a - 1) a^2}{2 b^4} - \frac{a \ln(b x + a - 1)^2}{4 b^4} + \frac{a \operatorname{dilog}\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{b^4}$$

$$+ \frac{a \ln(b x + a + 1)^2}{4 b^4} + \frac{a^4 \ln(b x + a + 1)^2}{16 b^4} - \frac{\ln(b x + a - 1) \ln\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{8 b^4} + \frac{\operatorname{arctanh}(b x + a) \ln(b x + a - 1)}{4 b^4}$$

$$- \frac{\operatorname{arctanh}(b x + a) \ln(b x + a + 1)}{4 b^4} - \frac{5 a x}{6 b^3} + \frac{a^3 \ln\left(-\frac{b x}{2} - \frac{a}{2} + \frac{1}{2}\right) \ln\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{2 b^4} - \frac{a^4 \ln\left(-\frac{b x}{2} - \frac{a}{2} + \frac{1}{2}\right) \ln(b x + a + 1)}{8 b^4}$$

$$+ \frac{a^4 \ln\left(-\frac{b x}{2} - \frac{a}{2} + \frac{1}{2}\right) \ln\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{8 b^4} - \frac{\operatorname{arctanh}(b x + a) x^2 a}{2 b^2} + \frac{3 \operatorname{arctanh}(b x + a) x a^2}{2 b^3} + \frac{\operatorname{arctanh}(b x + a) \ln(b x + a - 1) a^4}{4 b^4}$$

$$- \frac{\operatorname{arctanh}(b x + a) \ln(b x + a - 1) a^3}{b^4} + \frac{3 \operatorname{arctanh}(b x + a) \ln(b x + a - 1) a^2}{2 b^4} - \frac{\operatorname{arctanh}(b x + a) \ln(b x + a - 1) a}{b^4}$$

$$- \frac{\operatorname{arctanh}(b x + a) \ln(b x + a + 1) a^4}{4 b^4} - \frac{\operatorname{arctanh}(b x + a) \ln(b x + a + 1) a^3}{b^4} - \frac{3 \operatorname{arctanh}(b x + a) \ln(b x + a + 1) a^2}{2 b^4}$$

$$- \frac{\operatorname{arctanh}(b x + a) \ln(b x + a + 1) a}{b^4} + \frac{a \ln(b x + a - 1) \ln\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{2 b^4} - \frac{a \ln\left(-\frac{b x}{2} - \frac{a}{2} + \frac{1}{2}\right) \ln(b x + a + 1)}{2 b^4}$$

$$+ \frac{a \ln\left(-\frac{b x}{2} - \frac{a}{2} + \frac{1}{2}\right) \ln\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{2 b^4} - \frac{3 a^2 \ln(b x + a - 1) \ln\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{4 b^4} + \frac{a^3 \ln(b x + a - 1) \ln\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{2 b^4}$$

$$- \frac{a^4 \ln(b x + a - 1) \ln\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{8 b^4} - \frac{3 a^2 \ln\left(-\frac{b x}{2} - \frac{a}{2} + \frac{1}{2}\right) \ln(b x + a + 1)}{4 b^4} + \frac{3 a^2 \ln\left(-\frac{b x}{2} - \frac{a}{2} + \frac{1}{2}\right) \ln\left(\frac{b x}{2} + \frac{a}{2} + \frac{1}{2}\right)}{4 b^4}$$

$$- \frac{a^3 \ln\left(-\frac{b x}{2} - \frac{a}{2} + \frac{1}{2}\right) \ln(b x + a + 1)}{2 b^4} + \frac{a \operatorname{arctanh}(b x + a)}{2 b^4}$$

Problem 2: Result more than twice size of optimal antiderivative.

$$\int x \operatorname{arctanh}(b x + a)^2 \, dx$$

Optimal(type 4, 132 leaves, 12 steps):

$$\frac{(b x + a) \operatorname{arctanh}(b x + a)}{b^2} - \frac{a \operatorname{arctanh}(b x + a)^2}{b^2} - \frac{(a^2 + 1) \operatorname{arctanh}(b x + a)^2}{2 b^2} + \frac{x^2 \operatorname{arctanh}(b x + a)^2}{2} + \frac{2 a \operatorname{arctanh}(b x + a) \ln\left(\frac{2}{-b x - a + 1}\right)}{b^2}$$

$$+ \frac{\ln(1 - (b x + a)^2)}{2 b^2} + \frac{a \operatorname{polylog}\left(2, \frac{-b x - a - 1}{-b x - a + 1}\right)}{b^2}$$

Result(type 4, 364 leaves):

$$\frac{x^2 \operatorname{arctanh}(bx+a)^2}{2} - \frac{\operatorname{arctanh}(bx+a)^2 a^2}{2b^2} + \frac{\operatorname{arctanh}(bx+a)\, x}{b} + \frac{\operatorname{arctanh}(bx+a)\, a}{b^2} - \frac{\operatorname{arctanh}(bx+a)\ln(bx+a-1)\, a}{b^2}$$
$$+ \frac{\operatorname{arctanh}(bx+a)\ln(bx+a-1)}{2b^2} - \frac{\operatorname{arctanh}(bx+a)\ln(bx+a+1)\, a}{b^2} - \frac{\operatorname{arctanh}(bx+a)\ln(bx+a+1)}{2b^2} + \frac{\ln(bx+a-1)^2}{8b^2}$$
$$- \frac{\ln(bx+a-1)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{4b^2} + \frac{\ln(bx+a-1)}{2b^2} + \frac{\ln(bx+a+1)}{2b^2} + \frac{\ln(bx+a+1)^2}{8b^2} - \frac{\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln(bx+a+1)}{4b^2}$$
$$+ \frac{\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{4b^2} - \frac{a\ln(bx+a-1)^2}{4b^2} + \frac{a\operatorname{dilog}\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{b^2} + \frac{a\ln(bx+a-1)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2b^2}$$
$$+ \frac{a\ln(bx+a+1)^2}{4b^2} - \frac{a\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln(bx+a+1)}{2b^2} + \frac{a\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2b^2}$$

Problem 3: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{arctanh}(bx+a)^2}{x^3}\, dx$$

Optimal(type 4, 358 leaves, 21 steps):

$$-\frac{b\operatorname{arctanh}(bx+a)}{(-a^2+1)\,x} - \frac{\operatorname{arctanh}(bx+a)^2}{2x^2} + \frac{b^2\ln(x)}{(-a^2+1)^2} + \frac{b^2\operatorname{arctanh}(bx+a)\ln\left(\frac{2}{-bx-a+1}\right)}{2(1-a)^2} - \frac{b^2\ln(-bx-a+1)}{2(1-a)^2(1+a)}$$
$$- \frac{b^2\operatorname{arctanh}(bx+a)\ln\left(\frac{2}{bx+a+1}\right)}{2(1+a)^2} - \frac{2ab^2\operatorname{arctanh}(bx+a)\ln\left(\frac{2}{bx+a+1}\right)}{(-a^2+1)^2} + \frac{2ab^2\operatorname{arctanh}(bx+a)\ln\left(\frac{2bx}{(1-a)(bx+a+1)}\right)}{(-a^2+1)^2}$$
$$- \frac{b^2\ln(bx+a+1)}{2(1-a)(1+a)^2} + \frac{b^2\operatorname{polylog}\left(2, \frac{-bx-a-1}{-bx-a+1}\right)}{4(1-a)^2} + \frac{b^2\operatorname{polylog}\left(2, 1-\frac{2}{bx+a+1}\right)}{4(1+a)^2} + \frac{ab^2\operatorname{polylog}\left(2, 1-\frac{2}{bx+a+1}\right)}{(-a^2+1)^2}$$
$$- \frac{ab^2\operatorname{polylog}\left(2, 1-\frac{2bx}{(1-a)(bx+a+1)}\right)}{(-a^2+1)^2}$$

Result(type 4, 1612 leaves):

$$-\frac{3b^2 a\operatorname{dilog}\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(-2+2a)} + \frac{b^2 a\ln(bx+a+1)^2}{4(-1+a)^2(1+a)^2(2+2a)} - \frac{2b^2 a\operatorname{dilog}\left(\frac{bx+a-1}{-1+a}\right)}{(-1+a)^2(1+a)^2(-2+2a)} - \frac{2b^2 a\operatorname{dilog}\left(\frac{bx+a+1}{1+a}\right)}{(-1+a)^2(1+a)^2(2+2a)}$$

$$+\frac{b^2\ln(bx+a-1)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(2+2a)}+\frac{2b^2\operatorname{arctanh}(bx+a)\,a\ln(bx)}{(-1+a)^2(1+a)^2}-\frac{b^2a^3\operatorname{dilog}\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(-2+2a)}-\frac{b^2a^3\ln(bx+a+1)^2}{4(-1+a)^2(1+a)^2(2+2a)}$$

$$-\frac{b^2a^2\ln(bx+a-1)^2}{4(-1+a)^2(1+a)^2(-2+2a)}+\frac{3b^2a^2\operatorname{dilog}\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(2+2a)}+\frac{b^2a\ln(bx+a-1)^2}{4(-1+a)^2(1+a)^2(-2+2a)}+\frac{3b^2a\operatorname{dilog}\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(2+2a)}$$

$$+\frac{b^2a^2\ln(bx+a+1)}{(-1+a)^2(1+a)^2(2+2a)}+\frac{b^2\operatorname{dilog}\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(2+2a)}+\frac{b\operatorname{arctanh}(bx+a)}{(-1+a)(1+a)x}-\frac{b^2\ln(bx+a+1)}{(-1+a)^2(1+a)^2(2+2a)}$$

$$+\frac{b^2\ln(bx+a-1)}{(-1+a)^2(1+a)^2(-2+2a)}+\frac{b^2a^2\ln(bx)}{(-1+a)^3(1+a)^3}+\frac{b^2\operatorname{dilog}\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(-2+2a)}-\frac{b^2\ln(bx+a+1)^2}{4(-1+a)^2(1+a)^2(2+2a)}$$

$$-\frac{\operatorname{arctanh}(bx+a)^2}{2x^2}-\frac{2b^2a\ln(bx)\ln\left(\frac{bx+a-1}{-1+a}\right)}{(-1+a)^2(1+a)^2(-2+2a)}-\frac{2b^2a\ln(bx)\ln\left(\frac{bx+a+1}{1+a}\right)}{(-1+a)^2(1+a)^2(2+2a)}+\frac{3b^2a\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln(bx+a+1)}{2(-1+a)^2(1+a)^2(-2+2a)}$$

$$-\frac{3b^2a\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(-2+2a)}+\frac{b^2a^3\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln(bx+a+1)}{2(-1+a)^2(1+a)^2(-2+2a)}-\frac{b^2a^3\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(-2+2a)}$$

$$+\frac{3b^2a^2\ln(bx+a-1)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(2+2a)}+\frac{3b^2a\ln(bx+a-1)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(2+2a)}+\frac{b^2a^3\ln(bx+a-1)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(2+2a)}$$

$$+\frac{2b^2a^2\ln(bx)\ln\left(\frac{bx+a-1}{-1+a}\right)}{(-1+a)^2(1+a)^2(-2+2a)}-\frac{2b^2a^2\ln(bx)\ln\left(\frac{bx+a+1}{1+a}\right)}{(-1+a)^2(1+a)^2(2+2a)}-\frac{3b^2a^2\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln(bx+a+1)}{2(-1+a)^2(1+a)^2(-2+2a)}$$

$$+\frac{3b^2a^2\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(-2+2a)}+\frac{b^2\ln(bx+a-1)^2}{4(-1+a)^2(1+a)^2(-2+2a)}-\frac{b^2a^2\ln(bx+a-1)}{(-1+a)^2(1+a)^2(-2+2a)}$$

$$+\frac{2b^2a^2\operatorname{dilog}\left(\frac{bx+a-1}{-1+a}\right)}{(-1+a)^2(1+a)^2(-2+2a)}-\frac{2b^2a^2\operatorname{dilog}\left(\frac{bx+a+1}{1+a}\right)}{(-1+a)^2(1+a)^2(2+2a)}-\frac{b^2a^3\ln(bx+a-1)^2}{4(-1+a)^2(1+a)^2(-2+2a)}+\frac{b^2a^3\operatorname{dilog}\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(2+2a)}$$

$$-\frac{b^2\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln(bx+a+1)}{2(-1+a)^2(1+a)^2(-2+2a)}+\frac{b^2\ln\left(-\frac{bx}{2}-\frac{a}{2}+\frac{1}{2}\right)\ln\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(-2+2a)}+\frac{3b^2a^2\operatorname{dilog}\left(\frac{bx}{2}+\frac{a}{2}+\frac{1}{2}\right)}{2(-1+a)^2(1+a)^2(-2+2a)}$$

$$+\frac{b^2a^2\ln(bx+a+1)^2}{4(-1+a)^2(1+a)^2(2+2a)}-\frac{b^2\ln(bx)}{(-1+a)^3(1+a)^3}-\frac{b^2\operatorname{arctanh}(bx+a)\ln(bx+a-1)}{2(-1+a)^2}+\frac{b^2\operatorname{arctanh}(bx+a)\ln(bx+a+1)}{2(1+a)^2}$$

Problem 4: Result more than twice size of optimal antiderivative.

$$\int(dex+ce)^2\,(a+b\operatorname{arctanh}(dx+c))\,dx$$

Optimal(type 3, 63 leaves, 6 steps):

$$\frac{b e^2 (d x+c)^2}{6 d}+\frac{e^2 (d x+c)^3 (a+b \operatorname{arctanh}(d x+c))}{3 d}+\frac{b e^2 \ln\left(1-(d x+c)^2\right)}{6 d}$$

Result(type 3, 173 leaves):

$$\frac{d^2 x^3 a e^2}{3}+d x^2 a c e^2+x a c^2 e^2+\frac{a c^3 e^2}{3 d}+\frac{d^2 \operatorname{arctanh}(d x+c) x^3 b e^2}{3}+d \operatorname{arctanh}(d x+c) x^2 b c e^2+\operatorname{arctanh}(d x+c) x b c^2 e^2+\frac{\operatorname{arctanh}(d x+c) b c^3 e^2}{3 d}+\frac{d b e^2 x^2}{6}+\frac{x b c e^2}{3}+\frac{b c^2 e^2}{6 d}+\frac{b e^2 \ln(d x+c-1)}{6 d}+\frac{b e^2 \ln(d x+c+1)}{6 d}$$

Problem 5: Result more than twice size of optimal antiderivative.

$$\int (d e x+c e)^3 (a+b \operatorname{arctanh}(d x+c))^2 \, dx$$

Optimal(type 3, 145 leaves, 13 steps):

$$\frac{a b e^3 x}{2}+\frac{b^2 e^3 (d x+c)^2}{12 d}+\frac{b^2 e^3 (d x+c) \operatorname{arctanh}(d x+c)}{2 d}+\frac{b e^3 (d x+c)^3 (a+b \operatorname{arctanh}(d x+c))}{6 d}-\frac{e^3 (a+b \operatorname{arctanh}(d x+c))^2}{4 d}+\frac{e^3 (d x+c)^4 (a+b \operatorname{arctanh}(d x+c))^2}{4 d}+\frac{b^2 e^3 \ln\left(1-(d x+c)^2\right)}{3 d}$$

Result(type 3, 731 leaves):

$$2 d^2 \operatorname{arctanh}(d x+c) x^3 a b c e^3+3 d \operatorname{arctanh}(d x+c) x^2 a b c^2 e^3+d^2 x^3 a^2 c e^3+\frac{a b c^3 e^3}{6 d}+\frac{a b c e^3}{2 d}+\frac{3 d x^2 a^2 c^2 e^3}{2}+\frac{d^2 x^3 a b e^3}{6}+\frac{d^3 \operatorname{arctanh}(d x+c)^2 x^4 b^2 e^3}{4}+\frac{d^2 \operatorname{arctanh}(d x+c) x^3 b^2 e^3}{6}+\frac{e^3 a b \ln(d x+c-1)}{4 d}-\frac{e^3 a b \ln(d x+c+1)}{4 d}-\frac{e^3 b^2 \ln\left(-\frac{d x}{2}-\frac{c}{2}+\frac{1}{2}\right) \ln(d x+c+1)}{8 d}+\frac{e^3 b^2 \operatorname{arctanh}(d x+c) \ln(d x+c-1)}{4 d}-\frac{e^3 b^2 \operatorname{arctanh}(d x+c) \ln(d x+c+1)}{4 d}-\frac{e^3 b^2 \ln(d x+c-1) \ln\left(\frac{d x}{2}+\frac{c}{2}+\frac{1}{2}\right)}{8 d}+\frac{e^3 b^2 \ln\left(-\frac{d x}{2}-\frac{c}{2}+\frac{1}{2}\right) \ln\left(\frac{d x}{2}+\frac{c}{2}+\frac{1}{2}\right)}{8 d}+\frac{\operatorname{arctanh}(d x+c)^2 b^2 c^4 e^3}{4 d}+\frac{\operatorname{arctanh}(d x+c) b^2 c^3 e^3}{6 d}+\frac{\operatorname{arctanh}(d x+c) b^2 c e^3}{2 d}+\operatorname{arctanh}(d x+c)^2 x b^2 c^3 e^3+\frac{\operatorname{arctanh}(d x+c) x b^2 c^2 e^3}{2}+\frac{x a b c^2 e^3}{2}+2 \operatorname{arctanh}(d x+c) x a b c^3 e^3+\frac{\operatorname{arctanh}(d x+c) a b c^4 e^3}{2 d}+\frac{d^3 \operatorname{arctanh}(d x+c) x^4 a b e^3}{2}+d^2 \operatorname{arctanh}(d x+c)^2 x^3 b^2 c e^3+\frac{3 d \operatorname{arctanh}(d x+c)^2 x^2 b^2 c^2 e^3}{2}+\frac{d \operatorname{arctanh}(d x+c) x^2 b^2 c e^3}{2}+\frac{d x^2 a b c e^3}{2}+\frac{a b e^3 x}{2}+\frac{a^2 c^4 e^3}{4 d}+\frac{b^2 c^2 e^3}{12 d}+x a^2 c^3 e^3+\frac{x b^2 c e^3}{6}+\frac{d^3 x^4 a^2 e^3}{4}+\frac{d x^2 b^2 e^3}{12}+\frac{\operatorname{arctanh}(d x+c) x b^2 e^3}{2}+\frac{e^3 b^2 \ln(d x+c-1)}{3 d}+\frac{e^3 b^2 \ln(d x+c+1)}{3 d}+\frac{e^3 b^2 \ln(d x+c-1)^2}{16 d}+\frac{e^3 b^2 \ln(d x+c+1)^2}{16 d}$$

Problem 6: Result more than twice size of optimal antiderivative.

$$\int (d e x + c e)^2 (a + b \operatorname{arctanh}(d x + c))^2 \, dx$$

Optimal(type 4, 167 leaves, 11 steps):

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

Result(type 4, 582 leaves):

$$\frac{\operatorname{arctanh}(d x + c) b^2 c^2 e^2}{3 d} + \operatorname{arctanh}(d x + c)^2 x b^2 c^2 e^2 + \frac{2 \operatorname{arctanh}(d x + c) x b^2 c e^2}{3} + \frac{d x^2 a b e^2}{3} + d x^2 a^2 c e^2 + \frac{d^2 \operatorname{arctanh}(d x + c)^2 x^3 b^2 e^2}{3} + \frac{d \operatorname{arctanh}(d x + c) x^2 b^2 e^2}{3} + \frac{a b e^2 \ln(d x + c - 1)}{3 d} + \frac{a b e^2 \ln(d x + c + 1)}{3 d} + \frac{b^2 e^2 \operatorname{arctanh}(d x + c) \ln(d x + c - 1)}{3 d} + \frac{b^2 e^2 \operatorname{arctanh}(d x + c) \ln(d x + c + 1)}{3 d} + \frac{b^2 e^2 \ln\left(-\frac{d x}{2} - \frac{c}{2} + \frac{1}{2}\right) \ln(d x + c + 1)}{6 d} - \frac{b^2 e^2 \ln(d x + c - 1) \ln\left(\frac{d x}{2} + \frac{c}{2} + \frac{1}{2}\right)}{6 d} - \frac{b^2 e^2 \ln\left(-\frac{d x}{2} - \frac{c}{2} + \frac{1}{2}\right) \ln\left(\frac{d x}{2} + \frac{c}{2} + \frac{1}{2}\right)}{6 d} + \frac{2 x a b c e^2}{3} + \frac{a b c^2 e^2}{3 d} + \frac{\operatorname{arctanh}(d x + c)^2 b^2 c^3 e^2}{3 d} + \frac{2 \operatorname{arctanh}(d x + c) a b c^3 e^2}{3 d} + d \operatorname{arctanh}(d x + c)^2 x^2 b^2 c e^2 + \frac{2 d^2 \operatorname{arctanh}(d x + c) x^3 a b e^2}{3} + 2 \operatorname{arctanh}(d x + c) x a b c^2 e^2 + \frac{a^2 c^3 e^2}{3 d} + \frac{b^2 c e^2}{3 d} + x a^2 c^2 e^2 + \frac{d^2 x^3 a^2 e^2}{3} + \frac{b^2 e^2 \ln(d x + c - 1)}{6 d} - \frac{b^2 e^2 \ln(d x + c + 1)}{6 d} + \frac{b^2 e^2 \ln(d x + c - 1)^2}{12 d} - \frac{b^2 e^2 \operatorname{dilog}\left(\frac{d x}{2} + \frac{c}{2} + \frac{1}{2}\right)}{3 d} - \frac{b^2 e^2 \ln(d x + c + 1)^2}{12 d} + \frac{b^2 e^2 x}{3} + 2 d \operatorname{arctanh}(d x + c) x^2 a b c e^2$$

Problem 7: Result more than twice size of optimal antiderivative.

$$\int (d e x + c e) (a + b \operatorname{arctanh}(d x + c))^2 \, dx$$

Optimal(type 3, 89 leaves, 8 steps):

$$a b e x + \frac{b^2 e (d x + c) \operatorname{arctanh}(d x + c)}{d} - \frac{e (a + b \operatorname{arctanh}(d x + c))^2}{2 d} + \frac{e (d x + c)^2 (a + b \operatorname{arctanh}(d x + c))^2}{2 d} + \frac{b^2 e \ln\left(1 - (d x + c)^2\right)}{2 d}$$

Result(type 3, 389 leaves):

$$\frac{d x^2 a^2 e}{2} + x a^2 c e + \frac{a^2 c^2 e}{2 d} + \frac{d \operatorname{arctanh}(d x + c)^2 x^2 b^2 e}{2} + \operatorname{arctanh}(d x + c)^2 x b^2 c e + \frac{\operatorname{arctanh}(d x + c)^2 b^2 c^2 e}{2 d} + \operatorname{arctanh}(d x + c) x b^2 e + \frac{\operatorname{arctanh}(d x + c) b^2 c e}{d} + \frac{e b^2 \operatorname{arctanh}(d x + c) \ln(d x + c - 1)}{2 d} - \frac{e b^2 \operatorname{arctanh}(d x + c) \ln(d x + c + 1)}{2 d} + \frac{e b^2 \ln(d x + c - 1)^2}{8 d}$$

$$- \frac{e b^2 \ln(d x + c - 1) \ln\left(\frac{d x}{2} + \frac{c}{2} + \frac{1}{2}\right)}{4 d} + \frac{e b^2 \ln(d x + c - 1)}{2 d} + \frac{e b^2 \ln(d x + c + 1)}{2 d} + \frac{e b^2 \ln(d x + c + 1)^2}{8 d}$$
$$- \frac{e b^2 \ln\left(-\frac{d x}{2} - \frac{c}{2} + \frac{1}{2}\right) \ln(d x + c + 1)}{4 d} + \frac{e b^2 \ln\left(-\frac{d x}{2} - \frac{c}{2} + \frac{1}{2}\right) \ln\left(\frac{d x}{2} + \frac{c}{2} + \frac{1}{2}\right)}{4 d} + d \operatorname{arctanh}(d x + c) x^2 a b e + 2 \operatorname{arctanh}(d x + c) x a b c e$$
$$+ \frac{\operatorname{arctanh}(d x + c) a b c^2 e}{d} + a b e x + \frac{a b c e}{d} + \frac{e a b \ln(d x + c - 1)}{2 d} - \frac{e a b \ln(d x + c + 1)}{2 d}$$

Problem 8: Result more than twice size of optimal antiderivative.

$$\int \frac{(a + b \operatorname{arctanh}(d x + c))^2}{d e x + c e} \, dx$$

Optimal(type 4, 164 leaves, 8 steps):

$$- \frac{2 (a + b \operatorname{arctanh}(d x + c))^2 \operatorname{arctanh}\left(-1 + \frac{2}{-d x - c + 1}\right)}{e d} - \frac{b (a + b \operatorname{arctanh}(d x + c)) \operatorname{polylog}\left(2, 1 - \frac{2}{-d x - c + 1}\right)}{e d}$$
$$+ \frac{b (a + b \operatorname{arctanh}(d x + c)) \operatorname{polylog}\left(2, -1 + \frac{2}{-d x - c + 1}\right)}{e d} + \frac{b^2 \operatorname{polylog}\left(3, 1 - \frac{2}{-d x - c + 1}\right)}{2 e d} - \frac{b^2 \operatorname{polylog}\left(3, -1 + \frac{2}{-d x - c + 1}\right)}{2 e d}$$

Result(type 4, 892 leaves):

$$\frac{a^2 \ln(d x + c)}{d e} + \frac{b^2 \ln(d x + c) \operatorname{arctanh}(d x + c)^2}{d e} - \frac{b^2 \operatorname{arctanh}(d x + c) \operatorname{polylog}\left(2, -\frac{(d x + c + 1)^2}{1 - (d x + c)^2}\right)}{d e} + \frac{b^2 \operatorname{polylog}\left(3, -\frac{(d x + c + 1)^2}{1 - (d x + c)^2}\right)}{2 d e}$$
$$- \frac{b^2 \operatorname{arctanh}(d x + c)^2 \ln\left(\frac{(d x + c + 1)^2}{1 - (d x + c)^2} - 1\right)}{d e} + \frac{b^2 \operatorname{arctanh}(d x + c)^2 \ln\left(1 + \frac{d x + c + 1}{\sqrt{1 - (d x + c)^2}}\right)}{d e}$$
$$+ \frac{2 b^2 \operatorname{arctanh}(d x + c) \operatorname{polylog}\left(2, -\frac{d x + c + 1}{\sqrt{1 - (d x + c)^2}}\right)}{d e} - \frac{2 b^2 \operatorname{polylog}\left(3, -\frac{d x + c + 1}{\sqrt{1 - (d x + c)^2}}\right)}{d e} + \frac{b^2 \operatorname{arctanh}(d x + c)^2 \ln\left(1 - \frac{d x + c + 1}{\sqrt{1 - (d x + c)^2}}\right)}{d e}$$
$$+ \frac{2 b^2 \operatorname{arctanh}(d x + c) \operatorname{polylog}\left(2, \frac{d x + c + 1}{\sqrt{1 - (d x + c)^2}}\right)}{d e} - \frac{2 b^2 \operatorname{polylog}\left(3, \frac{d x + c + 1}{\sqrt{1 - (d x + c)^2}}\right)}{d e}$$
$$+ \frac{I b^2 \pi \operatorname{csgn}\left(\frac{I \left(\frac{(d x + c + 1)^2}{1 - (d x + c)^2} - 1\right)}{1 + \frac{(d x + c + 1)^2}{1 - (d x + c)^2}}\right)^3 \operatorname{arctanh}(d x + c)^2}{2 d e}$$

$$+\frac{I b^2 \pi \operatorname{csgn}\left(I\left(\frac{(dx+c+1)^2}{1-(dx+c)^2}-1\right)\right) \operatorname{csgn}\left(\frac{I}{1+\frac{(dx+c+1)^2}{1-(dx+c)^2}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{(dx+c+1)^2}{1-(dx+c)^2}-1\right)}{1+\frac{(dx+c+1)^2}{1-(dx+c)^2}}\right) \operatorname{arctanh}(dx+c)^2}{2de}$$

$$-\frac{I b^2 \pi \operatorname{csgn}\left(I\left(\frac{(dx+c+1)^2}{1-(dx+c)^2}-1\right)\right) \operatorname{csgn}\left(\frac{I\left(\frac{(dx+c+1)^2}{1-(dx+c)^2}-1\right)}{1+\frac{(dx+c+1)^2}{1-(dx+c)^2}}\right)^2 \operatorname{arctanh}(dx+c)^2}{2de}$$

$$-\frac{I b^2 \pi \operatorname{csgn}\left(\frac{I}{1+\frac{(dx+c+1)^2}{1-(dx+c)^2}}\right) \operatorname{csgn}\left(\frac{I\left(\frac{(dx+c+1)^2}{1-(dx+c)^2}-1\right)}{1+\frac{(dx+c+1)^2}{1-(dx+c)^2}}\right)^2 \operatorname{arctanh}(dx+c)^2}{2de} + \frac{2ab\ln(dx+c)\operatorname{arctanh}(dx+c)}{de} - \frac{ab\operatorname{dilog}(dx+c+1)}{de}$$

$$-\frac{ab\ln(dx+c)\ln(dx+c+1)}{de} - \frac{ab\operatorname{dilog}(dx+c)}{de}$$

Problem 9: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\operatorname{arctanh}(dx+c))^2}{(dex+ce)^2}\,dx$$

Optimal(type 4, 104 leaves, 6 steps):

$$\frac{(a+b\operatorname{arctanh}(dx+c))^2}{de^2} - \frac{(a+b\operatorname{arctanh}(dx+c))^2}{de^2(dx+c)} + \frac{2b(a+b\operatorname{arctanh}(dx+c))\ln\left(2-\frac{2}{dx+c+1}\right)}{de^2} - \frac{b^2\operatorname{polylog}\left(2,-1+\frac{2}{dx+c+1}\right)}{de^2}$$

Result(type 4, 395 leaves):

$$-\frac{a^2}{de^2(dx+c)} - \frac{b^2\operatorname{arctanh}(dx+c)^2}{de^2(dx+c)} + \frac{2b^2\ln(dx+c)\operatorname{arctanh}(dx+c)}{de^2} - \frac{b^2\operatorname{arctanh}(dx+c)\ln(dx+c+1)}{de^2} - \frac{b^2\operatorname{arctanh}(dx+c)\ln(dx+c-1)}{de^2}$$

$$-\frac{b^2\ln(dx+c-1)^2}{4de^2} + \frac{b^2\operatorname{dilog}\left(\frac{dx}{2}+\frac{c}{2}+\frac{1}{2}\right)}{de^2} + \frac{b^2\ln(dx+c-1)\ln\left(\frac{dx}{2}+\frac{c}{2}+\frac{1}{2}\right)}{2de^2} + \frac{b^2\ln(dx+c+1)^2}{4de^2}$$

$$-\frac{b^2\ln\left(-\frac{dx}{2}-\frac{c}{2}+\frac{1}{2}\right)\ln(dx+c+1)}{2de^2} + \frac{b^2\ln\left(-\frac{dx}{2}-\frac{c}{2}+\frac{1}{2}\right)\ln\left(\frac{dx}{2}+\frac{c}{2}+\frac{1}{2}\right)}{2de^2} - \frac{b^2\operatorname{dilog}(dx+c+1)}{de^2} - \frac{b^2\ln(dx+c)\ln(dx+c+1)}{de^2}$$

$$-\frac{b^2\operatorname{dilog}(dx+c)}{de^2} - \frac{2ab\operatorname{arctanh}(dx+c)}{de^2(dx+c)} + \frac{2ab\ln(dx+c)}{de^2} - \frac{ab\ln(dx+c+1)}{de^2} - \frac{ab\ln(dx+c-1)}{de^2}$$

Problem 10: Result more than twice size of optimal antiderivative.

$$\int (d e x + c e)^2 (a + b \operatorname{arctanh}(d x + c))^3 \, dx$$

Optimal(type 4, 251 leaves, 14 steps):

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

Result(type 4, 1785 leaves):

$$-\frac{e^2 a b^2 \ln\left(-\frac{d x}{2} - \frac{c}{2} + \frac{1}{2}\right) \ln\left(\frac{d x}{2} + \frac{c}{2} + \frac{1}{2}\right)}{2 d} + \frac{\operatorname{arctanh}(d x + c)^2 a b^2 c^3 e^2}{d} + \frac{\operatorname{arctanh}(d x + c) a b^2 c^2 e^2}{d} + \frac{\operatorname{arctanh}(d x + c) a^2 b c^3 e^2}{d} + 3 \operatorname{arctanh}(d x + c)^2 x a b^2 c^2 e^2 + 2 \operatorname{arctanh}(d x + c) x a b^2 c e^2 + 3 \operatorname{arctanh}(d x + c) x a^2 b c^2 e^2 - \frac{I e^2 b^3 \pi \operatorname{arctanh}(d x + c)^2}{2 d} + d^2 \operatorname{arctanh}(d x + c)^2 x^3 a b^2 e^2 + d \operatorname{arctanh}(d x + c) x^2 a b^2 e^2 + d^2 \operatorname{arctanh}(d x + c) x^3 a^2 b e^2 + d \operatorname{arctanh}(d x + c)^3 x^2 b^3 c e^2 + \frac{e^2 a b^2 \operatorname{arctanh}(d x + c) \ln(d x + c - 1)}{d} + \frac{e^2 a b^2 \operatorname{arctanh}(d x + c) \ln(d x + c + 1)}{d} - \frac{e^2 a b^2 \ln(d x + c - 1) \ln\left(\frac{d x}{2} + \frac{c}{2} + \frac{1}{2}\right)}{2 d} + \frac{e^2 a b^2 \ln\left(-\frac{d x}{2} - \frac{c}{2} + \frac{1}{2}\right) \ln(d x + c + 1)}{2 d} + \frac{a b^2 c e^2}{d} + \frac{a^2 b c^2 e^2}{2 d} + d x^2 a^3 c e^2 + \operatorname{arctanh}(d x + c)^3 x b^3 c^2 e^2 + \operatorname{arctanh}(d x + c)^2 x b^3 c e^2 + \frac{d^2 \operatorname{arctanh}(d x + c)^3 x^3 b^3 e^2}{3} + \frac{d \operatorname{arctanh}(d x + c)^2 x^2 b^3 e^2}{2} + \frac{a^2 b e^2 \ln(d x + c + 1)}{2 d} + \frac{e^2 b^3 \operatorname{arctanh}(d x + c)^2 \ln(d x + c - 1)}{2 d} + \frac{e^2 b^3 \operatorname{arctanh}(d x + c)^2 \ln(d x + c + 1)}{2 d} - \frac{e^2 b^3 \operatorname{arctanh}(d x + c)^2 \ln\left(\frac{d x + c + 1}{\sqrt{1 - (d x + c)^2}}\right)}{d} - \frac{e^2 b^3 \operatorname{arctanh}(d x + c) \operatorname{polylog}\left(2, -\frac{(d x + c + 1)^2}{1 - (d x + c)^2}\right)}{d} + \frac{\operatorname{arctanh}(d x + c) b^3 c e^2}{d} + \frac{\operatorname{arctanh}(d x + c)^3 b^3 c^3 e^2}{3 d} + \frac{\operatorname{arctanh}(d x + c)^2 b^3 c^2 e^2}{2 d} - \frac{e^2 b^3 \ln(2) \operatorname{arctanh}(d x + c)^2}{d} + \frac{e^2 a b^2 \ln(d x + c - 1)}{2 d} - \frac{I e^2 b^3 \pi \operatorname{arctanh}(d x + c)^2 \operatorname{csgn}\left(\frac{I}{1 + \frac{(d x + c + 1)^2}{1 - (d x + c)^2}}\right) \operatorname{csgn}\left(\frac{I (d x + c + 1)^2}{(1 - (d x + c)^2)\left(1 + \frac{(d x + c + 1)^2}{1 - (d x + c)^2}\right)}\right)^2}{4 d} - \frac{e^2 a b^2 \ln(d x + c + 1)}{2 d} + \frac{e^2 a b^2 \ln(d x + c - 1)^2}{4 d} - \frac{e^2 a b^2 \operatorname{dilog}\left(\frac{d x}{2} + \frac{c}{2} + \frac{1}{2}\right)}{d} - \frac{e^2 a b^2 \ln(d x + c + 1)^2}{4 d} + \frac{a^2 b e^2 \ln(d x + c - 1)}{2 d} + \frac{a^2 b x^2 d e^2}{2} + a b^2 e^2 x + \frac{d^2 x^3 a^3 e^2}{3}$$

$$+\operatorname{arctanh}(dx+c)\,x b^3 e^2+\frac{e^2 b^3 \operatorname{polylog}\left(3,-\frac{(dx+c+1)^2}{1-(dx+c)^2}\right)}{2d}+\frac{e^2 b^3 \operatorname{arctanh}(dx+c)^3}{3d}-\frac{e^2 b^3 \operatorname{arctanh}(dx+c)^2}{2d}+\frac{e^2 b^3 \operatorname{arctanh}(dx+c)}{d}$$

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

$$+\frac{I e^2 b^3 \pi \operatorname{arctanh}(dx+c)^2 \operatorname{csgn}\left(\frac{I}{1+\frac{(dx+c+1)^2}{1-(dx+c)^2}}\right)\operatorname{csgn}\left(\frac{I(dx+c+1)^2}{1-(dx+c)^2}\right)\operatorname{csgn}\left(\frac{I(dx+c+1)^2}{\left(1-(dx+c)^2\right)\left(1+\frac{(dx+c+1)^2}{1-(dx+c)^2}\right)}\right)}{4d}$$

$$+3d\operatorname{arctanh}(dx+c)\,x^2 a b^2 c e^2+3d\operatorname{arctanh}(dx+c)\,x^2 a^2 b c e^2-\frac{I e^2 b^3 \pi \operatorname{arctanh}(dx+c)^2 \operatorname{csgn}\left(\frac{I}{1+\frac{(dx+c+1)^2}{1-(dx+c)^2}}\right)^3}{2d}$$

$$+\frac{I e^2 b^3 \pi \operatorname{arctanh}(dx+c)^2 \operatorname{csgn}\left(\frac{I(dx+c+1)^2}{1-(dx+c)^2}\right)^3}{4d}+\frac{I e^2 b^3 \pi \operatorname{arctanh}(dx+c)^2 \operatorname{csgn}\left(\frac{I(dx+c+1)^2}{\left(1-(dx+c)^2\right)\left(1+\frac{(dx+c+1)^2}{1-(dx+c)^2}\right)}\right)^3}{4d}$$

$$+\frac{I e^2 b^3 \pi \operatorname{arctanh}(dx+c)^2 \operatorname{csgn}\left(\frac{I}{1+\frac{(dx+c+1)^2}{1-(dx+c)^2}}\right)^2}{2d}-\frac{I e^2 b^3 \pi \operatorname{arctanh}(dx+c)^2 \operatorname{csgn}\left(\frac{I(dx+c+1)^2}{1-(dx+c)^2}\right)^2 \operatorname{csgn}\left(\frac{I(dx+c+1)}{\sqrt{1-(dx+c)^2}}\right)}{2d}$$

$$-\frac{I e^2 b^3 \pi \operatorname{arctanh}(dx+c)^2 \operatorname{csgn}\left(\frac{I(dx+c+1)^2}{1-(dx+c)^2}\right)\operatorname{csgn}\left(\frac{I(dx+c+1)^2}{\left(1-(dx+c)^2\right)\left(1+\frac{(dx+c+1)^2}{1-(dx+c)^2}\right)}\right)^2}{4d}$$

$$+\frac{I e^2 b^3 \pi \operatorname{arctanh}(dx+c)^2 \operatorname{csgn}\left(\frac{I(dx+c+1)^2}{1-(dx+c)^2}\right)\operatorname{csgn}\left(\frac{I(dx+c+1)}{\sqrt{1-(dx+c)^2}}\right)^2}{4d}+x a^2 b c e^2$$

Problem 13: Result more than twice size of optimal antiderivative.

