Maple 2018.2 Integration Test Results
on the problems in "5 Inverse trig functions/5.4 Inverse cotangent"

Test results for the 63 problems in "5.4.1 Inverse cotangent functions.txt"

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

$$\int \frac{\operatorname{arccot}(a x)}{x}\, dx$$

Optimal(type 4, 29 leaves, 3 steps):

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

Result(type 4, 62 leaves):

$$\ln(a x) \operatorname{arccot}(a x)-\frac{I \ln(a x) \ln(1+I a x)}{2}+\frac{I \ln(a x) \ln(1-I a x)}{2}-\frac{I \operatorname{dilog}(1+I a x)}{2}+\frac{I \operatorname{dilog}(1-I a x)}{2}$$

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

$$\int x^2 \operatorname{arccot}(a x)^2\, dx$$

Optimal(type 4, 93 leaves, 9 steps):

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

Result(type 4, 212 leaves):

$$\frac{x^3 \operatorname{arccot}(a x)^2}{3}+\frac{x^2 \operatorname{arccot}(a x)}{3 a}-\frac{\operatorname{arccot}(a x) \ln\left(a^2 x^2+1\right)}{3 a^3}+\frac{x}{3 a^2}-\frac{\arctan(a x)}{3 a^3}-\frac{I \ln(a x-I)^2}{12 a^3}+\frac{I \ln(a x-I) \ln\left(a^2 x^2+1\right)}{6 a^3}$$
$$-\frac{I \ln(a x-I) \ln\left(-\frac{I}{2}(I+a x)\right)}{6 a^3}-\frac{I \operatorname{dilog}\left(-\frac{I}{2}(I+a x)\right)}{6 a^3}+\frac{I \ln(I+a x)^2}{12 a^3}+\frac{I \ln(I+a x) \ln\left(\frac{I}{2}(a x-I)\right)}{6 a^3}-\frac{I \ln(I+a x) \ln\left(a^2 x^2+1\right)}{6 a^3}$$
$$+\frac{I \operatorname{dilog}\left(\frac{I}{2}(a x-I)\right)}{6 a^3}$$

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

$$\int \operatorname{arccot}(a x)^2\, dx$$

Optimal(type 4, 63 leaves, 5 steps):

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

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Result(type 4, 135 leaves):
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$$x\operatorname{arccot}(a x)^2+\frac{I\operatorname{arccot}(a x)^2}{a}+\frac{2 I\operatorname{polylog}\left(2,\frac{I+a x}{\sqrt{a^2x^2+1}}\right)}{a}+\frac{2 I\operatorname{polylog}\left(2,-\frac{I+a x}{\sqrt{a^2x^2+1}}\right)}{a}-\frac{2\operatorname{arccot}(a x)\ln\left(1+\frac{I+a x}{\sqrt{a^2x^2+1}}\right)}{a}-\frac{2\operatorname{arccot}(a x)\ln\left(1-\frac{I+a x}{\sqrt{a^2x^2+1}}\right)}{a}$$

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Problem 8: Result more than twice size of optimal antiderivative.
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$$\int\frac{\operatorname{arccot}(a x)^2}{x}\,dx$$

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Optimal(type 4, 103 leaves, 6 steps):
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$$2\operatorname{arccot}(a x)^2\operatorname{arccoth}\left(1-\frac{2}{1+I a x}\right)-I\operatorname{arccot}(a x)\operatorname{polylog}\left(2,1-\frac{2 I}{I+a x}\right)+I\operatorname{arccot}(a x)\operatorname{polylog}\left(2,1-\frac{2 a x}{I+a x}\right)-\frac{\operatorname{polylog}\left(3,1-\frac{2 I}{I+a x}\right)}{2}+\frac{\operatorname{polylog}\left(3,1-\frac{2 a x}{I+a x}\right)}{2}$$

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Result(type 4, 958 leaves):
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$$\ln(a x)\operatorname{arccot}(a x)^2+2 I\operatorname{arccot}(a x)\operatorname{polylog}\left(2,\frac{I+a x}{\sqrt{a^2x^2+1}}\right)-\frac{I\pi\operatorname{csgn}\left(\frac{1+\frac{(I+a x)^2}{a^2x^2+1}}{\frac{(I+a x)^2}{a^2x^2+1}-1}\right)^3\operatorname{arccot}(a x)^2}{2}+\frac{I\pi\operatorname{csgn}\left(\frac{I\left(1+\frac{(I+a x)^2}{a^2x^2+1}\right)}{\frac{(I+a x)^2}{a^2x^2+1}-1}\right)^3\operatorname{arccot}(a x)^2}{2}-I\operatorname{arccot}(a x)\operatorname{polylog}\left(2,-\frac{(I+a x)^2}{a^2x^2+1}\right)-\frac{I\pi\operatorname{csgn}\left(\frac{1+\frac{(I+a x)^2}{a^2x^2+1}}{\frac{(I+a x)^2}{a^2x^2+1}-1}\right)^2\operatorname{csgn}\left(\frac{I\left(1+\frac{(I+a x)^2}{a^2x^2+1}\right)}{\frac{(I+a x)^2}{a^2x^2+1}-1}\right)\operatorname{arccot}(a x)^2}{2}$$

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

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

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

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

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

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

$$\int \frac{\operatorname{arccot}(a x)^2}{x^2} \, dx$$

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

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

Result(type 4, 233 leaves):