$$\int (fx+e)^2 \left(a+b\operatorname{arctanh}(dx+c)\right)^2 dx$$

Optimal(type 4, 360 leaves, 16 steps):

$$\frac{b^2 f^2 x}{3d^2}+\frac{2abf(-cf+ed)x}{d^2}-\frac{b^2 f^2 \operatorname{arctanh}(dx+c)}{3d^3}+\frac{2b^2 f(-cf+ed)(dx+c)\operatorname{arctanh}(dx+c)}{d^3}+\frac{b f^2 (dx+c)^2 \left(a+b\operatorname{arctanh}(dx+c)\right)}{3d^3}$$

$$- \frac{(-cf+ed)\left(d^2 e^2 - 2cdef + (c^2+3) f^2\right)(a+b\,\mathrm{arctanh}(dx+c))^2}{3 d^3 f} + \frac{\left(3 d^2 e^2 - 6cdef + (3c^2+1) f^2\right)(a+b\,\mathrm{arctanh}(dx+c))^2}{3 d^3}$$

$$+ \frac{(fx+e)^3 (a+b\,\mathrm{arctanh}(dx+c))^2}{3f} - \frac{2b\left(3 d^2 e^2 - 6cdef + (3c^2+1) f^2\right)(a+b\,\mathrm{arctanh}(dx+c)) \ln\left(\frac{2}{-dx-c+1}\right)}{3 d^3}$$

$$+ \frac{b^2 f(-cf+ed) \ln\left(1-(dx+c)^2\right)}{d^3} - \frac{b^2\left(3 d^2 e^2 - 6cdef + (3c^2+1) f^2\right) \mathrm{polylog}\left(2, \frac{-dx-c-1}{-dx-c+1}\right)}{3 d^3}$$

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Result(type ?, 2693 leaves): Display of huge result suppressed!
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Problem 15: Result more than twice size of optimal antiderivative.
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$$\int (fx+e)^2 (a+b\,\mathrm{arctanh}(dx+c))^3 \, dx$$

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Optimal(type 4, 534 leaves, 21 steps):
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$$\frac{a b^2 f^2 x}{d^2} + \frac{b^3 f^2 (dx+c)\,\mathrm{arctanh}(dx+c)}{d^3} - \frac{b f^2 (a+b\,\mathrm{arctanh}(dx+c))^2}{2 d^3} + \frac{3 b f(-cf+ed)(a+b\,\mathrm{arctanh}(dx+c))^2}{d^3}$$

$$+ \frac{3 b f(-cf+ed)(dx+c)(a+b\,\mathrm{arctanh}(dx+c))^2}{d^3} + \frac{b f^2 (dx+c)^2 (a+b\,\mathrm{arctanh}(dx+c))^2}{2 d^3}$$

$$- \frac{(-cf+ed)\left(d^2 e^2 - 2cdef + (c^2+3) f^2\right)(a+b\,\mathrm{arctanh}(dx+c))^3}{3 d^3 f} + \frac{\left(3 d^2 e^2 - 6cdef + (3c^2+1) f^2\right)(a+b\,\mathrm{arctanh}(dx+c))^3}{3 d^3}$$

$$+ \frac{(fx+e)^3 (a+b\,\mathrm{arctanh}(dx+c))^3}{3f} - \frac{6 b^2 f(-cf+ed)(a+b\,\mathrm{arctanh}(dx+c)) \ln\left(\frac{2}{-dx-c+1}\right)}{d^3}$$

$$- \frac{b\left(3 d^2 e^2 - 6cdef + (3c^2+1) f^2\right)(a+b\,\mathrm{arctanh}(dx+c))^2 \ln\left(\frac{2}{-dx-c+1}\right)}{d^3} + \frac{b^3 f^2 \ln\left(1-(dx+c)^2\right)}{2 d^3}$$

$$- \frac{3 b^3 f(-cf+ed)\,\mathrm{polylog}\left(2, \frac{-dx-c-1}{-dx-c+1}\right)}{d^3} - \frac{b^2\left(3 d^2 e^2 - 6cdef + (3c^2+1) f^2\right)(a+b\,\mathrm{arctanh}(dx+c))\,\mathrm{polylog}\left(2, 1-\frac{2}{-dx-c+1}\right)}{d^3}$$

$$+ \frac{b^3\left(3 d^2 e^2 - 6cdef + (3c^2+1) f^2\right) \mathrm{polylog}\left(3, 1-\frac{2}{-dx-c+1}\right)}{2 d^3}$$

```
Result(type ?, 12290 leaves): Display of huge result suppressed!
```

```
Problem 16: Result more than twice size of optimal antiderivative.
```

$$\int (a+b\,\mathrm{arctanh}(dx+c))^3 \, dx$$

```
Optimal(type 4, 130 leaves, 6 steps):
```

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

```
Result(type 4, 345 leaves):
```

$$a^3x+\frac{a^3c}{d}+\mathrm{arctanh}(dx+c)^3xb^3+\frac{\mathrm{arctanh}(dx+c)^3b^3c}{d}+\frac{b^3\,\mathrm{arctanh}(dx+c)^3}{d}-\frac{3\,b^3\,\mathrm{arctanh}(dx+c)^2\ln\left(1+\frac{(dx+c+1)^2}{1-(dx+c)^2}\right)}{d}$$
$$-\frac{3\,b^3\,\mathrm{arctanh}(dx+c)\,\mathrm{polylog}\left(2,-\frac{(dx+c+1)^2}{1-(dx+c)^2}\right)}{d}+\frac{3\,b^3\,\mathrm{polylog}\left(3,-\frac{(dx+c+1)^2}{1-(dx+c)^2}\right)}{2\,d}+3\,\mathrm{arctanh}(dx+c)^2xab^2+\frac{3\,\mathrm{arctanh}(dx+c)^2ab^2c}{d}$$
$$+\frac{3\,a\,b^2\,\mathrm{arctanh}(dx+c)^2}{d}-\frac{6\,\mathrm{arctanh}(dx+c)\ln\left(1+\frac{(dx+c+1)^2}{1-(dx+c)^2}\right)ab^2}{d}-\frac{3\,\mathrm{polylog}\left(2,-\frac{(dx+c+1)^2}{1-(dx+c)^2}\right)ab^2}{d}+3\,\mathrm{arctanh}(dx+c)\,xa^2b$$
$$+\frac{3\,\mathrm{arctanh}(dx+c)\,a^2bc}{d}+\frac{3\,a^2b\ln\left(1-(dx+c)^2\right)}{2\,d}$$

```
Problem 17: Result more than twice size of optimal antiderivative.
```

$$\int\frac{(a+b\,\mathrm{arctanh}(dx+c))^3}{(fx+e)^2}\,\mathrm{d}x$$

```
Optimal(type 4, 1067 leaves, 33 steps):
```

$$-\frac{(a+b\,\mathrm{arctanh}(dx+c))^3}{f(fx+e)}+\frac{3\,a\,b^2\,d\,\mathrm{arctanh}(dx+c)\ln\left(\frac{2}{-dx-c+1}\right)}{f(-cf+ed+f)}+\frac{3\,b^3\,d\,\mathrm{arctanh}(dx+c)^2\ln\left(\frac{2}{-dx-c+1}\right)}{2f(-cf+ed+f)}-\frac{3\,a^2\,b\,d\ln(-dx-c+1)}{2f(-cf+ed+f)}$$
$$-\frac{3\,a\,b^2\,d\,\mathrm{arctanh}(dx+c)\ln\left(\frac{2}{dx+c+1}\right)}{f(-cf+ed-f)}+\frac{6\,a\,b^2\,d\,\mathrm{arctanh}(dx+c)\ln\left(\frac{2}{dx+c+1}\right)}{(-cf+ed+f)\,(ed-(c+1)f)}-\frac{3\,b^3\,d\,\mathrm{arctanh}(dx+c)^2\ln\left(\frac{2}{dx+c+1}\right)}{2f(-cf+ed-f)}$$
$$+\frac{3\,b^3\,d\,\mathrm{arctanh}(dx+c)^2\ln\left(\frac{2}{dx+c+1}\right)}{(-cf+ed+f)\,(ed-(c+1)f)}+\frac{3\,a^2\,b\,d\ln(dx+c+1)}{2f(-cf+ed-f)}+\frac{3\,a^2\,b\,d\ln(fx+e)}{f^2-(-cf+ed)^2}$$
$$-\frac{6\,a\,b^2\,d\,\mathrm{arctanh}(dx+c)\ln\left(\frac{2\,d\,(fx+e)}{(-cf+ed+f)\,(dx+c+1)}\right)}{(-cf+ed+f)\,(ed-(c+1)f)}-\frac{3\,b^3\,d\,\mathrm{arctanh}(dx+c)^2\ln\left(\frac{2\,d\,(fx+e)}{(-cf+ed+f)\,(dx+c+1)}\right)}{(-cf+ed+f)\,(ed-(c+1)f)}$$
$$+\frac{3\,a\,b^2\,d\,\mathrm{polylog}\left(2,\frac{-dx-c-1}{-dx-c+1}\right)}{2f(-cf+ed+f)}+\frac{3\,b^3\,d\,\mathrm{arctanh}(dx+c)\,\mathrm{polylog}\left(2,1-\frac{2}{-dx-c+1}\right)}{2f(-cf+ed+f)}+\frac{3\,a\,b^2\,d\,\mathrm{polylog}\left(2,1-\frac{2}{dx+c+1}\right)}{2f(-cf+ed-f)}$$

$$-\frac{3 a b^{2} d \operatorname{polylog}\left(2, 1-\frac{2}{d x+c+1}\right)}{(-c f+e d+f)\,(e d-(c+1) f)}+\frac{3 b^{3} d \operatorname{arctanh}(d x+c) \operatorname{polylog}\left(2, 1-\frac{2}{d x+c+1}\right)}{2 f(-c f+e d-f)}-\frac{3 b^{3} d \operatorname{arctanh}(d x+c) \operatorname{polylog}\left(2, 1-\frac{2}{d x+c+1}\right)}{(-c f+e d+f)\,(e d-(c+1) f)}$$
$$+\frac{3 a b^{2} d \operatorname{polylog}\left(2, 1-\frac{2 d (f x+e)}{(-c f+e d+f)\,(d x+c+1)}\right)}{(-c f+e d+f)\,(e d-(c+1) f)}+\frac{3 b^{3} d \operatorname{arctanh}(d x+c) \operatorname{polylog}\left(2, 1-\frac{2 d (f x+e)}{(-c f+e d+f)\,(d x+c+1)}\right)}{(-c f+e d+f)\,(e d-(c+1) f)}$$
$$-\frac{3 b^{3} d \operatorname{polylog}\left(3, 1-\frac{2}{-d x-c+1}\right)}{4 f(-c f+e d+f)}+\frac{3 b^{3} d \operatorname{polylog}\left(3, 1-\frac{2}{d x+c+1}\right)}{4 f(-c f+e d-f)}-\frac{3 b^{3} d \operatorname{polylog}\left(3, 1-\frac{2}{d x+c+1}\right)}{2\,(-c f+e d+f)\,(e d-(c+1) f)}$$
$$+\frac{3 b^{3} d \operatorname{polylog}\left(3, 1-\frac{2 d (f x+e)}{(-c f+e d+f)\,(d x+c+1)}\right)}{2\,(-c f+e d+f)\,(e d-(c+1) f)}$$

Result(type ?, 6293 leaves): Display of huge result suppressed!

Test results for the 351 problems in "7.3.6 Exponentials of inverse hyperbolic tangent functions.txt"

Problem 12: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{2} \sqrt{-x^{2} a^{2}+1}}{a x+1}\, dx$$

Optimal(type 3, 61 leaves, 7 steps):

$$-\frac{(-x^{2} a^{2}+1)^{3/2}}{3 a^{3}}+\frac{\arcsin(a x)}{2 a^{3}}+\frac{\sqrt{-x^{2} a^{2}+1}}{a^{3}}-\frac{x \sqrt{-x^{2} a^{2}+1}}{2 a^{2}}$$

Result(type 3, 133 leaves):

$$-\frac{(-x^{2} a^{2}+1)^{3/2}}{3 a^{3}}+\frac{\sqrt{-\left(x+\frac{1}{a}\right)^{2} a^{2}+2 a \left(x+\frac{1}{a}\right)}}{a^{3}}+\frac{\arctan\left(\frac{\sqrt{a^{2}}\, x}{\sqrt{-\left(x+\frac{1}{a}\right)^{2} a^{2}+2 a \left(x+\frac{1}{a}\right)}}\right)}{a^{2} \sqrt{a^{2}}}-\frac{x \sqrt{-x^{2} a^{2}+1}}{2 a^{2}}-\frac{\arctan\left(\frac{\sqrt{a^{2}}\, x}{\sqrt{-x^{2} a^{2}+1}}\right)}{2 a^{2} \sqrt{a^{2}}}$$

Problem 13: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{-x^{2} a^{2}+1}}{(a x+1)\, x^{2}}\, dx$$

Optimal(type 3, 33 leaves, 5 steps):

$$a \operatorname{arctanh}\left(\sqrt{-x^{2} a^{2}+1}\right)-\frac{\sqrt{-x^{2} a^{2}+1}}{x}$$

Result(type 3, 161 leaves):

$$-\frac{(-x^2 a^2+1)^{3/2}}{x}-\sqrt{-x^2 a^2+1}\, x a^2-\frac{a^2 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-x^2 a^2+1}}\right)}{\sqrt{a^2}}+a\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2a\left(x+\frac{1}{a}\right)}$$
$$+\frac{a^2 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2a\left(x+\frac{1}{a}\right)}}\right)}{\sqrt{a^2}}+a\,\mathrm{arctanh}\left(\frac{1}{\sqrt{-x^2 a^2+1}}\right)-a\sqrt{-x^2 a^2+1}$$

Problem 14: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{-x^2 a^2+1}}{(a x+1)\, x^4}\, dx$$

Optimal(type 3, 74 leaves, 7 steps):

$$\frac{a^3 \,\mathrm{arctanh}\left(\sqrt{-x^2 a^2+1}\right)}{2}-\frac{\sqrt{-x^2 a^2+1}}{3 x^3}+\frac{a\sqrt{-x^2 a^2+1}}{2 x^2}-\frac{2 a^2\sqrt{-x^2 a^2+1}}{3 x}$$

Result(type 3, 206 leaves):

$$-\frac{(-x^2 a^2+1)^{3/2}}{3 x^3}-\frac{a^2 (-x^2 a^2+1)^{3/2}}{x}-a^4 x\sqrt{-x^2 a^2+1}-\frac{a^4 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-x^2 a^2+1}}\right)}{\sqrt{a^2}}+a^3\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2a\left(x+\frac{1}{a}\right)}$$
$$+\frac{a^4 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2a\left(x+\frac{1}{a}\right)}}\right)}{\sqrt{a^2}}+\frac{a(-x^2 a^2+1)^{3/2}}{2 x^2}+\frac{a^3 \,\mathrm{arctanh}\left(\frac{1}{\sqrt{-x^2 a^2+1}}\right)}{2}-\frac{a^3\sqrt{-x^2 a^2+1}}{2}$$

Problem 18: Result more than twice size of optimal antiderivative.

$$\int \frac{(-x^2 a^2+1)^{3/2}}{(a x+1)^3 x^2}\, dx$$

Optimal(type 3, 56 leaves, 8 steps):

$$3 a\,\mathrm{arctanh}\left(\sqrt{-x^2 a^2+1}\right)-\frac{\sqrt{-x^2 a^2+1}}{x}-\frac{4 a\sqrt{-x^2 a^2+1}}{a x+1}$$

Result(type 3, 260 leaves):

$$-\frac{\left(-x^2 a^2+1\right)^{5/2}}{x}-a^2 x\left(-x^2 a^2+1\right)^{3/2}-\frac{3\sqrt{-x^2 a^2+1}\,x a^2}{2}-\frac{3 a^2 \arctan\left(\frac{\sqrt{a^2}\,x}{\sqrt{-x^2 a^2+1}}\right)}{2\sqrt{a^2}}-\frac{\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{5/2}}{a^2\left(x+\frac{1}{a}\right)^3}-a\left(-x^2 a^2\right.$$

$$\left.+1\right)^{3/2}+3 a \operatorname{arctanh}\left(\frac{1}{\sqrt{-x^2 a^2+1}}\right)-3 a\sqrt{-x^2 a^2+1}+a\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{3/2}+\frac{3 a^2\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}\,x}{2}$$

$$+\frac{3 a^2 \arctan\left(\frac{\sqrt{a^2}\,x}{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}}\right)}{2\sqrt{a^2}}$$

Problem 19: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(-x^2 a^2+1\right)^{3/2}}{(a x+1)^3 x^5}\, dx$$

Optimal(type 3, 117 leaves, 19 steps):

$$-\frac{51 a^4 \operatorname{arctanh}\left(\sqrt{-x^2 a^2+1}\right)}{8}-\frac{\sqrt{-x^2 a^2+1}}{4 x^4}+\frac{a\sqrt{-x^2 a^2+1}}{x^3}-\frac{19 a^2\sqrt{-x^2 a^2+1}}{8 x^2}+\frac{6 a^3\sqrt{-x^2 a^2+1}}{x}+\frac{4 a^4\sqrt{-x^2 a^2+1}}{a x+1}$$

Result(type 3, 358 leaves):

$$-\frac{\left(-x^2 a^2+1\right)^{5/2}}{4 x^4}-\frac{23 a^2\left(-x^2 a^2+1\right)^{5/2}}{8 x^2}+\frac{17 a^4\left(-x^2 a^2+1\right)^{3/2}}{8}+\frac{51 a^4\sqrt{-x^2 a^2+1}}{8}-\frac{51 a^4 \operatorname{arctanh}\left(\frac{1}{\sqrt{-x^2 a^2+1}}\right)}{8}+\frac{a\left(-x^2 a^2+1\right)^{5/2}}{x^3}$$

$$+\frac{8 a^3\left(-x^2 a^2+1\right)^{5/2}}{x}+8 a^5 x\left(-x^2 a^2+1\right)^{3/2}+12 a^5 x\sqrt{-x^2 a^2+1}+\frac{12 a^5 \arctan\left(\frac{\sqrt{a^2}\,x}{\sqrt{-x^2 a^2+1}}\right)}{\sqrt{a^2}}+\frac{a\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{5/2}}{\left(x+\frac{1}{a}\right)^3}$$

$$-\frac{3 a^2\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{5/2}}{\left(x+\frac{1}{a}\right)^2}-8 a^4\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{3/2}-12 a^5\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}\,x$$

$$-\frac{12 a^5 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}}\right)}{\sqrt{a^2}}$$

Problem 20: Unable to integrate problem.

$$\int \frac{\sqrt{\frac{a x+1}{\sqrt{-x^2 a^2+1}}}}{x}\, dx$$

Optimal(type 3, 180 leaves, 17 steps):

$$-2 \arctan\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)-2 \operatorname{arctanh}\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)-\frac{\ln\left(1-\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right) \sqrt{2}}{2}$$
$$+\frac{\ln\left(1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right) \sqrt{2}}{2}-\arctan\left(-1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}\right) \sqrt{2}-\arctan\left(1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}\right) \sqrt{2}$$

Result(type 8, 26 leaves):

$$\int \frac{\sqrt{\frac{a x+1}{\sqrt{-x^2 a^2+1}}}}{x}\, dx$$

Problem 21: Unable to integrate problem.

$$\int \frac{\sqrt{\frac{a x+1}{\sqrt{-x^2 a^2+1}}}}{x^2}\, dx$$

Optimal(type 3, 61 leaves, 6 steps):

$$-\frac{(-a x+1)^{3/4} (a x+1)^{1/4}}{x}-a \arctan\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)-a \operatorname{arctanh}\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)$$

Result(type 8, 26 leaves):

$$\int \frac{\sqrt{\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}}}{x^2}\, dx$$

Problem 22: Unable to integrate problem.

$$\int \frac{\sqrt{\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}}}{x^3}\, dx$$

Optimal(type 3, 86 leaves, 7 steps):

$$-\frac{a (-a x + 1)^{3/4} (a x + 1)^{1/4}}{4 x} - \frac{(-a x + 1)^{3/4} (a x + 1)^{5/4}}{2 x^2} - \frac{a^2 \arctan\left(\frac{(a x + 1)^{1/4}}{(-a x + 1)^{1/4}}\right)}{4} - \frac{a^2 \operatorname{arctanh}\left(\frac{(a x + 1)^{1/4}}{(-a x + 1)^{1/4}}\right)}{4}$$

Result(type 8, 26 leaves):

$$\int \frac{\sqrt{\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}}}{x^3}\, dx$$

Problem 23: Unable to integrate problem.

$$\int \left(\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right)^{3/2} x^m\, dx$$

Optimal(type 6, 27 leaves, 2 steps):

$$\frac{x^{1+m} \mathit{AppellF1}\left(1 + m, \frac{3}{4}, -\frac{3}{4}, 2 + m, a x, -a x\right)}{1 + m}$$

Result(type 8, 26 leaves):

$$\int \left(\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right)^{3/2} x^m\, dx$$

Problem 24: Unable to integrate problem.

$$\int \left(\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}\right)^{5/2} x^m\, dx$$

Optimal(type 6, 27 leaves, 2 steps):

$$\frac{x^{1+m} AppellF1\left(1+m, \frac{5}{4}, -\frac{5}{4}, 2+m, a x, -a x\right)}{1+m}$$

Result(type 8, 26 leaves):

$$\int \left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2} x^m \, dx$$

Problem 25: Unable to integrate problem.

$$\int \left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2} x^3 \, dx$$

Optimal(type 3, 246 leaves, 16 steps):

$$\frac{475 (-a x+1)^{3/4} (a x+1)^{1/4}}{64 a^4}+\frac{4 x^3 (a x+1)^{5/4}}{a (-a x+1)^{1/4}}+\frac{17 x^2 (-a x+1)^{3/4} (a x+1)^{5/4}}{4 a^2}+\frac{(-a x+1)^{3/4} (a x+1)^{5/4} (452 a x+521)}{96 a^4}$$
$$+\frac{475 \arctan\left(-1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}\right) \sqrt{2}}{128 a^4}+\frac{475 \arctan\left(1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}\right) \sqrt{2}}{128 a^4}+\frac{475 \ln\left(1-\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right) \sqrt{2}}{256 a^4}$$
$$-\frac{475 \ln\left(1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right) \sqrt{2}}{256 a^4}$$

Result(type 8, 26 leaves):

$$\int \left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2} x^3 \, dx$$

Problem 26: Unable to integrate problem.

$$\int \frac{x^3}{\sqrt{\frac{a x+1}{\sqrt{-x^2 a^2+1}}}} \, dx$$

Optimal(type 3, 223 leaves, 15 steps):

$$-\frac{11 (-a x+1)^{1/4} (a x+1)^{3/4}}{64 a^4}-\frac{x^2 (-a x+1)^{5/4} (a x+1)^{3/4}}{4 a^2}-\frac{(-4 a x+25) (-a x+1)^{5/4} (a x+1)^{3/4}}{96 a^4}$$

$$+\frac{11\arctan\left(-1+\frac{(-ax+1)^{1/4}\sqrt{2}}{(ax+1)^{1/4}}\right)\sqrt{2}}{128a^4}+\frac{11\arctan\left(1+\frac{(-ax+1)^{1/4}\sqrt{2}}{(ax+1)^{1/4}}\right)\sqrt{2}}{128a^4}-\frac{11\ln\left(1-\frac{(-ax+1)^{1/4}\sqrt{2}}{(ax+1)^{1/4}}+\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}\right)\sqrt{2}}{256a^4}$$

$$+\frac{11\ln\left(1+\frac{(-ax+1)^{1/4}\sqrt{2}}{(ax+1)^{1/4}}+\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}\right)\sqrt{2}}{256a^4}$$

Result(type 8, 26 leaves):

$$\int\frac{x^3}{\sqrt{\frac{ax+1}{\sqrt{-x^2a^2+1}}}}\,dx$$

Problem 27: Unable to integrate problem.

$$\int\frac{x^2}{\sqrt{\frac{ax+1}{\sqrt{-x^2a^2+1}}}}\,dx$$

Optimal(type 3, 215 leaves, 15 steps):

$$\frac{3(-ax+1)^{1/4}(ax+1)^{3/4}}{8a^3}+\frac{(-ax+1)^{5/4}(ax+1)^{3/4}}{12a^3}-\frac{x(-ax+1)^{5/4}(ax+1)^{3/4}}{3a^2}-\frac{3\arctan\left(-1+\frac{(-ax+1)^{1/4}\sqrt{2}}{(ax+1)^{1/4}}\right)\sqrt{2}}{16a^3}$$

$$-\frac{3\arctan\left(1+\frac{(-ax+1)^{1/4}\sqrt{2}}{(ax+1)^{1/4}}\right)\sqrt{2}}{16a^3}+\frac{3\ln\left(1-\frac{(-ax+1)^{1/4}\sqrt{2}}{(ax+1)^{1/4}}+\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}\right)\sqrt{2}}{32a^3}-\frac{3\ln\left(1+\frac{(-ax+1)^{1/4}\sqrt{2}}{(ax+1)^{1/4}}+\frac{\sqrt{-ax+1}}{\sqrt{ax+1}}\right)\sqrt{2}}{32a^3}$$

Result(type 8, 26 leaves):

$$\int\frac{x^2}{\sqrt{\frac{ax+1}{\sqrt{-x^2a^2+1}}}}\,dx$$

Problem 28: Unable to integrate problem.

$$\int \frac{x^m}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{3/2}}\, dx$$

Optimal(type 6, 27 leaves, 2 steps):

$$\frac{x^{1+m} AppellF1\left(1+m, -\frac{3}{4}, \frac{3}{4}, 2+m, a x, -a x\right)}{1+m}$$

Result(type 8, 26 leaves):

$$\int \frac{x^m}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{3/2}}\, dx$$

Problem 29: Unable to integrate problem.

$$\int \frac{x^3}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{3/2}}\, dx$$

Optimal(type 3, 223 leaves, 15 steps):

$$-\frac{41 (-a x+1)^{3/4} (a x+1)^{1/4}}{64 a^4} - \frac{x^2 (-a x+1)^{7/4} (a x+1)^{1/4}}{4 a^2} - \frac{(-4 a x+11) (-a x+1)^{7/4} (a x+1)^{1/4}}{32 a^4}$$
$$+ \frac{123 \arctan\left(-1+\frac{(-a x+1)^{1/4}\sqrt{2}}{(a x+1)^{1/4}}\right)\sqrt{2}}{128 a^4} + \frac{123 \arctan\left(1+\frac{(-a x+1)^{1/4}\sqrt{2}}{(a x+1)^{1/4}}\right)\sqrt{2}}{128 a^4} + \frac{123 \ln\left(1-\frac{(-a x+1)^{1/4}\sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right)\sqrt{2}}{256 a^4}$$
$$- \frac{123 \ln\left(1+\frac{(-a x+1)^{1/4}\sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right)\sqrt{2}}{256 a^4}$$

Result(type 8, 26 leaves):

$$\int \frac{x^3}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{3/2}}\, dx$$

Problem 30: Unable to integrate problem.

$$\int \frac{x^2}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{3/2}}\, dx$$

Optimal(type 3, 215 leaves, 15 steps):

$$\frac{17 (-a x+1)^{3/4} (a x+1)^{1/4}}{24 a^3}+\frac{(-a x+1)^{7/4} (a x+1)^{1/4}}{4 a^3}-\frac{x (-a x+1)^{7/4} (a x+1)^{1/4}}{3 a^2}-\frac{17 \arctan\left(-1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}\right) \sqrt{2}}{16 a^3}$$
$$-\frac{17 \arctan\left(1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}\right) \sqrt{2}}{16 a^3}-\frac{17 \ln\left(1-\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right) \sqrt{2}}{32 a^3}$$
$$+\frac{17 \ln\left(1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right) \sqrt{2}}{32 a^3}$$

Result(type 8, 26 leaves):

$$\int \frac{x^2}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{3/2}}\, dx$$

Problem 31: Unable to integrate problem.

$$\int \frac{x}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2}}\, dx$$

Optimal(type 3, 214 leaves, 15 steps):

$$\frac{2 (-a x+1)^{9/4}}{a^2 (a x+1)^{1/4}}+\frac{25 (-a x+1)^{1/4} (a x+1)^{3/4}}{4 a^2}+\frac{5 (-a x+1)^{5/4} (a x+1)^{3/4}}{2 a^2}-\frac{25 \arctan\left(-1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}\right) \sqrt{2}}{8 a^2}$$
$$-\frac{25 \arctan\left(1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}\right) \sqrt{2}}{8 a^2}+\frac{25 \ln\left(1-\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right) \sqrt{2}}{16 a^2}$$
$$-\frac{25 \ln\left(1+\frac{(-a x+1)^{1/4} \sqrt{2}}{(a x+1)^{1/4}}+\frac{\sqrt{-a x+1}}{\sqrt{a x+1}}\right) \sqrt{2}}{16 a^2}$$

Result(type 8, 24 leaves):

$$\int \frac{x}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2}}\, dx$$

Problem 32: Unable to integrate problem.

$$\int \frac{1}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2} x^3}\, dx$$

Optimal(type 3, 106 leaves, 8 steps):

$$\frac{25 a^2 (-a x+1)^{1/4}}{2 (a x+1)^{1/4}}+\frac{5 a (-a x+1)^{5/4}}{4 x (a x+1)^{1/4}}-\frac{(-a x+1)^{9/4}}{2 x^2 (a x+1)^{1/4}}+\frac{25 a^2 \arctan\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)}{4}-\frac{25 a^2 \operatorname{arctanh}\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)}{4}$$

Result(type 8, 26 leaves):

$$\int \frac{1}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2} x^3}\, dx$$

Problem 33: Unable to integrate problem.

$$\int \frac{1}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2} x^4}\, dx$$

Optimal(type 3, 129 leaves, 10 steps):

$$-\frac{287 a^3 (-a x+1)^{1/4}}{24 (a x+1)^{1/4}}-\frac{(-a x+1)^{1/4}}{3 x^3 (a x+1)^{1/4}}+\frac{13 a (-a x+1)^{1/4}}{12 x^2 (a x+1)^{1/4}}-\frac{61 a^2 (-a x+1)^{1/4}}{24 x (a x+1)^{1/4}}-\frac{55 a^3 \arctan\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)}{8}$$
$$+\frac{55 a^3 \operatorname{arctanh}\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)}{8}$$

Result(type 8, 26 leaves):

$$\int \frac{1}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2} x^4}\, dx$$

Problem 34: Unable to integrate problem.

$$\int \frac{1}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2} x^5}\, dx$$

Optimal(type 3, 152 leaves, 11 steps):

$$\frac{2467 a^4 (-a x+1)^{1/4}}{192 (a x+1)^{1/4}} - \frac{(-a x+1)^{1/4}}{4 x^4 (a x+1)^{1/4}} + \frac{17 a (-a x+1)^{1/4}}{24 x^3 (a x+1)^{1/4}} - \frac{113 a^2 (-a x+1)^{1/4}}{96 x^2 (a x+1)^{1/4}} + \frac{521 a^3 (-a x+1)^{1/4}}{192 x (a x+1)^{1/4}} + \frac{475 a^4 \arctan\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)}{64}$$
$$- \frac{475 a^4 \operatorname{arctanh}\left(\frac{(a x+1)^{1/4}}{(-a x+1)^{1/4}}\right)}{64}$$

Result(type 8, 26 leaves):

$$\int \frac{1}{\left(\frac{a x+1}{\sqrt{-x^2 a^2+1}}\right)^{5/2} x^5}\, dx$$

Problem 35: Unable to integrate problem.

$$\int \left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{1/3} x^m\, dx$$

Optimal(type 6, 24 leaves, 2 steps):

$$\frac{x^{1+m} \mathit{AppellF1}\left(1+m, \frac{1}{6}, -\frac{1}{6}, 2+m, x, -x\right)}{1+m}$$

Result(type 8, 21 leaves):

$$\int \left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{1/3} x^m\, dx$$

Problem 36: Unable to integrate problem.

$$\int \left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{1/3} x \, dx$$

Optimal(type 3, 164 leaves, 15 steps):

$$-\frac{(1-x)^{5/6}(1+x)^{1/6}}{6}-\frac{(1-x)^{5/6}(1+x)^{7/6}}{2}-\frac{\arctan\left(\frac{(1-x)^{1/6}}{(1+x)^{1/6}}\right)}{9}-\frac{\arctan\left(\frac{2(1-x)^{1/6}}{(1+x)^{1/6}}-\sqrt{3}\right)}{18}-\frac{\arctan\left(\frac{2(1-x)^{1/6}}{(1+x)^{1/6}}+\sqrt{3}\right)}{18}$$
$$-\frac{\ln\left(1+\frac{(1-x)^{1/3}}{(1+x)^{1/3}}-\frac{(1-x)^{1/6}\sqrt{3}}{(1+x)^{1/6}}\right)\sqrt{3}}{36}+\frac{\ln\left(1+\frac{(1-x)^{1/3}}{(1+x)^{1/3}}+\frac{(1-x)^{1/6}\sqrt{3}}{(1+x)^{1/6}}\right)\sqrt{3}}{36}$$

Result(type 8, 19 leaves):

$$\int \left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{1/3} x \, dx$$

Problem 37: Unable to integrate problem.

$$\int \frac{\left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{1/3}}{x} \, dx$$

Optimal(type 3, 268 leaves, 25 steps):

$$-2\arctan\left(\frac{(1-x)^{1/6}}{(1+x)^{1/6}}\right)-\arctan\left(\frac{2(1-x)^{1/6}}{(1+x)^{1/6}}-\sqrt{3}\right)-\arctan\left(\frac{2(1-x)^{1/6}}{(1+x)^{1/6}}+\sqrt{3}\right)-2\,\mathrm{arctanh}\left(\frac{(1+x)^{1/6}}{(1-x)^{1/6}}\right)$$
$$+\frac{\ln\left(1-\frac{(1+x)^{1/6}}{(1-x)^{1/6}}+\frac{(1+x)^{1/3}}{(1-x)^{1/3}}\right)}{2}-\frac{\ln\left(1+\frac{(1+x)^{1/6}}{(1-x)^{1/6}}+\frac{(1+x)^{1/3}}{(1-x)^{1/3}}\right)}{2}+\arctan\left(\frac{\left(1-\frac{2(1+x)^{1/6}}{(1-x)^{1/6}}\right)\sqrt{3}}{3}\right)\sqrt{3}$$
$$-\arctan\left(\frac{\left(1+\frac{2(1+x)^{1/6}}{(1-x)^{1/6}}\right)\sqrt{3}}{3}\right)\sqrt{3}-\frac{\ln\left(1+\frac{(1-x)^{1/3}}{(1+x)^{1/3}}-\frac{(1-x)^{1/6}\sqrt{3}}{(1+x)^{1/6}}\right)\sqrt{3}}{2}+\frac{\ln\left(1+\frac{(1-x)^{1/3}}{(1+x)^{1/3}}+\frac{(1-x)^{1/6}\sqrt{3}}{(1+x)^{1/6}}\right)\sqrt{3}}{2}$$

Result(type 8, 21 leaves):

$$\int \frac{\left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{1/3}}{x} \, dx$$

Problem 38: Unable to integrate problem.

$$\int \frac{\left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{1/3}}{x^3}\,dx$$

Optimal(type 3, 168 leaves, 14 steps):

$$-\frac{(1-x)^{5/6}(1+x)^{1/6}}{6x}-\frac{(1-x)^{5/6}(1+x)^{7/6}}{2x^2}-\frac{\operatorname{arctanh}\left(\frac{(1+x)^{1/6}}{(1-x)^{1/6}}\right)}{9}+\frac{\ln\left(1-\frac{(1+x)^{1/6}}{(1-x)^{1/6}}+\frac{(1+x)^{1/3}}{(1-x)^{1/3}}\right)}{36}$$
$$-\frac{\ln\left(1+\frac{(1+x)^{1/6}}{(1-x)^{1/6}}+\frac{(1+x)^{1/3}}{(1-x)^{1/3}}\right)}{36}+\frac{\arctan\left(\frac{\left(1-\frac{2(1+x)^{1/6}}{(1-x)^{1/6}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{18}-\frac{\arctan\left(\frac{\left(1+\frac{2(1+x)^{1/6}}{(1-x)^{1/6}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{18}$$

Result(type 8, 21 leaves):

$$\int \frac{\left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{1/3}}{x^3}\,dx$$

Problem 39: Unable to integrate problem.

$$\int \frac{\left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{2/3}}{x}\,dx$$

Optimal(type 3, 104 leaves, 4 steps):

$$-\frac{\ln(x)}{2}+\frac{\ln(1+x)}{2}+\frac{3\ln\left(1+\frac{(1-x)^{1/3}}{(1+x)^{1/3}}\right)}{2}+\frac{3\ln\left((1-x)^{1/3}-(1+x)^{1/3}\right)}{2}-\arctan\left(-\frac{\sqrt{3}}{3}+\frac{2(1-x)^{1/3}\sqrt{3}}{3(1+x)^{1/3}}\right)\sqrt{3}+\arctan\left(\frac{\sqrt{3}}{3}\right.$$
$$\left.+\frac{2(1-x)^{1/3}\sqrt{3}}{3(1+x)^{1/3}}\right)\sqrt{3}$$

Result(type 8, 21 leaves):

$$\int \frac{\left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{2/3}}{x}\,dx$$

Problem 40: Unable to integrate problem.

$$\int \frac{\left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{2/3}}{x^3}\,dx$$

Optimal(type 3, 86 leaves, 4 steps):

$$-\frac{(1-x)^{2/3}(1+x)^{1/3}}{3x}-\frac{(1-x)^{2/3}(1+x)^{4/3}}{2x^2}-\frac{\ln(x)}{9}+\frac{\ln\left((1-x)^{1/3}-(1+x)^{1/3}\right)}{3}+\frac{2\arctan\left(\frac{\sqrt{3}}{3}+\frac{2(1-x)^{1/3}\sqrt{3}}{3(1+x)^{1/3}}\right)\sqrt{3}}{9}$$

Result(type 8, 21 leaves):

$$\int \frac{\left(\frac{1+x}{\sqrt{-x^2+1}}\right)^{2/3}}{x^3}\,dx$$

Problem 42: Unable to integrate problem.

$$\int \frac{x^m(-x^2a^2+1)^{3/2}}{(ax+1)^3}\,dx$$

Optimal(type 5, 134 leaves, 9 steps):

$$-\frac{3x^{1+m}\operatorname{hypergeom}\left(\left[\frac{1}{2},\frac{1}{2}+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],x^2a^2\right)}{1+m}+\frac{a\,x^{2+m}\operatorname{hypergeom}\left(\left[\frac{1}{2},1+\frac{m}{2}\right],\left[2+\frac{m}{2}\right],x^2a^2\right)}{2+m}$$
$$+\frac{4x^{1+m}\operatorname{hypergeom}\left(\left[\frac{3}{2},\frac{1}{2}+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],x^2a^2\right)}{1+m}-\frac{4a\,x^{2+m}\operatorname{hypergeom}\left(\left[\frac{3}{2},1+\frac{m}{2}\right],\left[2+\frac{m}{2}\right],x^2a^2\right)}{2+m}$$

Result(type 8, 25 leaves):

$$\int \frac{x^m(-x^2a^2+1)^{3/2}}{(ax+1)^3}\,dx$$

Problem 43: Unable to integrate problem.

$$\int e^{n\,\operatorname{arctanh}(a x)}x^m\,dx$$

Optimal(type 6, 31 leaves, 2 steps):

$$\frac{x^{1+m}\mathit{AppellF1}\left(1+m,\frac{n}{2},-\frac{n}{2},2+m,ax,-ax\right)}{1+m}$$

Result(type 8, 13 leaves):

$$\int e^{n \operatorname{arctanh}(a x)} x^m \, dx$$

Problem 44: Unable to integrate problem.

$$\int e^{n \operatorname{arctanh}(a x)} \, dx$$

Optimal(type 5, 53 leaves, 2 steps):

$$-\frac{2^{1+\frac{n}{2}} (-a x+1)^{1-\frac{n}{2}} \operatorname{hypergeom}\left(\left[-\frac{n}{2}, 1-\frac{n}{2}\right], \left[2-\frac{n}{2}\right], -\frac{a x}{2}+\frac{1}{2}\right)}{a (2-n)}$$

Result(type 8, 9 leaves):

$$\int e^{n \operatorname{arctanh}(a x)} \, dx$$

Problem 45: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{x^3} \, dx$$

Optimal(type 5, 93 leaves, 3 steps):

$$-\frac{(-a x+1)^{1-\frac{n}{2}} (a x+1)^{1+\frac{n}{2}}}{2 x^2} - \frac{2 a^2 n (-a x+1)^{1-\frac{n}{2}} (a x+1)^{-1+\frac{n}{2}} \operatorname{hypergeom}\left(\left[2, 1-\frac{n}{2}\right], \left[2-\frac{n}{2}\right], \frac{-a x+1}{a x+1}\right)}{2-n}$$

Result(type 8, 13 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{x^3} \, dx$$