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

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

$$+ I a \ln(a x) \ln(1 + I a x) - I a \ln(a x) \ln(1 - I a x) + I a \,\mathrm{dilog}(1 + I a x) - I a \,\mathrm{dilog}(1 - I a x)$$

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

$$\int \frac{\operatorname{arccot}(a x)^3}{x} \, dx$$

Optimal(type 4, 152 leaves, 8 steps):

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

Result(type 4, 1049 leaves):

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

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

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

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

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Problem 20: Unable to integrate problem.
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$$\int\frac{\mathrm{arccot}(ax)}{(dx^2+c)^{9/2}}\,dx$$

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Optimal(type 3, 257 leaves, 8 steps):
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$$\frac{a}{35c(ca^2-d)(dx^2+c)^{5/2}}+\frac{a(11ca^2-6d)}{105c^2(ca^2-d)^2(dx^2+c)^{3/2}}+\frac{x\,\mathrm{arccot}(ax)}{7c(dx^2+c)^{7/2}}+\frac{6x\,\mathrm{arccot}(ax)}{35c^2(dx^2+c)^{5/2}}+\frac{8x\,\mathrm{arccot}(ax)}{35c^3(dx^2+c)^{3/2}}$$

$$-\frac{(35a^6c^3-70a^4c^2d+56a^2cd^2-16d^3)\,\mathrm{arctanh}\left(\frac{a\sqrt{dx^2+c}}{\sqrt{ca^2-d}}\right)}{35c^4(ca^2-d)^{7/2}}+\frac{a(19a^4c^2-22a^2cd+8d^2)}{35c^3(ca^2-d)^3\sqrt{dx^2+c}}+\frac{16x\,\mathrm{arccot}(ax)}{35c^4\sqrt{dx^2+c}}$$

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Result(type 8, 16 leaves):
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$$\int\frac{\mathrm{arccot}(ax)}{(dx^2+c)^{9/2}}\,dx$$

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Problem 31: Result is not expressed in closed-form.
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$$\int\frac{\mathrm{arccot}(ex+d)}{cx^2+bx+a}\,dx$$

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Optimal(type 4, 329 leaves, 12 steps):
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$$\frac{\operatorname{arccot}(e x+d) \ln\left(\frac{2 e \left(b+2 c x-\sqrt{-4 a c+b^2}\right)}{(1-I(e x+d))\left(2 c(I-d)+e\left(b-\sqrt{-4 a c+b^2}\right)\right)}\right)}{\sqrt{-4 a c+b^2}}$$

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

$$+\frac{I \operatorname{polylog}\left(2, 1+\frac{2\left(2 c d-2 c(e x+d)-e\left(b-\sqrt{-4 a c+b^2}\right)\right)}{(1-I(e x+d))\left(2 I c-2 c d+b e-e\sqrt{-4 a c+b^2}\right)}\right)}{2\sqrt{-4 a c+b^2}}$$

$$-\frac{I \operatorname{polylog}\left(2, 1+\frac{2\left(2 c d-2 c(e x+d)-e\left(b+\sqrt{-4 a c+b^2}\right)\right)}{(1-I(e x+d))\left(2 c(I-d)+e\left(b+\sqrt{-4 a c+b^2}\right)\right)}\right)}{2\sqrt{-4 a c+b^2}}$$

Result(type 7, 227 leaves):

$$-e\left(\sum_{\_R1=RootOf((I b e-2 I c d+a e^2-b e d+c d^2-c)\_Z^4+(-2 a e^2+2 b e d-2 c d^2-2 c)\_Z^2-I b e+2 I c d+a e^2-b e d+c d^2-c)} \frac{I \operatorname{arccot}(e x+d) \ln\left(\frac{\_R1-\frac{e x+d+I}{\sqrt{(e x+d)^2+1}}}{\_R1}\right)+\operatorname{dilog}\left(\frac{\_R1-\frac{e x+d+I}{\sqrt{(e x+d)^2+1}}}{\_R1}\right)}{\_R1^2 a e^2-\_R1^2 b d e+I\_R1^2 b e+\_R1^2 c d^2-2 I\_R1^2 c d-\_R1^2 c-a e^2+b e d-c d^2-c}\right)$$

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

$$\int \frac{\operatorname{arccot}(b x+a)}{b x+a}\, dx$$

Optimal(type 4, 37 leaves, 4 steps):

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

Result(type 4, 97 leaves):

$$\frac{\ln(bx+a)\operatorname{arccot}(bx+a)}{b}-\frac{I\ln(bx+a)\ln(1+I(bx+a))}{2b}+\frac{I\ln(bx+a)\ln(1-I(bx+a))}{2b}-\frac{I\operatorname{dilog}(1+I(bx+a))}{2b}+\frac{I\operatorname{dilog}(1-I(bx+a))}{2b}$$

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

$$\int \frac{\operatorname{arccot}(1+x)}{2+2x}\,dx$$

Optimal(type 4, 27 leaves, 5 steps):

$$-\frac{I\operatorname{polylog}\left(2,\frac{-I}{1+x}\right)}{4}+\frac{I\operatorname{polylog}\left(2,\frac{I}{1+x}\right)}{4}$$

Result(type 4, 67 leaves):

$$\frac{\ln(1+x)\operatorname{arccot}(1+x)}{2}-\frac{I\ln(1+x)\ln(1+I(1+x))}{4}+\frac{I\ln(1+x)\ln(1-I(1+x))}{4}-\frac{I\operatorname{dilog}(1+I(1+x))}{4}+\frac{I\operatorname{dilog}(1-I(1+x))}{4}$$

Problem 41: Result more than twice size of optimal antiderivative.

$$\int (fx+e)\,(a+b\operatorname{arccot}(dx+c))^3\,dx$$

Optimal(type 4, 316 leaves, 15 steps):

$$\frac{3Ibf(a+b\operatorname{arccot}(dx+c))^2}{2d^2}+\frac{3bf(dx+c)\,(a+b\operatorname{arccot}(dx+c))^2}{2d^2}+\frac{I(-cf+de)\,(a+b\operatorname{arccot}(dx+c))^3}{d^2}$$
$$-\frac{(-cf+de+f)\,(de-(1+c)f)\,(a+b\operatorname{arccot}(dx+c))^3}{2d^2f}+\frac{(fx+e)^2\,(a+b\operatorname{arccot}(dx+c))^3}{2f}$$
$$-\frac{3b^2f(a+b\operatorname{arccot}(dx+c))\ln\left(\frac{2}{1+I(dx+c)}\right)}{d^2}-\frac{3b\,(-cf+de)\,(a+b\operatorname{arccot}(dx+c))^2\ln\left(\frac{2}{1+I(dx+c)}\right)}{d^2}$$
$$+\frac{3Ib^3f\operatorname{polylog}\left(2,1-\frac{2}{1+I(dx+c)}\right)}{2d^2}+\frac{3Ib^2\,(-cf+de)\,(a+b\operatorname{arccot}(dx+c))\operatorname{polylog}\left(2,1-\frac{2}{1+I(dx+c)}\right)}{d^2}$$
$$-\frac{3b^3\,(-cf+de)\operatorname{polylog}\left(3,1-\frac{2}{1+I(dx+c)}\right)}{2d^2}$$

Result(type 4, 1569 leaves):

$$-\frac{b^3\operatorname{arccot}(dx+c)^3fc^2}{2d^2}+\frac{3b^3\operatorname{arccot}(dx+c)^2fx}{2d}+\frac{3b^3\operatorname{arccot}(dx+c)^2fc}{2d^2}-\frac{3b^3f\operatorname{arccot}(dx+c)\ln\left(1+\frac{dx+c+I}{\sqrt{1+(dx+c)^2}}\right)}{d^2}$$

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

$$+3 \,\mathrm{arccot}(d x+c)^{2} x a b^{2} e+3 \,\mathrm{arccot}(d x+c) x a^{2} b e+\frac{3 a^{2} b \,\mathrm{arccot}(d x+c) f x^{2}}{2}+\frac{3 a^{2} b x f}{2 d}+\frac{3 \mathrm{I} b^{3} \,\mathrm{arccot}(d x+c)^{2} f}{2 d^{2}}$$

$$+\frac{3 \mathrm{I} b^{3} f \,\mathrm{polylog}\left(2,-\frac{d x+c+\mathrm{I}}{\sqrt{1+(d x+c)^{2}}}\right)}{d^{2}}+\frac{3 \mathrm{I} b^{3} f \,\mathrm{polylog}\left(2, \frac{d x+c+\mathrm{I}}{\sqrt{1+(d x+c)^{2}}}\right)}{d^{2}}-\frac{3 a^{2} b f \arctan(d x+c)}{2 d^{2}}-\frac{3 a b^{2} f \arctan(d x+c)^{2}}{2 d^{2}}$$

$$+\frac{3 a b^{2} f \ln\left(1+(d x+c)^{2}\right)}{2 d^{2}}-\frac{3 b^{3} e \,\mathrm{arccot}(d x+c)^{2} \ln\left(1-\frac{d x+c+\mathrm{I}}{\sqrt{1+(d x+c)^{2}}}\right)}{d}-\frac{3 b^{3} e \,\mathrm{arccot}(d x+c)^{2} \ln\left(1+\frac{d x+c+\mathrm{I}}{\sqrt{1+(d x+c)^{2}}}\right)}{d}$$

$$+\frac{\mathrm{arccot}(d x+c)^{3} b^{3} c e}{d}+\frac{3 a^{2} b \ln\left(1+(d x+c)^{2}\right) e}{2 d}+\frac{\mathrm{I} b^{3} \,\mathrm{arccot}(d x+c)^{3} e}{d}+\frac{3 a^{2} b f c}{2 d^{2}}+\frac{3 a b^{2} \,\mathrm{arccot}(d x+c)^{2} f x^{2}}{2}$$