Problem 46: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{x^4} \, dx$$

Optimal(type 5, 127 leaves, 5 steps):

$$-\frac{(-a x+1)^{1-\frac{n}{2}} (a x+1)^{1+\frac{n}{2}}}{3 x^3} - \frac{a n (-a x+1)^{1-\frac{n}{2}} (a x+1)^{1+\frac{n}{2}}}{6 x^2}$$
$$- \frac{2 a^3 \left(n^2+2\right) (-a x+1)^{1-\frac{n}{2}} (a x+1)^{-1+\frac{n}{2}} \operatorname{hypergeom}\left(\left[2, 1-\frac{n}{2}\right], \left[2-\frac{n}{2}\right], \frac{-a x+1}{a x+1}\right)}{3 (2-n)}$$

Result(type 8, 13 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{x^4}\, dx$$

Problem 51: Unable to integrate problem.

$$\int \frac{(-a c x+c)^p \sqrt{-x^2 a^2+1}}{a x+1}\, dx$$

Optimal(type 5, 53 leaves, 3 steps):

$$-\frac{(-a c x+c)^{1+p} \operatorname{hypergeom}\left(\left[\frac{1}{2}, \frac{3}{2}+p\right],\left[\frac{5}{2}+p\right],-\frac{a x}{2}+\frac{1}{2}\right) \sqrt{2}\, \sqrt{-a x+1}}{a c\, (3+2 p)}$$

Result(type 8, 31 leaves):

$$\int \frac{(-a c x+c)^p \sqrt{-x^2 a^2+1}}{a x+1}\, dx$$

Problem 52: Result more than twice size of optimal antiderivative.

$$\int \frac{(-a c x+c) \sqrt{-x^2 a^2+1}}{a x+1}\, dx$$

Optimal(type 3, 53 leaves, 4 steps):

$$\frac{3 c \arcsin(a x)}{2 a}+\frac{3 c \sqrt{-x^2 a^2+1}}{2 a}+\frac{c\, (-a x+1) \sqrt{-x^2 a^2+1}}{2 a}$$

Result(type 3, 113 leaves):

$$-\frac{c x \sqrt{-x^2 a^2+1}}{2}-\frac{c \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-x^2 a^2+1}}\right)}{2 \sqrt{a^2}}+\frac{2 c \sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a \left(x+\frac{1}{a}\right)}}{a}+\frac{2 c \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a \left(x+\frac{1}{a}\right)}}\right)}{\sqrt{a^2}}$$

Problem 57: Result more than twice size of optimal antiderivative.

$$\int \frac{(-x^2 a^2+1)^{3/2}}{(a x+1)^3 (-a c x+c)}\, dx$$

Optimal(type 3, 39 leaves, 3 steps):

$$-\frac{\arcsin(a x)}{c a}-\frac{2\, (-a x+1)}{a c \sqrt{-x^2 a^2+1}}$$

Result(type 3, 291 leaves):

$$-\frac{\left(-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)\right)^{3/2}}{24 c a}+\frac{\sqrt{-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)}\, x}{16 c}+\frac{\arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)}}\right)}{16 c\sqrt{a^2}}$$

$$-\frac{\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{5/2}}{2 c a^4\left(x+\frac{1}{a}\right)^3}-\frac{3\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{5/2}}{4 c a^3\left(x+\frac{1}{a}\right)^2}-\frac{17\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{3/2}}{24 c a}$$

$$-\frac{17\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}\, x}{16 c}-\frac{17\arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}}\right)}{16 c\sqrt{a^2}}$$

Problem 74: Unable to integrate problem.

$$\int e^{n\,\mathrm{arctanh}(a x)}\left(-a c x+c\right)^{7/2} dx$$

Optimal(type 5, 65 leaves, 3 steps):

$$-\frac{2^{1+\frac{n}{2}}\left(-a c x+c\right)^{9/2}\mathrm{hypergeom}\left(\left[-\frac{n}{2},\frac{9}{2}-\frac{n}{2}\right],\left[\frac{11}{2}-\frac{n}{2}\right],-\frac{a x}{2}+\frac{1}{2}\right)}{a c\left(9-n\right)\left(-a x+1\right)^{\frac{n}{2}}}$$

Result(type 8, 19 leaves):

$$\int e^{n\,\mathrm{arctanh}(a x)}\left(-a c x+c\right)^{7/2} dx$$

Problem 75: Unable to integrate problem.

$$\int e^{n\,\mathrm{arctanh}(a x)}\sqrt{-a c x+c}\, dx$$

Optimal(type 5, 65 leaves, 3 steps):

$$-\frac{2^{1+\frac{n}{2}}\left(-a c x+c\right)^{3/2}\mathrm{hypergeom}\left(\left[-\frac{n}{2},\frac{3}{2}-\frac{n}{2}\right],\left[\frac{5}{2}-\frac{n}{2}\right],-\frac{a x}{2}+\frac{1}{2}\right)}{a c\left(3-n\right)\left(-a x+1\right)^{\frac{n}{2}}}$$

Result(type 8, 19 leaves):

$$\int e^{n\,\mathrm{arctanh}(a x)}\sqrt{-a c x+c}\, dx$$

Problem 76: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{\sqrt{-a c x+c}}\, dx$$

Optimal(type 5, 65 leaves, 3 steps):

$$-\frac{2^{1+\frac{n}{2}} \operatorname{hypergeom}\left(\left[-\frac{n}{2}, \frac{1}{2}-\frac{n}{2}\right], \left[\frac{3}{2}-\frac{n}{2}\right], -\frac{a x}{2}+\frac{1}{2}\right) \sqrt{-a c x+c}}{a c (1-n) (-a x+1)^{\frac{n}{2}}}$$

Result(type 8, 19 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{\sqrt{-a c x+c}}\, dx$$

Problem 77: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{(-a c x+c)^{5/2}}\, dx$$

Optimal(type 5, 62 leaves, 3 steps):

$$\frac{2^{1+\frac{n}{2}} \operatorname{hypergeom}\left(\left[-\frac{n}{2}, -\frac{3}{2}-\frac{n}{2}\right], \left[-\frac{1}{2}-\frac{n}{2}\right], -\frac{a x}{2}+\frac{1}{2}\right)}{a c (3+n) (-a x+1)^{\frac{n}{2}} (-a c x+c)^{3/2}}$$

Result(type 8, 19 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{(-a c x+c)^{5/2}}\, dx$$

Problem 102: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{1+x}}{\sqrt{-x^2+1}}\, dx$$

Optimal(type 2, 9 leaves, 2 steps):

$$-2 \sqrt{1-x}$$

Result(type 2, 19 leaves):

$$\frac{2 (-1+x) \sqrt{1+x}}{\sqrt{-x^2+1}}$$

Problem 103: Result more than twice size of optimal antiderivative.

$$\int \frac{1+x}{\sqrt{-x^2+1}\,\sqrt{1-x}}\,dx$$

Optimal(type 3, 24 leaves, 5 steps):

$$2\,\mathrm{arctanh}\left(\frac{\sqrt{1+x}\,\sqrt{2}}{2}\right)\sqrt{2}-2\sqrt{1+x}$$

Result(type 3, 51 leaves):

$$-\frac{2\sqrt{-x^2+1}\,\sqrt{1-x}\left(\mathrm{arctanh}\left(\frac{\sqrt{1+x}\,\sqrt{2}}{2}\right)\sqrt{2}-\sqrt{1+x}\right)}{(-1+x)\sqrt{1+x}}$$

Problem 118: Unable to integrate problem.

$$\int \frac{(-a\,c\,x+c)^p}{e^{2\,p\,\mathrm{arctanh}(a\,x)}}\,dx$$

Optimal(type 5, 59 leaves, 3 steps):

$$-\frac{(-a\,x+1)^p\,(-a\,c\,x+c)^{1+p}\,\mathrm{hypergeom}\left([p,1+2\,p],[2+2\,p],-\frac{a\,x}{2}+\frac{1}{2}\right)}{2^p\,a\,c\,(1+2\,p)}$$

Result(type 8, 22 leaves):

$$\int \frac{(-a\,c\,x+c)^p}{e^{2\,p\,\mathrm{arctanh}(a\,x)}}\,dx$$

Problem 119: Unable to integrate problem.

$$\int e^{n\,\mathrm{arctanh}(a\,x)}\,(-a\,c\,x+c)^p\,dx$$

Optimal(type 5, 72 leaves, 3 steps):

$$-\frac{2^{1+\frac{n}{2}}\,(-a\,c\,x+c)^{1+p}\,\mathrm{hypergeom}\left(\left[-\frac{n}{2},1-\frac{n}{2}+p\right],\left[2-\frac{n}{2}+p\right],-\frac{a\,x}{2}+\frac{1}{2}\right)}{a\,c\,(2-n+2\,p)\,(-a\,x+1)^{\frac{n}{2}}}$$

Result(type 8, 19 leaves):

$$\int e^{n\,\mathrm{arctanh}(a\,x)}\,(-a\,c\,x+c)^p\,dx$$

Problem 121: Unable to integrate problem.

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

Optimal(type 6, 56 leaves, 3 steps):

$$\frac{\left(c-\frac{c}{a x}\right)^{p} x\, AppellF1\left(1-p, \frac{1}{2}-p, -\frac{1}{2}, 2-p, a x, -a x\right)}{(1-p)\,(-a x+1)^{p}}$$

Result(type 8, 33 leaves):

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

Problem 128: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^{3}\left(c-\frac{c}{a x}\right)^{2}}{\left(-x^{2} a^{2}+1\right)^{3/2}}\,dx$$

Optimal(type 3, 63 leaves, 9 steps):

$$-\frac{c^{2} \arcsin(a x)}{a}-\frac{c^{2} \operatorname{arctanh}\left(\sqrt{-x^{2} a^{2}+1}\right)}{a}-\frac{c^{2}\,(-a x+1) \sqrt{-x^{2} a^{2}+1}}{x a^{2}}$$

Result(type 3, 132 leaves):

$$-\frac{c^{2}}{a^{2} x \sqrt{-x^{2} a^{2}+1}}+\frac{c^{2} x}{\sqrt{-x^{2} a^{2}+1}}+\frac{c^{2}}{a \sqrt{-x^{2} a^{2}+1}}-\frac{c^{2} \operatorname{arctanh}\left(\frac{1}{\sqrt{-x^{2} a^{2}+1}}\right)}{a}-\frac{c^{2} \arctan\left(\frac{\sqrt{a^{2}}\, x}{\sqrt{-x^{2} a^{2}+1}}\right)}{\sqrt{a^{2}}}-\frac{c^{2} a x^{2}}{\sqrt{-x^{2} a^{2}+1}}$$

Problem 131: Unable to integrate problem.

$$\int \frac{(a x+1)^{4}\left(c-\frac{c}{a x}\right)^{p}}{\left(-x^{2} a^{2}+1\right)^{2}}\,dx$$

Optimal(type 5, 95 leaves, 7 steps):

$$-\frac{c\,(5-p)\left(c-\frac{c}{a x}\right)^{-1+p}}{a\,(1-p)}+c\left(c-\frac{c}{a x}\right)^{-1+p} x+\frac{(4-p)\left(c-\frac{c}{a x}\right)^{p} \operatorname{hypergeom}\left([1, p], [1+p], 1-\frac{1}{a x}\right)}{a p}$$

Result(type 8, 35 leaves):

$$\int \frac{(a x+1)^4 \left(c-\frac{c}{a x}\right)^p}{\left(-x^2 a^2+1\right)^2}\, dx$$

Problem 133: Unable to integrate problem.

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

Optimal(type 6, 56 leaves, 3 steps):

$$\frac{\left(c-\frac{c}{a x}\right)^p x \, AppellF1\left(1-p, -\frac{1}{2}-p, \frac{1}{2}, 2-p, a x, -a x\right)}{(1-p)\ (-a x+1)^p}$$

Result(type 8, 35 leaves):

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

Problem 134: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{-x^2 a^2+1}}{(a x+1) \left(c-\frac{c}{a x}\right)^3}\, dx$$

Optimal(type 3, 84 leaves, 7 steps):

$$-\frac{(a x+1)^2}{3 a c^3 \left(-x^2 a^2+1\right)^{3/2}}-\frac{2 \arcsin(a x)}{a c^3}+\frac{8\,(a x+1)}{3 a c^3 \sqrt{-x^2 a^2+1}}+\frac{\sqrt{-x^2 a^2+1}}{a c^3}$$

Result(type 3, 241 leaves):

$$\frac{5 \left(-\left(x-\frac{1}{a}\right)^2 a^2-2 a \left(x-\frac{1}{a}\right)\right)^{3/2}}{4 a^3 c^3 \left(x-\frac{1}{a}\right)^2}+\frac{17 \sqrt{-\left(x-\frac{1}{a}\right)^2 a^2-2 a \left(x-\frac{1}{a}\right)}}{8 a c^3}-\frac{17 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x-\frac{1}{a}\right)^2 a^2-2 a \left(x-\frac{1}{a}\right)}}\right)}{8 c^3 \sqrt{a^2}}$$

$$+\frac{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}}{8 a c^3}+\frac{\arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}}\right)}{8 c^3 \sqrt{a^2}}+\frac{\left(-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)\right)^{3/2}}{6 a^4 c^3\left(x-\frac{1}{a}\right)^3}$$

Problem 135: Unable to integrate problem.

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

Optimal(type 5, 114 leaves, 8 steps):

$$-\frac{\left(c-\frac{c}{a x}\right)^{2+p} x}{c^2}-\frac{\left(c-\frac{c}{a x}\right)^{2+p} \operatorname{hypergeom}\left([1,2+p],[3+p],\frac{a-\frac{1}{x}}{2 a}\right)}{2 a c^2 (2+p)}+\frac{\left(c-\frac{c}{a x}\right)^{2+p} \operatorname{hypergeom}\left([1,2+p],[3+p],1-\frac{1}{a x}\right)}{a c^2}$$

Result(type 8, 33 leaves):

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

Problem 137: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(-x^2 a^2+1\right)^{3/2}}{(a x+1)^3\left(c-\frac{c}{a x}\right)}\, dx$$

Optimal(type 3, 61 leaves, 5 steps):

$$-\frac{2 \arcsin(a x)}{c a}-\frac{(-a x+1)^2}{a c \sqrt{-x^2 a^2+1}}-\frac{2 \sqrt{-x^2 a^2+1}}{c a}$$

Result(type 3, 291 leaves):

$$\frac{\left(-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)\right)^{3/2}}{24 c a}-\frac{\sqrt{-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)}\, x}{16 c}-\frac{\arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)}}\right)}{16 c \sqrt{a^2}}$$

$$-\frac{\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{5/2}}{2 c a^4\left(x+\frac{1}{a}\right)^3}-\frac{5\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{5/2}}{4 c a^3\left(x+\frac{1}{a}\right)^2}-\frac{31\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{3/2}}{24 c a}$$

$$-\frac{31 \sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}\, x}{16 c}-\frac{31 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)}}\right)}{16 c \sqrt{a^2}}$$

Problem 138: Result more than twice size of optimal antiderivative.

$$\int \frac{(-x^2 a^2+1)^{3/2}}{(a x+1)^3\left(c-\frac{c}{a x}\right)^5}\, dx$$

Optimal(type 3, 111 leaves, 8 steps):

$$-\frac{(a x+1)^2}{5 a c^5(-x^2 a^2+1)^{5/2}}+\frac{22\,(a x+1)}{15 a c^5(-x^2 a^2+1)^{3/2}}+\frac{2 \arcsin(a x)}{a c^5}-\frac{2\,(23 a x+30)}{15 a c^5 \sqrt{-x^2 a^2+1}}-\frac{\sqrt{-x^2 a^2+1}}{a c^5}$$

Result(type 3, 467 leaves):

$$\frac{\left(-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)\right)^{5/2}}{40 a^6 c^5\left(x-\frac{1}{a}\right)^5}+\frac{7\left(-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)\right)^{5/2}}{48 a^5 c^5\left(x-\frac{1}{a}\right)^4}+\frac{31\left(-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)\right)^{5/2}}{48 a^4 c^5\left(x-\frac{1}{a}\right)^3}$$

$$-\frac{139\left(-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)\right)^{5/2}}{96 a^3 c^5\left(x-\frac{1}{a}\right)^2}-\frac{187\left(-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)\right)^{3/2}}{128 a c^5}+\frac{561 \sqrt{-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)}\, x}{256 c^5}$$

$$+\frac{561 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x-\frac{1}{a}\right)^2 a^2-2 a\left(x-\frac{1}{a}\right)}}\right)}{256 c^5 \sqrt{a^2}}-\frac{\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{5/2}}{32 a^4 c^5\left(x+\frac{1}{a}\right)^3}-\frac{9\left(-\left(x+\frac{1}{a}\right)^2 a^2+2 a\left(x+\frac{1}{a}\right)\right)^{5/2}}{64 a^3 c^5\left(x+\frac{1}{a}\right)^2}$$

$$-\frac{49\left(-\left(x+\frac{1}{a}\right)^2 a^2+2a\left(x+\frac{1}{a}\right)\right)^{3/2}}{384\,a\,c^5}-\frac{49\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2a\left(x+\frac{1}{a}\right)}\;x}{256\,c^5}-\frac{49\arctan\left(\frac{\sqrt{a^2}\,x}{\sqrt{-\left(x+\frac{1}{a}\right)^2 a^2+2a\left(x+\frac{1}{a}\right)}}\right)}{256\,c^5\sqrt{a^2}}$$

Problem 140: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 61 leaves, 8 steps):

$$-\frac{5\,\mathrm{arctanh}\left(\frac{\sqrt{c-\frac{c}{a x}}}{\sqrt{c}}\right)}{a\sqrt{c}}+\frac{5}{a\sqrt{c-\frac{c}{a x}}}-\frac{x}{\sqrt{c-\frac{c}{a x}}}$$

Result(type 3, 196 leaves):

$$-\frac{1}{2\sqrt{(a x-1)\,x}\;c\,a^{3/2}\,(a x-1)^2}\Bigg(\sqrt{\frac{c\,(a x-1)}{a x}}\;x\Bigg(10\,a^{7/2}\sqrt{(a x-1)\,x}\;x^2-8\,a^{5/2}\,((a x-1)\,x)^{3/2}+5\ln\left(\frac{2\sqrt{(a x-1)\,x}\,\sqrt{a}+2 a x-1}{2\sqrt{a}}\right)x^2 a^3$$
$$-20\,a^{5/2}\sqrt{(a x-1)\,x}\;x-10\ln\left(\frac{2\sqrt{(a x-1)\,x}\,\sqrt{a}+2 a x-1}{2\sqrt{a}}\right)x\,a^2+10\sqrt{(a x-1)\,x}\;a^{3/2}+5\ln\left(\frac{2\sqrt{(a x-1)\,x}\,\sqrt{a}+2 a x-1}{2\sqrt{a}}\right)a\Bigg)\Bigg)$$

Problem 146: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(c-\frac{c}{a x}\right)^{3/2}\left(-x^2 a^2+1\right)}{(a x+1)^2}\,dx$$

Optimal(type 3, 94 leaves, 11 steps):

$$-\left(c-\frac{c}{a x}\right)^{3/2} x+\frac{7\,c^{3/2}\,\mathrm{arctanh}\left(\frac{\sqrt{c-\frac{c}{a x}}}{\sqrt{c}}\right)}{a}-\frac{8\,c^{3/2}\,\mathrm{arctanh}\left(\frac{\sqrt{c-\frac{c}{a x}}\,\sqrt{2}}{2\sqrt{c}}\right)\sqrt{2}}{a}+\frac{c\sqrt{c-\frac{c}{a x}}}{a}$$

Result(type 3, 222 leaves):

$$-\frac{1}{2 x a \sqrt{(a x-1) x} \sqrt{\frac{1}{a}}}\left(\sqrt{\frac{c (a x-1)}{a x}}\, c \left(5 \sqrt{a} \ln\left(\frac{2 \sqrt{a x^2-x} \sqrt{a}+2 a x-1}{2 \sqrt{a}}\right) x^2 \sqrt{\frac{1}{a}}-12 \sqrt{a} \ln\left(\frac{2 \sqrt{(a x-1) x} \sqrt{a}+2 a x-1}{2 \sqrt{a}}\right) x^2 \sqrt{\frac{1}{a}}\right.\right.$$

$$\left.\left.-10 a \sqrt{a x^2-x}\, x^2 \sqrt{\frac{1}{a}}+8 a \sqrt{(a x-1) x}\, x^2 \sqrt{\frac{1}{a}}-8 \sqrt{2} \ln\left(\frac{2 \sqrt{2} \sqrt{\frac{1}{a}} \sqrt{(a x-1) x}\, a-3 a x+1}{a x+1}\right) x^2+4 \left(a x^2-x\right)^{3/2} \sqrt{\frac{1}{a}}\right)\right)$$

Problem 147: Result more than twice size of optimal antiderivative.

$$\int \frac{-x^2 a^2+1}{(a x+1)^2 \left(c-\frac{c}{a x}\right)^{9/2}}\, dx$$

Optimal(type 3, 142 leaves, 13 steps):

$$\frac{6}{5 a c^2 \left(c-\frac{c}{a x}\right)^{5/2}}+\frac{11}{6 a c^3 \left(c-\frac{c}{a x}\right)^{3/2}}-\frac{x}{c^2 \left(c-\frac{c}{a x}\right)^{5/2}}-\frac{5 \operatorname{arctanh}\left(\frac{\sqrt{c-\frac{c}{a x}}}{\sqrt{c}}\right)}{a c^{9/2}}-\frac{\operatorname{arctanh}\left(\frac{\sqrt{c-\frac{c}{a x}}\sqrt{2}}{2 \sqrt{c}}\right)\sqrt{2}}{8 a c^{9/2}}+\frac{21}{4 a c^4 \sqrt{c-\frac{c}{a x}}}$$

Result(type 3, 627 leaves):

$$\frac{1}{240 a^{13/2} \sqrt{(a x-1) x}\, c^5 (a x-1)^4 \sqrt{\frac{1}{a}}}\left(\sqrt{\frac{c (a x-1)}{a x}}\, x \left(-1260 \sqrt{\frac{1}{a}}\, a^{21/2} \sqrt{(a x-1) x}\, x^4\right.\right.$$

$$+15 \ln\left(\frac{2 \sqrt{2} \sqrt{\frac{1}{a}} \sqrt{(a x-1) x}\, a-3 a x+1}{a x+1}\right) a^{19/2} \sqrt{2}\, x^4+1020 \sqrt{\frac{1}{a}}\, a^{19/2} ((a x-1) x)^{3/2} x^2+5040 \sqrt{\frac{1}{a}}\, a^{19/2} \sqrt{(a x-1) x}\, x^3$$

$$-60 \ln\left(\frac{2 \sqrt{2} \sqrt{\frac{1}{a}} \sqrt{(a x-1) x}\, a-3 a x+1}{a x+1}\right) a^{17/2} \sqrt{2}\, x^3-1792 \sqrt{\frac{1}{a}}\, a^{17/2} ((a x-1) x)^{3/2} x-7560 \sqrt{\frac{1}{a}}\, a^{17/2} \sqrt{(a x-1) x}\, x^2$$

$$+90 \ln\left(\frac{2 \sqrt{2} \sqrt{\frac{1}{a}} \sqrt{(a x-1) x}\, a-3 a x+1}{a x+1}\right) a^{15/2} \sqrt{2}\, x^2+820 a^{15/2} ((a x-1) x)^{3/2} \sqrt{\frac{1}{a}}$$

$$-600 \sqrt{\frac{1}{a}} \ln\left(\frac{2 \sqrt{(a x-1) x} \sqrt{a}+2 a x-1}{2 \sqrt{a}}\right) x^4 a^{10}+5040 \sqrt{\frac{1}{a}}\, a^{15/2} \sqrt{(a x-1) x}\, x$$

$$- 60 \ln\left(\frac{2\sqrt{2}\sqrt{\frac{1}{a}}\sqrt{(ax-1)x}\,a - 3ax + 1}{ax+1}\right) a^{13/2}\sqrt{2}\,x + 2400\sqrt{\frac{1}{a}}\ln\left(\frac{2\sqrt{(ax-1)x}\sqrt{a} + 2ax - 1}{2\sqrt{a}}\right) x^3 a^9 - 1260\sqrt{(ax-1)x}\,a^{13/2}\sqrt{\frac{1}{a}}$$

$$+ 15\sqrt{2}\ln\left(\frac{2\sqrt{2}\sqrt{\frac{1}{a}}\sqrt{(ax-1)x}\,a - 3ax + 1}{ax+1}\right) a^{11/2} - 3600\sqrt{\frac{1}{a}}\ln\left(\frac{2\sqrt{(ax-1)x}\sqrt{a} + 2ax - 1}{2\sqrt{a}}\right) x^2 a^8$$

$$+ 2400\sqrt{\frac{1}{a}}\ln\left(\frac{2\sqrt{(ax-1)x}\sqrt{a} + 2ax - 1}{2\sqrt{a}}\right) x a^7 - 600\ln\left(\frac{2\sqrt{(ax-1)x}\sqrt{a} + 2ax - 1}{2\sqrt{a}}\right) a^6\sqrt{\frac{1}{a}}\Bigg)\Bigg)$$

Problem 159: Result more than twice size of optimal antiderivative.

$$\int \frac{x\sqrt{c - \frac{c}{ax}}\,(-x^2a^2 + 1)}{(ax+1)^2}\,dx$$

Optimal(type 3, 97 leaves, 11 steps):

$$-\frac{23\,\mathrm{arctanh}\left(\frac{\sqrt{c - \frac{c}{ax}}}{\sqrt{c}}\right)\sqrt{c}}{4a^2} + \frac{4\,\mathrm{arctanh}\left(\frac{\sqrt{c - \frac{c}{ax}}\sqrt{2}}{2\sqrt{c}}\right)\sqrt{2}\sqrt{c}}{a^2} + \frac{9x\sqrt{c - \frac{c}{ax}}}{4a} - \frac{x^2\sqrt{c - \frac{c}{ax}}}{2}$$

Result(type 3, 214 leaves):

$$\frac{1}{8\sqrt{(ax-1)x}\,a^{7/2}\sqrt{\frac{1}{a}}}\Bigg(\sqrt{\frac{c(ax-1)}{ax}}\,x\Bigg(-4\sqrt{\frac{1}{a}}\sqrt{ax^2-x}\,a^{7/2}x + 2\sqrt{ax^2-x}\,a^{5/2}\sqrt{\frac{1}{a}} + 16\sqrt{(ax-1)x}\,a^{5/2}\sqrt{\frac{1}{a}}$$

$$- 16\sqrt{2}\ln\left(\frac{2\sqrt{2}\sqrt{\frac{1}{a}}\sqrt{(ax-1)x}\,a - 3ax + 1}{ax+1}\right) a^{3/2} + \ln\left(\frac{2\sqrt{ax^2-x}\sqrt{a} + 2ax - 1}{2\sqrt{a}}\right) a^2\sqrt{\frac{1}{a}}$$

$$- 24\ln\left(\frac{2\sqrt{(ax-1)x}\sqrt{a} + 2ax - 1}{2\sqrt{a}}\right) a^2\sqrt{\frac{1}{a}}\Bigg)\Bigg)$$

Problem 160: Result more than twice size of optimal antiderivative.

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

Optimal(type 3, 67 leaves, 8 steps):

$$\frac{2 a \left(c-\frac{c}{a x}\right)^{3/2}}{3 c}-4 a \operatorname{arctanh}\left(\frac{\sqrt{c-\frac{c}{a x}}\,\sqrt{2}}{2 \sqrt{c}}\right) \sqrt{2}\,\sqrt{c}+4 a \sqrt{c-\frac{c}{a x}}$$

Result(type 3, 243 leaves):

$$-\frac{1}{3 x^2 \sqrt{(a x-1) x}\,\sqrt{\frac{1}{a}}}\left(\sqrt{\frac{c (a x-1)}{a x}}\left(9 a^{3/2} \ln\left(\frac{2 \sqrt{a x^2-x}\,\sqrt{a}+2 a x-1}{2 \sqrt{a}}\right) x^3 \sqrt{\frac{1}{a}}-9 a^{3/2} \ln\left(\frac{2 \sqrt{(a x-1) x}\,\sqrt{a}+2 a x-1}{2 \sqrt{a}}\right) x^3 \sqrt{\frac{1}{a}}\right.\right.$$

$$-18 a^2 \sqrt{a x^2-x}\,x^3 \sqrt{\frac{1}{a}}+6 a^2 \sqrt{(a x-1) x}\,x^3 \sqrt{\frac{1}{a}}-6 a \sqrt{2}\,\ln\left(\frac{2 \sqrt{2}\,\sqrt{\frac{1}{a}}\,\sqrt{(a x-1) x}\,a-3 a x+1}{a x+1}\right) x^3+12 a \left(a x^2-x\right)^{3/2} x \sqrt{\frac{1}{a}}$$

$$\left.\left.-2 \left(a x^2-x\right)^{3/2} \sqrt{\frac{1}{a}}\right)\right)$$

Problem 161: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{c-\frac{c}{a x}}\,\left(-x^2 a^2+1\right)}{(a x+1)^2 x^3}\,dx$$

Optimal(type 3, 94 leaves, 9 steps):

$$-\frac{2 a^2 \left(c-\frac{c}{a x}\right)^{3/2}}{3 c}-\frac{2 a^2 \left(c-\frac{c}{a x}\right)^{5/2}}{5 c^2}+4 a^2 \operatorname{arctanh}\left(\frac{\sqrt{c-\frac{c}{a x}}\,\sqrt{2}}{2 \sqrt{c}}\right) \sqrt{2}\,\sqrt{c}-4 a^2 \sqrt{c-\frac{c}{a x}}$$

Result(type 3, 269 leaves):

$$\frac{1}{15 x^3 \sqrt{(a x-1) x}\,\sqrt{\frac{1}{a}}}\left(\sqrt{\frac{c (a x-1)}{a x}}\left(45 a^{5/2} \ln\left(\frac{2 \sqrt{a x^2-x}\,\sqrt{a}+2 a x-1}{2 \sqrt{a}}\right) x^4 \sqrt{\frac{1}{a}}-45 a^{5/2} \ln\left(\frac{2 \sqrt{(a x-1) x}\,\sqrt{a}+2 a x-1}{2 \sqrt{a}}\right) x^4 \sqrt{\frac{1}{a}}\right.\right.$$

$$- 90\, a^3 \sqrt{a x^2 - x}\, x^4 \sqrt{\frac{1}{a}} + 30\, a^3 \sqrt{(a x - 1)\, x}\, x^4 \sqrt{\frac{1}{a}} - 30\, a^2 \sqrt{2} \ln\left(\frac{2 \sqrt{2} \sqrt{\frac{1}{a}} \sqrt{(a x - 1)\, x}\, a - 3\, a x + 1}{a x + 1}\right) x^4 + 60\, a^2 \left(a x^2 - x\right)^{3/2} x^2 \sqrt{\frac{1}{a}}$$

$$- 16\, a \left(a x^2 - x\right)^{3/2} x \sqrt{\frac{1}{a}} + 6 \left(a x^2 - x\right)^{3/2} \sqrt{\frac{1}{a}}\Bigg)\Bigg)$$

Problem 165: Unable to integrate problem.

$$\int e^{n \operatorname{arctanh}(a x)} \left(c - \frac{c}{a x}\right)^p dx$$

Optimal(type 6, 60 leaves, 3 steps):

$$\frac{\left(c - \frac{c}{a x}\right)^p x \, AppellF1\left(1 - p, \frac{n}{2} - p, -\frac{n}{2}, 2 - p, a x, -a x\right)}{(1 - p)\, (-a x + 1)^p}$$

Result(type 8, 23 leaves):

$$\int e^{n \operatorname{arctanh}(a x)} \left(c - \frac{c}{a x}\right)^p dx$$

Problem 166: Unable to integrate problem.

$$\int \frac{\left(c - \frac{c}{a x}\right)^p}{e^{2 p \operatorname{arctanh}(a x)}} dx$$

Optimal(type 6, 54 leaves, 3 steps):

$$\frac{\left(c - \frac{c}{a x}\right)^p x \, AppellF1(1 - p, -2 p, p, 2 - p, a x, -a x)}{(1 - p)\, (-a x + 1)^p}$$

Result(type 8, 26 leaves):

$$\int \frac{\left(c - \frac{c}{a x}\right)^p}{e^{2 p \operatorname{arctanh}(a x)}} dx$$

Problem 167: Unable to integrate problem.

$$\int e^{n \operatorname{arctanh}(a x)} \left(c - \frac{c}{a x}\right) dx$$

Optimal(type 5, 163 leaves, 6 steps):

$$\frac{c\,(-ax+1)^{2-\frac{n}{2}}\,(ax+1)^{-1+\frac{n}{2}}}{a\,(2-n)} - \frac{2\,c\,(-ax+1)^{1-\frac{n}{2}}\,(ax+1)^{-1+\frac{n}{2}}\,\mathrm{hypergeom}\left(\left[1,-1+\frac{n}{2}\right],\left[\frac{n}{2}\right],\frac{ax+1}{-ax+1}\right)}{a\,(2-n)}$$
$$+\frac{2^{\frac{n}{2}}\,c\,(1-n)\,(-ax+1)^{2-\frac{n}{2}}\,\mathrm{hypergeom}\left(\left[1-\frac{n}{2},2-\frac{n}{2}\right],\left[3-\frac{n}{2}\right],-\frac{ax}{2}+\frac{1}{2}\right)}{a\,(2-n)\,(4-n)}$$

Result(type 8, 21 leaves):

$$\int \mathrm{e}^{n\,\mathrm{arctanh}(a\,x)}\left(c-\frac{c}{a\,x}\right)\mathrm{d}x$$

Problem 168: Unable to integrate problem.

$$\int \frac{\mathrm{e}^{n\,\mathrm{arctanh}(a\,x)}}{c-\frac{c}{a\,x}}\,\mathrm{d}x$$

Optimal(type 5, 97 leaves, 4 steps):

$$-\frac{(ax+1)^{1+\frac{n}{2}}}{a\,c\,n\,(-ax+1)^{\frac{n}{2}}} - \frac{2^{1+\frac{n}{2}}\,(1+n)\,(-ax+1)^{1-\frac{n}{2}}\,\mathrm{hypergeom}\left(\left[-\frac{n}{2},1-\frac{n}{2}\right],\left[2-\frac{n}{2}\right],-\frac{ax}{2}+\frac{1}{2}\right)}{a\,c\,(2-n)\,n}$$

Result(type 8, 23 leaves):

$$\int \frac{\mathrm{e}^{n\,\mathrm{arctanh}(a\,x)}}{c-\frac{c}{a\,x}}\,\mathrm{d}x$$

Problem 169: Unable to integrate problem.

$$\int \frac{\mathrm{e}^{n\,\mathrm{arctanh}(a\,x)}}{\left(c-\frac{c}{a\,x}\right)^2}\,\mathrm{d}x$$

Optimal(type 5, 121 leaves, 5 steps):

$$\frac{(3+n)\,(-ax+1)^{-1-\frac{n}{2}}\,(ax+1)^{1+\frac{n}{2}}}{a\,c^2\,(2+n)} - \frac{x\,(-ax+1)^{-1-\frac{n}{2}}\,(ax+1)^{1+\frac{n}{2}}}{c^2} - \frac{2^{1+\frac{n}{2}}\,(2+n)\,\mathrm{hypergeom}\left(\left[-\frac{n}{2},-\frac{n}{2}\right],\left[1-\frac{n}{2}\right],-\frac{ax}{2}+\frac{1}{2}\right)}{a\,c^2\,n\,(-ax+1)^{\frac{n}{2}}}$$

Result(type 8, 23 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{\left(c - \frac{c}{a x}\right)^2}\, dx$$

Problem 170: Unable to integrate problem.

$$\int e^{n \operatorname{arctanh}(a x)} \left(c - \frac{c}{a x}\right)^{3/2} dx$$

Optimal(type 6, 42 leaves, 3 steps):

$$-\frac{2 \left(c - \frac{c}{a x}\right)^{3/2} x \, AppellF1\left(-\frac{1}{2}, -\frac{3}{2} + \frac{n}{2}, -\frac{n}{2}, \frac{1}{2}, a x, -a x\right)}{(-a x + 1)^{3/2}}$$

Result(type 8, 23 leaves):

$$\int e^{n \operatorname{arctanh}(a x)} \left(c - \frac{c}{a x}\right)^{3/2} dx$$

Problem 180: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{-x^2 a^2 + 1}}{(a x + 1) \left(c - \frac{c}{x^2 a^2}\right)^3}\, dx$$

Optimal(type 3, 114 leaves, 7 steps):

$$-\frac{a^4 x^5 (-a x + 1)}{5 c^3 (-x^2 a^2 + 1)^{5/2}} + \frac{a^2 x^3 (-6 a x + 5)}{15 c^3 (-x^2 a^2 + 1)^{3/2}} + \frac{\arcsin(a x)}{a c^3} - \frac{x (-8 a x + 5)}{5 c^3 \sqrt{-x^2 a^2 + 1}} + \frac{16 \sqrt{-x^2 a^2 + 1}}{5 a c^3}$$

Result(type 3, 355 leaves):

$$\frac{\left(-\left(x + \frac{1}{a}\right)^2 a^2 + 2 a \left(x + \frac{1}{a}\right)\right)^{3/2}}{40 a^5 c^3 \left(x + \frac{1}{a}\right)^4} - \frac{43 \left(-\left(x + \frac{1}{a}\right)^2 a^2 + 2 a \left(x + \frac{1}{a}\right)\right)^{3/2}}{240 a^4 c^3 \left(x + \frac{1}{a}\right)^3} + \frac{\left(-\left(x - \frac{1}{a}\right)^2 a^2 - 2 a \left(x - \frac{1}{a}\right)\right)^{3/2}}{48 a^4 c^3 \left(x - \frac{1}{a}\right)^3}$$

$$+ \frac{\left(-\left(x - \frac{1}{a}\right)^2 a^2 - 2 a \left(x - \frac{1}{a}\right)\right)^{3/2}}{4 a^3 c^3 \left(x - \frac{1}{a}\right)^2} + \frac{19 \sqrt{-\left(x - \frac{1}{a}\right)^2 a^2 - 2 a \left(x - \frac{1}{a}\right)}}{32 a c^3} - \frac{19 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-\left(x - \frac{1}{a}\right)^2 a^2 - 2 a \left(x - \frac{1}{a}\right)}}\right)}{32 c^3 \sqrt{a^2}}$$

$$+\frac{15\left(-\left(x+\frac{1}{a}\right)^{2}a^{2}+2a\left(x+\frac{1}{a}\right)\right)^{3/2}}{16a^{3}c^{3}\left(x+\frac{1}{a}\right)^{2}}+\frac{51\sqrt{-\left(x+\frac{1}{a}\right)^{2}a^{2}+2a\left(x+\frac{1}{a}\right)}}{32ac^{3}}+\frac{51\arctan\left(\frac{\sqrt{a^{2}}\,x}{\sqrt{-\left(x+\frac{1}{a}\right)^{2}a^{2}+2a\left(x+\frac{1}{a}\right)}}\right)}{32c^{3}\sqrt{a^{2}}}$$

Problem 184: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(c-\frac{c}{x^{2}a^{2}}\right)^{2}\left(-x^{2}a^{2}+1\right)^{3/2}}{\left(ax+1\right)^{3}}\,dx$$

Optimal(type 3, 109 leaves, 10 steps):

$$-\frac{c^{2}\left(-x^{2}a^{2}+1\right)^{3/2}}{3a^{4}x^{3}}+\frac{3c^{2}\left(-x^{2}a^{2}+1\right)^{3/2}}{2a^{3}x^{2}}-\frac{3c^{2}\arcsin(ax)}{a}-\frac{c^{2}\operatorname{arctanh}\left(\sqrt{-x^{2}a^{2}+1}\right)}{2a}-\frac{c^{2}\left(-ax+6\right)\sqrt{-x^{2}a^{2}+1}}{2xa^{2}}$$

Result(type 3, 298 leaves):

$$-\frac{c^{2}\left(-x^{2}a^{2}+1\right)^{5/2}}{3a^{4}x^{3}}-\frac{10c^{2}\left(-x^{2}a^{2}+1\right)^{5/2}}{3a^{2}x}-\frac{10c^{2}\left(-x^{2}a^{2}+1\right)^{3/2}x}{3}-5c^{2}\sqrt{-x^{2}a^{2}+1}\,x-\frac{5c^{2}\arctan\left(\frac{\sqrt{a^{2}}\,x}{\sqrt{-x^{2}a^{2}+1}}\right)}{\sqrt{a^{2}}}+\frac{3c^{2}\left(-x^{2}a^{2}+1\right)^{5/2}}{2a^{3}x^{2}}$$
$$+\frac{c^{2}\left(-x^{2}a^{2}+1\right)^{3/2}}{6a}+\frac{c^{2}\sqrt{-x^{2}a^{2}+1}}{2a}-\frac{c^{2}\operatorname{arctanh}\left(\frac{1}{\sqrt{-x^{2}a^{2}+1}}\right)}{2a}+\frac{4c^{2}\left(-\left(x+\frac{1}{a}\right)^{2}a^{2}+2a\left(x+\frac{1}{a}\right)\right)^{3/2}}{3a}$$
$$+2c^{2}\sqrt{-\left(x+\frac{1}{a}\right)^{2}a^{2}+2a\left(x+\frac{1}{a}\right)}\,x+\frac{2c^{2}\arctan\left(\frac{\sqrt{a^{2}}\,x}{\sqrt{-\left(x+\frac{1}{a}\right)^{2}a^{2}+2a\left(x+\frac{1}{a}\right)}}\right)}{\sqrt{a^{2}}}$$