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

$$-\frac{3 \mathrm{I} a b^{2} \,\mathrm{dilog}\left(-\frac{\mathrm{I}}{2}(d x+c+\mathrm{I})\right) c f}{2 d^{2}}+\frac{3 \mathrm{I} a b^{2} \ln(d x+c+\mathrm{I})^{2} c f}{4 d^{2}}+\frac{3 \mathrm{I} a b^{2} \,\mathrm{dilog}\left(\frac{\mathrm{I}}{2}(d x+c-\mathrm{I})\right) c f}{2 d^{2}}-\frac{3 \mathrm{I} a b^{2} \ln(d x+c-\mathrm{I}) \ln\left(1+(d x+c)^{2}\right) e}{2 d}$$

$$-\frac{3 \mathrm{I} a b^{2} \ln(d x+c+\mathrm{I}) \ln\left(\frac{\mathrm{I}}{2}(d x+c-\mathrm{I})\right) e}{2 d}-\frac{3 a b^{2} \,\mathrm{arccot}(d x+c) \ln\left(1+(d x+c)^{2}\right) c f}{d^{2}}+\frac{3 \mathrm{I} a b^{2} \ln(d x+c+\mathrm{I}) \ln\left(1+(d x+c)^{2}\right) e}{2 d}$$

$$+\frac{3 \mathrm{I} a b^{2} \ln(d x+c-\mathrm{I}) \ln\left(-\frac{\mathrm{I}}{2}(d x+c+\mathrm{I})\right) e}{2 d}+\frac{b^{3} \,\mathrm{arccot}(d x+c)^{3} f x^{2}}{2}+\mathrm{arccot}(d x+c)^{3} x b^{3} e+\frac{b^{3} \,\mathrm{arccot}(d x+c)^{3} f}{2 d^{2}}$$

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

$$-\frac{3 \mathrm{I} a b^{2} \ln(d x+c-\mathrm{I}) \ln\left(-\frac{\mathrm{I}}{2}(d x+c+\mathrm{I})\right) c f}{2 d^{2}}+\frac{3 \mathrm{I} a b^{2} \ln(d x+c-\mathrm{I}) \ln\left(1+(d x+c)^{2}\right) c f}{2 d^{2}}+\frac{3 \mathrm{I} a b^{2} \ln(d x+c+\mathrm{I}) \ln\left(\frac{\mathrm{I}}{2}(d x+c-\mathrm{I})\right) c f}{2 d^{2}}$$

$$-\frac{3 \mathrm{I} a b^{2} \ln(d x+c+\mathrm{I}) \ln\left(1+(d x+c)^{2}\right) c f}{2 d^{2}}+\frac{3 \mathrm{I} a b^{2} \ln(d x+c-\mathrm{I})^{2} e}{4 d}+\frac{3 \mathrm{I} a b^{2} \,\mathrm{dilog}\left(-\frac{\mathrm{I}}{2}(d x+c+\mathrm{I})\right) e}{2 d}-\frac{3 \mathrm{I} a b^{2} \ln(d x+c+\mathrm{I})^{2} e}{4 d}$$

$$-\frac{\mathrm{I} b^{3} \,\mathrm{arccot}(d x+c)^{3} c f}{d^{2}}+\frac{3 \,\mathrm{arccot}(d x+c)^{2} a b^{2} c e}{d}+\frac{3 \,\mathrm{arccot}(d x+c) a^{2} b c e}{d}+\frac{3 a b^{2} \,\mathrm{arccot}(d x+c) \ln\left(1+(d x+c)^{2}\right) e}{d}$$

$$-\frac{3 a b^2 \operatorname{arccot}(d x+c) \arctan(d x+c) f}{d^2}+\frac{3 b^3 c f \operatorname{arccot}(d x+c)^2 \ln\left(1-\frac{d x+c+I}{\sqrt{1+(d x+c)^2}}\right)}{d^2}+\frac{3 b^3 c f \operatorname{arccot}(d x+c)^2 \ln\left(1+\frac{d x+c+I}{\sqrt{1+(d x+c)^2}}\right)}{d^2}$$

$$-\frac{3 a^2 b \operatorname{arccot}(d x+c) c^2 f}{2 d^2}-\frac{3 a b^2 \operatorname{arccot}(d x+c)^2 c^2 f}{2 d^2}+\frac{3 a b^2 \operatorname{arccot}(d x+c) f x}{d}+\frac{3 a b^2 \operatorname{arccot}(d x+c) f c}{d^2}-\frac{3 a^2 b \ln(1+(d x+c)^2) c f}{2 d^2}$$

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

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

$$\int \frac{\left(a+b \operatorname{arccot}\left(\frac{\sqrt{-c x+1}}{\sqrt{c x+1}}\right)\right)^3}{-c^2 x^2+1} dx$$

Optimal(type 4, 402 leaves, 9 steps):

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

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

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

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

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

Result(type 4, 1716 leaves):

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

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

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

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

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

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

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

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

$$+\frac{b^3 \operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^3 \ln\left(1+\frac{I+\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}}{\sqrt{\frac{-cx+1}{cx+1}+1}}\right)}{c} + \frac{6 b^3 \operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) \operatorname{polylog}\left(3, -\frac{I+\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}}{\sqrt{\frac{-cx+1}{cx+1}+1}}\right)}{c}$$

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

$$+\frac{b^3 \operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right)^3 \ln\left(1-\frac{I+\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}}{\sqrt{\frac{-cx+1}{cx+1}+1}}\right)}{c} + \frac{6 b^3 \operatorname{arccot}\left(\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}\right) \operatorname{polylog}\left(3, \frac{I+\frac{\sqrt{-cx+1}}{\sqrt{cx+1}}}{\sqrt{\frac{-cx+1}{cx+1}+1}}\right)}{c}$$