Problem 189: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(ax+1\right)^{2}\left(c-\frac{c}{x^{2}a^{2}}\right)^{9/2}}{-x^{2}a^{2}+1}\,dx$$

Optimal(type 3, 396 leaves, 16 steps):

$$\frac{295 a^4 \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^5}{1344 (-a x+1)^4}-\frac{501 a^8 \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^9}{128 (-a x+1)^4 (a x+1)^4}+\frac{373 a^7 \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^8}{192 (-a x+1)^4 (a x+1)^3}+\frac{501 a^6 \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^7}{640 (-a x+1)^4 (a x+1)^2}+\frac{661 a^5 \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^6}{1680 (-a x+1)^4 (a x+1)}$$

$$-\frac{127 a^3 \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^4 (a x+1)}{420 (-a x+1)^4}+\frac{71 a^2 \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^3 (a x+1)}{336 (-a x+1)^3}-\frac{a \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^2 (a x+1)}{28 (-a x+1)^2}-\frac{\left(c-\frac{c}{x^2 a^2}\right)^{9/2} x (a x+1)}{8 (-a x+1)}$$

$$+\frac{2 a^8 \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^9 \arcsin(a x)}{(-a x+1)^{9/2} (a x+1)^{9/2}}+\frac{245 a^8 \left(c-\frac{c}{x^2 a^2}\right)^{9/2} x^9 \operatorname{arctanh}\left(\sqrt{-a x+1}\sqrt{a x+1}\right)}{128 (-a x+1)^{9/2} (a x+1)^{9/2}}$$

Result(type 3, 964 leaves):

$$-\frac{1}{40320 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{9/2} a^2 c \sqrt{-\frac{c}{a^2}}}\left(\left(\frac{c (x^2 a^2-1)}{x^2 a^2}\right)^{9/2} x \left(-5040 a^4 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{11/2} \sqrt{-\frac{c}{a^2}}\right.\right.$$

$$+77175 c^6 \ln\left(\frac{2\left(\sqrt{-\frac{c}{a^2}}\sqrt{\frac{c (x^2 a^2-1)}{a^2}}\, a^2-c\right)}{x a^2}\right) x^8+22050 c^{11/2} \ln\left(\frac{\sqrt{c}\sqrt{\frac{(a x-1)(a x+1) c}{a^2}}+c x}{\sqrt{c}}\right) a x^8 \sqrt{-\frac{c}{a^2}}+58590 c^{11/2} \ln\left(x\sqrt{c}\right.$$

$$\left.+\sqrt{\frac{c (x^2 a^2-1)}{a^2}}\right) a x^8 \sqrt{-\frac{c}{a^2}}-11760 a^7 c^3 \left(\frac{(a x-1)(a x+1) c}{a^2}\right)^{5/2} x^9 \sqrt{-\frac{c}{a^2}}-31248 a^7 c^3 x^9 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{5/2} \sqrt{-\frac{c}{a^2}}$$

$$+15435 a^6 c^3 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{5/2} x^8 \sqrt{-\frac{c}{a^2}}+14700 a^5 c^4 \left(\frac{(a x-1)(a x+1) c}{a^2}\right)^{3/2} x^9 \sqrt{-\frac{c}{a^2}}+39060 a^5 c^4 x^9 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} \sqrt{-\frac{c}{a^2}}$$

$$-25725 a^4 c^4 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} x^8 \sqrt{-\frac{c}{a^2}}-22050 a^3 c^5 \sqrt{\frac{(a x-1)(a x+1) c}{a^2}}\, x^9 \sqrt{-\frac{c}{a^2}}-58590 a^3 c^5 x^9 \sqrt{\frac{c (x^2 a^2-1)}{a^2}} \sqrt{-\frac{c}{a^2}}$$

$$+77175 c^5 \sqrt{\frac{c (x^2 a^2-1)}{a^2}}\, a^2 x^8 \sqrt{-\frac{c}{a^2}}-23808 a^{11} x^9 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{9/2} c \sqrt{-\frac{c}{a^2}}+8960 a^{10} \left(\frac{(a x-1)(a x+1) c}{a^2}\right)^{9/2} c x^8 \sqrt{-\frac{c}{a^2}}$$

$$+8575 a^{10} \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{9/2} c x^8 \sqrt{-\frac{c}{a^2}}+10080 a^9 c^2 \left(\frac{(a x-1)(a x+1) c}{a^2}\right)^{7/2} x^9 \sqrt{-\frac{c}{a^2}}+26784 a^9 c^2 x^9 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{7/2} \sqrt{-\frac{c}{a^2}}$$

$$-11025\,a^8 c^2 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{7/2} x^8 \sqrt{-\frac{c}{a^2}} + 23808\,a^{11} \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{11/2} x^7 \sqrt{-\frac{c}{a^2}} - 17535\,a^{10} \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{11/2} x^6 \sqrt{-\frac{c}{a^2}}$$

$$-13056\,a^9 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{11/2} x^5 \sqrt{-\frac{c}{a^2}} - 6510\,a^8 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{11/2} x^4 \sqrt{-\frac{c}{a^2}} - 6912\,a^7 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{11/2} x^3 \sqrt{-\frac{c}{a^2}}$$

$$-10920\,a^6 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{11/2} x^2 \sqrt{-\frac{c}{a^2}} - 11520\,a^5 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{11/2} x \sqrt{-\frac{c}{a^2}} \Bigg)\Bigg)$$

Problem 190: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2 \left(c-\frac{c}{x^2 a^2}\right)^{3/2}}{-x^2 a^2+1}\, dx$$

Optimal(type 3, 186 leaves, 10 steps):

$$-\frac{a \left(c-\frac{c}{x^2 a^2}\right)^{3/2} x^2}{-a x+1} + \frac{5 a^2 \left(c-\frac{c}{x^2 a^2}\right)^{3/2} x^3}{2\,(-a x+1)\,(a x+1)} - \frac{\left(c-\frac{c}{x^2 a^2}\right)^{3/2} x\,(a x+1)}{2\,(-a x+1)} - \frac{2 a^2 \left(c-\frac{c}{x^2 a^2}\right)^{3/2} x^3 \arcsin(a x)}{(-a x+1)^{3/2}\,(a x+1)^{3/2}}$$

$$-\frac{a^2 \left(c-\frac{c}{x^2 a^2}\right)^{3/2} x^3 \operatorname{arctanh}\left(\sqrt{-a x+1}\,\sqrt{a x+1}\right)}{2\,(-a x+1)^{3/2}\,(a x+1)^{3/2}}$$

Result(type 3, 453 leaves):

$$\frac{1}{6 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{3/2} c\,a^2 \sqrt{-\frac{c}{a^2}}} \Bigg(\left(\frac{c\,(x^2 a^2-1)}{x^2 a^2}\right)^{3/2} x \Bigg(-12\,a^5 x^3 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{3/2} c \sqrt{-\frac{c}{a^2}} + 12\,a^5 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{5/2} x \sqrt{-\frac{c}{a^2}}$$

$$-4\,a^4 \left(\frac{(a x-1)\,(a x+1)\,c}{a^2}\right)^{3/2} x^2 c \sqrt{-\frac{c}{a^2}} + a^4 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{3/2} x^2 c \sqrt{-\frac{c}{a^2}} - 6\,a^3 c^2 \sqrt{\frac{(a x-1)\,(a x+1)\,c}{a^2}}\, x^3 \sqrt{-\frac{c}{a^2}}$$

$$+3\,a^4 \left(\frac{c\,(x^2 a^2-1)}{a^2}\right)^{5/2} \sqrt{-\frac{c}{a^2}} + 18\,a^3 c^2 x^3 \sqrt{\frac{c\,(x^2 a^2-1)}{a^2}} \sqrt{-\frac{c}{a^2}} + 6\,c^{5/2} \ln\left(\frac{\sqrt{c}\,\sqrt{\frac{(a x-1)\,(a x+1)\,c}{a^2}} + c x}{\sqrt{c}}\right) x^2 a \sqrt{-\frac{c}{a^2}}$$

$$-18 c^{5/2} \ln\left(x\sqrt{c}+\sqrt{\frac{c(x^2a^2-1)}{a^2}}\right) x^2 a \sqrt{-\frac{c}{a^2}} - 3c^2\sqrt{\frac{c(x^2a^2-1)}{a^2}}\, x^2 a^2 \sqrt{-\frac{c}{a^2}} - 3c^3 \ln\left(\frac{2\left(\sqrt{-\frac{c}{a^2}}\sqrt{\frac{c(x^2a^2-1)}{a^2}}\, a^2 - c\right)}{x a^2}\right) x^2\Bigg)\Bigg)$$

Problem 192: Result more than twice size of optimal antiderivative.

$$\int \frac{(ax+1)^2}{(-x^2a^2+1)\left(c-\frac{c}{x^2a^2}\right)^{5/2}}\, dx$$

Optimal(type 3, 181 leaves, 8 steps):

$$\frac{(ax+1)^2}{5a^2\left(c-\frac{c}{x^2a^2}\right)^{5/2} x} - \frac{2(-ax+1)(ax+1)^2}{3a^3\left(c-\frac{c}{x^2a^2}\right)^{5/2} x^2} + \frac{58(-ax+1)^2(ax+1)^2}{15a^4\left(c-\frac{c}{x^2a^2}\right)^{5/2} x^3} + \frac{2(-ax+1)^3(ax+1)^2(43ax+28)}{15a^6\left(c-\frac{c}{x^2a^2}\right)^{5/2} x^5}$$
$$- \frac{2(-ax+1)^{5/2}(ax+1)^{5/2}\arcsin(ax)}{a^6\left(c-\frac{c}{x^2a^2}\right)^{5/2} x^5}$$

Result(type 3, 465 leaves):

$$-\frac{1}{15\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{3/2} x^5\left(\frac{c(x^2a^2-1)}{x^2a^2}\right)^{5/2} a^6 c^{7/2}}\Bigg(\Bigg(15c^{7/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{3/2} x^5a^5$$
$$-45x^4c^{7/2}a^4\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{3/2} - 16c^{7/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2} x^4a^4 - 60x^3c^{7/2}a^3\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{3/2}$$
$$+16c^{7/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2} x^3a^3 + 90c^{7/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{3/2} x^2a^2 + 24c^{7/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2} x^2a^2 + 30\ln\Bigg(x\sqrt{c}$$
$$+\sqrt{\frac{c(x^2a^2-1)}{a^2}}\Bigg)\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{3/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2} x a^4 c^2 + 50c^{7/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{3/2} x a$$
$$-24c^{7/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2} x a - 30\ln\left(x\sqrt{c}+\sqrt{\frac{c(x^2a^2-1)}{a^2}}\right) c^2\left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2} a^3\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{3/2}$$
$$-50c^{7/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{3/2} - 6c^{7/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2}\Bigg)(ax+1)\Bigg)$$

Problem 193: Result more than twice size of optimal antiderivative.

$$\int \frac{(ax+1)^2}{(-x^2a^2+1)\left(c-\frac{c}{x^2a^2}\right)^{7/2}}\,dx$$

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Optimal(type 3, 253 leaves, 10 steps):
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$$\frac{(ax+1)^2}{7a^2\left(c-\frac{c}{x^2a^2}\right)^{7/2}x}-\frac{2(-ax+1)(ax+1)^2}{5a^3\left(c-\frac{c}{x^2a^2}\right)^{7/2}x^2}+\frac{124(-ax+1)^2(ax+1)^2}{105a^4\left(c-\frac{c}{x^2a^2}\right)^{7/2}x^3}-\frac{782(-ax+1)^3(ax+1)^2}{105a^5\left(c-\frac{c}{x^2a^2}\right)^{7/2}x^4}-\frac{142(-ax+1)^4(ax+1)^2}{35a^6\left(c-\frac{c}{x^2a^2}\right)^{7/2}x^5}$$
$$-\frac{2(-ax+1)^4(ax+1)^3(107ax+72)}{35a^8\left(c-\frac{c}{x^2a^2}\right)^{7/2}x^7}+\frac{2(-ax+1)^{7/2}(ax+1)^{7/2}\arcsin(ax)}{a^8\left(c-\frac{c}{x^2a^2}\right)^{7/2}x^7}$$

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Result(type 3, 575 leaves):
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$$-\frac{1}{105\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}x^7\left(\frac{c(x^2a^2-1)}{x^2a^2}\right)^{7/2}a^8c^{11/2}}\Bigg(\Bigg(105c^{11/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}x^7a^7$$
$$-553x^6c^{11/2}a^6\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}+96c^{11/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{5/2}x^6a^6-392x^5c^{11/2}a^5\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}$$
$$-96c^{11/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{5/2}x^5a^5+1540c^{11/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}x^4a^4-240c^{11/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{5/2}x^4a^4$$
$$+350c^{11/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}x^3a^3+240c^{11/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{5/2}x^3a^3+210\ln\Bigg(x\sqrt{c}$$
$$+\sqrt{\frac{c(x^2a^2-1)}{a^2}}\Bigg)\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{5/2}xa^6c^3-1470c^{11/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}x^2a^2$$
$$+180c^{11/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{5/2}x^2a^2-210\ln\left(x\sqrt{c}+\sqrt{\frac{c(x^2a^2-1)}{a^2}}\right)c^3\left(\frac{c(x^2a^2-1)}{a^2}\right)^{5/2}a^5\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}$$
$$-42c^{11/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}xa-180c^{11/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{5/2}xa+462c^{11/2}\left(\frac{(ax-1)(ax+1)c}{a^2}\right)^{5/2}$$
$$-30c^{11/2}\left(\frac{c(x^2a^2-1)}{a^2}\right)^{5/2}\Bigg)(ax+1)\Bigg)$$

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Problem 199: Result more than twice size of optimal antiderivative.
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$$\int \frac{\left(c-\frac{c}{x^2 a^2}\right)^{7/2}\left(-x^2 a^2+1\right)}{(a x+1)^2}\, dx$$

Optimal(type 3, 329 leaves, 14 steps):

$$-\frac{7 a^6 \left(c-\frac{c}{x^2 a^2}\right)^{7/2} x^7}{16 (-a x+1)^3 (a x+1)^3}-\frac{3 a^5 \left(c-\frac{c}{x^2 a^2}\right)^{7/2} x^6}{8 (-a x+1)^3 (a x+1)^2}+\frac{a \left(c-\frac{c}{x^2 a^2}\right)^{7/2} x^2}{15 (a x+1)}+\frac{19 a^4 \left(c-\frac{c}{x^2 a^2}\right)^{7/2} x^5}{16 (-a x+1)^3 (a x+1)}-\frac{2 a^3 \left(c-\frac{c}{x^2 a^2}\right)^{7/2} x^4}{3 (-a x+1)^2 (a x+1)}$$
$$+\frac{23 a^2 \left(c-\frac{c}{x^2 a^2}\right)^{7/2} x^3}{120 (-a x+1) (a x+1)}-\frac{\left(c-\frac{c}{x^2 a^2}\right)^{7/2} x (-a x+1)}{6 (a x+1)}+\frac{2 a^6 \left(c-\frac{c}{x^2 a^2}\right)^{7/2} x^7 \arcsin(a x)}{(-a x+1)^{7/2} (a x+1)^{7/2}}$$
$$-\frac{25 a^6 \left(c-\frac{c}{x^2 a^2}\right)^{7/2} x^7 \operatorname{arctanh}\left(\sqrt{-a x+1}\, \sqrt{a x+1}\right)}{16 (-a x+1)^{7/2} (a x+1)^{7/2}}$$

Result(type 3, 794 leaves):

$$-\frac{1}{1680 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{7/2} c a^2 \sqrt{-\frac{c}{a^2}}}\Bigg(\left(\frac{c (x^2 a^2-1)}{x^2 a^2}\right)^{7/2} x \Bigg(-2016 a^9 x^7 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{7/2} c \sqrt{-\frac{c}{a^2}}+2016 a^9 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{9/2} x^5 \sqrt{-\frac{c}{a^2}}$$
$$+480 a^8 \left(\frac{(a x-1) (a x+1) c}{a^2}\right)^{7/2} x^6 c \sqrt{-\frac{c}{a^2}}-375 a^8 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{7/2} x^6 c \sqrt{-\frac{c}{a^2}}-560 a^7 c^2 \left(\frac{(a x-1) (a x+1) c}{a^2}\right)^{5/2} x^7 \sqrt{-\frac{c}{a^2}}$$
$$-105 a^8 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{9/2} x^4 \sqrt{-\frac{c}{a^2}}+2352 a^7 c^2 x^7 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{5/2} \sqrt{-\frac{c}{a^2}}+224 a^7 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{9/2} x^3 \sqrt{-\frac{c}{a^2}}$$
$$+525 a^6 c^2 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{5/2} x^6 \sqrt{-\frac{c}{a^2}}+700 a^5 c^3 \left(\frac{(a x-1) (a x+1) c}{a^2}\right)^{3/2} x^7 \sqrt{-\frac{c}{a^2}}-2940 a^5 c^3 x^7 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} \sqrt{-\frac{c}{a^2}}$$
$$-630 a^6 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{9/2} x^2 \sqrt{-\frac{c}{a^2}}+1050 c^{9/2} \ln\left(\frac{\sqrt{c}\sqrt{\frac{(a x-1) (a x+1) c}{a^2}}+c x}{\sqrt{c}}\right) x^6 a \sqrt{-\frac{c}{a^2}}-4410 c^{9/2} \ln\Bigg(x \sqrt{c}$$
$$+\sqrt{\frac{c (x^2 a^2-1)}{a^2}}\Bigg) x^6 a \sqrt{-\frac{c}{a^2}}-875 a^4 c^3 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} x^6 \sqrt{-\frac{c}{a^2}}-1050 a^3 c^4 \sqrt{\frac{(a x-1) (a x+1) c}{a^2}}\, x^7 \sqrt{-\frac{c}{a^2}}$$

$$+672 a^5 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{9/2} x \sqrt{-\frac{c}{a^2}} + 4410 a^3 c^4 x^7 \sqrt{\frac{c (x^2 a^2-1)}{a^2}} \sqrt{-\frac{c}{a^2}} - 280 a^4 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{9/2} \sqrt{-\frac{c}{a^2}}$$

$$+2625 c^4 \sqrt{\frac{c (x^2 a^2-1)}{a^2}} x^6 a^2 \sqrt{-\frac{c}{a^2}} + 2625 c^5 \ln\left(\frac{2 \left(\sqrt{-\frac{c}{a^2}} \sqrt{\frac{c (x^2 a^2-1)}{a^2}} a^2 - c\right)}{x a^2}\right) x^6 \Bigg) \Bigg)$$

Problem 200: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(c-\frac{c}{x^2 a^2}\right)^{5/2} (-x^2 a^2+1)}{(a x+1)^2} \, dx$$

Optimal(type 3, 257 leaves, 12 steps):

$$\frac{7 a^4 \left(c-\frac{c}{x^2 a^2}\right)^{5/2} x^5}{8 (-a x+1)^2 (a x+1)^2} + \frac{a \left(c-\frac{c}{x^2 a^2}\right)^{5/2} x^2}{6 (a x+1)} - \frac{2 a^3 \left(c-\frac{c}{x^2 a^2}\right)^{5/2} x^4}{(-a x+1)^2 (a x+1)} + \frac{7 a^2 \left(c-\frac{c}{x^2 a^2}\right)^{5/2} x^3}{24 (-a x+1) (a x+1)} - \frac{\left(c-\frac{c}{x^2 a^2}\right)^{5/2} x (-a x+1)}{4 (a x+1)}$$

$$- \frac{2 a^4 \left(c-\frac{c}{x^2 a^2}\right)^{5/2} x^5 \arcsin(a x)}{(-a x+1)^{5/2} (a x+1)^{5/2}} + \frac{9 a^4 \left(c-\frac{c}{x^2 a^2}\right)^{5/2} x^5 \operatorname{arctanh}\left(\sqrt{-a x+1} \sqrt{a x+1}\right)}{8 (-a x+1)^{5/2} (a x+1)^{5/2}}$$

Result(type 3, 624 leaves):

$$\frac{1}{120 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{5/2} c a^2 \sqrt{-\frac{c}{a^2}}} \Bigg(\left(\frac{c (x^2 a^2-1)}{x^2 a^2}\right)^{5/2} x \Bigg(-80 a^7 x^5 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{5/2} c \sqrt{-\frac{c}{a^2}} + 80 a^7 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{7/2} x^3 \sqrt{-\frac{c}{a^2}}$$

$$-48 a^6 \left(\frac{(a x-1) (a x+1) c}{a^2}\right)^{5/2} x^4 c \sqrt{-\frac{c}{a^2}} - 27 a^6 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{5/2} x^4 c \sqrt{-\frac{c}{a^2}} + 60 a^5 c^2 \left(\frac{(a x-1) (a x+1) c}{a^2}\right)^{3/2} x^5 \sqrt{-\frac{c}{a^2}}$$

$$+75 a^6 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{7/2} x^2 \sqrt{-\frac{c}{a^2}} + 100 a^5 c^2 x^5 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} \sqrt{-\frac{c}{a^2}} - 80 a^5 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{7/2} x \sqrt{-\frac{c}{a^2}}$$

$$+45 c^2 a^4 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} x^4 \sqrt{-\frac{c}{a^2}} + 90 c^{7/2} \ln\left(\frac{\sqrt{c} \sqrt{\frac{(a x-1) (a x+1) c}{a^2}} + c x}{\sqrt{c}}\right) x^4 a \sqrt{-\frac{c}{a^2}} + 150 c^{7/2} \ln\Big(x \sqrt{c}$$

$$+\sqrt{\frac{c\,(x^2a^2-1)}{a^2}}\Bigg)x^4 a\sqrt{-\frac{c}{a^2}}-90\,a^3c^3\sqrt{\frac{(ax-1)\,(ax+1)\,c}{a^2}}\,x^5\sqrt{-\frac{c}{a^2}}-150\,a^3c^3x^5\sqrt{\frac{c\,(x^2a^2-1)}{a^2}}\sqrt{-\frac{c}{a^2}}$$

$$+30\,a^4\left(\frac{c\,(x^2a^2-1)}{a^2}\right)^{7/2}\sqrt{-\frac{c}{a^2}}-135\,c^3\sqrt{\frac{c\,(x^2a^2-1)}{a^2}}\,x^4a^2\sqrt{-\frac{c}{a^2}}-135\,c^4\ln\left(\frac{2\left(\sqrt{-\frac{c}{a^2}}\sqrt{\frac{c\,(x^2a^2-1)}{a^2}}\,a^2-c\right)}{x\,a^2}\right)x^4\Bigg)\Bigg)$$

Problem 201: Result more than twice size of optimal antiderivative.

$$\int\frac{-x^2a^2+1}{(a\,x+1)^2\left(c-\frac{c}{x^2a^2}\right)^{5/2}}\,dx$$

Optimal(type 3, 174 leaves, 8 steps):

$$\frac{(-a\,x+1)^2}{a^2\left(c-\frac{c}{x^2a^2}\right)^{5/2}x}+\frac{2\,(-a\,x+1)^3}{5\,a^3\left(c-\frac{c}{x^2a^2}\right)^{5/2}x^2}-\frac{2\,(-a\,x+1)^3\,(a\,x+1)}{15\,a^4\left(c-\frac{c}{x^2a^2}\right)^{5/2}x^3}+\frac{2\,(-a\,x+1)^3\,(a\,x+1)^2\,(13\,a\,x+28)}{15\,a^6\left(c-\frac{c}{x^2a^2}\right)^{5/2}x^5}$$

$$+\frac{2\,(-a\,x+1)^{5/2}\,(a\,x+1)^{5/2}\arcsin(a\,x)}{a^6\left(c-\frac{c}{x^2a^2}\right)^{5/2}x^5}$$

Result(type 3, 465 leaves):

$$-\frac{1}{15\left(\frac{(a\,x-1)\,(a\,x+1)\,c}{a^2}\right)^{3/2}x^5\left(\frac{c\,(x^2a^2-1)}{x^2a^2}\right)^{5/2}a^6c^{7/2}}\Bigg(\Bigg(15\,c^{7/2}\left(\frac{(a\,x-1)\,(a\,x+1)\,c}{a^2}\right)^{3/2}x^5a^5$$

$$+45\,x^4c^{7/2}a^4\left(\frac{(a\,x-1)\,(a\,x+1)\,c}{a^2}\right)^{3/2}+16\,c^{7/2}\left(\frac{c\,(x^2a^2-1)}{a^2}\right)^{3/2}x^4a^4-60\,x^3c^{7/2}a^3\left(\frac{(a\,x-1)\,(a\,x+1)\,c}{a^2}\right)^{3/2}$$

$$+16\,c^{7/2}\left(\frac{c\,(x^2a^2-1)}{a^2}\right)^{3/2}x^3a^3-90\,c^{7/2}\left(\frac{(a\,x-1)\,(a\,x+1)\,c}{a^2}\right)^{3/2}x^2a^2-24\,c^{7/2}\left(\frac{c\,(x^2a^2-1)}{a^2}\right)^{3/2}x^2a^2-30\ln\Bigg(x\sqrt{c}$$

$$+\sqrt{\frac{c\,(x^2a^2-1)}{a^2}}\Bigg)\left(\frac{(a\,x-1)\,(a\,x+1)\,c}{a^2}\right)^{3/2}\left(\frac{c\,(x^2a^2-1)}{a^2}\right)^{3/2}x\,a^4c^2+50\,c^{7/2}\left(\frac{(a\,x-1)\,(a\,x+1)\,c}{a^2}\right)^{3/2}x\,a$$

$$-24\,c^{7/2}\left(\frac{c\,(x^2a^2-1)}{a^2}\right)^{3/2}x\,a-30\ln\left(x\sqrt{c}+\sqrt{\frac{c\,(x^2a^2-1)}{a^2}}\right)c^2\left(\frac{c\,(x^2a^2-1)}{a^2}\right)^{3/2}a^3\left(\frac{(a\,x-1)\,(a\,x+1)\,c}{a^2}\right)^{3/2}$$

$$+50\,c^{7/2}\left(\frac{(a\,x-1)\,(a\,x+1)\,c}{a^2}\right)^{3/2}+6\,c^{7/2}\left(\frac{c\,(x^2a^2-1)}{a^2}\right)^{3/2}\Bigg)(a\,x-1)\Bigg)$$

Problem 206: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2 \sqrt{c-\frac{c}{x^2 a^2}}}{(-x^2 a^2+1) x^5}\, dx$$

Optimal(type 3, 149 leaves, 10 steps):

$$-\frac{6 a^4 \sqrt{c-\frac{c}{x^2 a^2}}}{5}-\frac{\sqrt{c-\frac{c}{x^2 a^2}}}{5 x^4}-\frac{a \sqrt{c-\frac{c}{x^2 a^2}}}{2 x^3}-\frac{3 a^2 \sqrt{c-\frac{c}{x^2 a^2}}}{5 x^2}-\frac{3 a^3 \sqrt{c-\frac{c}{x^2 a^2}}}{4 x}-\frac{3 a^5 x \operatorname{arctanh}\left(\sqrt{-a x+1}\, \sqrt{a x+1}\right) \sqrt{c-\frac{c}{x^2 a^2}}}{4 \sqrt{-a x+1}\, \sqrt{a x+1}}$$

Result(type 3, 446 leaves):

$$-\frac{1}{20 x^4 \sqrt{\frac{c (x^2 a^2-1)}{a^2}}\, c \sqrt{-\frac{c}{a^2}}}\left(\sqrt{\frac{c (x^2 a^2-1)}{x^2 a^2}}\, a^2 \left(40 a^4 x^6 \sqrt{\frac{c (x^2 a^2-1)}{a^2}}\, c \sqrt{-\frac{c}{a^2}}-40 a^4 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} x^4 \sqrt{-\frac{c}{a^2}}\right.\right.$$

$$+40 a^2 c^{3/2} \ln\left(\frac{\sqrt{c} \sqrt{\frac{(a x-1) (a x+1) c}{a^2}}+c x}{\sqrt{c}}\right) x^5 \sqrt{-\frac{c}{a^2}}-40 a^2 c^{3/2} \ln\left(x \sqrt{c}+\sqrt{\frac{c (x^2 a^2-1)}{a^2}}\right) x^5 \sqrt{-\frac{c}{a^2}}$$

$$+40 a^3 \sqrt{\frac{(a x-1) (a x+1) c}{a^2}}\, c x^5 \sqrt{-\frac{c}{a^2}}-15 a^3 \sqrt{\frac{c (x^2 a^2-1)}{a^2}}\, c x^5 \sqrt{-\frac{c}{a^2}}-25 a^3 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} x^3 \sqrt{-\frac{c}{a^2}}$$

$$-15 a c^2 \ln\left(\frac{2 \left(\sqrt{-\frac{c}{a^2}} \sqrt{\frac{c (x^2 a^2-1)}{a^2}}\, a^2-c\right)}{x a^2}\right) x^5-16 a^2 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} x^2 \sqrt{-\frac{c}{a^2}}-10 a \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} x \sqrt{-\frac{c}{a^2}}$$

$$\left.\left.-4 \left(\frac{c (x^2 a^2-1)}{a^2}\right)^{3/2} \sqrt{-\frac{c}{a^2}}\right)\right)$$

Problem 213: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{c-\frac{c}{x^2 a^2}}\, (-x^2 a^2+1)}{(a x+1)^2 x}\, dx$$

Optimal(type 3, 100 leaves, 8 steps):

$$-\sqrt{c-\frac{c}{x^2 a^2}}+\frac{a x \arcsin(a x)\sqrt{c-\frac{c}{x^2 a^2}}}{\sqrt{-a x+1}\,\sqrt{a x+1}}+\frac{2 a x \operatorname{arctanh}\left(\sqrt{-a x+1}\,\sqrt{a x+1}\right)\sqrt{c-\frac{c}{x^2 a^2}}}{\sqrt{-a x+1}\,\sqrt{a x+1}}$$

Result(type 3, 306 leaves):

$$-\frac{1}{\sqrt{\frac{c(x^2a^2-1)}{a^2}}\,c\,a\sqrt{-\frac{c}{a^2}}}\left(\sqrt{\frac{c(x^2a^2-1)}{x^2a^2}}\left(a^3x^2\sqrt{\frac{c(x^2a^2-1)}{a^2}}\,c\sqrt{-\frac{c}{a^2}}-a^3\left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2}\sqrt{-\frac{c}{a^2}}\right.\right.$$
$$+2c^{3/2}\ln\left(\frac{\sqrt{c}\sqrt{\frac{(ax-1)(ax+1)c}{a^2}}+cx}{\sqrt{c}}\right)xa\sqrt{-\frac{c}{a^2}}-c^{3/2}\ln\left(x\sqrt{c}+\sqrt{\frac{c(x^2a^2-1)}{a^2}}\right)xa\sqrt{-\frac{c}{a^2}}$$
$$\left.\left.-2a^2\sqrt{\frac{(ax-1)(ax+1)c}{a^2}}\,cx\sqrt{-\frac{c}{a^2}}+2a^2\sqrt{\frac{c(x^2a^2-1)}{a^2}}\,cx\sqrt{-\frac{c}{a^2}}+2c^2\ln\left(\frac{2\left(\sqrt{-\frac{c}{a^2}}\sqrt{\frac{c(x^2a^2-1)}{a^2}}\,a^2-c\right)}{x a^2}\right)x\right)\right)$$

Problem 214: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{c-\frac{c}{x^2a^2}}\,(-x^2a^2+1)}{(ax+1)^2x^4}\,dx$$

Optimal(type 3, 128 leaves, 9 steps):

$$\frac{4a^3\sqrt{c-\frac{c}{x^2a^2}}}{3}-\frac{\sqrt{c-\frac{c}{x^2a^2}}}{4x^3}+\frac{2a\sqrt{c-\frac{c}{x^2a^2}}}{3x^2}-\frac{7a^2\sqrt{c-\frac{c}{x^2a^2}}}{8x}-\frac{7a^4x\operatorname{arctanh}\left(\sqrt{-ax+1}\,\sqrt{ax+1}\right)\sqrt{c-\frac{c}{x^2a^2}}}{8\sqrt{-ax+1}\,\sqrt{ax+1}}$$

Result(type 3, 409 leaves):

$$\frac{1}{24x^3\sqrt{\frac{c(x^2a^2-1)}{a^2}}\,c\sqrt{-\frac{c}{a^2}}}\left(\sqrt{\frac{c(x^2a^2-1)}{x^2a^2}}\,a^2\left(48a^3\sqrt{\frac{c(x^2a^2-1)}{a^2}}\,cx^5\sqrt{-\frac{c}{a^2}}-48a^3\left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2}x^3\sqrt{-\frac{c}{a^2}}\right.\right.$$
$$+48ac^{3/2}\ln\left(\frac{\sqrt{c}\sqrt{\frac{(ax-1)(ax+1)c}{a^2}}+cx}{\sqrt{c}}\right)x^4\sqrt{-\frac{c}{a^2}}-48ac^{3/2}\ln\left(x\sqrt{c}+\sqrt{\frac{c(x^2a^2-1)}{a^2}}\right)x^4\sqrt{-\frac{c}{a^2}}$$

$$-48 a^2 \sqrt{\frac{(ax-1)(ax+1)c}{a^2}}\, x^4 c \sqrt{-\frac{c}{a^2}} + 21 a^2 \sqrt{\frac{c(x^2a^2-1)}{a^2}}\, x^4 c \sqrt{-\frac{c}{a^2}} + 27 a^2 \left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2} x^2 \sqrt{-\frac{c}{a^2}}$$

$$+ 21 c^2 \ln\left(\frac{2\left(\sqrt{-\frac{c}{a^2}}\sqrt{\frac{c(x^2a^2-1)}{a^2}}\, a^2 - c\right)}{x a^2}\right) x^4 - 16 a \left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2} x \sqrt{-\frac{c}{a^2}} + 6 \left(\frac{c(x^2a^2-1)}{a^2}\right)^{3/2} \sqrt{-\frac{c}{a^2}}\Bigg)\Bigg)$$

Problem 217: Unable to integrate problem.

$$\int e^{n \operatorname{arctanh}(a x)} \sqrt{c - \frac{c}{x^2 a^2}}\, dx$$

Optimal(type 5, 226 leaves, 6 steps):

$$-\frac{x(-ax+1)^{\frac{3}{2}-\frac{n}{2}}(ax+1)^{-\frac{1}{2}+\frac{n}{2}}\sqrt{c-\frac{c}{x^2a^2}}}{(1-n)\sqrt{-x^2a^2+1}}$$

$$+\frac{2x(-ax+1)^{\frac{1}{2}-\frac{n}{2}}(ax+1)^{-\frac{1}{2}+\frac{n}{2}}\operatorname{hypergeom}\left(\left[1,-\frac{1}{2}+\frac{n}{2}\right],\left[\frac{1}{2}+\frac{n}{2}\right],\frac{ax+1}{-ax+1}\right)\sqrt{c-\frac{c}{x^2a^2}}}{(1-n)\sqrt{-x^2a^2+1}}$$

$$+\frac{2^{\frac{1}{2}+\frac{n}{2}}\, n x(-ax+1)^{\frac{3}{2}-\frac{n}{2}}\operatorname{hypergeom}\left(\left[\frac{3}{2}-\frac{n}{2},\frac{1}{2}-\frac{n}{2}\right],\left[\frac{5}{2}-\frac{n}{2}\right],-\frac{ax}{2}+\frac{1}{2}\right)\sqrt{c-\frac{c}{x^2a^2}}}{(n^2-4n+3)\sqrt{-x^2a^2+1}}$$

Result(type 8, 23 leaves):

$$\int e^{n \operatorname{arctanh}(a x)} \sqrt{c - \frac{c}{x^2 a^2}}\, dx$$

Problem 218: Unable to integrate problem.