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

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

$$\int x \operatorname{arccot}(c - (1 - I c) \tan(b x + a))\, dx$$

Optimal(type 4, 99 leaves, 6 steps):

$$-\frac{b x^3}{6}+\frac{x^2 \operatorname{arccot}(c-(1-I c)\tan(b x+a))}{2}-\frac{I x^2 \ln(1+I c e^{2 I a+2 I b x})}{4}-\frac{x \operatorname{polylog}(2,-I c e^{2 I a+2 I b x})}{4 b}-\frac{I \operatorname{polylog}(3,-I c e^{2 I a+2 I b x})}{8 b^2}$$

Result(type 4, 1491 leaves):

$$-\frac{x^2 \pi \operatorname{csgn}\left(\frac{I(c+I)}{e^{2 I(b x+a)}+1}\right)^3}{8}+\frac{x^2 \pi \operatorname{csgn}\left(\frac{I(c e^{2 I(b x+a)}-I)}{e^{2 I(b x+a)}+1}\right)^3}{8}-\frac{x^2 \pi \operatorname{csgn}\left(\frac{I e^{2 I(b x+a)}(c+I)}{e^{2 I(b x+a)}+1}\right)^3}{8}-\frac{\operatorname{polylog}(2,-I c e^{2 I(b x+a)}) a}{4 b^2}$$
$$+\frac{a \operatorname{dilog}(1+I e^{I(b x+a)}\sqrt{I c})}{2 b^2}+\frac{a \operatorname{dilog}(1-I e^{I(b x+a)}\sqrt{I c})}{2 b^2}-\frac{x^2 \pi \operatorname{csgn}(I e^{2 I(b x+a)})^3}{8}-\frac{x^2 \pi \operatorname{csgn}\left(\frac{e^{2 I(b x+a)}(c+I)}{e^{2 I(b x+a)}+1}\right)^3}{8}$$
$$+\frac{x^2 \pi \operatorname{csgn}\left(\frac{c e^{2 I(b x+a)}-I}{e^{2 I(b x+a)}+1}\right)^2}{8}-\frac{x^2 \pi \operatorname{csgn}\left(\frac{c e^{2 I(b x+a)}-I}{e^{2 I(b x+a)}+1}\right)^3}{8}-\frac{b x^3}{6}-\frac{x \operatorname{polylog}(2,-I c e^{2 I(b x+a)})}{4 b}-\frac{I \operatorname{polylog}(3,-I c e^{2 I(b x+a)})}{8 b^2}$$
$$+\frac{x^2 \pi \operatorname{csgn}\left(\frac{e^{2 I(b x+a)}(c+I)}{e^{2 I(b x+a)}+1}\right)^2}{8}+\frac{I x^2 \ln(c e^{2 I(b x+a)}-I)}{4}-\frac{I x^2 \ln(c+I)}{4}+\frac{I a \ln(1+I e^{I(b x+a)}\sqrt{I c}) x}{2 b}$$
$$-\frac{x^2 \pi \operatorname{csgn}\left(\frac{I}{e^{2 I(b x+a)}+1}\right) \operatorname{csgn}(I(c+I)) \operatorname{csgn}\left(\frac{I(c+I)}{e^{2 I(b x+a)}+1}\right)}{8}$$
$$+\frac{x^2 \pi \operatorname{csgn}\left(\frac{I}{e^{2 I(b x+a)}+1}\right) \operatorname{csgn}(I(c e^{2 I(b x+a)}-I)) \operatorname{csgn}\left(\frac{I(c e^{2 I(b x+a)}-I)}{e^{2 I(b x+a)}+1}\right)}{8}$$
$$-\frac{x^2 \pi \operatorname{csgn}(I e^{2 I(b x+a)}) \operatorname{csgn}\left(\frac{I(c+I)}{e^{2 I(b x+a)}+1}\right) \operatorname{csgn}\left(\frac{I e^{2 I(b x+a)}(c+I)}{e^{2 I(b x+a)}+1}\right)}{8}+\frac{x^2 \pi \operatorname{csgn}\left(\frac{I(c e^{2 I(b x+a)}-I)}{e^{2 I(b x+a)}+1}\right) \operatorname{csgn}\left(\frac{c e^{2 I(b x+a)}-I}{e^{2 I(b x+a)}+1}\right)}{8}$$
$$-\frac{I x^2 \ln(e^{I(b x+a)})}{2}+\frac{x^2 \pi \operatorname{csgn}\left(\frac{I}{e^{2 I(b x+a)}+1}\right) \operatorname{csgn}\left(\frac{I(c+I)}{e^{2 I(b x+a)}+1}\right)^2}{8}-\frac{I a^2 \ln(-c e^{2 I(b x+a)}+I)}{4 b^2}+\frac{I a^2 \ln(1+I e^{I(b x+a)}\sqrt{I c})}{2 b^2}$$
$$+\frac{I a^2 \ln(1-I e^{I(b x+a)}\sqrt{I c})}{2 b^2}-\frac{I x^2 \ln(1+I c e^{2 I(b x+a)})}{4}-\frac{x^2 \pi \operatorname{csgn}\left(\frac{I(c e^{2 I(b x+a)}-I)}{e^{2 I(b x+a)}+1}\right) \operatorname{csgn}\left(\frac{c e^{2 I(b x+a)}-I}{e^{2 I(b x+a)}+1}\right)^2}{8}-\frac{I \ln(1+I c e^{2 I(b x+a)}) a^2}{4 b^2}$$
$$-\frac{x^2 \pi \operatorname{csgn}\left(\frac{I e^{2 I(b x+a)}(c+I)}{e^{2 I(b x+a)}+1}\right) \operatorname{csgn}\left(\frac{e^{2 I(b x+a)}(c+I)}{e^{2 I(b x+a)}+1}\right)}{8}+\frac{x^2 \pi \operatorname{csgn}\left(\frac{I e^{2 I(b x+a)}(c+I)}{e^{2 I(b x+a)}+1}\right) \operatorname{csgn}\left(\frac{e^{2 I(b x+a)}(c+I)}{e^{2 I(b x+a)}+1}\right)^2}{8}$$
$$-\frac{x^2 \pi \operatorname{csgn}(I(c e^{2 I(b x+a)}-I)) \operatorname{csgn}\left(\frac{I(c e^{2 I(b x+a)}-I)}{e^{2 I(b x+a)}+1}\right)^2}{8}+\frac{x^2 \pi \operatorname{csgn}\left(\frac{I(c+I)}{e^{2 I(b x+a)}+1}\right) \operatorname{csgn}\left(\frac{I e^{2 I(b x+a)}(c+I)}{e^{2 I(b x+a)}+1}\right)^2}{8}$$

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

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

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

Problem 49: Result more than twice size of optimal antiderivative.

$$\int x^2\,\mathrm{arccot}(c+d\tanh(bx+a))\,\mathrm{d}x$$

Optimal(type 4, 305 leaves, 11 steps):

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

$$+\frac{\mathrm{I}\,x^2\,\mathrm{polylog}\left(2,-\frac{(\mathrm{I}+c+d)\,\mathrm{e}^{2bx+2a}}{\mathrm{I}+c-d}\right)}{4\,b}+\frac{\mathrm{I}\,x\,\mathrm{polylog}\left(3,-\frac{(\mathrm{I}-c-d)\,\mathrm{e}^{2bx+2a}}{\mathrm{I}-c+d}\right)}{4\,b^2}-\frac{\mathrm{I}\,x\,\mathrm{polylog}\left(3,-\frac{(\mathrm{I}+c+d)\,\mathrm{e}^{2bx+2a}}{\mathrm{I}+c-d}\right)}{4\,b^2}$$

$$-\frac{\mathrm{I}\,\mathrm{polylog}\left(4,-\frac{(\mathrm{I}-c-d)\,\mathrm{e}^{2bx+2a}}{\mathrm{I}-c+d}\right)}{8\,b^3}+\frac{\mathrm{I}\,\mathrm{polylog}\left(4,-\frac{(\mathrm{I}+c+d)\,\mathrm{e}^{2bx+2a}}{\mathrm{I}+c-d}\right)}{8\,b^3}$$

Result(type ?, 6983 leaves): Display of huge result suppressed!

Problem 50: Result more than twice size of optimal antiderivative.

$$\int \mathrm{arccot}(c+d\tanh(bx+a))\,\mathrm{d}x$$

Optimal(type 4, 150 leaves, 7 steps):

$$x\,\mathrm{arccot}(c+d\tanh(bx+a))-\frac{\mathrm{I}\,x\ln\left(1+\frac{(\mathrm{I}-c-d)\,\mathrm{e}^{2bx+2a}}{\mathrm{I}-c+d}\right)}{2}+\frac{\mathrm{I}\,x\ln\left(1+\frac{(\mathrm{I}+c+d)\,\mathrm{e}^{2bx+2a}}{\mathrm{I}+c-d}\right)}{2}-\frac{\mathrm{I}\,\mathrm{polylog}\left(2,-\frac{(\mathrm{I}-c-d)\,\mathrm{e}^{2bx+2a}}{\mathrm{I}-c+d}\right)}{4\,b}$$

$$+\frac{\mathrm{I}\,\mathrm{polylog}\left(2,-\frac{(\mathrm{I}+c+d)\,\mathrm{e}^{2bx+2a}}{\mathrm{I}+c-d}\right)}{4\,b}$$

Result(type 4, 349 leaves):

$$-\frac{\mathrm{arccot}(c+d\tanh(bx+a))\ln(d\tanh(bx+a)-d)}{2\,b}+\frac{\mathrm{arccot}(c+d\tanh(bx+a))\ln(d\tanh(bx+a)+d)}{2\,b}$$

$$+\frac{I\ln(d\tanh(bx+a)-d)\ln\left(\frac{I-d\tanh(bx+a)-c}{I-c-d}\right)}{4b}-\frac{I\ln(d\tanh(bx+a)-d)\ln\left(\frac{d\tanh(bx+a)+c+I}{I+c+d}\right)}{4b}$$

$$+\frac{I\,\mathrm{dilog}\left(\frac{I-d\tanh(bx+a)-c}{I-c-d}\right)}{4b}-\frac{I\,\mathrm{dilog}\left(\frac{d\tanh(bx+a)+c+I}{I+c+d}\right)}{4b}-\frac{I\ln(d\tanh(bx+a)+d)\ln\left(\frac{I-d\tanh(bx+a)-c}{I-c+d}\right)}{4b}$$

$$+\frac{I\ln(d\tanh(bx+a)+d)\ln\left(\frac{d\tanh(bx+a)+c+I}{I+c-d}\right)}{4b}-\frac{I\,\mathrm{dilog}\left(\frac{I-d\tanh(bx+a)-c}{I-c+d}\right)}{4b}+\frac{I\,\mathrm{dilog}\left(\frac{d\tanh(bx+a)+c+I}{I+c-d}\right)}{4b}$$