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

Optimal(type 5, 207 leaves, 10 steps):

$$\frac{\left(c-\frac{c}{x^2a^2}\right)^p x \operatorname{hypergeom}\left(\left[1-p,\frac{1}{2}-p\right],\left[\frac{3}{2}-p\right],x^2a^2\right)}{(1-2p)(-ax+1)^p(ax+1)^p}+\frac{a^2\left(c-\frac{c}{x^2a^2}\right)^p x^3 \operatorname{hypergeom}\left(\left[1-p,\frac{3}{2}-p\right],\left[\frac{5}{2}-p\right],x^2a^2\right)}{(3-2p)(-ax+1)^p(ax+1)^p}$$

$$+\frac{a\left(c-\frac{c}{x^2 a^2}\right)^p x^2 \operatorname{hypergeom}([1-p,1-p],[2-p],x^2a^2)}{(1-p)(-ax+1)^p(ax+1)^p}$$

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Result(type 8, 35 leaves):
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$$\int \frac{(ax+1)^2\left(c-\frac{c}{x^2a^2}\right)^p}{-x^2a^2+1}\,dx$$

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Problem 219: Unable to integrate problem.
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$$\int \frac{\left(c-\frac{c}{x^2a^2}\right)^p\sqrt{-x^2a^2+1}}{ax+1}\,dx$$

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Optimal(type 5, 127 leaves, 5 steps):
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$$\frac{\left(c-\frac{c}{x^2a^2}\right)^p x \operatorname{hypergeom}\left(\left[\frac{1}{2}-p,\frac{1}{2}-p\right],\left[\frac{3}{2}-p\right],x^2a^2\right)}{(1-2p)\left(-x^2a^2+1\right)^p}-\frac{a\left(c-\frac{c}{x^2a^2}\right)^p x^2\operatorname{hypergeom}\left(\left[1-p,\frac{1}{2}-p\right],[2-p],x^2a^2\right)}{2(1-p)\left(-x^2a^2+1\right)^p}$$

```
Result(type 8, 35 leaves):
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$$\int \frac{\left(c-\frac{c}{x^2a^2}\right)^p\sqrt{-x^2a^2+1}}{ax+1}\,dx$$

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Problem 220: Unable to integrate problem.
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$$\int \frac{(1+x)^{3/2}x\sin(x)}{\sqrt{-x^2+1}}\,dx$$

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Optimal(type 4, 134 leaves, 16 steps):
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$$-(1-x)^{3/2}\cos(x)-\frac{3\cos(1)\operatorname{FresnelC}\left(\frac{\sqrt{2}\sqrt{1-x}}{\sqrt{\pi}}\right)\sqrt{2}\sqrt{\pi}}{2}+\frac{5\cos(1)\operatorname{FresnelS}\left(\frac{\sqrt{2}\sqrt{1-x}}{\sqrt{\pi}}\right)\sqrt{2}\sqrt{\pi}}{4}$$

$$-\frac{5\operatorname{FresnelC}\left(\frac{\sqrt{2}\sqrt{1-x}}{\sqrt{\pi}}\right)\sin(1)\sqrt{2}\sqrt{\pi}}{4}-\frac{3\operatorname{FresnelS}\left(\frac{\sqrt{2}\sqrt{1-x}}{\sqrt{\pi}}\right)\sin(1)\sqrt{2}\sqrt{\pi}}{2}+3\cos(x)\sqrt{1-x}-\frac{3\sin(x)\sqrt{1-x}}{2}$$

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Result(type 8, 20 leaves):
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$$\int \frac{(1+x)^{3/2} x \sin(x)}{\sqrt{-x^2+1}}\, dx$$

Problem 221: Unable to integrate problem.

$$\int \frac{\sqrt{1+x}\, \sin(x)}{\sqrt{-x^2+1}}\, dx$$

Optimal(type 4, 50 leaves, 6 steps):

$$\cos(1)\, \mathrm{FresnelS}\left(\frac{\sqrt{2}\, \sqrt{1-x}}{\sqrt{\pi}}\right) \sqrt{2}\, \sqrt{\pi} - \mathrm{FresnelC}\left(\frac{\sqrt{2}\, \sqrt{1-x}}{\sqrt{\pi}}\right) \sin(1)\, \sqrt{2}\, \sqrt{\pi}$$

Result(type 8, 19 leaves):

$$\int \frac{\sqrt{1+x}\, \sin(x)}{\sqrt{-x^2+1}}\, dx$$

Problem 222: Result more than twice size of optimal antiderivative.

$$\int \frac{b x+a+1}{\sqrt{1-(b x+a)^2}\, x^3}\, dx$$

Optimal(type 3, 140 leaves, 5 steps):

$$-\frac{(2 a+1)\, b^2 \operatorname{arctanh}\left(\frac{\sqrt{1-a}\, \sqrt{b x+a+1}}{\sqrt{1+a}\, \sqrt{-b x-a+1}}\right)}{(1-a)^2\, (1+a)\, \sqrt{-a^2+1}} - \frac{(b x+a+1)^{3/2} \sqrt{-b x-a+1}}{2\left(-a^2+1\right) x^2} - \frac{(2 a+1)\, b \sqrt{-b x-a+1}\, \sqrt{b x+a+1}}{2\, (1-a)^2\, (1+a)\, x}$$

Result(type 3, 452 leaves):

$$-\frac{b \sqrt{-b^2 x^2-2 a b x-a^2+1}}{\left(-a^2+1\right) x} - \frac{3 a b^2 \ln\left(\frac{-2 a^2+2-2 a b x+2 \sqrt{-a^2+1}\, \sqrt{-b^2 x^2-2 a b x-a^2+1}}{x}\right)}{2\left(-a^2+1\right)^{3/2}} - \frac{\sqrt{-b^2 x^2-2 a b x-a^2+1}}{2\left(-a^2+1\right) x^2}$$

$$-\frac{3 a b \sqrt{-b^2 x^2-2 a b x-a^2+1}}{2\left(-a^2+1\right)^2 x} - \frac{3 a^2 b^2 \ln\left(\frac{-2 a^2+2-2 a b x+2 \sqrt{-a^2+1}\, \sqrt{-b^2 x^2-2 a b x-a^2+1}}{x}\right)}{2\left(-a^2+1\right)^{5/2}}$$

$$-\frac{b^2 \ln\left(\frac{-2 a^2+2-2 a b x+2 \sqrt{-a^2+1}\, \sqrt{-b^2 x^2-2 a b x-a^2+1}}{x}\right)}{2\left(-a^2+1\right)^{3/2}} - \frac{a \sqrt{-b^2 x^2-2 a b x-a^2+1}}{2\left(-a^2+1\right) x^2} - \frac{3 a^2 b \sqrt{-b^2 x^2-2 a b x-a^2+1}}{2\left(-a^2+1\right)^2 x}$$

$$-\frac{3 a^3 b^2 \ln\left(\frac{-2 a^2+2-2 a b x+2 \sqrt{-a^2+1}\, \sqrt{-b^2 x^2-2 a b x-a^2+1}}{x}\right)}{2 \left(-a^2+1\right)^{5/2}}$$

Problem 223: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x+a+1)^2 x^4}{1-(b x+a)^2}\, dx$$

Optimal(type 3, 77 leaves, 3 steps):

$$-\frac{2 (1-a)^3 x}{b^4}-\frac{(1-a)^2 x^2}{b^3}-\frac{2 (1-a) x^3}{3 b^2}-\frac{x^4}{2 b}-\frac{x^5}{5}-\frac{2 (1-a)^4 \ln(-b x-a+1)}{b^5}$$

Result(type 3, 160 leaves):

$$-\frac{x^5}{5}-\frac{x^4}{2 b}+\frac{2 a x^3}{3 b^2}-\frac{2 x^3}{3 b^2}-\frac{a^2 x^2}{b^3}+\frac{2 x^2 a}{b^3}+\frac{2 a^3 x}{b^4}-\frac{x^2}{b^3}-\frac{6 x a^2}{b^4}+\frac{6 a x}{b^4}-\frac{2 x}{b^4}-\frac{2 \ln(b x+a-1) a^4}{b^5}+\frac{8 \ln(b x+a-1) a^3}{b^5}$$
$$-\frac{12 \ln(b x+a-1) a^2}{b^5}+\frac{8 \ln(b x+a-1) a}{b^5}-\frac{2 \ln(b x+a-1)}{b^5}$$

Problem 227: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x+a+1)^3 x}{\left(1-(b x+a)^2\right)^{3/2}}\, dx$$

Optimal(type 3, 103 leaves, 7 steps):

$$-\frac{3 (3-2 a) \arcsin(b x+a)}{2 b^2}+\frac{(1-a) (b x+a+1)^{5/2}}{b^2 \sqrt{-b x-a+1}}+\frac{(3-2 a) (b x+a+1)^{3/2} \sqrt{-b x-a+1}}{2 b^2}+\frac{3 (3-2 a) \sqrt{-b x-a+1}\, \sqrt{b x+a+1}}{2 b^2}$$

Result(type 3, 380 leaves):

$$-\frac{10 a x}{b \sqrt{-b^2 x^2-2 a b x-a^2+1}}+\frac{3 a \arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2 x^2-2 a b x-a^2+1}}\right)}{b \sqrt{b^2}}-\frac{7 a^2}{b^2 \sqrt{-b^2 x^2-2 a b x-a^2+1}}+\frac{a^2 x}{2 b \sqrt{-b^2 x^2-2 a b x-a^2+1}}$$
$$+\frac{7}{b^2 \sqrt{-b^2 x^2-2 a b x-a^2+1}}-\frac{3 x^2}{\sqrt{-b^2 x^2-2 a b x-a^2+1}}-\frac{b x^3}{2 \sqrt{-b^2 x^2-2 a b x-a^2+1}}-\frac{a x^2}{2 \sqrt{-b^2 x^2-2 a b x-a^2+1}}$$
$$+\frac{a^3}{2 b^2 \sqrt{-b^2 x^2-2 a b x-a^2+1}}-\frac{a}{2 b^2 \sqrt{-b^2 x^2-2 a b x-a^2+1}}+\frac{9 x}{2 b \sqrt{-b^2 x^2-2 a b x-a^2+1}}-\frac{9 \arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2 x^2-2 a b x-a^2+1}}\right)}{2 b \sqrt{b^2}}$$

Problem 228: Result more than twice size of optimal antiderivative.

$$\int \frac{(b x + a + 1)^3}{\left(1 - (b x + a)^2\right)^{3/2} x^2}\, dx$$

Optimal(type 3, 116 leaves, 5 steps):

$$-\frac{6 (1 + a) b \operatorname{arctanh}\left(\frac{\sqrt{1 - a}\, \sqrt{b x + a + 1}}{\sqrt{1 + a}\, \sqrt{-b x - a + 1}}\right)}{(1 - a)^2 \sqrt{-a^2 + 1}} - \frac{(b x + a + 1)^{3/2}}{(1 - a)\, x \sqrt{-b x - a + 1}} + \frac{6 b \sqrt{b x + a + 1}}{(1 - a)^2 \sqrt{-b x - a + 1}}$$

Result(type 3, 1519 leaves):

$$\frac{3 a^5 b^2 x}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{9 a^4 b^2 x}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{9 a^3 b^2 x}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}$$
$$+ \frac{5 b^2 x a^3}{(-a^2 + 1) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{12 b^2 x a^2}{(-a^2 + 1) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{9 b^2 x a}{(-a^2 + 1) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}$$
$$+ \frac{6 a b^2 (-2 b^2 x - 2 a b)}{\left(-4 b^2 (-a^2 + 1) - 4 a^2 b^2\right) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{3 a^2 b^2 x}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{12 a^4 b}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}$$
$$+ \frac{9 a^2 b}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{3 a^6 b}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{9 a^5 b}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}$$
$$- \frac{3 a^4 b \ln\left(\frac{-2 a^2 + 2 - 2 a b x + 2 \sqrt{-a^2 + 1}\, \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}{x}\right)}{(-a^2 + 1)^{5/2}} - \frac{9 a^3 b \ln\left(\frac{-2 a^2 + 2 - 2 a b x + 2 \sqrt{-a^2 + 1}\, \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}{x}\right)}{(-a^2 + 1)^{5/2}}$$
$$- \frac{9 a^2 b \ln\left(\frac{-2 a^2 + 2 - 2 a b x + 2 \sqrt{-a^2 + 1}\, \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}{x}\right)}{(-a^2 + 1)^{5/2}} + \frac{5 a^4 b}{(-a^2 + 1) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}$$
$$+ \frac{12 a^3 b}{(-a^2 + 1) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{12 a^2 b}{(-a^2 + 1) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{6 b^2 (-2 b^2 x - 2 a b)}{\left(-4 b^2 (-a^2 + 1) - 4 a^2 b^2\right) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}$$
$$- \frac{3 a b \ln\left(\frac{-2 a^2 + 2 - 2 a b x + 2 \sqrt{-a^2 + 1}\, \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}{x}\right)}{(-a^2 + 1)^{5/2}} - \frac{6 a b \ln\left(\frac{-2 a^2 + 2 - 2 a b x + 2 \sqrt{-a^2 + 1}\, \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}{x}\right)}{(-a^2 + 1)^{3/2}}$$
$$- \frac{b^2 a x}{\sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} - \frac{3 b \ln\left(\frac{-2 a^2 + 2 - 2 a b x + 2 \sqrt{-a^2 + 1}\, \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}{x}\right) a^2}{(-a^2 + 1)^{3/2}} + \frac{3 a b}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}$$
$$+ \frac{12 a^3 b}{(-a^2 + 1)^2 \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{2 b^2 x}{(-a^2 + 1) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}} + \frac{8 a b}{(-a^2 + 1) \sqrt{-b^2 x^2 - 2 a b x - a^2 + 1}}$$

$$-\frac{a^3}{(-a^2+1)x\sqrt{-b^2x^2-2abx-a^2+1}}-\frac{3a^2}{(-a^2+1)x\sqrt{-b^2x^2-2abx-a^2+1}}-\frac{3a}{(-a^2+1)x\sqrt{-b^2x^2-2abx-a^2+1}}$$

$$-\frac{1}{(-a^2+1)x\sqrt{-b^2x^2-2abx-a^2+1}}-\frac{b\,a^2}{\sqrt{-b^2x^2-2abx-a^2+1}}+\frac{3b}{(-a^2+1)\sqrt{-b^2x^2-2abx-a^2+1}}$$

$$-\frac{3b\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\sqrt{-b^2x^2-2abx-a^2+1}}{x}\right)}{(-a^2+1)^{3/2}}+\frac{b}{\sqrt{-b^2x^2-2abx-a^2+1}}$$

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Problem 229: Result more than twice size of optimal antiderivative.
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$$\int\frac{x^3\sqrt{1-(bx+a)^2}}{bx+a+1}\,dx$$

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Optimal(type 3, 136 leaves, 7 steps):
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$$-\frac{(8a^3+12a^2+12a+3)\arcsin(bx+a)}{8b^4}-\frac{x^2(-bx-a+1)^{3/2}\sqrt{bx+a+1}}{4b^2}-\frac{(-bx-a+1)^{3/2}(7+10a+18a^2-2(1+6a)bx)\sqrt{bx+a+1}}{24b^4}$$

$$-\frac{(8a^3+12a^2+12a+3)\sqrt{-bx-a+1}\sqrt{bx+a+1}}{8b^4}$$

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Result(type 3, 808 leaves):
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$$\frac{3a^2\sqrt{-b^2x^2-2abx-a^2+1}\,x}{2b^3}+\frac{3a^2\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{2b^3\sqrt{b^2}}+\frac{3\sqrt{-b^2x^2-2abx-a^2+1}\,xa}{2b^3}$$

$$-\frac{\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}}{b^4}-\frac{\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}\,a^3}{b^4}-\frac{3\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}\,a^2}{b^4}$$

$$-\frac{3\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}\,a}{b^4}-\frac{\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{1+a}{b}-\frac{1}{b}\right)}{\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}}\right)}{b^3\sqrt{b^2}}+\frac{3\sqrt{-b^2x^2-2abx-a^2+1}\,a^2}{2b^4}$$

$$-\frac{x(-b^2x^2-2abx-a^2+1)^{3/2}}{4b^3}+\frac{3a(-b^2x^2-2abx-a^2+1)^{3/2}}{4b^4}+\frac{3a^3\sqrt{-b^2x^2-2abx-a^2+1}}{2b^4}+\frac{5\sqrt{-b^2x^2-2abx-a^2+1}\,x}{8b^3}$$

$$+\frac{5\sqrt{-b^2x^2-2abx-a^2+1}\;a}{8b^4}+\frac{5\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{8b^3\sqrt{b^2}}+\frac{\left(-b^2x^2-2abx-a^2+1\right)^{3/2}}{3b^4}$$

$$+\frac{3a\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{2b^3\sqrt{b^2}}-\frac{\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{1+a}{b}-\frac{1}{b}\right)}{\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}}\right)a^3}{b^3\sqrt{b^2}}$$

$$-\frac{3\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{1+a}{b}-\frac{1}{b}\right)}{\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}}\right)a^2}{b^3\sqrt{b^2}}-\frac{3\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{1+a}{b}-\frac{1}{b}\right)}{\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}}\right)a}{b^3\sqrt{b^2}}$$

Problem 230: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{1-(bx+a)^2}}{(bx+a+1)x^2}\,dx$$

Optimal(type 3, 80 leaves, 4 steps):

$$\frac{2b\operatorname{arctanh}\left(\frac{\sqrt{1-a}\sqrt{bx+a+1}}{\sqrt{1+a}\sqrt{-bx-a+1}}\right)}{(1+a)\sqrt{-a^2+1}}-\frac{\sqrt{-bx-a+1}\sqrt{bx+a+1}}{(1+a)x}$$

Result(type 3, 564 leaves):

$$-\frac{\left(-b^2x^2-2abx-a^2+1\right)^{3/2}}{(1+a)\left(-a^2+1\right)x}-\frac{2ab\sqrt{-b^2x^2-2abx-a^2+1}}{(1+a)\left(-a^2+1\right)}+\frac{a^2b^2\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{(1+a)\left(-a^2+1\right)\sqrt{b^2}}$$

$$+\frac{ab\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\sqrt{-b^2x^2-2abx-a^2+1}}{x}\right)}{(1+a)\sqrt{-a^2+1}}-\frac{b^2\sqrt{-b^2x^2-2abx-a^2+1}\;x}{(1+a)\left(-a^2+1\right)}-\frac{b^2\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{(1+a)\left(-a^2+1\right)\sqrt{b^2}}$$

$$+\frac{b\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}}{(1+a)^2}+\frac{b^2\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{1+a}{b}-\frac{1}{b}\right)}{\sqrt{-b^2\left(x+\frac{1+a}{b}\right)^2+2b\left(x+\frac{1+a}{b}\right)}}\right)}{(1+a)^2\sqrt{b^2}}-\frac{b\sqrt{-b^2x^2-2abx-a^2+1}}{(1+a)^2}$$

$$+\frac{b^2a\arctan\left(\frac{\sqrt{b^2}\left(x+\frac{a}{b}\right)}{\sqrt{-b^2x^2-2abx-a^2+1}}\right)}{(1+a)^2\sqrt{b^2}}+\frac{b\sqrt{-a^2+1}\ln\left(\frac{-2a^2+2-2abx+2\sqrt{-a^2+1}\sqrt{-b^2x^2-2abx-a^2+1}}{x}\right)}{(1+a)^2}$$

Problem 231: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(1-(bx+a)^2\right)^{3/2}}{(bx+a+1)^3x^3}\,dx$$

Optimal(type 3, 174 leaves, 6 steps):

$$-\frac{3(3-2a)b^2\operatorname{arctanh}\left(\frac{\sqrt{1-a}\sqrt{bx+a+1}}{\sqrt{1+a}\sqrt{-bx-a+1}}\right)}{(1+a)^3\sqrt{-a^2+1}}+\frac{(3-2a)b(-bx-a+1)^{3/2}}{2(1-a)(1+a)^2x\sqrt{bx+a+1}}-\frac{(-bx-a+1)^{5/2}}{2\left(-a^2+1\right)x^2\sqrt{bx+a+1}}$$

$$+\frac{3(3-2a)b^2\sqrt{-bx-a+1}}{(1-a)(1+a)^3\sqrt{bx+a+1}}$$

Result(type ?, 2847 leaves): Display of huge result suppressed!

Problem 232: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(1-(bx+a)^2\right)^{3/2}}{(bx+a+1)^3x^4}\,dx$$

Optimal(type 3, 223 leaves, 8 steps):

$$\frac{\left(6a^2-18a+11\right)b^3\operatorname{arctanh}\left(\frac{\sqrt{1-a}\sqrt{bx+a+1}}{\sqrt{1+a}\sqrt{-bx-a+1}}\right)}{(1-a)(1+a)^4\sqrt{-a^2+1}}-\frac{\left(2a^2-51a+52\right)b^3\sqrt{-bx-a+1}}{6(1-a)(1+a)^4\sqrt{bx+a+1}}-\frac{(1-a)\sqrt{-bx-a+1}}{3(1+a)x^3\sqrt{bx+a+1}}$$

$$+\frac{7b\sqrt{-bx-a+1}}{6(1+a)^2x^2\sqrt{bx+a+1}}-\frac{(19-16a)b^2\sqrt{-bx-a+1}}{6(1-a)(1+a)^3x\sqrt{bx+a+1}}$$

Result(type ?, 4211 leaves): Display of huge result suppressed!

Problem 233: Unable to integrate problem.

$$\int e^{n\operatorname{arctanh}(bx+a)}x^3\,dx$$

Optimal(type 5, 180 leaves, 4 steps):

$$-\frac{x^2 (-b x-a+1)^{1-\frac{n}{2}} (b x+a+1)^{1+\frac{n}{2}}}{4 b^2}-\frac{(-b x-a+1)^{1-\frac{n}{2}} (b x+a+1)^{1+\frac{n}{2}} \left(6+18 a^2-10 a n+n^2-2 b (6 a-n) x\right)}{24 b^4}$$
$$+\frac{2^{-2+\frac{n}{2}} \left(24 a^3-36 a^2 n+12 a \left(n^2+2\right)-n \left(n^2+8\right)\right) (-b x-a+1)^{1-\frac{n}{2}} \operatorname{hypergeom}\left(\left[-\frac{n}{2}, 1-\frac{n}{2}\right], \left[2-\frac{n}{2}\right], -\frac{b x}{2}-\frac{a}{2}+\frac{1}{2}\right)}{3 b^4 (2-n)}$$

Result(type 8, 15 leaves):

$$\int e^{n \operatorname{arctanh}(b x+a)} x^3 \, dx$$

Problem 234: Unable to integrate problem.

$$\int e^{n \operatorname{arctanh}(b x+a)} x \, dx$$

Optimal(type 5, 96 leaves, 3 steps):

$$-\frac{(-b x-a+1)^{1-\frac{n}{2}} (b x+a+1)^{1+\frac{n}{2}}}{2 b^2}+\frac{2^{\frac{n}{2}} (2 a-n) (-b x-a+1)^{1-\frac{n}{2}} \operatorname{hypergeom}\left(\left[-\frac{n}{2}, 1-\frac{n}{2}\right], \left[2-\frac{n}{2}\right], -\frac{b x}{2}-\frac{a}{2}+\frac{1}{2}\right)}{b^2 (2-n)}$$

Result(type 8, 13 leaves):

$$\int e^{n \operatorname{arctanh}(b x+a)} x \, dx$$

Problem 235: Unable to integrate problem.

$$\int e^{n \operatorname{arctanh}(b x+a)} \, dx$$

Optimal(type 5, 59 leaves, 2 steps):

$$-\frac{2^{1+\frac{n}{2}} (-b x-a+1)^{1-\frac{n}{2}} \operatorname{hypergeom}\left(\left[-\frac{n}{2}, 1-\frac{n}{2}\right], \left[2-\frac{n}{2}\right], -\frac{b x}{2}-\frac{a}{2}+\frac{1}{2}\right)}{b (2-n)}$$

Result(type 8, 11 leaves):

$$\int e^{n \operatorname{arctanh}(b x+a)} \, dx$$

Problem 236: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(b x+a)}}{x^2} \, dx$$

Optimal(type 5, 86 leaves, 2 steps):

$$-\frac{4 b (-b x - a + 1)^{1-\frac{n}{2}} (b x + a + 1)^{-1+\frac{n}{2}} \mathrm{hypergeom}\left(\left[2, 1-\frac{n}{2}\right], \left[2-\frac{n}{2}\right], \frac{(1+a)(-b x - a + 1)}{(1-a)(b x + a + 1)}\right)}{(1-a)^2 (2-n)}$$

Result(type 8, 15 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(b x + a)}}{x^2} \, dx$$

Problem 239: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x + 1) x^6}{\sqrt{-x^2 a^2 + 1}\, (-a^2 c x^2 + c)^3} \, dx$$

Optimal(type 3, 117 leaves, 6 steps):

$$\frac{x^5 (a x + 1)}{5 a^2 c^3 (-x^2 a^2 + 1)^{5/2}} - \frac{x^3 (6 a x + 5)}{15 a^4 c^3 (-x^2 a^2 + 1)^{3/2}} - \frac{\arcsin(a x)}{a^7 c^3} + \frac{x (8 a x + 5)}{5 a^6 c^3 \sqrt{-x^2 a^2 + 1}} + \frac{16 \sqrt{-x^2 a^2 + 1}}{5 a^7 c^3}$$

Result(type 3, 261 leaves):

$$-\frac{\arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-x^2 a^2 + 1}}\right)}{c^3 a^6 \sqrt{a^2}} + \frac{\sqrt{-x^2 a^2 + 1}}{a^7 c^3} - \frac{\sqrt{-\left(x - \frac{1}{a}\right)^2 a^2 - 2 a \left(x - \frac{1}{a}\right)}}{20 c^3 a^{10} \left(x - \frac{1}{a}\right)^3} - \frac{23 \sqrt{-\left(x - \frac{1}{a}\right)^2 a^2 - 2 a \left(x - \frac{1}{a}\right)}}{60 c^3 a^9 \left(x - \frac{1}{a}\right)^2}$$

$$- \frac{493 \sqrt{-\left(x - \frac{1}{a}\right)^2 a^2 - 2 a \left(x - \frac{1}{a}\right)}}{240 c^3 a^8 \left(x - \frac{1}{a}\right)} - \frac{\sqrt{-\left(x + \frac{1}{a}\right)^2 a^2 + 2 a \left(x + \frac{1}{a}\right)}}{24 c^3 a^9 \left(x + \frac{1}{a}\right)^2} + \frac{25 \sqrt{-\left(x + \frac{1}{a}\right)^2 a^2 + 2 a \left(x + \frac{1}{a}\right)}}{48 c^3 a^8 \left(x + \frac{1}{a}\right)}$$

Problem 254: Unable to integrate problem.

$$\int \frac{(a x + 1) x^m}{\sqrt{-x^2 a^2 + 1}\, (-a^2 c x^2 + c)} \, dx$$

Optimal(type 5, 72 leaves, 4 steps):

$$\frac{x^{1+m} \mathrm{hypergeom}\left(\left[\frac{3}{2}, \frac{1}{2} + \frac{m}{2}\right], \left[\frac{3}{2} + \frac{m}{2}\right], x^2 a^2\right)}{c (1+m)} + \frac{a x^{2+m} \mathrm{hypergeom}\left(\left[\frac{3}{2}, 1 + \frac{m}{2}\right], \left[2 + \frac{m}{2}\right], x^2 a^2\right)}{c (2+m)}$$

Result(type 8, 36 leaves):

$$\int \frac{(a x + 1) x^m}{\sqrt{-x^2 a^2 + 1}\, (-a^2 c x^2 + c)} \, dx$$

Problem 255: Result more than twice size of optimal antiderivative.

$$\int (a x+1) \left(-x^2 a^2+1\right) x^m \, dx$$

Optimal(type 3, 54 leaves, 3 steps):

$$\frac{x^{1+m}}{1+m}+\frac{a x^{2+m}}{2+m}-\frac{a^2 x^{3+m}}{3+m}-\frac{a^3 x^{4+m}}{4+m}$$

Result(type 3, 141 leaves):

$$-\frac{1}{(4+m)(3+m)(2+m)(1+m)}\left(x^{1+m}\left(a^3 m^3 x^3+6 a^3 m^2 x^3+11 a^3 m x^3+a^2 m^3 x^2+6 a^3 x^3+7 a^2 m^2 x^2+14 a^2 m x^2-a m^3 x+8 x^2 a^2-8 a m^2 x-19 a m x-m^3-12 a x-9 m^2-26 m-24\right)\right)$$

Problem 257: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1) x^m}{-x^2 a^2+1} \, dx$$

Optimal(type 5, 24 leaves, 2 steps):

$$\frac{x^{1+m} \mathrm{hypergeom}([1, 1+m], [2+m], a x)}{1+m}$$

Result(type 5, 99 leaves):

$$-\frac{(-a^2)^{-\frac{m}{2}}\left(-\frac{2 x^m (-a^2)^{\frac{m}{2}}(-m-2)}{(2+m) m}-x^m (-a^2)^{\frac{m}{2}} \mathrm{LerchPhi}\left(x^2 a^2, 1, \frac{m}{2}\right)\right)}{2 a}+\frac{x^{1+m}\left(\frac{1}{2}+\frac{m}{2}\right) \mathrm{LerchPhi}\left(x^2 a^2, 1, \frac{1}{2}+\frac{m}{2}\right)}{1+m}$$

Problem 258: Result more than twice size of optimal antiderivative.

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

Optimal(type 5, 66 leaves, 6 steps):

$$\frac{x^{1+m} \mathrm{hypergeom}\left(\left[2, \frac{1}{2}+\frac{m}{2}\right], \left[\frac{3}{2}+\frac{m}{2}\right], x^2 a^2\right)}{1+m}+\frac{a x^{2+m} \mathrm{hypergeom}\left(\left[2, 1+\frac{m}{2}\right], \left[2+\frac{m}{2}\right], x^2 a^2\right)}{2+m}$$

Result(type 5, 176 leaves):

$$-\frac{(-a^2)^{-\frac{m}{2}}\left(\frac{x^m (-a^2)^{\frac{m}{2}}(-m-2)}{(2+m)\left(-x^2 a^2+1\right)}+\frac{x^m (-a^2)^{\frac{m}{2}} m \, \mathrm{LerchPhi}\left(x^2 a^2, 1, \frac{m}{2}\right)}{2}\right)}{2 a}$$

$$+\frac{(-a^2)^{-\frac{1}{2}-\frac{m}{2}}\left(-\frac{2x^{1+m}(-a^2)^{\frac{1}{2}+\frac{m}{2}}(-1-m)}{(1+m)(-2x^2a^2+2)}+\frac{2x^{1+m}(-a^2)^{\frac{1}{2}+\frac{m}{2}}\left(-\frac{m^2}{4}+\frac{1}{4}\right)\mathrm{LerchPhi}\left(x^2a^2,1,\frac{1}{2}+\frac{m}{2}\right)}{1+m}\right)}{2}$$

Problem 259: Result more than twice size of optimal antiderivative.

$$\int\frac{(ax+1)x^m}{(-x^2a^2+1)^3}\,dx$$

Optimal(type 5, 66 leaves, 6 steps):

$$\frac{x^{1+m}\mathrm{hypergeom}\left(\left[3,\frac{1}{2}+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],x^2a^2\right)}{1+m}+\frac{a\,x^{2+m}\mathrm{hypergeom}\left(\left[3,1+\frac{m}{2}\right],\left[2+\frac{m}{2}\right],x^2a^2\right)}{2+m}$$

Result(type 5, 223 leaves):

$$\frac{1}{4}\left((-a^2)^{-\frac{1}{2}-\frac{m}{2}}\left(\frac{x^{1+m}(-a^2)^{\frac{1}{2}+\frac{m}{2}}(a^2m^2x^2-2a^2mx^2-3x^2a^2-m^2+4m+5)}{2(1+m)(-x^2a^2+1)^2}\right.\right.$$
$$\left.\left.+\frac{4x^{1+m}(-a^2)^{\frac{1}{2}+\frac{m}{2}}\left(\frac{1}{16}m^3-\frac{3}{16}m^2-\frac{1}{16}m+\frac{3}{16}\right)\mathrm{LerchPhi}\left(x^2a^2,1,\frac{1}{2}+\frac{m}{2}\right)}{1+m}\right)\right)$$
$$-\frac{(-a^2)^{-\frac{m}{2}}\left(-\frac{x^m(-a^2)^{\frac{m}{2}}(a^2mx^2-m+2)}{2(-x^2a^2+1)^2}-\frac{x^m(-a^2)^{\frac{m}{2}}(m-2)\,m\,\mathrm{LerchPhi}\left(x^2a^2,1,\frac{m}{2}\right)}{4}\right)}{4a}$$

Problem 260: Unable to integrate problem.

$$\int\frac{(ax+1)x^m}{\sqrt{-x^2a^2+1}\,(-a^2cx^2+c)^{3/2}}\,dx$$

Optimal(type 5, 122 leaves, 7 steps):

$$\frac{x^{1+m}\mathrm{hypergeom}\left(\left[2,\frac{1}{2}+\frac{m}{2}\right],\left[\frac{3}{2}+\frac{m}{2}\right],x^2a^2\right)\sqrt{-x^2a^2+1}}{c(1+m)\sqrt{-a^2cx^2+c}}+\frac{a\,x^{2+m}\mathrm{hypergeom}\left(\left[2,1+\frac{m}{2}\right],\left[2+\frac{m}{2}\right],x^2a^2\right)\sqrt{-x^2a^2+1}}{c(2+m)\sqrt{-a^2cx^2+c}}$$

Result(type 8, 36 leaves):

$$\int \frac{(a x+1) x^m}{\sqrt{-x^2 a^2+1}\,(-a^2 c x^2+c)^{3/2}}\,dx$$

Problem 261: Unable to integrate problem.

$$\int \frac{(a x+1) x^m (-a^2 c x^2+c)^p}{\sqrt{-x^2 a^2+1}}\,dx$$

Optimal(type 5, 128 leaves, 5 steps):

$$\frac{x^{1+m} (-a^2 c x^2+c)^p \operatorname{hypergeom}\left(\left[\frac{1}{2}-p, \frac{1}{2}+\frac{m}{2}\right], \left[\frac{3}{2}+\frac{m}{2}\right], x^2 a^2\right)}{(1+m) (-x^2 a^2+1)^p}+\frac{a x^{2+m} (-a^2 c x^2+c)^p \operatorname{hypergeom}\left(\left[1+\frac{m}{2}, \frac{1}{2}-p\right], \left[2+\frac{m}{2}\right], x^2 a^2\right)}{(2+m) (-x^2 a^2+1)^p}$$

Result(type 8, 36 leaves):

$$\int \frac{(a x+1) x^m (-a^2 c x^2+c)^p}{\sqrt{-x^2 a^2+1}}\,dx$$

Problem 263: Unable to integrate problem.

$$\int \frac{(a x+1) x^3 (-a^2 c x^2+c)^p}{\sqrt{-x^2 a^2+1}}\,dx$$

Optimal(type 5, 124 leaves, 7 steps):

$$\frac{(-x^2 a^2+1)^{3/2} (-a^2 c x^2+c)^p}{a^4 (3+2 p)}+\frac{a x^5 (-a^2 c x^2+c)^p \operatorname{hypergeom}\left(\left[\frac{5}{2}, \frac{1}{2}-p\right], \left[\frac{7}{2}\right], x^2 a^2\right)}{5 (-x^2 a^2+1)^p}-\frac{(-a^2 c x^2+c)^p \sqrt{-x^2 a^2+1}}{a^4 (1+2 p)}$$

Result(type 8, 36 leaves):

$$\int \frac{(a x+1) x^3 (-a^2 c x^2+c)^p}{\sqrt{-x^2 a^2+1}}\,dx$$

Problem 264: Unable to integrate problem.

$$\int \frac{(a x+1) x (-a^2 c x^2+c)^p}{\sqrt{-x^2 a^2+1}}\,dx$$

Optimal(type 5, 88 leaves, 5 steps):

$$\frac{a x^3 (-a^2 c x^2+c)^p \operatorname{hypergeom}\left(\left[\frac{3}{2}, \frac{1}{2}-p\right], \left[\frac{5}{2}\right], x^2 a^2\right)}{3 (-x^2 a^2+1)^p}-\frac{(-a^2 c x^2+c)^p \sqrt{-x^2 a^2+1}}{a^2 (1+2 p)}$$

Result(type 8, 34 leaves):

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

Problem 265: Unable to integrate problem.

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

Optimal(type 5, 74 leaves, 3 steps):

$$-\frac{2^{\frac{3}{2}+p} (-a x+1)^{\frac{1}{2}+p} \left(-a^2 c x^2+c\right)^p \operatorname{hypergeom}\left(\left[\frac{1}{2}+p, -\frac{1}{2}-p\right], \left[\frac{3}{2}+p\right], -\frac{a x}{2}+\frac{1}{2}\right)}{a (1+2 p) \left(-x^2 a^2+1\right)^p}$$

Result(type 8, 33 leaves):

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

Problem 282: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2 \sqrt{-a^2 c x^2+c}}{\left(-x^2 a^2+1\right) x^3}\, dx$$

Optimal(type 3, 64 leaves, 6 steps):

$$-\frac{3 a^2 \operatorname{arctanh}\left(\frac{\sqrt{-a^2 c x^2+c}}{\sqrt{c}}\right) \sqrt{c}}{2} - \frac{\sqrt{-a^2 c x^2+c}}{2 x^2} - \frac{2 a \sqrt{-a^2 c x^2+c}}{x}$$

Result(type 3, 238 leaves):

$$-\frac{\left(-a^2 c x^2+c\right)^{3/2}}{2 c x^2} - \frac{3 \sqrt{c} \ln\left(\frac{2 c+2 \sqrt{c} \sqrt{-a^2 c x^2+c}}{x}\right) a^2}{2} + \frac{3 \sqrt{-a^2 c x^2+c}\, a^2}{2} - \frac{2 a \left(-a^2 c x^2+c\right)^{3/2}}{c x} - 2 a^3 x \sqrt{-a^2 c x^2+c}$$

$$-\frac{2 a^3 c \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2+c}}\right)}{\sqrt{a^2 c}} - 2 a^2 \sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2 - 2 \left(x-\frac{1}{a}\right) a c} + \frac{2 a^3 c \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2 - 2 \left(x-\frac{1}{a}\right) a c}}\right)}{\sqrt{a^2 c}}$$

Problem 283: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2 x^2 \left(-a^2 c x^2+c\right)^{3/2}}{-x^2 a^2+1}\, dx$$

Optimal(type 3, 112 leaves, 7 steps):

$$-\frac{2 x^2 \left(-a^2 c x^2+c\right)^{3/2}}{5 a}-\frac{x^3 \left(-a^2 c x^2+c\right)^{3/2}}{6}-\frac{(45 a x+32) \left(-a^2 c x^2+c\right)^{3/2}}{120 a^3}+\frac{3 c^{3/2} \arctan\left(\frac{a x \sqrt{c}}{\sqrt{-a^2 c x^2+c}}\right)}{16 a^3}+\frac{3 c x \sqrt{-a^2 c x^2+c}}{16 a^2}$$

Result(type 3, 243 leaves):

$$\frac{x \left(-a^2 c x^2+c\right)^{5/2}}{6 a^2 c}-\frac{13 x \left(-a^2 c x^2+c\right)^{3/2}}{24 a^2}-\frac{13 c x \sqrt{-a^2 c x^2+c}}{16 a^2}-\frac{13 c^2 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2+c}}\right)}{16 a^2 \sqrt{a^2 c}}+\frac{2 \left(-a^2 c x^2+c\right)^{5/2}}{5 a^3 c}$$
$$-\frac{2 \left(-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c\right)^{3/2}}{3 a^3}+\frac{c \sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}\; x}{a^2}+\frac{c^2 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}}\right)}{a^2 \sqrt{a^2 c}}$$

Problem 284: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2 x \left(-a^2 c x^2+c\right)^{3/2}}{-x^2 a^2+1}\, dx$$

Optimal(type 3, 91 leaves, 6 steps):

$$-\frac{x^2 \left(-a^2 c x^2+c\right)^{3/2}}{5}-\frac{(15 a x+14) \left(-a^2 c x^2+c\right)^{3/2}}{30 a^2}+\frac{c^{3/2} \arctan\left(\frac{a x \sqrt{c}}{\sqrt{-a^2 c x^2+c}}\right)}{4 a^2}+\frac{c x \sqrt{-a^2 c x^2+c}}{4 a}$$

Result(type 3, 221 leaves):

$$\frac{\left(-a^2 c x^2+c\right)^{5/2}}{5 a^2 c}-\frac{x \left(-a^2 c x^2+c\right)^{3/2}}{2 a}-\frac{3 c x \sqrt{-a^2 c x^2+c}}{4 a}-\frac{3 c^2 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2+c}}\right)}{4 a \sqrt{a^2 c}}-\frac{2 \left(-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c\right)^{3/2}}{3 a^2}$$
$$+\frac{c \sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}\; x}{a}+\frac{c^2 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}}\right)}{a \sqrt{a^2 c}}$$

Problem 285: Result more than twice size of optimal antiderivative.

$$\int \frac{(ax+1)^2 \left(-a^2 c x^2 + c\right)^{3/2}}{-x^2 a^2 + 1}\, dx$$

Optimal(type 3, 87 leaves, 6 steps):

$$-\frac{5 \left(-a^2 c x^2 + c\right)^{3/2}}{12 a} - \frac{(ax+1) \left(-a^2 c x^2 + c\right)^{3/2}}{4 a} + \frac{5 c^{3/2} \arctan\left(\frac{a x \sqrt{c}}{\sqrt{-a^2 c x^2 + c}}\right)}{8 a} + \frac{5 c x \sqrt{-a^2 c x^2 + c}}{8}$$

Result(type 3, 185 leaves):

$$-\frac{x \left(-a^2 c x^2 + c\right)^{3/2}}{4} - \frac{3 c x \sqrt{-a^2 c x^2 + c}}{8} - \frac{3 c^2 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2 + c}}\right)}{8 \sqrt{a^2 c}} - \frac{2 \left(-c \left(x - \frac{1}{a}\right)^2 a^2 - 2 \left(x - \frac{1}{a}\right) a c\right)^{3/2}}{3 a}$$
$$+ c \sqrt{-c \left(x - \frac{1}{a}\right)^2 a^2 - 2 \left(x - \frac{1}{a}\right) a c}\; x + \frac{c^2 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-c \left(x - \frac{1}{a}\right)^2 a^2 - 2 \left(x - \frac{1}{a}\right) a c}}\right)}{\sqrt{a^2 c}}$$

Problem 286: Result more than twice size of optimal antiderivative.

$$\int \frac{(ax+1)^2 \left(-a^2 c x^2 + c\right)^{3/2}}{\left(-x^2 a^2 + 1\right) x^4}\, dx$$

Optimal(type 3, 97 leaves, 9 steps):

$$-\frac{\left(-a^2 c x^2 + c\right)^{3/2}}{3 x^3} - a^3 c^{3/2} \arctan\left(\frac{a x \sqrt{c}}{\sqrt{-a^2 c x^2 + c}}\right) + a^3 c^{3/2} \operatorname{arctanh}\left(\frac{\sqrt{-a^2 c x^2 + c}}{\sqrt{c}}\right) - \frac{a c (ax+1) \sqrt{-a^2 c x^2 + c}}{x^2}$$

Result(type 3, 338 leaves):

$$-\frac{\left(-a^2 c x^2 + c\right)^{5/2}}{3 c x^3} - \frac{4 a^2 \left(-a^2 c x^2 + c\right)^{5/2}}{3 c x} - \frac{4 a^4 x \left(-a^2 c x^2 + c\right)^{3/2}}{3} - 2 a^4 c x \sqrt{-a^2 c x^2 + c} - \frac{2 a^4 c^2 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2 + c}}\right)}{\sqrt{a^2 c}} - \frac{a \left(-a^2 c x^2 + c\right)^{5/2}}{c x^2}$$
$$- \frac{a^3 \left(-a^2 c x^2 + c\right)^{3/2}}{3} + a^3 c^{3/2} \ln\left(\frac{2 c + 2 \sqrt{c} \sqrt{-a^2 c x^2 + c}}{x}\right) - a^3 c \sqrt{-a^2 c x^2 + c} - \frac{2 a^3 \left(-c \left(x - \frac{1}{a}\right)^2 a^2 - 2 \left(x - \frac{1}{a}\right) a c\right)^{3/2}}{3}$$

$$+a^4 c \sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2 - 2 \left(x-\frac{1}{a}\right) a c}\; x + \frac{a^4 c^2 \arctan\left(\frac{\sqrt{a^2 c}\; x}{\sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2 - 2 \left(x-\frac{1}{a}\right) a c}}\right)}{\sqrt{a^2 c}}$$

Problem 287: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2 x^2 \left(-a^2 c x^2+c\right)^{5/2}}{-x^2 a^2+1}\, dx$$

Optimal(type 3, 134 leaves, 8 steps):

$$\frac{11 c x \left(-a^2 c x^2+c\right)^{3/2}}{192 a^2} - \frac{2 x^2 \left(-a^2 c x^2+c\right)^{5/2}}{7 a} - \frac{x^3 \left(-a^2 c x^2+c\right)^{5/2}}{8} - \frac{(385 a x+192) \left(-a^2 c x^2+c\right)^{5/2}}{1680 a^3} + \frac{11 c^{5/2} \arctan\left(\frac{a x \sqrt{c}}{\sqrt{-a^2 c x^2+c}}\right)}{128 a^3}$$
$$+ \frac{11 c^2 x \sqrt{-a^2 c x^2+c}}{128 a^2}$$

Result(type 3, 305 leaves):

$$\frac{x \left(-a^2 c x^2+c\right)^{7/2}}{8 a^2 c} - \frac{17 x \left(-a^2 c x^2+c\right)^{5/2}}{48 a^2} - \frac{85 c x \left(-a^2 c x^2+c\right)^{3/2}}{192 a^2} - \frac{85 c^2 x \sqrt{-a^2 c x^2+c}}{128 a^2} - \frac{85 c^3 \arctan\left(\frac{\sqrt{a^2 c}\; x}{\sqrt{-a^2 c x^2+c}}\right)}{128 a^2 \sqrt{a^2 c}} + \frac{2 \left(-a^2 c x^2+c\right)^{7/2}}{7 a^3 c}$$
$$- \frac{2 \left(-c \left(x-\frac{1}{a}\right)^2 a^2 - 2 \left(x-\frac{1}{a}\right) a c\right)^{5/2}}{5 a^3} + \frac{c \left(-c \left(x-\frac{1}{a}\right)^2 a^2 - 2 \left(x-\frac{1}{a}\right) a c\right)^{3/2} x}{2 a^2} + \frac{3 c^2 \sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2 - 2 \left(x-\frac{1}{a}\right) a c}\; x}{4 a^2}$$
$$+ \frac{3 c^3 \arctan\left(\frac{\sqrt{a^2 c}\; x}{\sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2 - 2 \left(x-\frac{1}{a}\right) a c}}\right)}{4 a^2 \sqrt{a^2 c}}$$

Problem 288: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2 x \left(-a^2 c x^2+c\right)^{5/2}}{-x^2 a^2+1}\, dx$$

Optimal(type 3, 113 leaves, 7 steps):

$$\frac{c x \left(-a^2 c x^2+c\right)^{3/2}}{12 a}-\frac{x^2 \left(-a^2 c x^2+c\right)^{5/2}}{7}-\frac{(35 a x+27) \left(-a^2 c x^2+c\right)^{5/2}}{105 a^2}+\frac{c^{5/2} \arctan\left(\frac{a x \sqrt{c}}{\sqrt{-a^2 c x^2+c}}\right)}{8 a^2}+\frac{c^2 x \sqrt{-a^2 c x^2+c}}{8 a}$$

Result(type 3, 283 leaves):

$$\frac{\left(-a^2 c x^2+c\right)^{7/2}}{7 a^2 c}-\frac{x \left(-a^2 c x^2+c\right)^{5/2}}{3 a}-\frac{5 c x \left(-a^2 c x^2+c\right)^{3/2}}{12 a}-\frac{5 c^2 x \sqrt{-a^2 c x^2+c}}{8 a}-\frac{5 c^3 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2+c}}\right)}{8 a \sqrt{a^2 c}}$$
$$-\frac{2 \left(-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c\right)^{5/2}}{5 a^2}+\frac{c \left(-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c\right)^{3/2} x}{2 a}+\frac{3 c^2 \sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}\; x}{4 a}$$
$$+\frac{3 c^3 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}}\right)}{4 a \sqrt{a^2 c}}$$

Problem 289: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2 \left(-a^2 c x^2+c\right)^{5/2}}{-x^2 a^2+1}\, dx$$

Optimal(type 3, 106 leaves, 7 steps):

$$\frac{7 c x \left(-a^2 c x^2+c\right)^{3/2}}{24}-\frac{7 \left(-a^2 c x^2+c\right)^{5/2}}{30 a}-\frac{(a x+1) \left(-a^2 c x^2+c\right)^{5/2}}{6 a}+\frac{7 c^{5/2} \arctan\left(\frac{a x \sqrt{c}}{\sqrt{-a^2 c x^2+c}}\right)}{16 a}+\frac{7 c^2 x \sqrt{-a^2 c x^2+c}}{16}$$

Result(type 3, 241 leaves):

$$-\frac{x \left(-a^2 c x^2+c\right)^{5/2}}{6}-\frac{5 c x \left(-a^2 c x^2+c\right)^{3/2}}{24}-\frac{5 c^2 x \sqrt{-a^2 c x^2+c}}{16}-\frac{5 c^3 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2+c}}\right)}{16 \sqrt{a^2 c}}-\frac{2 \left(-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c\right)^{5/2}}{5 a}$$
$$+\frac{c \left(-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c\right)^{3/2} x}{2}+\frac{3 c^2 \sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}\; x}{4}+\frac{3 c^3 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}}\right)}{4 \sqrt{a^2 c}}$$

Problem 290: Result more than twice size of optimal antiderivative.

$$\int \frac{(ax+1)^2 \left(-a^2 c x^2+c\right)^{5/2}}{\left(-x^2 a^2+1\right) x^3}\, dx$$

Optimal(type 3, 125 leaves, 10 steps):

$$-\frac{ac(ax+12)\left(-a^2cx^2+c\right)^{3/2}}{6x}-\frac{\left(-a^2cx^2+c\right)^{5/2}}{2x^2}-3a^2c^{5/2}\arctan\left(\frac{ax\sqrt{c}}{\sqrt{-a^2cx^2+c}}\right)+\frac{a^2c^{5/2}\operatorname{arctanh}\left(\frac{\sqrt{-a^2cx^2+c}}{\sqrt{c}}\right)}{2}$$
$$-\frac{a^2c^2(6ax+1)\sqrt{-a^2cx^2+c}}{2}$$

Result(type 3, 398 leaves):

$$-\frac{\left(-a^2cx^2+c\right)^{7/2}}{2cx^2}-\frac{a^2\left(-a^2cx^2+c\right)^{5/2}}{10}-\frac{a^2c\left(-a^2cx^2+c\right)^{3/2}}{6}+\frac{a^2c^{5/2}\ln\left(\frac{2c+2\sqrt{c}\sqrt{-a^2cx^2+c}}{x}\right)}{2}-\frac{a^2c^2\sqrt{-a^2cx^2+c}}{2}$$
$$-\frac{2a\left(-a^2cx^2+c\right)^{7/2}}{cx}-2a^3x\left(-a^2cx^2+c\right)^{5/2}-\frac{5a^3cx\left(-a^2cx^2+c\right)^{3/2}}{2}-\frac{15a^3c^2x\sqrt{-a^2cx^2+c}}{4}-\frac{15a^3c^3\arctan\left(\frac{\sqrt{a^2c}\,x}{\sqrt{-a^2cx^2+c}}\right)}{4\sqrt{a^2c}}$$
$$-\frac{2a^2\left(-c\left(x-\frac{1}{a}\right)^2a^2-2\left(x-\frac{1}{a}\right)ac\right)^{5/2}}{5}+\frac{a^3c\left(-c\left(x-\frac{1}{a}\right)^2a^2-2\left(x-\frac{1}{a}\right)ac\right)^{3/2}x}{2}+\frac{3a^3c^2\sqrt{-c\left(x-\frac{1}{a}\right)^2a^2-2\left(x-\frac{1}{a}\right)ac}\;x}{4}$$
$$+\frac{3a^3c^3\arctan\left(\frac{\sqrt{a^2c}\,x}{\sqrt{-c\left(x-\frac{1}{a}\right)^2a^2-2\left(x-\frac{1}{a}\right)ac}}\right)}{4\sqrt{a^2c}}$$

Problem 291: Result more than twice size of optimal antiderivative.

$$\int \frac{(ax+1)^2\left(-a^2cx^2+c\right)^{7/2}}{-x^2a^2+1}\, dx$$

Optimal(type 3, 125 leaves, 8 steps):

$$\frac{15c^2x\left(-a^2cx^2+c\right)^{3/2}}{64}+\frac{3cx\left(-a^2cx^2+c\right)^{5/2}}{16}-\frac{9\left(-a^2cx^2+c\right)^{7/2}}{56a}-\frac{(ax+1)\left(-a^2cx^2+c\right)^{7/2}}{8a}+\frac{45c^{7/2}\arctan\left(\frac{ax\sqrt{c}}{\sqrt{-a^2cx^2+c}}\right)}{128a}$$

$$+\frac{45 c^3 x\sqrt{-a^2 c x^2+c}}{128}$$

Result(type 3, 295 leaves):

$$-\frac{x\left(-a^2 c x^2+c\right)^{7/2}}{8}-\frac{7 c x\left(-a^2 c x^2+c\right)^{5/2}}{48}-\frac{35 c^2 x\left(-a^2 c x^2+c\right)^{3/2}}{192}-\frac{35 c^3 x\sqrt{-a^2 c x^2+c}}{128}-\frac{35 c^4 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2+c}}\right)}{128\sqrt{a^2 c}}$$
$$-\frac{2\left(-c\left(x-\frac{1}{a}\right)^2 a^2-2\left(x-\frac{1}{a}\right) a c\right)^{7/2}}{7 a}+\frac{c\left(-c\left(x-\frac{1}{a}\right)^2 a^2-2\left(x-\frac{1}{a}\right) a c\right)^{5/2} x}{3}+\frac{5 c^2\left(-c\left(x-\frac{1}{a}\right)^2 a^2-2\left(x-\frac{1}{a}\right) a c\right)^{3/2} x}{12}$$
$$+\frac{5 c^3\sqrt{-c\left(x-\frac{1}{a}\right)^2 a^2-2\left(x-\frac{1}{a}\right) a c}\; x}{8}+\frac{5 c^4 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-c\left(x-\frac{1}{a}\right)^2 a^2-2\left(x-\frac{1}{a}\right) a c}}\right)}{8\sqrt{a^2 c}}$$

Problem 295: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2 x^2}{\left(-x^2 a^2+1\right)\left(-a^2 c x^2+c\right)^{3/2}}\, dx$$

Optimal(type 3, 79 leaves, 5 steps):

$$\frac{(a x+1)^2}{3 a^3\left(-a^2 c x^2+c\right)^{3/2}}+\frac{\arctan\left(\frac{a x\sqrt{c}}{\sqrt{-a^2 c x^2+c}}\right)}{a^3 c^{3/2}}-\frac{5(a x+1)}{3 a^3 c\sqrt{-a^2 c x^2+c}}$$

Result(type 3, 165 leaves):

$$-\frac{3 x}{a^2 c\sqrt{-a^2 c x^2+c}}+\frac{\arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2+c}}\right)}{a^2 c\sqrt{a^2 c}}-\frac{2}{a^3 c\sqrt{-a^2 c x^2+c}}-\frac{2}{3 a^4 c\left(x-\frac{1}{a}\right)\sqrt{-c\left(x-\frac{1}{a}\right)^2 a^2-2\left(x-\frac{1}{a}\right) a c}}$$
$$+\frac{4 x}{3 a^2 c\sqrt{-c\left(x-\frac{1}{a}\right)^2 a^2-2\left(x-\frac{1}{a}\right) a c}}$$

Problem 296: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^2}{(-x^2 a^2+1) x (-a^2 c x^2+c)^{3/2}}\, dx$$

Optimal(type 3, 68 leaves, 7 steps):

$$\frac{2 (a x+1)}{3 (-a^2 c x^2+c)^{3/2}}-\frac{\operatorname{arctanh}\left(\frac{\sqrt{-a^2 c x^2+c}}{\sqrt{c}}\right)}{c^{3/2}}+\frac{4 a x+3}{3 c \sqrt{-a^2 c x^2+c}}$$

Result(type 3, 151 leaves):

$$\frac{1}{c \sqrt{-a^2 c x^2+c}}-\frac{\ln\left(\frac{2 c+2 \sqrt{c}\, \sqrt{-a^2 c x^2+c}}{x}\right)}{c^{3/2}}-\frac{2}{3 c a \left(x-\frac{1}{a}\right) \sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}}-\frac{2 \left(-2 c \left(x-\frac{1}{a}\right) a^2-2 c a\right)}{3 a c^2 \sqrt{-c \left(x-\frac{1}{a}\right)^2 a^2-2 \left(x-\frac{1}{a}\right) a c}}$$

Problem 298: Unable to integrate problem.

$$\int \frac{(a x+1)^2 x^m (-a^2 c x^2+c)^{3/2}}{-x^2 a^2+1}\, dx$$

Optimal(type 5, 154 leaves, 7 steps):

$$-\frac{x^{1+m} (-a^2 c x^2+c)^{3/2}}{4+m}+\frac{c (5+2 m) x^{1+m} \operatorname{hypergeom}\left(\left[-\frac{1}{2}, \frac{1}{2}+\frac{m}{2}\right], \left[\frac{3}{2}+\frac{m}{2}\right], x^2 a^2\right) \sqrt{-a^2 c x^2+c}}{(1+m) (4+m) \sqrt{-x^2 a^2+1}}$$
$$+\frac{2 a c x^{2+m} \operatorname{hypergeom}\left(\left[-\frac{1}{2}, 1+\frac{m}{2}\right], \left[2+\frac{m}{2}\right], x^2 a^2\right) \sqrt{-a^2 c x^2+c}}{(2+m) \sqrt{-x^2 a^2+1}}$$

Result(type 8, 38 leaves):

$$\int \frac{(a x+1)^2 x^m (-a^2 c x^2+c)^{3/2}}{-x^2 a^2+1}\, dx$$

Problem 300: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^3 (-a^2 c x^2+c)}{(-x^2 a^2+1)^{3/2} x^2}\, dx$$

Optimal(type 3, 60 leaves, 8 steps):

$$3 a c \arcsin(a x)-3 a c \operatorname{arctanh}\left(\sqrt{-x^2 a^2+1}\right)-a c \sqrt{-x^2 a^2+1}-\frac{c \sqrt{-x^2 a^2+1}}{x}$$

Result(type 3, 121 leaves):

$$\frac{c a^3 x^2}{\sqrt{-x^2 a^2+1}}-\frac{c a}{\sqrt{-x^2 a^2+1}}-\frac{c}{x\sqrt{-x^2 a^2+1}}+\frac{c a^2 x}{\sqrt{-x^2 a^2+1}}-3 c a \operatorname{arctanh}\left(\frac{1}{\sqrt{-x^2 a^2+1}}\right)+\frac{3 c a^2 \arctan\left(\frac{\sqrt{a^2}\, x}{\sqrt{-x^2 a^2+1}}\right)}{\sqrt{a^2}}$$

Problem 301: Result more than twice size of optimal antiderivative.

$$\int \frac{(a x+1)^3 (-a^2 c x^2+c)}{(-x^2 a^2+1)^{3/2} x^5}\, dx$$

Optimal(type 3, 99 leaves, 8 steps):

$$-\frac{15 a^4 c \operatorname{arctanh}\left(\sqrt{-x^2 a^2+1}\right)}{8}-\frac{c\sqrt{-x^2 a^2+1}}{4 x^4}-\frac{a c\sqrt{-x^2 a^2+1}}{x^3}-\frac{15 a^2 c\sqrt{-x^2 a^2+1}}{8 x^2}-\frac{3 a^3 c\sqrt{-x^2 a^2+1}}{x}$$

Result(type 3, 230 leaves):

$$-c\left(\frac{a^5 x}{\sqrt{-x^2 a^2+1}}+\frac{1}{4 x^4\sqrt{-x^2 a^2+1}}-\frac{13 a^2\left(-\frac{1}{2 x^2\sqrt{-x^2 a^2+1}}+\frac{3 a^2\left(\frac{1}{\sqrt{-x^2 a^2+1}}-\operatorname{arctanh}\left(\frac{1}{\sqrt{-x^2 a^2+1}}\right)\right)}{2}\right)}{4}-3 a\left(-\frac{1}{3 x^3\sqrt{-x^2 a^2+1}}\right.\right.$$
$$\left.\left.+\frac{4 a^2\left(-\frac{1}{x\sqrt{-x^2 a^2+1}}+\frac{2 a^2 x}{\sqrt{-x^2 a^2+1}}\right)}{3}\right)+2 a^3\left(-\frac{1}{x\sqrt{-x^2 a^2+1}}+\frac{2 a^2 x}{\sqrt{-x^2 a^2+1}}\right)+3 a^4\left(\frac{1}{\sqrt{-x^2 a^2+1}}-\operatorname{arctanh}\left(\frac{1}{\sqrt{-x^2 a^2+1}}\right)\right)\right)$$

Problem 307: Unable to integrate problem.

$$\int \frac{(a x+1)^3 x^m\sqrt{-a^2 c x^2+c}}{(-x^2 a^2+1)^{3/2}}\, dx$$

Optimal(type 5, 126 leaves, 5 steps):

$$-\frac{3 x^{1+m}\sqrt{-a^2 c x^2+c}}{(1+m)\sqrt{-x^2 a^2+1}}-\frac{a x^{2+m}\sqrt{-a^2 c x^2+c}}{(2+m)\sqrt{-x^2 a^2+1}}+\frac{4 x^{1+m}\operatorname{hypergeom}([1, 1+m], [2+m], a x)\sqrt{-a^2 c x^2+c}}{(1+m)\sqrt{-x^2 a^2+1}}$$

Result(type 8, 38 leaves):

$$\int \frac{(a x+1)^3 x^m\sqrt{-a^2 c x^2+c}}{(-x^2 a^2+1)^{3/2}}\, dx$$

Problem 308: Unable to integrate problem.

$$\int \frac{(ax+1)^3 x\,(-a^2cx^2+c)^p}{(-x^2a^2+1)^{3/2}}\,dx$$

Optimal(type 5, 122 leaves, 5 steps):

$$\frac{3\,2^{\frac{3}{2}+p}(-ax+1)^{-\frac{1}{2}+p}(-a^2cx^2+c)^p\,\text{hypergeom}\left(\left[-\frac{1}{2}+p,-\frac{3}{2}-p\right],\left[\frac{1}{2}+p\right],-\frac{ax}{2}+\frac{1}{2}\right)}{a^2(-2p^2-p+1)(-x^2a^2+1)^p}-\frac{(ax+1)^3(-a^2cx^2+c)^p}{2a^2(1+p)\sqrt{-x^2a^2+1}}$$

Result(type 8, 36 leaves):

$$\int \frac{(ax+1)^3 x\,(-a^2cx^2+c)^p}{(-x^2a^2+1)^{3/2}}\,dx$$

Problem 309: Unable to integrate problem.

$$\int \frac{(ax+1)^3(-a^2cx^2+c)^p}{(-x^2a^2+1)^{3/2}x^3}\,dx$$

Optimal(type 5, 178 leaves, 8 steps):

$$\frac{a^3(7-6p)\,x\,(-a^2cx^2+c)^p\,\text{hypergeom}\left(\left[\frac{1}{2},\frac{3}{2}-p\right],\left[\frac{3}{2}\right],x^2a^2\right)}{(-x^2a^2+1)^p}-\frac{(-a^2cx^2+c)^p}{2x^2\sqrt{-x^2a^2+1}}-\frac{3a(-a^2cx^2+c)^p}{x\sqrt{-x^2a^2+1}}$$
$$+\frac{a^2(9-2p)(-a^2cx^2+c)^p\,\text{hypergeom}\left(\left[1,-\frac{1}{2}+p\right],\left[\frac{1}{2}+p\right],-x^2a^2+1\right)}{2(1-2p)\sqrt{-x^2a^2+1}}$$

Result(type 8, 38 leaves):

$$\int \frac{(ax+1)^3(-a^2cx^2+c)^p}{(-x^2a^2+1)^{3/2}x^3}\,dx$$

Problem 313: Unable to integrate problem.

$$\int \frac{(ax+1)^4(-a^2cx^2+c)^p}{(-x^2a^2+1)^2}\,dx$$

Optimal(type 5, 61 leaves, 3 steps):

$$\frac{2^{2+p}c\,(ax+1)^{1-p}(-a^2cx^2+c)^{-1+p}\,\text{hypergeom}\left([-2-p,-1+p],[p],-\frac{ax}{2}+\frac{1}{2}\right)}{a(1-p)}$$

Result(type 8, 35 leaves):

$$\int \frac{(a x+1)^4 (-a^2 c x^2+c)^p}{(-x^2 a^2+1)^2}\, dx$$

Problem 320: Unable to integrate problem.

$$\int \frac{(-x^2 a^2+1)^p \sqrt{-x^2 a^2+1}}{a x+1}\, dx$$

Optimal(type 5, 47 leaves, 2 steps):

$$-\frac{2^{\frac{1}{2}+p} (-a x+1)^{\frac{3}{2}+p} \operatorname{hypergeom}\left(\left[\frac{3}{2}+p, \frac{1}{2}-p\right], \left[\frac{5}{2}+p\right], -\frac{a x}{2}+\frac{1}{2}\right)}{a (3+2 p)}$$

Result(type 8, 34 leaves):

$$\int \frac{(-x^2 a^2+1)^p \sqrt{-x^2 a^2+1}}{a x+1}\, dx$$

Problem 321: Unable to integrate problem.

$$\int \frac{(-x^2 a^2+1)^p \sqrt{-x^2 a^2+1}}{(a x+1) x^2}\, dx$$

Optimal(type 5, 66 leaves, 5 steps):

$$-\frac{\operatorname{hypergeom}\left(\left[-\frac{1}{2}, \frac{1}{2}-p\right], \left[\frac{1}{2}\right], x^2 a^2\right)}{x}+\frac{a (-x^2 a^2+1)^{\frac{1}{2}+p} \operatorname{hypergeom}\left(\left[1, \frac{1}{2}+p\right], \left[\frac{3}{2}+p\right], -x^2 a^2+1\right)}{1+2 p}$$

Result(type 8, 37 leaves):

$$\int \frac{(-x^2 a^2+1)^p \sqrt{-x^2 a^2+1}}{(a x+1) x^2}\, dx$$

Problem 322: Unable to integrate problem.

$$\int \frac{x^3 (-a^2 c x^2+c)^p \sqrt{-x^2 a^2+1}}{a x+1}\, dx$$

Optimal(type 5, 124 leaves, 7 steps):

$$\frac{(-x^2 a^2+1)^{3/2} (-a^2 c x^2+c)^p}{a^4 (3+2 p)}-\frac{a x^5 (-a^2 c x^2+c)^p \operatorname{hypergeom}\left(\left[\frac{5}{2}, \frac{1}{2}-p\right], \left[\frac{7}{2}\right], x^2 a^2\right)}{5 (-x^2 a^2+1)^p}-\frac{(-a^2 c x^2+c)^p \sqrt{-x^2 a^2+1}}{a^4 (1+2 p)}$$

Result(type 8, 38 leaves):

$$\int \frac{x^3 (-a^2 c x^2 + c)^p \sqrt{-x^2 a^2 + 1}}{a x + 1}\, dx$$

Problem 327: Result more than twice size of optimal antiderivative.

$$\int \frac{(-a^2 c x^2 + c)^{5/2} (-x^2 a^2 + 1)}{(a x + 1)^2}\, dx$$

Optimal(type 3, 107 leaves, 7 steps):

$$\frac{7 c x (-a^2 c x^2 + c)^{3/2}}{24} + \frac{7 (-a^2 c x^2 + c)^{5/2}}{30 a} + \frac{(-a x + 1) (-a^2 c x^2 + c)^{5/2}}{6 a} + \frac{7 c^{5/2} \arctan\left(\frac{a x \sqrt{c}}{\sqrt{-a^2 c x^2 + c}}\right)}{16 a} + \frac{7 c^2 x \sqrt{-a^2 c x^2 + c}}{16}$$

Result(type 3, 225 leaves):

$$-\frac{x (-a^2 c x^2 + c)^{5/2}}{6} - \frac{5 c x (-a^2 c x^2 + c)^{3/2}}{24} - \frac{5 c^2 x \sqrt{-a^2 c x^2 + c}}{16} - \frac{5 c^3 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-a^2 c x^2 + c}}\right)}{16 \sqrt{a^2 c}} + \frac{2 \left(-c \left(x + \frac{1}{a}\right)^2 a^2 + 2 \left(x + \frac{1}{a}\right) a c\right)^{5/2}}{5 a}$$

$$+ \frac{c \left(-c \left(x + \frac{1}{a}\right)^2 a^2 + 2 \left(x + \frac{1}{a}\right) a c\right)^{3/2} x}{2} + \frac{3 c^2 \sqrt{-c \left(x + \frac{1}{a}\right)^2 a^2 + 2 \left(x + \frac{1}{a}\right) a c}\; x}{4} + \frac{3 c^3 \arctan\left(\frac{\sqrt{a^2 c}\, x}{\sqrt{-c \left(x + \frac{1}{a}\right)^2 a^2 + 2 \left(x + \frac{1}{a}\right) a c}}\right)}{4 \sqrt{a^2 c}}$$

Problem 334: Unable to integrate problem.

$$\int \frac{x^m \sqrt{-a^2 c x^2 + c}\, (-x^2 a^2 + 1)^{3/2}}{(a x + 1)^3}\, dx$$

Optimal(type 5, 126 leaves, 5 steps):

$$-\frac{3 x^{1+m} \sqrt{-a^2 c x^2 + c}}{(1 + m) \sqrt{-x^2 a^2 + 1}} + \frac{a x^{2+m} \sqrt{-a^2 c x^2 + c}}{(2 + m) \sqrt{-x^2 a^2 + 1}} + \frac{4 x^{1+m} \operatorname{hypergeom}([1, 1 + m], [2 + m], -a x) \sqrt{-a^2 c x^2 + c}}{(1 + m) \sqrt{-x^2 a^2 + 1}}$$

Result(type 8, 38 leaves):

$$\int \frac{x^m \sqrt{-a^2 c x^2 + c}\, (-x^2 a^2 + 1)^{3/2}}{(a x + 1)^3}\, dx$$

Problem 335: Unable to integrate problem.

$$\int \frac{(-a^2 c x^2 + c)^p (-x^2 a^2 + 1)^{3/2}}{(a x + 1)^3} \, dx$$

Optimal(type 5, 74 leaves, 3 steps):

$$-\frac{2^{-\frac{1}{2}+p} (-a x + 1)^{\frac{5}{2}+p} (-a^2 c x^2 + c)^p \operatorname{hypergeom}\left(\left[\frac{5}{2}+p, \frac{3}{2}-p\right], \left[\frac{7}{2}+p\right], -\frac{a x}{2}+\frac{1}{2}\right)}{a (5 + 2 p) (-x^2 a^2 + 1)^p}$$

Result(type 8, 35 leaves):

$$\int \frac{(-a^2 c x^2 + c)^p (-x^2 a^2 + 1)^{3/2}}{(a x + 1)^3} \, dx$$

Problem 337: Unable to integrate problem.

$$\int \frac{\sqrt{\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}}}{(-a^2 c x^2 + c)^{5/4}} \, dx$$

Optimal(type 3, 91 leaves, 5 steps):

$$-\frac{(-x^2 a^2 + 1)^{1/4} \operatorname{arctanh}\left(\frac{\sqrt{-a x + 1}\,\sqrt{2}}{2}\right) \sqrt{2}}{2 a c (-a^2 c x^2 + c)^{1/4}} + \frac{(-x^2 a^2 + 1)^{1/4}}{a c (-a^2 c x^2 + c)^{1/4} \sqrt{-a x + 1}}$$

Result(type 8, 36 leaves):

$$\int \frac{\sqrt{\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}}}{(-a^2 c x^2 + c)^{5/4}} \, dx$$

Problem 338: Unable to integrate problem.

$$\int \frac{\sqrt{\frac{a x + 1}{\sqrt{-x^2 a^2 + 1}}}}{x^2 (-a^2 c x^2 + c)^{5/4}} \, dx$$

Optimal(type 3, 169 leaves, 9 steps):

$$-\frac{a (-x^2 a^2 + 1)^{1/4} \operatorname{arctanh}\left(\sqrt{-a x + 1}\right)}{c (-a^2 c x^2 + c)^{1/4}} - \frac{a (-x^2 a^2 + 1)^{1/4} \operatorname{arctanh}\left(\frac{\sqrt{-a x + 1}\,\sqrt{2}}{2}\right) \sqrt{2}}{2 c (-a^2 c x^2 + c)^{1/4}} + \frac{2 a (-x^2 a^2 + 1)^{1/4}}{c (-a^2 c x^2 + c)^{1/4} \sqrt{-a x + 1}}$$

$$-\frac{(-x^2 a^2+1)^{1/4}}{c x (-a^2 c x^2+c)^{1/4} \sqrt{-a x+1}}$$

Result(type 8, 39 leaves):

$$\int \frac{\sqrt{\frac{a x+1}{\sqrt{-x^2 a^2+1}}}}{x^2 (-a^2 c x^2+c)^{5/4}}\, dx$$

Problem 339: Unable to integrate problem.

$$\int \frac{\sqrt{\frac{a x+1}{\sqrt{-x^2 a^2+1}}}\, x^3}{(-a^2 c x^2+c)^{9/8}}\, dx$$

Optimal(type 5, 162 leaves, 5 steps):

$$-\frac{4 x^2 (a x+1)^{1/8} (-x^2 a^2+1)^{1/8}}{7 a^2 c (-a x+1)^{3/8} (-a^2 c x^2+c)^{1/8}}+\frac{8 (-a x+6) (a x+1)^{1/8} (-x^2 a^2+1)^{1/8}}{21 a^4 c (-a x+1)^{3/8} (-a^2 c x^2+c)^{1/8}}$$
$$+\frac{64\, 2^{1/8} (-a x+1)^{5/8} (-x^2 a^2+1)^{1/8} \operatorname{hypergeom}\left(\left[\frac{5}{8}, \frac{7}{8}\right], \left[\frac{13}{8}\right], -\frac{a x}{2}+\frac{1}{2}\right)}{105 a^4 c (-a^2 c x^2+c)^{1/8}}$$

Result(type 8, 39 leaves):

$$\int \frac{\sqrt{\frac{a x+1}{\sqrt{-x^2 a^2+1}}}\, x^3}{(-a^2 c x^2+c)^{9/8}}\, dx$$

Problem 340: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(a x)}\, x}{-a^2 c x^2+c}\, dx$$

Optimal(type 5, 82 leaves, 3 steps):

$$-\frac{(a x+1)^{\frac{n}{2}}}{a^2 c n (-a x+1)^{\frac{n}{2}}}+\frac{2^{1+\frac{n}{2}} \operatorname{hypergeom}\left(\left[-\frac{n}{2}, -\frac{n}{2}\right], \left[1-\frac{n}{2}\right], -\frac{a x}{2}+\frac{1}{2}\right)}{a^2 c n (-a x+1)^{\frac{n}{2}}}$$

Result(type 8, 24 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(a x)} x}{-a^2 c x^2 + c}\, dx$$

Problem 341: Unable to integrate problem.

$$\int e^{n \operatorname{arctanh}(a x)} x^3 \sqrt{-a^2 c x^2 + c}\, dx$$

Optimal(type 5, 206 leaves, 5 steps):

$$-\frac{x^2 (-a x+1)^{\frac{3}{2}-\frac{n}{2}} (a x+1)^{\frac{3}{2}+\frac{n}{2}} \sqrt{-a^2 c x^2+c}}{5 a^2 \sqrt{-x^2 a^2+1}} - \frac{(-a x+1)^{\frac{3}{2}-\frac{n}{2}} (a x+1)^{\frac{3}{2}+\frac{n}{2}} \left(3 a n x+n^2+8\right) \sqrt{-a^2 c x^2+c}}{60 a^4 \sqrt{-x^2 a^2+1}}$$
$$- \frac{2^{-\frac{1}{2}+\frac{n}{2}} n \left(n^2+11\right) (-a x+1)^{\frac{3}{2}-\frac{n}{2}} \operatorname{hypergeom}\left(\left[\frac{3}{2}-\frac{n}{2}, -\frac{1}{2}-\frac{n}{2}\right], \left[\frac{5}{2}-\frac{n}{2}\right], -\frac{a x}{2}+\frac{1}{2}\right) \sqrt{-a^2 c x^2+c}}{15 a^4 (3-n) \sqrt{-x^2 a^2+1}}$$

Result(type 8, 26 leaves):

$$\int e^{n \operatorname{arctanh}(a x)} x^3 \sqrt{-a^2 c x^2 + c}\, dx$$

Problem 342: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(a x)} \sqrt{-a^2 c x^2 + c}}{x^2}\, dx$$

Optimal(type 5, 218 leaves, 6 steps):

$$-\frac{(-a x+1)^{\frac{1}{2}-\frac{n}{2}} (a x+1)^{\frac{1}{2}+\frac{n}{2}} \sqrt{-a^2 c x^2+c}}{x \sqrt{-x^2 a^2+1}} - \frac{2 a n (-a x+1)^{\frac{1}{2}-\frac{n}{2}} (a x+1)^{-\frac{1}{2}+\frac{n}{2}} \operatorname{hypergeom}\left(\left[1, \frac{1}{2}-\frac{n}{2}\right], \left[\frac{3}{2}-\frac{n}{2}\right], \frac{-a x+1}{a x+1}\right) \sqrt{-a^2 c x^2+c}}{(1-n) \sqrt{-x^2 a^2+1}}$$
$$+ \frac{2^{\frac{1}{2}+\frac{n}{2}} a (-a x+1)^{\frac{1}{2}-\frac{n}{2}} \operatorname{hypergeom}\left(\left[\frac{1}{2}-\frac{n}{2}, \frac{1}{2}-\frac{n}{2}\right], \left[\frac{3}{2}-\frac{n}{2}\right], -\frac{a x}{2}+\frac{1}{2}\right) \sqrt{-a^2 c x^2+c}}{(1-n) \sqrt{-x^2 a^2+1}}$$

Result(type 8, 26 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(a x)} \sqrt{-a^2 c x^2 + c}}{x^2}\, dx$$

Problem 343: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{\sqrt{-a^2 c x^2 + c}}\, dx$$

Optimal(type 5, 80 leaves, 3 steps):

$$-\frac{2^{\frac{1}{2}+\frac{n}{2}} (-a x+1)^{\frac{1}{2}-\frac{n}{2}} \operatorname{hypergeom}\left(\left[\frac{1}{2}-\frac{n}{2}, \frac{1}{2}-\frac{n}{2}\right], \left[\frac{3}{2}-\frac{n}{2}\right], -\frac{a x}{2}+\frac{1}{2}\right) \sqrt{-x^2 a^2+1}}{a (1-n) \sqrt{-a^2 c x^2+c}}$$

Result(type 8, 23 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{\sqrt{-a^2 c x^2 + c}}\, dx$$

Problem 344: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{x^3 \sqrt{-a^2 c x^2 + c}}\, dx$$

Optimal(type 5, 202 leaves, 6 steps):

$$-\frac{(-a x+1)^{\frac{1}{2}-\frac{n}{2}} (a x+1)^{\frac{1}{2}+\frac{n}{2}} \sqrt{-x^2 a^2+1}}{2 x^2 \sqrt{-a^2 c x^2+c}} - \frac{a n (-a x+1)^{\frac{1}{2}-\frac{n}{2}} (a x+1)^{\frac{1}{2}+\frac{n}{2}} \sqrt{-x^2 a^2+1}}{2 x \sqrt{-a^2 c x^2+c}}$$
$$- \frac{a^2 \left(n^2+1\right) (-a x+1)^{\frac{1}{2}-\frac{n}{2}} (a x+1)^{-\frac{1}{2}+\frac{n}{2}} \operatorname{hypergeom}\left(\left[1, \frac{1}{2}-\frac{n}{2}\right], \left[\frac{3}{2}-\frac{n}{2}\right], \frac{-a x+1}{a x+1}\right) \sqrt{-x^2 a^2+1}}{(1-n) \sqrt{-a^2 c x^2+c}}$$

Result(type 8, 26 leaves):

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{x^3 \sqrt{-a^2 c x^2 + c}}\, dx$$

Problem 347: Unable to integrate problem.

$$\int \frac{e^{n \operatorname{arctanh}(a x)}}{x^2 \left(-a^2 c x^2 + c\right)^{3/2}}\, dx$$

Optimal(type 5, 279 leaves, 7 steps):

$$\frac{a (2+n) (-a x+1)^{-\frac{1}{2}-\frac{n}{2}} (a x+1)^{-\frac{1}{2}+\frac{n}{2}} \sqrt{-x^2 a^2+1}}{c (1+n) \sqrt{-a^2 c x^2+c}} - \frac{(-a x+1)^{-\frac{1}{2}-\frac{n}{2}} (a x+1)^{-\frac{1}{2}+\frac{n}{2}} \sqrt{-x^2 a^2+1}}{c x \sqrt{-a^2 c x^2+c}}$$

$$-\frac{a\left(n^2+2n+2\right)\left(-ax+1\right)^{\frac{1}{2}-\frac{n}{2}}\left(ax+1\right)^{-\frac{1}{2}+\frac{n}{2}}\sqrt{-x^2a^2+1}}{c\left(-n^2+1\right)\sqrt{-a^2cx^2+c}}$$
$$+\frac{2an\left(-ax+1\right)^{\frac{1}{2}-\frac{n}{2}}\left(ax+1\right)^{-\frac{1}{2}+\frac{n}{2}}\operatorname{hypergeom}\left(\left[1,-\frac{1}{2}+\frac{n}{2}\right],\left[\frac{1}{2}+\frac{n}{2}\right],\frac{ax+1}{-ax+1}\right)\sqrt{-x^2a^2+1}}{c\left(1-n\right)\sqrt{-a^2cx^2+c}}$$

Result(type 8, 26 leaves):

$$\int\frac{e^{n\operatorname{arctanh}(ax)}}{x^2\left(-a^2cx^2+c\right)^{3/2}}\,dx$$

Problem 348: Unable to integrate problem.

$$\int\frac{e^{n\operatorname{arctanh}(ax)}x^m}{-a^2cx^2+c}\,dx$$

Optimal(type 6, 38 leaves, 2 steps):

$$\frac{x^{1+m}\mathit{AppellF1}\left(1+m,1+\frac{n}{2},1-\frac{n}{2},2+m,ax,-ax\right)}{c\left(1+m\right)}$$

Result(type 8, 26 leaves):

$$\int\frac{e^{n\operatorname{arctanh}(ax)}x^m}{-a^2cx^2+c}\,dx$$

Problem 349: Unable to integrate problem.

$$\int\frac{e^{n\operatorname{arctanh}(ax)}x^m}{\left(-a^2cx^2+c\right)^2}\,dx$$

Optimal(type 6, 38 leaves, 2 steps):

$$\frac{x^{1+m}\mathit{AppellF1}\left(1+m,2+\frac{n}{2},2-\frac{n}{2},2+m,ax,-ax\right)}{c^2\left(1+m\right)}$$

Result(type 8, 26 leaves):

$$\int\frac{e^{n\operatorname{arctanh}(ax)}x^m}{\left(-a^2cx^2+c\right)^2}\,dx$$

Test results for the 97 problems in "7.3.7 Inverse hyperbolic tangent functions.txt"

Problem 4: Result more than twice size of optimal antiderivative.

$$\int x^4 \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{ex^2+d}}\right) dx$$