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Problem 51: Result more than twice size of optimal antiderivative.
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$$\int x\,\mathrm{arccot}(c-(I-c)\tanh(bx+a))\,dx$$

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Optimal(type 4, 95 leaves, 6 steps):
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$$-\frac{Ibx^3}{6}+\frac{x^2\,\mathrm{arccot}(c-(I-c)\tanh(bx+a))}{2}+\frac{Ix^2\ln(1-Ic\,e^{2bx+2a})}{4}+\frac{Ix\,\mathrm{polylog}(2,Ic\,e^{2bx+2a})}{4b}-\frac{I\,\mathrm{polylog}(3,Ic\,e^{2bx+2a})}{8b^2}$$

```
Result(type 4, 1533 leaves):
```

$$\frac{\pi x^2\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(I\left(2Ie^{2bx+2a}-2e^{2bx+2a}c\right)\right)\mathrm{csgn}\left(\frac{I\left(2Ie^{2bx+2a}-2e^{2bx+2a}c\right)}{e^{2bx+2a}+1}\right)}{8}$$

$$-\frac{\pi x^2\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(I\left(-2e^{2bx+2a}c-2I\right)\right)\mathrm{csgn}\left(\frac{I\left(-2e^{2bx+2a}c-2I\right)}{e^{2bx+2a}+1}\right)}{8}+\frac{I\ln(1-Ic\,e^{2bx+2a})\,a^2}{4b^2}+\frac{I\,\mathrm{polylog}(2,Ic\,e^{2bx+2a})\,a}{4b^2}$$

$$-\frac{Ia^2\ln\left(1-Ie^{bx+a}\sqrt{-Ic}\right)}{2b^2}-\frac{Ia^2\ln\left(1+Ie^{bx+a}\sqrt{-Ic}\right)}{2b^2}-\frac{Ia\,\mathrm{dilog}\left(1-Ie^{bx+a}\sqrt{-Ic}\right)}{2b^2}-\frac{Ia\,\mathrm{dilog}\left(1+Ie^{bx+a}\sqrt{-Ic}\right)}{2b^2}$$

$$+\frac{Ix\,\mathrm{polylog}(2,Ic\,e^{2bx+2a})}{4b}-\frac{a^3}{3b^2(I-c)}+\frac{bx^3}{6(I-c)}+\frac{Ix^2\ln(1-Ic\,e^{2bx+2a})}{4}-\frac{I\,\mathrm{polylog}(3,Ic\,e^{2bx+2a})}{8b^2}-\frac{Icxa^2}{2b(I-c)}+\frac{Ica^2\ln(e^{bx+a})}{2b^2(I-c)}$$

$$-\frac{Ix^2\ln(-2e^{2bx+2a}c-2I)}{4}+\frac{Ix^2\ln(2Ie^{2bx+2a}-2e^{2bx+2a}c)}{4}-\frac{\pi x^2\,\mathrm{csgn}\left(\frac{-2e^{2bx+2a}c-2I}{e^{2bx+2a}+1}\right)^2}{8}-\frac{\pi x^2\,\mathrm{csgn}\left(\frac{2Ie^{2bx+2a}-2e^{2bx+2a}c}{e^{2bx+2a}+1}\right)^2}{8}$$

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

$$-\frac{\pi x^2\,\mathrm{csgn}\left(\frac{I\left(-2e^{2bx+2a}c-2I\right)}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(\frac{-2e^{2bx+2a}c-2I}{e^{2bx+2a}+1}\right)}{8}-\frac{\pi x^2\,\mathrm{csgn}\left(\frac{I}{e^{2bx+2a}+1}\right)\mathrm{csgn}\left(\frac{I\left(2Ie^{2bx+2a}-2e^{2bx+2a}c\right)}{e^{2bx+2a}+1}\right)^2}{8}$$