Optimal(type 3, 67 leaves, 4 steps):

$$\frac{2d\left(ex^2+d\right)^{3/2}}{15e^{5/2}} - \frac{\left(ex^2+d\right)^{5/2}}{25e^{5/2}} + \frac{x^5 \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{ex^2+d}}\right)}{5} - \frac{d^2\sqrt{ex^2+d}}{5e^{5/2}}$$

Result(type 3, 175 leaves):

$$\frac{x^5 \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{ex^2+d}}\right)}{5} + \frac{e^{3/2}\left(\frac{x^6\sqrt{ex^2+d}}{7e} - \frac{6d\left(\frac{x^4\sqrt{ex^2+d}}{5e} - \frac{4d\left(\frac{x^2\sqrt{ex^2+d}}{3e} - \frac{2d\sqrt{ex^2+d}}{3e^2}\right)}{5e}\right)}{7e}\right)}{5d}$$
$$- \frac{\sqrt{e}\left(\frac{x^4\left(ex^2+d\right)^{3/2}}{7e} - \frac{4d\left(\frac{x^2\left(ex^2+d\right)^{3/2}}{5e} - \frac{2d\left(ex^2+d\right)^{3/2}}{15e^2}\right)}{7e}\right)}{5d}$$

Problem 6: Unable to integrate problem.

$$\int x^{9/2} \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{ex^2+d}}\right) dx$$

Optimal(type 4, 177 leaves, 6 steps):

$$\frac{2x^{11/2} \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{ex^2+d}}\right)}{11} + \frac{36dx^{5/2}\sqrt{ex^2+d}}{847e^{3/2}} - \frac{4x^{9/2}\sqrt{ex^2+d}}{121\sqrt{e}} - \frac{60d^2\sqrt{x}\sqrt{ex^2+d}}{847e^{5/2}}$$
$$+ \frac{30d^{11/4}\sqrt{\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right)^2}\operatorname{EllipticF}\left(\sin\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right), \frac{\sqrt{2}}{2}\right)\left(\sqrt{d}+\sqrt{e}\,x\right)\sqrt{\frac{ex^2+d}{\left(\sqrt{d}+\sqrt{e}\,x\right)^2}}}{847\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right)e^{11/4}\sqrt{ex^2+d}}$$

Result(type 8, 21 leaves):

$$\int x^{9/2} \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{ex^2+d}}\right) dx$$

Problem 7: Unable to integrate problem.

$$\int x^{5/2} \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right) dx$$

Optimal(type 4, 157 leaves, 5 steps):

$$\frac{2 x^{7/2} \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right)}{7} - \frac{4 x^{5/2}\sqrt{e x^2+d}}{49\sqrt{e}} + \frac{20 d\sqrt{x}\sqrt{e x^2+d}}{147 e^{3/2}}$$
$$- \frac{10 d^{7/4}\sqrt{\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right)^2}\,\operatorname{EllipticF}\left(\sin\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right), \frac{\sqrt{2}}{2}\right)\left(\sqrt{d}+\sqrt{e}\,x\right)\sqrt{\frac{e x^2+d}{\left(\sqrt{d}+\sqrt{e}\,x\right)^2}}}{147\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right) e^{7/4}\sqrt{e x^2+d}}$$

Result(type 8, 21 leaves):

$$\int x^{5/2} \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right) dx$$

Problem 8: Unable to integrate problem.

$$\int \sqrt{x}\, \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right) dx$$

Optimal(type 4, 139 leaves, 4 steps):

$$\frac{2 x^{3/2} \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right)}{3} - \frac{4\sqrt{x}\sqrt{e x^2+d}}{9\sqrt{e}}$$
$$+ \frac{2 d^{3/4}\sqrt{\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right)^2}\,\operatorname{EllipticF}\left(\sin\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right), \frac{\sqrt{2}}{2}\right)\left(\sqrt{d}+\sqrt{e}\,x\right)\sqrt{\frac{e x^2+d}{\left(\sqrt{d}+\sqrt{e}\,x\right)^2}}}{9\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right) e^{3/4}\sqrt{e x^2+d}}$$

Result(type 8, 21 leaves):

$$\int \sqrt{x}\, \operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right) dx$$

Problem 9: Unable to integrate problem.

$$\int \frac{\operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right)}{x^{3/2}}\, dx$$

Optimal(type 4, 122 leaves, 3 steps):

$$-\frac{2\operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right)}{\sqrt{x}}+\frac{2 e^{1/4}\sqrt{\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right)^2}\,\mathrm{EllipticF}\left(\sin\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right),\frac{\sqrt{2}}{2}\right)\left(\sqrt{d}+\sqrt{e}\,x\right)\sqrt{\frac{e x^2+d}{\left(\sqrt{d}+\sqrt{e}\,x\right)^2}}}{\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right) d^{1/4}\sqrt{e x^2+d}}$$

Result(type 8, 21 leaves):

$$\int \frac{\operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right)}{x^{3/2}}\, dx$$

Problem 10: Unable to integrate problem.

$$\int x^{7/2}\operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right) dx$$

Optimal(type 4, 289 leaves, 7 steps):

$$\frac{2 x^{9/2}\operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right)}{9}+\frac{28 d x^{3/2}\sqrt{e x^2+d}}{405 e^{3/2}}-\frac{4 x^{7/2}\sqrt{e x^2+d}}{81\sqrt{e}}-\frac{28 d^2\sqrt{x}\sqrt{e x^2+d}}{135 e^2\left(\sqrt{d}+\sqrt{e}\,x\right)}$$

$$+\frac{28 d^{9/4}\sqrt{\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right)^2}\,\mathrm{EllipticE}\left(\sin\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right),\frac{\sqrt{2}}{2}\right)\left(\sqrt{d}+\sqrt{e}\,x\right)\sqrt{\frac{e x^2+d}{\left(\sqrt{d}+\sqrt{e}\,x\right)^2}}}{135\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right) e^{9/4}\sqrt{e x^2+d}}$$

$$-\frac{14 d^{9/4}\sqrt{\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right)^2}\,\mathrm{EllipticF}\left(\sin\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right),\frac{\sqrt{2}}{2}\right)\left(\sqrt{d}+\sqrt{e}\,x\right)\sqrt{\frac{e x^2+d}{\left(\sqrt{d}+\sqrt{e}\,x\right)^2}}}{135\cos\left(2\arctan\left(\frac{e^{1/4}\sqrt{x}}{d^{1/4}}\right)\right) e^{9/4}\sqrt{e x^2+d}}$$

Result(type 8, 21 leaves):

$$\int x^{7/2}\operatorname{arctanh}\left(\frac{x\sqrt{e}}{\sqrt{e x^2+d}}\right)dx$$

Problem 11: Result more than twice size of optimal antiderivative.

$$\int x^{-1+n}\operatorname{arctanh}(a+b x^n)\,dx$$

Optimal(type 3, 45 leaves, 4 steps):

$$\frac{(a+b x^n)\operatorname{arctanh}(a+b x^n)}{n b}+\frac{\ln\left(1-(a+b x^n)^2\right)}{2 n b}$$

Result(type 3, 120 leaves):

$$\frac{x^n\ln(a+b x^n+1)}{2n}-\frac{x^n\ln(1-a-b x^n)}{2n}-\frac{\ln\left(x^n+\frac{-1+a}{b}\right)a}{2nb}+\frac{\ln\left(x^n+\frac{1+a}{b}\right)a}{2nb}+\frac{\ln\left(x^n+\frac{-1+a}{b}\right)}{2nb}+\frac{\ln\left(x^n+\frac{1+a}{b}\right)}{2nb}$$

Problem 30: Unable to integrate problem.

$$\int\frac{x^m}{\operatorname{arctanh}(\tanh(b x+a))^3}\,dx$$

Optimal(type 5, 90 leaves, 3 steps):

$$-\frac{x^m}{2b\operatorname{arctanh}(\tanh(bx+a))^2}-\frac{m x^{m-1}}{2b^2\operatorname{arctanh}(\tanh(bx+a))}-\frac{m x^{m-1}\operatorname{hypergeom}\left([1,m-1],[m],\frac{bx}{bx-\operatorname{arctanh}(\tanh(bx+a))}\right)}{2b^2\,(bx-\operatorname{arctanh}(\tanh(bx+a)))}$$

Result(type 8, 838 leaves):

$$-\Bigg(2\,\mathrm{I}\Bigg(4\,\mathrm{I}\,e^{m\ln(x)}x b+\pi m\operatorname{csgn}\left(\frac{\mathrm{I}}{(e^{bx+a})^2+1}\right)\operatorname{csgn}\left(\mathrm{I}\,(e^{bx+a})^2\right)\operatorname{csgn}\left(\frac{\mathrm{I}\,(e^{bx+a})^2}{(e^{bx+a})^2+1}\right)e^{m\ln(x)}$$
$$-\pi m\operatorname{csgn}\left(\frac{\mathrm{I}}{(e^{bx+a})^2+1}\right)\operatorname{csgn}\left(\frac{\mathrm{I}\,(e^{bx+a})^2}{(e^{bx+a})^2+1}\right)^2e^{m\ln(x)}+\pi m\operatorname{csgn}(\mathrm{I}\,e^{bx+a})^2\operatorname{csgn}\left(\mathrm{I}\,(e^{bx+a})^2\right)e^{m\ln(x)}$$
$$-2\pi m\operatorname{csgn}(\mathrm{I}\,e^{bx+a})\operatorname{csgn}\left(\mathrm{I}\,(e^{bx+a})^2\right)^2e^{m\ln(x)}+\pi m\operatorname{csgn}\left(\mathrm{I}\,(e^{bx+a})^2\right)^3e^{m\ln(x)}-\pi m\operatorname{csgn}\left(\mathrm{I}\,(e^{bx+a})^2\right)\operatorname{csgn}\left(\frac{\mathrm{I}\,(e^{bx+a})^2}{(e^{bx+a})^2+1}\right)^2e^{m\ln(x)}$$
$$+\pi m\operatorname{csgn}\left(\frac{\mathrm{I}\,(e^{bx+a})^2}{(e^{bx+a})^2+1}\right)^3e^{m\ln(x)}+4\,\mathrm{I}\,m\,e^{m\ln(x)}\ln(e^{bx+a})\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(\pi\operatorname{csgn}\left(\frac{\mathrm{I}}{(e^{bx+a})^2+1}\right)\operatorname{csgn}\left(\mathrm{I}\,(e^{bx+a})^2\right)\operatorname{csgn}\left(\frac{\mathrm{I}\,(e^{bx+a})^2}{(e^{bx+a})^2+1}\right)$$
$$-\pi\operatorname{csgn}\left(\frac{\mathrm{I}}{(e^{bx+a})^2+1}\right)\operatorname{csgn}\left(\frac{\mathrm{I}\,(e^{bx+a})^2}{(e^{bx+a})^2+1}\right)^2+\pi\operatorname{csgn}(\mathrm{I}\,e^{bx+a})^2\operatorname{csgn}\left(\mathrm{I}\,(e^{bx+a})^2\right)-2\pi\operatorname{csgn}(\mathrm{I}\,e^{bx+a})\operatorname{csgn}\left(\mathrm{I}\,(e^{bx+a})^2\right)^2$$

$$+\pi\,\mathrm{csgn}\left(I\left(e^{bx+a}\right)^2\right)^3-\pi\,\mathrm{csgn}\left(I\left(e^{bx+a}\right)^2\right)\mathrm{csgn}\left(\frac{I\left(e^{bx+a}\right)^2}{\left(e^{bx+a}\right)^2+1}\right)^2+\pi\,\mathrm{csgn}\left(\frac{I\left(e^{bx+a}\right)^2}{\left(e^{bx+a}\right)^2+1}\right)^3+4\,I\ln\left(e^{bx+a}\right)\right)^2 x\,b^2\Bigg)+\int\Bigg(\left(-2\,I\,m\,e^{m\ln(x)}\,(m-1)\right)\Bigg/\Bigg(b^2x^2\Bigg(-\pi\,\mathrm{csgn}\left(\frac{I}{\left(e^{bx+a}\right)^2+1}\right)\mathrm{csgn}\left(I\left(e^{bx+a}\right)^2\right)\mathrm{csgn}\left(\frac{I\left(e^{bx+a}\right)^2}{\left(e^{bx+a}\right)^2+1}\right)+\pi\,\mathrm{csgn}\left(\frac{I}{\left(e^{bx+a}\right)^2+1}\right)\mathrm{csgn}\left(\frac{I\left(e^{bx+a}\right)^2}{\left(e^{bx+a}\right)^2+1}\right)^2$$

$$-\pi\,\mathrm{csgn}\left(I\,e^{bx+a}\right)^2\mathrm{csgn}\left(I\left(e^{bx+a}\right)^2\right)+2\pi\,\mathrm{csgn}\left(I\,e^{bx+a}\right)\mathrm{csgn}\left(I\left(e^{bx+a}\right)^2\right)^2-\pi\,\mathrm{csgn}\left(I\left(e^{bx+a}\right)^2\right)^3+\pi\,\mathrm{csgn}\left(I\left(e^{bx+a}\right)^2\right)\mathrm{csgn}\left(\frac{I\left(e^{bx+a}\right)^2}{\left(e^{bx+a}\right)^2+1}\right)^2$$

$$-\pi\,\mathrm{csgn}\left(\frac{I\left(e^{bx+a}\right)^2}{\left(e^{bx+a}\right)^2+1}\right)^3-4\,I\ln\left(e^{bx+a}\right)\Bigg)\Bigg)\,dx$$

Problem 52: Result more than twice size of optimal antiderivative.

$$\int\frac{x^{5/2}}{\operatorname{arctanh}(\tanh(bx+a))^2}\,dx$$

Optimal(type 3, 90 leaves, 4 steps):

$$\frac{5x^{3/2}}{3b^2}-\frac{5\arctan\left(\frac{\sqrt{b}\,\sqrt{x}}{\sqrt{bx-\operatorname{arctanh}(\tanh(bx+a))}}\right)(bx-\operatorname{arctanh}(\tanh(bx+a)))^{3/2}}{b^{7/2}}-\frac{x^{5/2}}{b\operatorname{arctanh}(\tanh(bx+a))}+\frac{5\,(bx-\operatorname{arctanh}(\tanh(bx+a)))\sqrt{x}}{b^3}$$

Result(type 3, 293 leaves):

$$\frac{2x^{3/2}}{3b^2}-\frac{4a\sqrt{x}}{b^3}-\frac{4\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)\sqrt{x}}{b^3}-\frac{\sqrt{x}\,a^2}{b^3\operatorname{arctanh}(\tanh(bx+a))}-\frac{2\sqrt{x}\,a\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{b^3\operatorname{arctanh}(\tanh(bx+a))}$$

$$-\frac{\sqrt{x}\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2}{b^3\operatorname{arctanh}(\tanh(bx+a))}+\frac{5\arctan\left(\frac{b\sqrt{x}}{\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}\right)a^2}{b^3\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}$$

$$+\frac{10\arctan\left(\frac{b\sqrt{x}}{\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}\right)a\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{b^3\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}$$

$$+\frac{5\arctan\left(\frac{b\sqrt{x}}{\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}\right)(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2}{b^3\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}$$

Problem 54: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{7/2}}{\operatorname{arctanh}(\tanh(bx+a))^3}\, dx$$

Optimal(type 3, 107 leaves, 5 steps):

$$\frac{35x^{3/2}}{12b^3} - \frac{35\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{bx-\operatorname{arctanh}(\tanh(bx+a))}}\right)(bx-\operatorname{arctanh}(\tanh(bx+a)))^{3/2}}{4b^{9/2}} - \frac{x^{7/2}}{2b\operatorname{arctanh}(\tanh(bx+a))^2} - \frac{7x^{5/2}}{4b^2\operatorname{arctanh}(\tanh(bx+a))} + \frac{35(bx-\operatorname{arctanh}(\tanh(bx+a)))\sqrt{x}}{4b^4}$$

Result(type 3, 417 leaves):

$$\frac{2x^{3/2}}{3b^3} - \frac{6a\sqrt{x}}{b^4} - \frac{6(\operatorname{arctanh}(\tanh(bx+a))-bx-a)\sqrt{x}}{b^4} - \frac{13a^2x^{3/2}}{4b^3\operatorname{arctanh}(\tanh(bx+a))^2} - \frac{13x^{3/2}a(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{2b^3\operatorname{arctanh}(\tanh(bx+a))^2}$$
$$- \frac{13x^{3/2}(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2}{4b^3\operatorname{arctanh}(\tanh(bx+a))^2} - \frac{11a^3\sqrt{x}}{4b^4\operatorname{arctanh}(\tanh(bx+a))^2} - \frac{33\sqrt{x}\,a^2(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{4b^4\operatorname{arctanh}(\tanh(bx+a))^2}$$
$$- \frac{33\sqrt{x}\,a(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2}{4b^4\operatorname{arctanh}(\tanh(bx+a))^2} - \frac{11\sqrt{x}(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^3}{4b^4\operatorname{arctanh}(\tanh(bx+a))^2}$$
$$+ \frac{35\arctan\left(\frac{b\sqrt{x}}{\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))b}}\right)a^2}{4b^4\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))b}} + \frac{35\arctan\left(\frac{b\sqrt{x}}{\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))b}}\right)a(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{2b^4\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))b}}$$
$$+ \frac{35\arctan\left(\frac{b\sqrt{x}}{\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))b}}\right)(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2}{4b^4\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))b}}$$

Problem 55: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{5/2}}{\operatorname{arctanh}(\tanh(bx+a))^3}\, dx$$

Optimal(type 3, 86 leaves, 4 steps):

$$-\frac{x^{5/2}}{2b\operatorname{arctanh}(\tanh(bx+a))^2} - \frac{5x^{3/2}}{4b^2\operatorname{arctanh}(\tanh(bx+a))} + \frac{15\sqrt{x}}{4b^3} - \frac{15\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{bx-\operatorname{arctanh}(\tanh(bx+a))}}\right)\sqrt{bx-\operatorname{arctanh}(\tanh(bx+a))}}{4b^{7/2}}$$

Result(type 3, 248 leaves):

$$\frac{2\sqrt{x}}{b^3} + \frac{9x^{3/2}a}{4b^2\operatorname{arctanh}(\tanh(bx+a))^2} + \frac{9x^{3/2}(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{4b^2\operatorname{arctanh}(\tanh(bx+a))^2} + \frac{7\sqrt{x}\,a^2}{4b^3\operatorname{arctanh}(\tanh(bx+a))^2}$$

$$+\frac{7\sqrt{x}\,a\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{2b^3\operatorname{arctanh}(\tanh(bx+a))^2}+\frac{7\sqrt{x}\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2}{4b^3\operatorname{arctanh}(\tanh(bx+a))^2}-\frac{15\arctan\left(\frac{b\sqrt{x}}{\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}\right)a}{4b^3\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}$$

$$-\frac{15\arctan\left(\frac{b\sqrt{x}}{\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}\right)(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{4b^3\sqrt{(-bx+\operatorname{arctanh}(\tanh(bx+a)))\,b}}$$

Problem 59: Result more than twice size of optimal antiderivative.

$$\int\frac{\operatorname{arctanh}(\tanh(bx+a))^{3/2}}{\sqrt{x}}\,dx$$

Optimal(type 3, 79 leaves, 3 steps):

$$\frac{3\operatorname{arctanh}\left(\frac{\sqrt{b}\,\sqrt{x}}{\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}\right)(bx-\operatorname{arctanh}(\tanh(bx+a)))^2}{4\sqrt{b}}+\frac{\operatorname{arctanh}(\tanh(bx+a))^{3/2}\sqrt{x}}{2}$$

$$-\frac{3\,(bx-\operatorname{arctanh}(\tanh(bx+a)))\sqrt{x}\,\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{4}$$

Result(type 3, 164 leaves):

$$\frac{\operatorname{arctanh}(\tanh(bx+a))^{3/2}\sqrt{x}}{2}+\frac{3a\sqrt{x}\,\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{4}+\frac{3\ln\left(\sqrt{b}\,\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)a^2}{4\sqrt{b}}$$

$$+\frac{3a\ln\left(\sqrt{b}\,\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{2\sqrt{b}}$$

$$+\frac{3\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)\sqrt{x}\,\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{4}$$

$$+\frac{3\ln\left(\sqrt{b}\,\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2}{4\sqrt{b}}$$

Problem 63: Result more than twice size of optimal antiderivative.

$$\int\frac{\operatorname{arctanh}(\tanh(bx+a))^{5/2}}{\sqrt{x}}\,dx$$

Optimal(type 3, 108 leaves, 4 steps):

$$-\frac{5\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}\right)(bx-\operatorname{arctanh}(\tanh(bx+a)))^3}{8\sqrt{b}} - \frac{5\,(bx-\operatorname{arctanh}(\tanh(bx+a)))\operatorname{arctanh}(\tanh(bx+a))^{3/2}\sqrt{x}}{12}$$

$$+\frac{\operatorname{arctanh}(\tanh(bx+a))^{5/2}\sqrt{x}}{3} + \frac{5\,(bx-\operatorname{arctanh}(\tanh(bx+a)))^2\sqrt{x}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{8}$$

Result(type 3, 285 leaves):

$$\frac{\operatorname{arctanh}(\tanh(bx+a))^{5/2}\sqrt{x}}{3} + \frac{5a\sqrt{x}\operatorname{arctanh}(\tanh(bx+a))^{3/2}}{12} + \frac{5a^2\sqrt{x}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{8} + \frac{5\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)a^3}{8\sqrt{b}}$$

$$+\frac{15a^2\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{8\sqrt{b}}$$

$$+\frac{5a\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)\sqrt{x}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{4}$$

$$+\frac{15a\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2}{8\sqrt{b}}$$

$$+\frac{5\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)\sqrt{x}\operatorname{arctanh}(\tanh(bx+a))^{3/2}}{12} + \frac{5\,(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2\sqrt{x}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{8}$$

$$+\frac{5\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^3}{8\sqrt{b}}$$

Problem 66: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{3/2}}{\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}\,dx$$

Optimal(type 3, 85 leaves, 3 steps):

$$\frac{3\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}\right)(bx-\operatorname{arctanh}(\tanh(bx+a)))^2}{4b^{5/2}} + \frac{x^{3/2}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{2b}$$

$$+\frac{3\,(bx-\operatorname{arctanh}(\tanh(bx+a)))\sqrt{x}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{4b^2}$$

Result(type 3, 173 leaves):

$$\frac{x^{3/2}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{2b} - \frac{3a\sqrt{x}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{4b^2} + \frac{3\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)a^2}{4b^{5/2}}$$

$$+\frac{3a\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{2b^{5/2}}$$

$$-\frac{3\left(\operatorname{arctanh}(\tanh(bx+a))-bx-a\right)\sqrt{x}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{4b^2}$$

$$+\frac{3\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)\left(\operatorname{arctanh}(\tanh(bx+a))-bx-a\right)^2}{4b^{5/2}}$$

Problem 69: Result more than twice size of optimal antiderivative.

$$\int\frac{x^{5/2}}{\operatorname{arctanh}(\tanh(bx+a))^{3/2}}\,dx$$

Optimal(type 3, 102 leaves, 4 steps):

$$\frac{15\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}\right)\left(bx-\operatorname{arctanh}(\tanh(bx+a))\right)^2}{4b^{7/2}}-\frac{2x^{5/2}}{b\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}+\frac{5x^{3/2}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{2b^2}$$

$$+\frac{15\left(bx-\operatorname{arctanh}(\tanh(bx+a))\right)\sqrt{x}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{4b^3}$$

Result(type 3, 260 leaves):

$$\frac{x^{5/2}}{2b\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}-\frac{5ax^{3/2}}{4b^2\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}-\frac{15a^2\sqrt{x}}{4b^3\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}+\frac{15a^2\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)}{4b^{7/2}}$$

$$-\frac{15a\left(\operatorname{arctanh}(\tanh(bx+a))-bx-a\right)\sqrt{x}}{2b^3\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}+\frac{15a\left(\operatorname{arctanh}(\tanh(bx+a))-bx-a\right)\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)}{2b^{7/2}}$$

$$-\frac{5\left(\operatorname{arctanh}(\tanh(bx+a))-bx-a\right)x^{3/2}}{4b^2\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}-\frac{15\left(\operatorname{arctanh}(\tanh(bx+a))-bx-a\right)^2\sqrt{x}}{4b^3\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}$$

$$+\frac{15\left(\operatorname{arctanh}(\tanh(bx+a))-bx-a\right)^2\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)}{4b^{7/2}}$$

Problem 70: Result more than twice size of optimal antiderivative.

$$\int\frac{x^{5/2}}{\operatorname{arctanh}(\tanh(bx+a))^{5/2}}\,dx$$

Optimal(type 3, 87 leaves, 4 steps):

$$\frac{5\operatorname{arctanh}\left(\frac{\sqrt{b}\sqrt{x}}{\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}\right)\left(bx-\operatorname{arctanh}(\tanh(bx+a))\right)}{b^{7/2}}-\frac{2x^{5/2}}{3b\operatorname{arctanh}(\tanh(bx+a))^{3/2}}-\frac{10x^{3/2}}{3b^2\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}$$

$$+\frac{5\sqrt{x}\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}{b^3}$$

Result(type 3, 179 leaves):

$$\frac{x^{5/2}}{b\operatorname{arctanh}(\tanh(bx+a))^{3/2}}+\frac{5ax^{3/2}}{3b^2\operatorname{arctanh}(\tanh(bx+a))^{3/2}}+\frac{5a\sqrt{x}}{b^3\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}-\frac{5a\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)}{b^{7/2}}$$
$$+\frac{5(\operatorname{arctanh}(\tanh(bx+a))-bx-a)x^{3/2}}{3b^2\operatorname{arctanh}(\tanh(bx+a))^{3/2}}+\frac{5(\operatorname{arctanh}(\tanh(bx+a))-bx-a)\sqrt{x}}{b^3\sqrt{\operatorname{arctanh}(\tanh(bx+a))}}$$
$$-\frac{5(\operatorname{arctanh}(\tanh(bx+a))-bx-a)\ln\left(\sqrt{b}\sqrt{x}+\sqrt{\operatorname{arctanh}(\tanh(bx+a))}\right)}{b^{7/2}}$$

Problem 73: Result more than twice size of optimal antiderivative.

$$\int x^3\operatorname{arctanh}(\tanh(bx+a))^n\,dx$$

Optimal(type 3, 121 leaves, 5 steps):

$$\frac{x^3\operatorname{arctanh}(\tanh(bx+a))^{1+n}}{b(1+n)}-\frac{3x^2\operatorname{arctanh}(\tanh(bx+a))^{2+n}}{b^2(1+n)(2+n)}+\frac{6x\operatorname{arctanh}(\tanh(bx+a))^{3+n}}{b^3(1+n)(2+n)(3+n)}-\frac{6\operatorname{arctanh}(\tanh(bx+a))^{4+n}}{b^4(1+n)(2+n)(3+n)(4+n)}$$

Result(type 3, 491 leaves):

$$\frac{x^4e^{n\ln(\operatorname{arctanh}(\tanh(bx+a)))}}{4+n}+\frac{n(-bx+\operatorname{arctanh}(\tanh(bx+a)))x^3e^{n\ln(\operatorname{arctanh}(\tanh(bx+a)))}}{b(n^2+7n+12)}-\frac{6e^{n\ln(\operatorname{arctanh}(\tanh(bx+a)))}a^4}{b^4(n^4+10n^3+35n^2+50n+24)}$$
$$-\frac{24e^{n\ln(\operatorname{arctanh}(\tanh(bx+a)))}a^3(\operatorname{arctanh}(\tanh(bx+a))-bx-a)}{b^4(n^4+10n^3+35n^2+50n+24)}-\frac{36e^{n\ln(\operatorname{arctanh}(\tanh(bx+a)))}a^2(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2}{b^4(n^4+10n^3+35n^2+50n+24)}$$
$$-\frac{24e^{n\ln(\operatorname{arctanh}(\tanh(bx+a)))}a(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^3}{b^4(n^4+10n^3+35n^2+50n+24)}-\frac{6e^{n\ln(\operatorname{arctanh}(\tanh(bx+a)))}(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^4}{b^4(n^4+10n^3+35n^2+50n+24)}$$
$$-\frac{3n\left(a^2+2a(\operatorname{arctanh}(\tanh(bx+a))-bx-a)+(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2\right)x^2e^{n\ln(\operatorname{arctanh}(\tanh(bx+a)))}}{b^2(n^3+9n^2+26n+24)}$$
$$+\frac{1}{b^3(n^4+10n^3+35n^2+50n+24)}\left(6n\left(a^3+3a^2(\operatorname{arctanh}(\tanh(bx+a))-bx-a)+3a(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^2\right.\right.$$
$$\left.\left.+(\operatorname{arctanh}(\tanh(bx+a))-bx-a)^3\right)xe^{n\ln(\operatorname{arctanh}(\tanh(bx+a)))}\right)$$

Problem 75: Unable to integrate problem.

$$\int x\operatorname{arctanh}(\sinh(x))\,dx$$

Optimal(type 1, 1 leaves, 8 steps):

$$0$$

Result(type 8, 7 leaves):

$$\int x\operatorname{arctanh}(\sinh(x))\,dx$$

Problem 77: Result more than twice size of optimal antiderivative.

$$\int x^2 \operatorname{arctanh}(\cosh(x))\, dx$$

Optimal(type 4, 66 leaves, 10 steps):

$$-\frac{2 x^3 \operatorname{arctanh}(e^x)}{3} + \frac{x^3 \operatorname{arctanh}(\cosh(x))}{3} - x^2 \operatorname{polylog}(2, -e^x) + x^2 \operatorname{polylog}(2, e^x) + 2 x \operatorname{polylog}(3, -e^x) - 2 x \operatorname{polylog}(3, e^x) - 2 \operatorname{polylog}(4, -e^x) + 2 \operatorname{polylog}(4, e^x)$$

Result(type 4, 500 leaves):

$$\frac{x^3 \ln(1 - e^x)}{3} - \frac{x^3 \ln(e^x - 1)}{3} - 2 \operatorname{polylog}(4, -e^x) + 2 \operatorname{polylog}(4, e^x) + x^2 \operatorname{polylog}(2, e^x) - x^2 \operatorname{polylog}(2, -e^x) + \frac{I \pi \operatorname{csgn}(I e^{-x}) \operatorname{csgn}\left(I e^{-x} (e^x + 1)^2\right)^2 x^3}{12}$$
$$- \frac{I \pi \operatorname{csgn}\left(I (e^x + 1)^2\right)^3 x^3}{12} + \frac{I \pi \operatorname{csgn}\left(I (e^x - 1)^2\right)^3 x^3}{12} + \frac{I \pi \operatorname{csgn}\left(I (e^x + 1)^2\right) \operatorname{csgn}\left(I e^{-x} (e^x + 1)^2\right)^2 x^3}{12} - \frac{I \pi x^3}{6}$$
$$+ \frac{I \pi \operatorname{csgn}(I e^{-x}) \operatorname{csgn}\left(I (e^x - 1)^2\right) \operatorname{csgn}\left(I e^{-x} (e^x - 1)^2\right) x^3}{12} - \frac{I \pi \operatorname{csgn}(I (e^x - 1)) \operatorname{csgn}\left(I (e^x - 1)^2\right)^2 x^3}{6} - \frac{I \pi \operatorname{csgn}(I e^{-x}) \operatorname{csgn}\left(I e^{-x} (e^x - 1)^2\right)^2 x^3}{12}$$
$$- \frac{I \pi \operatorname{csgn}(I e^{-x}) \operatorname{csgn}\left(I (e^x + 1)^2\right) \operatorname{csgn}\left(I e^{-x} (e^x + 1)^2\right) x^3}{12} + \frac{I \pi \operatorname{csgn}(I (e^x - 1))^2 \operatorname{csgn}\left(I (e^x - 1)^2\right) x^3}{12} + \frac{I \pi \operatorname{csgn}(I (e^x + 1)) \operatorname{csgn}\left(I (e^x + 1)^2\right)^2 x^3}{6}$$
$$- \frac{I \pi \operatorname{csgn}\left(I (e^x - 1)^2\right) \operatorname{csgn}\left(I e^{-x} (e^x - 1)^2\right)^2 x^3}{12} + \frac{I \pi \operatorname{csgn}\left(I e^{-x} (e^x - 1)^2\right)^2 x^3}{6} - \frac{I \pi \operatorname{csgn}(I (e^x + 1))^2 \operatorname{csgn}\left(I (e^x + 1)^2\right) x^3}{12}$$
$$- \frac{I \pi \operatorname{csgn}\left(I e^{-x} (e^x + 1)^2\right)^3 x^3}{12} + 2 x \operatorname{polylog}(3, -e^x) - 2 x \operatorname{polylog}(3, e^x) - \frac{I \pi \operatorname{csgn}\left(I e^{-x} (e^x - 1)^2\right)^3 x^3}{12}$$

Problem 78: Result more than twice size of optimal antiderivative.

$$\int x^3 \operatorname{arctanh}(1 + d + d \tanh(b x + a))\, dx$$

Optimal(type 4, 136 leaves, 8 steps):

$$\frac{b x^5}{20} + \frac{x^4 \operatorname{arctanh}(1 + d + d \tanh(b x + a))}{4} - \frac{x^4 \ln\left(1 + (1 + d) e^{2 b x + 2 a}\right)}{8} - \frac{x^3 \operatorname{polylog}\left(2, -(1 + d) e^{2 b x + 2 a}\right)}{4 b} + \frac{3 x^2 \operatorname{polylog}\left(3, -(1 + d) e^{2 b x + 2 a}\right)}{8 b^2}$$
$$- \frac{3 x \operatorname{polylog}\left(4, -(1 + d) e^{2 b x + 2 a}\right)}{8 b^3} + \frac{3 \operatorname{polylog}\left(5, -(1 + d) e^{2 b x + 2 a}\right)}{16 b^4}$$

Result(type 4, 1778 leaves):

$$-\frac{I \pi x^4}{8} - \frac{d \operatorname{polylog}\left(2, (-d - 1) e^{2 b x + 2 a}\right) a^3}{4 b^4 (1 + d)} + \frac{x^4 \ln\left(e^{2 b x + 2 a} d + e^{2 b x + 2 a} + 1\right)}{8} + \frac{3 d \operatorname{polylog}\left(3, (-d - 1) e^{2 b x + 2 a}\right) x^2}{8 b^2 (1 + d)}$$
$$- \frac{3 d \operatorname{polylog}\left(4, (-d - 1) e^{2 b x + 2 a}\right) x}{8 b^3 (1 + d)} + \frac{d a^3 \ln\left(1 + e^{b x + a} \sqrt{-d - 1}\right) x}{2 b^3 (1 + d)} + \frac{d a^3 \ln\left(1 - e^{b x + a} \sqrt{-d - 1}\right) x}{2 b^3 (1 + d)} - \frac{d \ln\left(1 + (1 + d) e^{2 b x + 2 a}\right) x a^3}{2 b^3 (1 + d)}$$

$$+\frac{a^4 \ln\left(1+e^{b x+a}\sqrt{-d-1}\right)}{2 b^4 (1+d)}-\frac{3 \ln\left(1+(1+d) e^{2 b x+2 a}\right) a^4}{8 b^4 (1+d)}+\frac{a^4 \ln\left(1-e^{b x+a}\sqrt{-d-1}\right)}{2 b^4 (1+d)}+\frac{a^3 \operatorname{dilog}\left(1+e^{b x+a}\sqrt{-d-1}\right)}{2 b^4 (1+d)}$$

$$+\frac{a^3 \operatorname{dilog}\left(1-e^{b x+a}\sqrt{-d-1}\right)}{2 b^4 (1+d)}-\frac{d \ln\left(1+(1+d) e^{2 b x+2 a}\right) x^4}{8 (1+d)}+\frac{I \pi \operatorname{csgn}\left(I e^{2 b x+2 a}\right)^3 x^4}{16}+\frac{I \pi \operatorname{csgn}\left(\frac{I e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right)^3 x^4}{16}$$

$$+\frac{I \pi \operatorname{csgn}\left(\frac{I d e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right)^2 x^4}{8}-\frac{\operatorname{polylog}\left(2,(-d-1) e^{2 b x+2 a}\right) x^3}{4 b (1+d)}-\frac{\operatorname{polylog}\left(2,(-d-1) e^{2 b x+2 a}\right) a^3}{4 b^4 (1+d)}+\frac{3 \operatorname{polylog}\left(3,(-d-1) e^{2 b x+2 a}\right) x^2}{8 b^2 (1+d)}$$

$$-\frac{3 \operatorname{polylog}\left(4,(-d-1) e^{2 b x+2 a}\right) x}{8 b^3 (1+d)}-\frac{a^4 \ln\left(e^{2 b x+2 a} d+e^{2 b x+2 a}+1\right)}{8 b^4 (1+d)}+\frac{3 d \operatorname{polylog}\left(5,(-d-1) e^{2 b x+2 a}\right)}{16 b^4 (1+d)}$$

$$-\frac{I \pi \operatorname{csgn}\left(\frac{I\left(e^{2 b x+2 a} d+e^{2 b x+2 a}+1\right)}{e^{2 b x+2 a}+1}\right)^3 x^4}{16}-\frac{x^4 \ln\left(e^{b x+a}\right)}{4}-\frac{\ln(d) x^4}{8}+\frac{I \pi \operatorname{csgn}\left(\frac{I}{e^{2 b x+2 a}+1}\right) \operatorname{csgn}\left(I e^{2 b x+2 a}\right) \operatorname{csgn}\left(\frac{I e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right) x^4}{16}$$

$$-\frac{I \pi \operatorname{csgn}\left(\frac{I}{e^{2 b x+2 a}+1}\right) \operatorname{csgn}\left(I\left(e^{2 b x+2 a} d+e^{2 b x+2 a}+1\right)\right) \operatorname{csgn}\left(\frac{I\left(e^{2 b x+2 a} d+e^{2 b x+2 a}+1\right)}{e^{2 b x+2 a}+1}\right) x^4}{16}$$

$$+\frac{I \pi \operatorname{csgn}(I d) \operatorname{csgn}\left(\frac{I e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right) \operatorname{csgn}\left(\frac{I d e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right) x^4}{16}+\frac{d a^4 \ln\left(1+e^{b x+a}\sqrt{-d-1}\right)}{2 b^4 (1+d)}+\frac{d a^4 \ln\left(1-e^{b x+a}\sqrt{-d-1}\right)}{2 b^4 (1+d)}$$

$$+\frac{d a^3 \operatorname{dilog}\left(1+e^{b x+a}\sqrt{-d-1}\right)}{2 b^4 (1+d)}+\frac{d a^3 \operatorname{dilog}\left(1-e^{b x+a}\sqrt{-d-1}\right)}{2 b^4 (1+d)}+\frac{a^3 \ln\left(1+e^{b x+a}\sqrt{-d-1}\right) x}{2 b^3 (1+d)}-\frac{\ln\left(1+(1+d) e^{2 b x+2 a}\right) x a^3}{2 b^3 (1+d)}$$

$$+\frac{a^3 \ln\left(1-e^{b x+a}\sqrt{-d-1}\right) x}{2 b^3 (1+d)}-\frac{3 d \ln\left(1+(1+d) e^{2 b x+2 a}\right) a^4}{8 b^4 (1+d)}-\frac{I \pi \operatorname{csgn}\left(\frac{I d e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right)^3 x^4}{16}$$

$$+\frac{I \pi \operatorname{csgn}\left(\frac{I}{e^{2 b x+2 a}+1}\right) \operatorname{csgn}\left(\frac{I\left(e^{2 b x+2 a} d+e^{2 b x+2 a}+1\right)}{e^{2 b x+2 a}+1}\right)^2 x^4}{16}+\frac{I \pi \operatorname{csgn}\left(I e^{b x+a}\right)^2 \operatorname{csgn}\left(I e^{2 b x+2 a}\right) x^4}{16}$$

$$+\frac{I \pi \operatorname{csgn}\left(I\left(e^{2 b x+2 a} d+e^{2 b x+2 a}+1\right)\right) \operatorname{csgn}\left(\frac{I\left(e^{2 b x+2 a} d+e^{2 b x+2 a}+1\right)}{e^{2 b x+2 a}+1}\right)^2 x^4}{16}-\frac{I \pi \operatorname{csgn}\left(I e^{b x+a}\right) \operatorname{csgn}\left(I e^{2 b x+2 a}\right)^2 x^4}{8}$$

$$-\frac{I \pi \operatorname{csgn}\left(I e^{2 b x+2 a}\right) \operatorname{csgn}\left(\frac{I e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right)^2 x^4}{16}-\frac{I \pi \operatorname{csgn}\left(\frac{I e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right) \operatorname{csgn}\left(\frac{I d e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right)^2 x^4}{16}-\frac{I \pi \operatorname{csgn}(I d) \operatorname{csgn}\left(\frac{I d e^{2 b x+2 a}}{e^{2 b x+2 a}+1}\right)^2 x^4}{16}$$

$$-\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(\frac{I\,e^{2bx+2a}}{e^{2bx+2a}+1}\right)^{2}x^{4}}{16}+\frac{b\,x^{5}}{20}-\frac{\ln\left(1+(1+d)\,e^{2bx+2a}\right)x^{4}}{8\,(1+d)}+\frac{3\,\mathrm{polylog}\left(5,\,(-d-1)\,e^{2bx+2a}\right)}{16\,b^{4}\,(1+d)}$$
$$-\frac{d\,a^{4}\ln\left(e^{2bx+2a}d+e^{2bx+2a}+1\right)}{8\,b^{4}\,(1+d)}-\frac{d\,\mathrm{polylog}\left(2,\,(-d-1)\,e^{2bx+2a}\right)x^{3}}{4\,b\,(1+d)}$$

Problem 79: Result more than twice size of optimal antiderivative.

$$\int -x^{2}\,\mathrm{arctanh}(-1+d+d\tanh(bx+a))\,dx$$

Optimal(type 4, 120 leaves, 7 steps):

$$\frac{b\,x^{4}}{12}-\frac{x^{3}\,\mathrm{arctanh}(-1+d+d\tanh(bx+a))}{3}-\frac{x^{3}\ln\left(1+(1-d)\,e^{2bx+2a}\right)}{6}-\frac{x^{2}\,\mathrm{polylog}\left(2,\,-(1-d)\,e^{2bx+2a}\right)}{4\,b}+\frac{x\,\mathrm{polylog}\left(3,\,-(1-d)\,e^{2bx+2a}\right)}{4\,b^{2}}$$
$$-\frac{\mathrm{polylog}\left(4,\,-(1-d)\,e^{2bx+2a}\right)}{8\,b^{3}}$$

Result(type 4, 1721 leaves):

$$-\frac{x^{3}\ln\left(e^{bx+a}\right)}{3}-\frac{\ln(d)\,x^{3}}{6}+\frac{I\pi x^{3}\,\mathrm{csgn}\left(\frac{I\,e^{2bx+2a}}{e^{2bx+2a}+1}\right)^{3}}{12}-\frac{I\pi\,\mathrm{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)}{e^{2bx+2a}+1}\right)^{2}x^{3}}{6}+\frac{\ln\left(1+(1-d)\,e^{2bx+2a}\right)x^{3}}{6\,(d-1)}$$
$$+\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)}{e^{2bx+2a}+1}\right)^{2}x^{3}}{12}$$
$$+\frac{I\pi\,\mathrm{csgn}\left(I\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)\right)\mathrm{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)}{e^{2bx+2a}+1}\right)^{2}x^{3}}{12}+\frac{d\,a^{3}\ln\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)}{6\,b^{3}\,(d-1)}$$
$$+\frac{x^{3}\ln\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)}{6}+\frac{d\ln\left(1+(1-d)\,e^{2bx+2a}\right)a^{3}}{3\,b^{3}\,(d-1)}+\frac{I\pi x^{3}}{6}+\frac{I\pi\,\mathrm{csgn}\left(\frac{I\,d\,e^{2bx+2a}}{e^{2bx+2a}+1}\right)^{3}x^{3}}{12}+\frac{I\pi x^{3}\,\mathrm{csgn}\left(I\,e^{2bx+2a}\right)^{3}}{12}$$
$$-\frac{d\,\mathrm{polylog}\left(4,\,(d-1)\,e^{2bx+2a}\right)}{8\,b^{3}\,(d-1)}+\frac{a^{2}\,\mathrm{dilog}\left(1-e^{bx+a}\sqrt{d-1}\right)}{2\,b^{3}\,(d-1)}+\frac{a^{2}\,\mathrm{dilog}\left(1+e^{bx+a}\sqrt{d-1}\right)}{2\,b^{3}\,(d-1)}+\frac{\mathrm{polylog}\left(2,\,(d-1)\,e^{2bx+2a}\right)x^{2}}{4\,b\,(d-1)}$$
$$-\frac{\mathrm{polylog}\left(2,\,(d-1)\,e^{2bx+2a}\right)a^{2}}{4\,b^{3}\,(d-1)}-\frac{\mathrm{polylog}\left(3,\,(d-1)\,e^{2bx+2a}\right)x}{4\,b^{2}\,(d-1)}+\frac{a^{3}\ln\left(1-e^{bx+a}\sqrt{d-1}\right)}{2\,b^{3}\,(d-1)}+\frac{a^{3}\ln\left(1+e^{bx+a}\sqrt{d-1}\right)}{2\,b^{3}\,(d-1)}$$
$$+\frac{d\,\mathrm{polylog}\left(3,\,(d-1)\,e^{2bx+2a}\right)x}{4\,b^{2}\,(d-1)}+\frac{a^{2}\ln\left(1-e^{bx+a}\sqrt{d-1}\right)x}{2\,b^{2}\,(d-1)}+\frac{a^{2}\ln\left(1+e^{bx+a}\sqrt{d-1}\right)x}{2\,b^{2}\,(d-1)}-\frac{d\,a^{3}\ln\left(1-e^{bx+a}\sqrt{d-1}\right)}{2\,b^{3}\,(d-1)}$$
$$-\frac{d\,a^{3}\ln\left(1+e^{bx+a}\sqrt{d-1}\right)}{2\,b^{3}\,(d-1)}-\frac{d\,a^{2}\,\mathrm{dilog}\left(1-e^{bx+a}\sqrt{d-1}\right)}{2\,b^{3}\,(d-1)}-\frac{d\,a^{2}\,\mathrm{dilog}\left(1+e^{bx+a}\sqrt{d-1}\right)}{2\,b^{3}\,(d-1)}-\frac{d\,\mathrm{polylog}\left(2,\,(d-1)\,e^{2bx+2a}\right)x^{2}}{4\,b\,(d-1)}$$

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

$$+\frac{\mathrm{polylog}\left(4,\,(d-1)\,e^{2bx+2a}\right)}{8b^3(d-1)}+\frac{d\ln\left(1+(1-d)\,e^{2bx+2a}\right)a^2x}{2b^2(d-1)}$$

$$-\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(I\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)\right)\mathrm{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)}{e^{2bx+2a}+1}\right)x^3}{12}$$

$$+\frac{I\pi x^3\,\mathrm{csgn}(I d)\,\mathrm{csgn}\left(\frac{I e^{2bx+2a}}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(\frac{I d\,e^{2bx+2a}}{e^{2bx+2a}+1}\right)}{12}+\frac{I\pi x^3\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(I e^{2bx+2a}\right)\mathrm{csgn}\left(\frac{I e^{2bx+2a}}{e^{2bx+2a}+1}\right)}{12}$$

$$-\frac{I\pi x^3\,\mathrm{csgn}\left(I e^{2bx+2a}\right)\mathrm{csgn}\left(\frac{I e^{2bx+2a}}{e^{2bx+2a}+1}\right)^2}{12}-\frac{I\pi x^3\,\mathrm{csgn}\left(\frac{I e^{2bx+2a}}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(\frac{I d\,e^{2bx+2a}}{e^{2bx+2a}+1}\right)^2}{12}-\frac{I\pi x^3\,\mathrm{csgn}(I d)\,\mathrm{csgn}\left(\frac{I d\,e^{2bx+2a}}{e^{2bx+2a}+1}\right)^2}{12}$$

$$-\frac{a^3\ln\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)}{6b^3(d-1)}-\frac{\ln\left(1+(1-d)\,e^{2bx+2a}\right)a^3}{3b^3(d-1)}-\frac{d\ln\left(1+(1-d)\,e^{2bx+2a}\right)x^3}{6(d-1)}$$

$$+\frac{I\pi\,\mathrm{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}-1\right)}{e^{2bx+2a}+1}\right)^3x^3}{12}+\frac{b x^4}{12}-\frac{I\pi x^3\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(\frac{I e^{2bx+2a}}{e^{2bx+2a}+1}\right)^2}{12}$$

$$+\frac{I\pi x^3\,\mathrm{csgn}\left(I e^{bx+a}\right)^2\mathrm{csgn}\left(I e^{2bx+2a}\right)}{12}-\frac{I\pi x^3\,\mathrm{csgn}\left(I e^{bx+a}\right)\mathrm{csgn}\left(I e^{2bx+2a}\right)^2}{6}$$

Problem 80: Result more than twice size of optimal antiderivative.

$$\int x^2\,\mathrm{arctanh}(c+d\coth(bx+a))\,dx$$

Optimal(type 4, 277 leaves, 11 steps):

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

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

$$+\frac{\mathrm{polylog}\left(4,\frac{(1-c-d)\,e^{2bx+2a}}{1-c+d}\right)}{8b^3}-\frac{\mathrm{polylog}\left(4,\frac{(1+c+d)\,e^{2bx+2a}}{1+c-d}\right)}{8b^3}$$

Result(type ?, 5293 leaves): Display of huge result suppressed!

Problem 82: Result more than twice size of optimal antiderivative.

$$\int -x^2 \operatorname{arctanh}(-1+d+d\coth(bx+a))\,dx$$

Optimal(type 4, 118 leaves, 7 steps):

$$\frac{b x^4}{12}-\frac{x^3 \operatorname{arctanh}(-1+d+d\coth(bx+a))}{3}-\frac{x^3 \ln\left(1-(1-d)\,e^{2bx+2a}\right)}{6}-\frac{x^2 \operatorname{polylog}\left(2,(1-d)\,e^{2bx+2a}\right)}{4b}+\frac{x \operatorname{polylog}\left(3,(1-d)\,e^{2bx+2a}\right)}{4b^2}-\frac{\operatorname{polylog}\left(4,(1-d)\,e^{2bx+2a}\right)}{8b^3}$$

Result(type 4, 1749 leaves):

$$-\frac{x^3\ln(e^{bx+a})}{3}-\frac{\ln(d)\,x^3}{6}+\frac{\ln\left(1+(d-1)\,e^{2bx+2a}\right)x^3}{6(d-1)}+\frac{I\pi\operatorname{csgn}\left(\frac{I d e^{2bx+2a}}{e^{2bx+2a}-1}\right)^3 x^3}{12}+\frac{I\pi x^3}{6}+\frac{I\pi x^3\operatorname{csgn}(I e^{2bx+2a})^3}{12}$$
$$-\frac{\ln\left(1+(d-1)\,e^{2bx+2a}\right)a^2 x}{2b^2(d-1)}+\frac{a^2\ln\left(1+e^{bx+a}\sqrt{1-d}\right)x}{2b^2(d-1)}+\frac{a^2\ln\left(1-e^{bx+a}\sqrt{1-d}\right)x}{2b^2(d-1)}-\frac{d a^3\ln\left(1+e^{bx+a}\sqrt{1-d}\right)}{2b^3(d-1)}$$
$$-\frac{d a^3\ln\left(1-e^{bx+a}\sqrt{1-d}\right)}{2b^3(d-1)}-\frac{d a^2\operatorname{dilog}\left(1+e^{bx+a}\sqrt{1-d}\right)}{2b^3(d-1)}-\frac{d a^2\operatorname{dilog}\left(1-e^{bx+a}\sqrt{1-d}\right)}{2b^3(d-1)}+\frac{I\pi\operatorname{csgn}\left(\frac{I e^{2bx+2a}}{e^{2bx+2a}-1}\right)^3 x^3}{12}$$
$$-\frac{I\pi\operatorname{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}+1\right)}{e^{2bx+2a}-1}\right)^2 x^3}{6}-\frac{d\operatorname{polylog}\left(4,(1-d)\,e^{2bx+2a}\right)}{8b^3(d-1)}+\frac{\operatorname{polylog}\left(2,(1-d)\,e^{2bx+2a}\right)x^2}{4b(d-1)}$$
$$-\frac{\operatorname{polylog}\left(2,(1-d)\,e^{2bx+2a}\right)a^2}{4b^3(d-1)}-\frac{\operatorname{polylog}\left(3,(1-d)\,e^{2bx+2a}\right)x}{4b^2(d-1)}+\frac{a^2\operatorname{dilog}\left(1+e^{bx+a}\sqrt{1-d}\right)}{2b^3(d-1)}+\frac{a^2\operatorname{dilog}\left(1-e^{bx+a}\sqrt{1-d}\right)}{2b^3(d-1)}$$
$$-\frac{\ln\left(1+(d-1)\,e^{2bx+2a}\right)a^3}{3b^3(d-1)}+\frac{a^3\ln\left(1+e^{bx+a}\sqrt{1-d}\right)}{2b^3(d-1)}-\frac{d\ln\left(1+(d-1)\,e^{2bx+2a}\right)x^3}{6(d-1)}+\frac{a^3\ln\left(1-e^{bx+a}\sqrt{1-d}\right)}{2b^3(d-1)}$$
$$-\frac{a^3\ln\left(e^{2bx+2a}d-e^{2bx+2a}+1\right)}{6b^3(d-1)}+\frac{I\pi\operatorname{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}+1\right)}{e^{2bx+2a}-1}\right)^3 x^3}{12}+\frac{b x^4}{12}+\frac{I\pi x^3\operatorname{csgn}(I e^{bx+a})^2\operatorname{csgn}(I e^{2bx+2a})}{12}$$
$$-\frac{I\pi x^3\operatorname{csgn}(I e^{bx+a})\operatorname{csgn}(I e^{2bx+2a})^2}{6}+\frac{d\ln\left(1+(d-1)\,e^{2bx+2a}\right)a^3}{3b^3(d-1)}+\frac{\operatorname{polylog}\left(4,(1-d)\,e^{2bx+2a}\right)}{8b^3(d-1)}+\frac{d\ln\left(1+(d-1)\,e^{2bx+2a}\right)a^2 x}{2b^2(d-1)}$$
$$-\frac{d a^2\ln\left(1+e^{bx+a}\sqrt{1-d}\right)x}{2b^2(d-1)}-\frac{d a^2\ln\left(1-e^{bx+a}\sqrt{1-d}\right)x}{2b^2(d-1)}+\frac{I\pi\operatorname{csgn}(I d)\operatorname{csgn}\left(\frac{I e^{2bx+2a}}{e^{2bx+2a}-1}\right)\operatorname{csgn}\left(\frac{I d e^{2bx+2a}}{e^{2bx+2a}-1}\right)x^3}{12}$$
$$+\frac{I\pi\operatorname{csgn}(I e^{2bx+2a})\operatorname{csgn}\left(\frac{I}{e^{2bx+2a}-1}\right)\operatorname{csgn}\left(\frac{I e^{2bx+2a}}{e^{2bx+2a}-1}\right)x^3}{12}$$

$$-\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}-1}\right)\mathrm{csgn}\left(I\left(e^{2bx+2a}d-e^{2bx+2a}+1\right)\right)\mathrm{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}+1\right)}{e^{2bx+2a}-1}\right)x^3}{12}+\frac{x^3\ln\left(e^{2bx+2a}d-e^{2bx+2a}+1\right)}{6}$$

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

$$+\frac{I\pi\,\mathrm{csgn}\left(I\left(e^{2bx+2a}d-e^{2bx+2a}+1\right)\right)\mathrm{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}+1\right)}{e^{2bx+2a}-1}\right)^2x^3}{12}-\frac{I\pi\,\mathrm{csgn}\left(\frac{I\,e^{2bx+2a}}{e^{2bx+2a}-1}\right)\mathrm{csgn}\left(\frac{I\,d\,e^{2bx+2a}}{e^{2bx+2a}-1}\right)^2x^3}{12}$$

$$-\frac{I\pi\,\mathrm{csgn}\left(I\,e^{2bx+2a}\right)\mathrm{csgn}\left(\frac{I\,e^{2bx+2a}}{e^{2bx+2a}-1}\right)^2x^3}{12}+\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}-1}\right)\mathrm{csgn}\left(\frac{I\left(e^{2bx+2a}d-e^{2bx+2a}+1\right)}{e^{2bx+2a}-1}\right)^2x^3}{12}$$

$$-\frac{I\pi\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}-1}\right)\mathrm{csgn}\left(\frac{I\,e^{2bx+2a}}{e^{2bx+2a}-1}\right)^2x^3}{12}-\frac{I\pi\,\mathrm{csgn}(I\,d)\,\mathrm{csgn}\left(\frac{I\,d\,e^{2bx+2a}}{e^{2bx+2a}-1}\right)^2x^3}{12}$$

Problem 84: Result more than twice size of optimal antiderivative.

$$\int \mathrm{arctanh}(\tan(bx+a))\,dx$$

Optimal(type 4, 64 leaves, 6 steps):

$$I\,x\arctan\left(e^{2I(bx+a)}\right)+x\,\mathrm{arctanh}(\tan(bx+a))-\frac{I\,\mathrm{polylog}\left(2,-I\,e^{2I(bx+a)}\right)}{4b}+\frac{I\,\mathrm{polylog}\left(2,I\,e^{2I(bx+a)}\right)}{4b}$$

Result(type 4, 515 leaves):

$$\frac{\arctan(\tan(bx+a))\,\mathrm{arctanh}(\tan(bx+a))}{b}+\frac{\arctan(\tan(bx+a))\ln\left(\frac{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}-\frac{1+I\tan(bx+a)}{\sqrt{1+\tan(bx+a)^2}}}{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}}\right)}{2b}$$

$$-\frac{I\,\mathrm{dilog}\left(\frac{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}-\frac{1+I\tan(bx+a)}{\sqrt{1+\tan(bx+a)^2}}}{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}}\right)}{2b}-\frac{\arctan(\tan(bx+a))\ln\left(\frac{-\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}-\frac{1+I\tan(bx+a)}{\sqrt{1+\tan(bx+a)^2}}}{-\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}}\right)}{2b}$$

$$+\frac{\mathrm{I}\,\mathrm{dilog}\left(\frac{-\frac{\sqrt{2}}{2}+\frac{\mathrm{I}\sqrt{2}}{2}-\frac{1+\mathrm{I}\tan(bx+a)}{\sqrt{1+\tan(bx+a)^2}}}{-\frac{\sqrt{2}}{2}+\frac{\mathrm{I}\sqrt{2}}{2}}\right)}{2b}+\frac{\arctan(\tan(bx+a))\ln\left(\frac{-\frac{\sqrt{2}}{2}-\frac{\mathrm{I}\sqrt{2}}{2}-\frac{1+\mathrm{I}\tan(bx+a)}{\sqrt{1+\tan(bx+a)^2}}}{-\frac{\sqrt{2}}{2}-\frac{\mathrm{I}\sqrt{2}}{2}}\right)}{2b}$$

$$-\frac{\mathrm{I}\,\mathrm{dilog}\left(\frac{-\frac{\sqrt{2}}{2}-\frac{\mathrm{I}\sqrt{2}}{2}-\frac{1+\mathrm{I}\tan(bx+a)}{\sqrt{1+\tan(bx+a)^2}}}{-\frac{\sqrt{2}}{2}-\frac{\mathrm{I}\sqrt{2}}{2}}\right)}{2b}-\frac{\arctan(\tan(bx+a))\ln\left(\frac{\frac{\sqrt{2}}{2}-\frac{\mathrm{I}\sqrt{2}}{2}-\frac{1+\mathrm{I}\tan(bx+a)}{\sqrt{1+\tan(bx+a)^2}}}{\frac{\sqrt{2}}{2}-\frac{\mathrm{I}\sqrt{2}}{2}}\right)}{2b}$$

$$+\frac{\mathrm{I}\,\mathrm{dilog}\left(\frac{\frac{\sqrt{2}}{2}-\frac{\mathrm{I}\sqrt{2}}{2}-\frac{1+\mathrm{I}\tan(bx+a)}{\sqrt{1+\tan(bx+a)^2}}}{\frac{\sqrt{2}}{2}-\frac{\mathrm{I}\sqrt{2}}{2}}\right)}{2b}$$

Problem 85: Result more than twice size of optimal antiderivative.

$$\int -x\,\mathrm{arctanh}(-1-\mathrm{I}d+d\tan(bx+a))\,dx$$

Optimal(type 4, 108 leaves, 6 steps):

$$\frac{\mathrm{I}bx^3}{6}-\frac{x^2\,\mathrm{arctanh}(-1-\mathrm{I}d+d\tan(bx+a))}{2}-\frac{x^2\ln\left(1+(1+\mathrm{I}d)\,\mathrm{e}^{2\mathrm{I}a+2\mathrm{I}bx}\right)}{4}+\frac{\mathrm{I}x\,\mathrm{polylog}\left(2,-(1+\mathrm{I}d)\,\mathrm{e}^{2\mathrm{I}a+2\mathrm{I}bx}\right)}{4b}$$
$$-\frac{\mathrm{polylog}\left(3,-(1+\mathrm{I}d)\,\mathrm{e}^{2\mathrm{I}a+2\mathrm{I}bx}\right)}{8b^2}$$

Result(type ?, 2357 leaves): Display of huge result suppressed!

Problem 86: Result more than twice size of optimal antiderivative.

$$\int (fx+e)^3\,\mathrm{arctanh}(\cot(bx+a))\,dx$$

Optimal(type 4, 251 leaves, 12 steps):

$$\frac{\mathrm{I}(fx+e)^4\arctan\left(\mathrm{e}^{2\mathrm{I}(bx+a)}\right)}{4f}+\frac{(fx+e)^4\,\mathrm{arctanh}(\cot(bx+a))}{4f}-\frac{\mathrm{I}(fx+e)^3\,\mathrm{polylog}\left(2,-\mathrm{I}\,\mathrm{e}^{2\mathrm{I}(bx+a)}\right)}{4b}+\frac{\mathrm{I}(fx+e)^3\,\mathrm{polylog}\left(2,\mathrm{I}\,\mathrm{e}^{2\mathrm{I}(bx+a)}\right)}{4b}$$
$$+\frac{3f(fx+e)^2\,\mathrm{polylog}\left(3,-\mathrm{I}\,\mathrm{e}^{2\mathrm{I}(bx+a)}\right)}{8b^2}-\frac{3f(fx+e)^2\,\mathrm{polylog}\left(3,\mathrm{I}\,\mathrm{e}^{2\mathrm{I}(bx+a)}\right)}{8b^2}+\frac{3\mathrm{I}f^2(fx+e)\,\mathrm{polylog}\left(4,-\mathrm{I}\,\mathrm{e}^{2\mathrm{I}(bx+a)}\right)}{8b^3}$$
$$-\frac{3\mathrm{I}f^2(fx+e)\,\mathrm{polylog}\left(4,\mathrm{I}\,\mathrm{e}^{2\mathrm{I}(bx+a)}\right)}{8b^3}-\frac{3f^3\,\mathrm{polylog}\left(5,-\mathrm{I}\,\mathrm{e}^{2\mathrm{I}(bx+a)}\right)}{16b^4}+\frac{3f^3\,\mathrm{polylog}\left(5,\mathrm{I}\,\mathrm{e}^{2\mathrm{I}(bx+a)}\right)}{16b^4}$$

Result(type ?, 7428 leaves): Display of huge result suppressed!

Problem 87: Result more than twice size of optimal antiderivative.

$$\int (fx+e)\operatorname{arctanh}(\cot(bx+a))\,dx$$

Optimal(type 4, 133 leaves, 8 steps):

$$\frac{I(fx+e)^2\arctan\left(e^{2I(bx+a)}\right)}{2f}+\frac{(fx+e)^2\operatorname{arctanh}(\cot(bx+a))}{2f}-\frac{I(fx+e)\operatorname{polylog}\left(2,-Ie^{2I(bx+a)}\right)}{4b}+\frac{I(fx+e)\operatorname{polylog}\left(2,Ie^{2I(bx+a)}\right)}{4b}+\frac{f\operatorname{polylog}\left(3,-Ie^{2I(bx+a)}\right)}{8b^2}-\frac{f\operatorname{polylog}\left(3,Ie^{2I(bx+a)}\right)}{8b^2}$$

Result(type ?, 2543 leaves): Display of huge result suppressed!

Problem 88: Result more than twice size of optimal antiderivative.

$$\int \operatorname{arctanh}(\cot(bx+a))\,dx$$

Optimal(type 4, 64 leaves, 6 steps):

$$Ix\arctan\left(e^{2I(bx+a)}\right)+x\operatorname{arctanh}(\cot(bx+a))-\frac{I\operatorname{polylog}\left(2,-Ie^{2I(bx+a)}\right)}{4b}+\frac{I\operatorname{polylog}\left(2,Ie^{2I(bx+a)}\right)}{4b}$$

Result(type 4, 764 leaves):

$$-\frac{\operatorname{arctanh}(\cot(bx+a))\pi}{2b}+\frac{\operatorname{arctanh}(\cot(bx+a))\operatorname{arccot}(\cot(bx+a))}{b}-\frac{\ln\left(\frac{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}}\right)\pi}{4b}$$
$$+\frac{\ln\left(\frac{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}}\right)\operatorname{arccot}(\cot(bx+a))}{2b}+\frac{I\operatorname{dilog}\left(\frac{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}}\right)}{2b}$$
$$+\frac{\ln\left(\frac{-\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{-\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}}\right)\pi}{4b}-\frac{\ln\left(\frac{-\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{-\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}}\right)\operatorname{arccot}(\cot(bx+a))}{2b}$$
$$-\frac{I\operatorname{dilog}\left(\frac{-\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{-\frac{\sqrt{2}}{2}+\frac{I\sqrt{2}}{2}}\right)}{2b}-\frac{\ln\left(\frac{-\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{-\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}}\right)\pi}{4b}$$

$$+\frac{\ln\left(\frac{-\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{-\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}}\right)\operatorname{arccot}(\cot(bx+a))}{2b}+\frac{I\operatorname{dilog}\left(\frac{-\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{-\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}}\right)}{2b}$$

$$+\frac{\ln\left(\frac{\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}}\right)\pi}{4b}-\frac{\ln\left(\frac{\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}}\right)\operatorname{arccot}(\cot(bx+a))}{2b}$$

$$-\frac{I\operatorname{dilog}\left(\frac{\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}-\frac{1+I\cot(bx+a)}{\sqrt{\cot(bx+a)^2+1}}}{\frac{\sqrt{2}}{2}-\frac{I\sqrt{2}}{2}}\right)}{2b}$$

Problem 89: Result more than twice size of optimal antiderivative.

$$\int x^2\operatorname{arctanh}(c+d\cot(bx+a))\,dx$$

Optimal(type 4, 329 leaves, 11 steps):

$$\frac{x^3\operatorname{arctanh}(c+d\cot(bx+a))}{3}+\frac{x^3\ln\left(1-\frac{(1-c-Id)\,e^{2Ia+2Ibx}}{1-c+Id}\right)}{6}-\frac{x^3\ln\left(1-\frac{(1+c+Id)\,e^{2Ia+2Ibx}}{1+c-Id}\right)}{6}$$

$$-\frac{Ix^2\operatorname{polylog}\left(2,\frac{(1-c-Id)\,e^{2Ia+2Ibx}}{1-c+Id}\right)}{4b}+\frac{Ix^2\operatorname{polylog}\left(2,\frac{(1+c+Id)\,e^{2Ia+2Ibx}}{1+c-Id}\right)}{4b}+\frac{x\operatorname{polylog}\left(3,\frac{(1-c-Id)\,e^{2Ia+2Ibx}}{1-c+Id}\right)}{4b^2}$$

$$-\frac{x\operatorname{polylog}\left(3,\frac{(1+c+Id)\,e^{2Ia+2Ibx}}{1+c-Id}\right)}{4b^2}+\frac{I\operatorname{polylog}\left(4,\frac{(1-c-Id)\,e^{2Ia+2Ibx}}{1-c+Id}\right)}{8b^3}-\frac{I\operatorname{polylog}\left(4,\frac{(1+c+Id)\,e^{2Ia+2Ibx}}{1+c-Id}\right)}{8b^3}$$

Result(type ?, 6738 leaves): Display of huge result suppressed!

Problem 90: Result more than twice size of optimal antiderivative.

$$\int\operatorname{arctanh}(c+d\cot(bx+a))\,dx$$

Optimal(type 4, 164 leaves, 7 steps):

$$x\operatorname{arctanh}(c+d\cot(bx+a))+\frac{x\ln\left(1-\frac{(1-c-Id)\,e^{2Ia+2Ibx}}{1-c+Id}\right)}{2}-\frac{x\ln\left(1-\frac{(1+c+Id)\,e^{2Ia+2Ibx}}{1+c-Id}\right)}{2}-\frac{I\operatorname{polylog}\left(2,\frac{(1-c-Id)\,e^{2Ia+2Ibx}}{1-c+Id}\right)}{4b}$$
$$+\frac{I\operatorname{polylog}\left(2,\frac{(1+c+Id)\,e^{2Ia+2Ibx}}{1+c-Id}\right)}{4b}$$

Result(type 4, 628 leaves):

$$-\frac{\operatorname{arctanh}(c+d\cot(bx+a))\,\pi}{2b}+\frac{\operatorname{arctanh}(c+d\cot(bx+a))\operatorname{arccot}(\cot(bx+a))}{b}$$
$$-\frac{\arctan\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)\ln\left(d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)+c-1\right)}{2b}$$
$$+\frac{\arctan\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)\ln\left(d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)+c+1\right)}{2b}$$
$$+\frac{I\ln\left(d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)+c+1\right)\ln\left(\frac{Id-d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)}{1+c+Id}\right)}{4b}$$
$$-\frac{I\ln\left(d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)+c+1\right)\ln\left(\frac{Id+d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)}{Id-c-1}\right)}{4b}+\frac{I\operatorname{dilog}\left(\frac{Id-d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)}{1+c+Id}\right)}{4b}$$
$$-\frac{I\operatorname{dilog}\left(\frac{Id+d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)}{Id-c-1}\right)}{4b}-\frac{I\ln\left(d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)+c-1\right)\ln\left(\frac{Id-d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)}{Id+c-1}\right)}{4b}$$
$$+\frac{I\ln\left(d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)+c-1\right)\ln\left(\frac{Id+d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)}{1-c+Id}\right)}{4b}-\frac{I\operatorname{dilog}\left(\frac{Id-d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)}{Id+c-1}\right)}{4b}$$
$$+\frac{I\operatorname{dilog}\left(\frac{Id+d\left(\frac{c+d\cot(bx+a)}{d}-\frac{c}{d}\right)}{1-c+Id}\right)}{4b}$$

Problem 91: Result more than twice size of optimal antiderivative.

$$\int x^2\operatorname{arctanh}(1+Id+d\cot(bx+a))\,dx$$

Optimal(type 4, 136 leaves, 7 steps):

$$\frac{I b x^4}{12}+\frac{x^3 \operatorname{arctanh}(1+I d+d \cot(b x+a))}{3}-\frac{x^3 \ln\left(1-(1+I d) e^{2 I a+2 I b x}\right)}{6}+\frac{I x^2 \operatorname{polylog}\left(2,(1+I d) e^{2 I a+2 I b x}\right)}{4 b}$$
$$-\frac{x \operatorname{polylog}\left(3,(1+I d) e^{2 I a+2 I b x}\right)}{4 b^2}-\frac{I \operatorname{polylog}\left(4,(1+I d) e^{2 I a+2 I b x}\right)}{8 b^3}$$

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Result(type ?, 2455 leaves): Display of huge result suppressed!
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Problem 92: Result more than twice size of optimal antiderivative.
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$$\int -x^2 \operatorname{arctanh}(-1+I d+d \cot(b x+a))\, dx$$

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Optimal(type 4, 136 leaves, 7 steps):
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$$\frac{I b x^4}{12}-\frac{x^3 \operatorname{arctanh}(-1+I d+d \cot(b x+a))}{3}-\frac{x^3 \ln\left(1-(1-I d) e^{2 I a+2 I b x}\right)}{6}+\frac{I x^2 \operatorname{polylog}\left(2,(1-I d) e^{2 I a+2 I b x}\right)}{4 b}$$
$$-\frac{x \operatorname{polylog}\left(3,(1-I d) e^{2 I a+2 I b x}\right)}{4 b^2}-\frac{I \operatorname{polylog}\left(4,(1-I d) e^{2 I a+2 I b x}\right)}{8 b^3}$$

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Result(type ?, 2345 leaves): Display of huge result suppressed!
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Problem 93: Result more than twice size of optimal antiderivative.
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$$\int -\operatorname{arctanh}(-1+I d+d \cot(b x+a))\, dx$$

```
Optimal(type 4, 77 leaves, 5 steps):
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$$\frac{I b x^2}{2}-x \operatorname{arctanh}(-1+I d+d \cot(b x+a))-\frac{x \ln\left(1-(1-I d) e^{2 I a+2 I b x}\right)}{2}+\frac{I \operatorname{polylog}\left(2,(1-I d) e^{2 I a+2 I b x}\right)}{4 b}$$

```
Result(type 4, 334 leaves):
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$$-\frac{I \operatorname{arctanh}(-1+I d+d \cot(b x+a)) \ln(I d-d \cot(b x+a))}{2 b}+\frac{I \operatorname{arctanh}(-1+I d+d \cot(b x+a)) \ln(I d+d \cot(b x+a))}{2 b}$$
$$+\frac{I \operatorname{dilog}\left(\frac{\frac{I}{2}(-I d-d \cot(b x+a))}{d}\right)}{4 b}+\frac{I \ln(I d-d \cot(b x+a)) \ln\left(\frac{\frac{I}{2}(-I d-d \cot(b x+a))}{d}\right)}{4 b}-\frac{I \operatorname{dilog}\left(\frac{2-I d-d \cot(b x+a)}{-2 I d+2}\right)}{4 b}$$
$$-\frac{I \ln(I d-d \cot(b x+a)) \ln\left(\frac{2-I d-d \cot(b x+a)}{-2 I d+2}\right)}{4 b}-\frac{I \ln(I d+d \cot(b x+a))^2}{8 b}+\frac{I \ln\left(1-\frac{I d}{2}-\frac{d \cot(b x+a)}{2}\right) \ln(I d+d \cot(b x+a))}{4 b}$$
$$-\frac{I \ln\left(1-\frac{I d}{2}-\frac{d \cot(b x+a)}{2}\right) \ln\left(\frac{I d}{2}+\frac{d \cot(b x+a)}{2}\right)}{4 b}-\frac{I \operatorname{dilog}\left(\frac{I d}{2}+\frac{d \cot(b x+a)}{2}\right)}{4 b}$$

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Problem 97: Result more than twice size of optimal antiderivative.
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$$\int x \operatorname{arctanh}\left(a+b f^{d x+c}\right) dx$$

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Optimal(type 4, 195 leaves, 9 steps):
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$$-\frac{x^2\ln(1-a-bf^{dx+c})}{4}+\frac{x^2\ln(1+a+bf^{dx+c})}{4}+\frac{x^2\ln\left(1-\frac{bf^{dx+c}}{1-a}\right)}{4}-\frac{x^2\ln\left(1+\frac{bf^{dx+c}}{1+a}\right)}{4}+\frac{x\,\mathrm{polylog}\left(2,\frac{bf^{dx+c}}{1-a}\right)}{2d\ln(f)}-\frac{x\,\mathrm{polylog}\left(2,-\frac{bf^{dx+c}}{1+a}\right)}{2d\ln(f)}$$

$$-\frac{\mathrm{polylog}\left(3,\frac{bf^{dx+c}}{1-a}\right)}{2d^2\ln(f)^2}+\frac{\mathrm{polylog}\left(3,-\frac{bf^{dx+c}}{1+a}\right)}{2d^2\ln(f)^2}$$

Result(type 4, 575 leaves):

$$\frac{x^2\ln(1+a+bf^{dx+c})}{4}-\frac{x^2\ln(1-a-bf^{dx+c})}{4}+\frac{x^2\ln\left(1-\frac{bf^{dx+c}}{1-a}\right)}{4}+\frac{\ln\left(1-\frac{bf^{dx+c}}{1-a}\right)xc}{2d}+\frac{\ln\left(1-\frac{bf^{dx+c}}{1-a}\right)c^2}{4d^2}+\frac{x\,\mathrm{polylog}\left(2,\frac{bf^{dx+c}}{1-a}\right)}{2d\ln(f)}$$

$$+\frac{\mathrm{polylog}\left(2,\frac{bf^{dx+c}}{1-a}\right)c}{2\ln(f)\,d^2}-\frac{\mathrm{polylog}\left(3,\frac{bf^{dx+c}}{1-a}\right)}{2d^2\ln(f)^2}+\frac{c^2\ln(1-a-bf^{dx+c})}{4d^2}-\frac{c\,\mathrm{dilog}\left(\frac{bf^{dx+c}+a-1}{-1+a}\right)}{2\ln(f)\,d^2}-\frac{c\ln\left(\frac{bf^{dx+c}+a-1}{-1+a}\right)x}{2d}$$

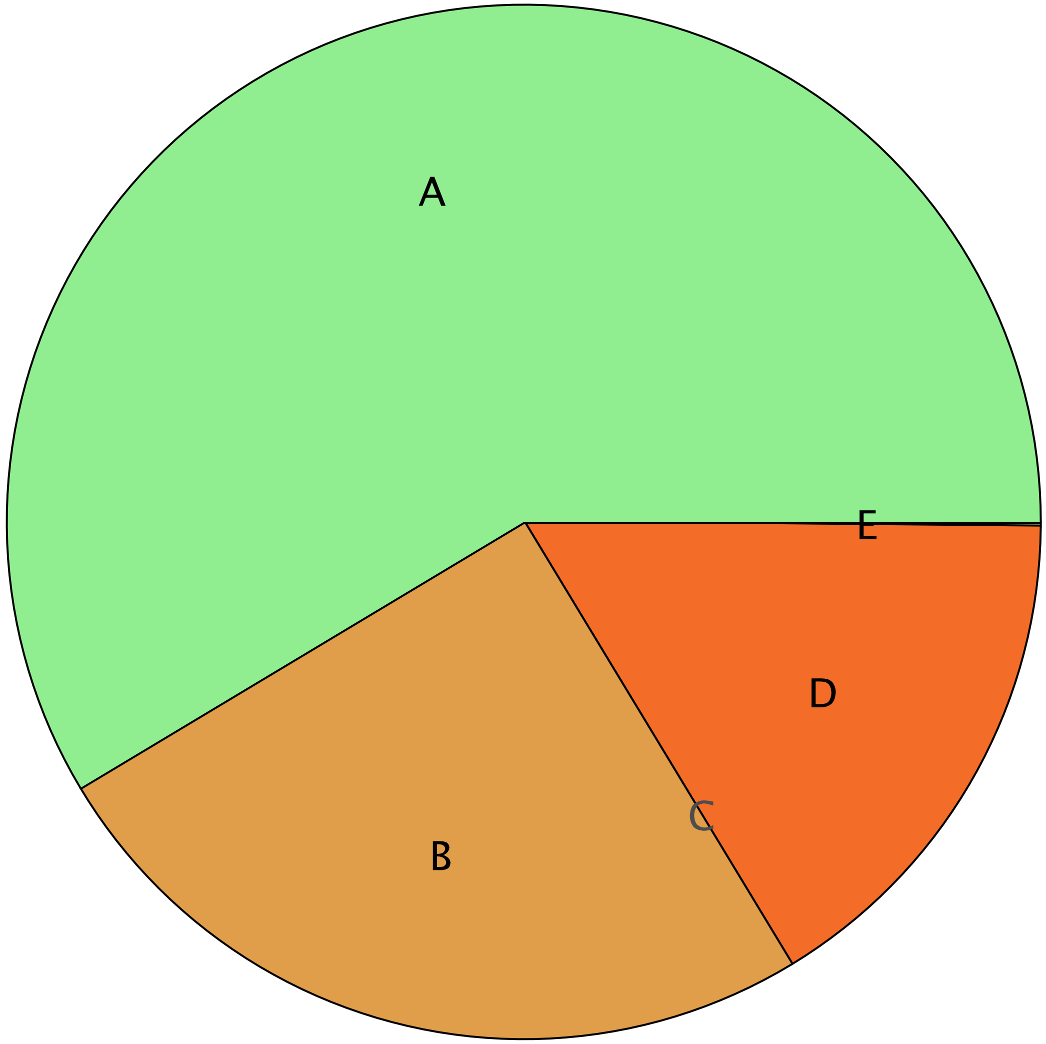
$$-\frac{c^2\ln\left(\frac{bf^{dx+c}+a-1}{-1+a}\right)}{2d^2}-\frac{\ln\left(1-\frac{bf^{dx+c}}{-1-a}\right)x^2}{4}-\frac{\ln\left(1-\frac{bf^{dx+c}}{-1-a}\right)xc}{2d}-\frac{\ln\left(1-\frac{bf^{dx+c}}{-1-a}\right)c^2}{4d^2}-\frac{\mathrm{polylog}\left(2,\frac{bf^{dx+c}}{-1-a}\right)x}{2\ln(f)\,d}$$

$$-\frac{\mathrm{polylog}\left(2,\frac{bf^{dx+c}}{-1-a}\right)c}{2\ln(f)\,d^2}+\frac{\mathrm{polylog}\left(3,\frac{bf^{dx+c}}{-1-a}\right)}{2\ln(f)^2d^2}-\frac{c^2\ln(1+a+bf^{dx+c})}{4d^2}+\frac{c\,\mathrm{dilog}\left(\frac{1+a+bf^{dx+c}}{1+a}\right)}{2\ln(f)\,d^2}+\frac{c\ln\left(\frac{1+a+bf^{dx+c}}{1+a}\right)x}{2d}$$

$$+\frac{c^2\ln\left(\frac{1+a+bf^{dx+c}}{1+a}\right)}{2d^2}$$

Summary of Integration Test Results

698 integration problems



A - 409 optimal antiderivatives
B - 175 more than twice size of optimal antiderivatives
C - 0 unnecessarily complex antiderivatives
D - 113 unable to integrate problems
E - 1 integration timeouts