$$-\frac{\pi x^2 \operatorname{csgn}\left(I\left(2 I e^{2 b x+2 a}-2 e^{2 b x+2 a} c\right)\right) \operatorname{csgn}\left(\frac{I\left(2 I e^{2 b x+2 a}-2 e^{2 b x+2 a} c\right)}{e^{2 b x+2 a}+1}\right)^2}{8}$$
$$-\frac{\pi x^2 \operatorname{csgn}\left(\frac{I\left(2 I e^{2 b x+2 a}-2 e^{2 b x+2 a} c\right)}{e^{2 b x+2 a}+1}\right) \operatorname{csgn}\left(\frac{2 I e^{2 b x+2 a}-2 e^{2 b x+2 a} c}{e^{2 b x+2 a}+1}\right)^2}{8}+\frac{\pi x^2 \operatorname{csgn}\left(\frac{2 I e^{2 b x+2 a}-2 e^{2 b x+2 a} c}{e^{2 b x+2 a}+1}\right)^3}{8}$$
$$-\frac{\pi x^2 \operatorname{csgn}\left(\frac{I\left(-2 e^{2 b x+2 a} c-2 I\right)}{e^{2 b x+2 a}+1}\right)^3}{8}+\frac{\pi x^2 \operatorname{csgn}\left(\frac{-2 e^{2 b x+2 a} c-2 I}{e^{2 b x+2 a}+1}\right)^3}{8}+\frac{\pi x^2 \operatorname{csgn}\left(\frac{I\left(2 I e^{2 b x+2 a}-2 e^{2 b x+2 a} c\right)}{e^{2 b x+2 a}+1}\right)^3}{8}$$
$$+\frac{\pi x^2 \operatorname{csgn}\left(\frac{I\left(-2 e^{2 b x+2 a} c-2 I\right)}{e^{2 b x+2 a}+1}\right) \operatorname{csgn}\left(\frac{-2 e^{2 b x+2 a} c-2 I}{e^{2 b x+2 a}+1}\right)^2}{8}+\frac{I a^2 \ln\left(e^{2 b x+2 a} c+I\right)}{4 b^2}$$
$$+\frac{\pi x^2 \operatorname{csgn}\left(\frac{I\left(2 I e^{2 b x+2 a}-2 e^{2 b x+2 a} c\right)}{e^{2 b x+2 a}+1}\right) \operatorname{csgn}\left(\frac{2 I e^{2 b x+2 a}-2 e^{2 b x+2 a} c}{e^{2 b x+2 a}+1}\right)}{8}+\frac{I b c x^3}{6 (I-c)}-\frac{I c a^3}{3 b^2 (I-c)}+\frac{I \ln\left(1-I c e^{2 b x+2 a}\right) x a}{2 b}$$
$$-\frac{I a \ln\left(1-I e^{b x+a} \sqrt{-I c}\right) x}{2 b}-\frac{I a \ln\left(1+I e^{b x+a} \sqrt{-I c}\right) x}{2 b}+\frac{a^2 \ln\left(e^{b x+a}\right)}{2 b^2 (I-c)}-\frac{x a^2}{2 b (I-c)}+\frac{\pi x^2}{2}$$

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Problem 52: Result more than twice size of optimal antiderivative.
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$$\int (f x+e)^3 \operatorname{arccot}(\coth(b x+a))\, dx$$

```
Optimal(type 4, 254 leaves, 12 steps):
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$$\frac{(f x+e)^4 \operatorname{arccot}(\coth(b x+a))}{4 f}-\frac{(f x+e)^4 \arctan\left(e^{2 b x+2 a}\right)}{4 f}+\frac{I (f x+e)^3 \operatorname{polylog}\left(2,-I e^{2 b x+2 a}\right)}{4 b}-\frac{I (f x+e)^3 \operatorname{polylog}\left(2, I e^{2 b x+2 a}\right)}{4 b}$$
$$-\frac{3 I f (f x+e)^2 \operatorname{polylog}\left(3,-I e^{2 b x+2 a}\right)}{8 b^2}+\frac{3 I f (f x+e)^2 \operatorname{polylog}\left(3, I e^{2 b x+2 a}\right)}{8 b^2}+\frac{3 I f^2 (f x+e) \operatorname{polylog}\left(4,-I e^{2 b x+2 a}\right)}{8 b^3}$$
$$-\frac{3 I f^2 (f x+e) \operatorname{polylog}\left(4, I e^{2 b x+2 a}\right)}{8 b^3}-\frac{3 I f^3 \operatorname{polylog}\left(5,-I e^{2 b x+2 a}\right)}{16 b^4}+\frac{3 I f^3 \operatorname{polylog}\left(5, I e^{2 b x+2 a}\right)}{16 b^4}$$

```
Result(type ?, 7274 leaves): Display of huge result suppressed!
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Problem 53: Result more than twice size of optimal antiderivative.
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$$\int x^2 \operatorname{arccot}(c+d \coth(b x+a))\, dx$$

```
Optimal(type 4, 301 leaves, 11 steps):
```

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

$$+\frac{I x^2 \operatorname{polylog}\left(2, \frac{(I+c+d) e^{2bx+2a}}{I+c-d}\right)}{4b}+\frac{I x \operatorname{polylog}\left(3, \frac{(I-c-d) e^{2bx+2a}}{I-c+d}\right)}{4b^2}-\frac{I x \operatorname{polylog}\left(3, \frac{(I+c+d) e^{2bx+2a}}{I+c-d}\right)}{4b^2}$$

$$-\frac{I \operatorname{polylog}\left(4, \frac{(I-c-d) e^{2bx+2a}}{I-c+d}\right)}{8b^3}+\frac{I \operatorname{polylog}\left(4, \frac{(I+c+d) e^{2bx+2a}}{I+c-d}\right)}{8b^3}$$

```
Result(type ?, 6911 leaves): Display of huge result suppressed!
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Problem 54: Result more than twice size of optimal antiderivative.
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$$\int \operatorname{arccot}(c+d\coth(bx+a))\, dx$$

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Optimal(type 4, 150 leaves, 7 steps):
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$$x\operatorname{arccot}(c+d\coth(bx+a))-\frac{I x \ln\left(1-\frac{(I-c-d) e^{2bx+2a}}{I-c+d}\right)}{2}+\frac{I x \ln\left(1-\frac{(I+c+d) e^{2bx+2a}}{I+c-d}\right)}{2}-\frac{I \operatorname{polylog}\left(2, \frac{(I-c-d) e^{2bx+2a}}{I-c+d}\right)}{4b}$$

$$+\frac{I \operatorname{polylog}\left(2, \frac{(I+c+d) e^{2bx+2a}}{I+c-d}\right)}{4b}$$

```
Result(type 4, 349 leaves):
```

$$-\frac{\operatorname{arccot}(c+d\coth(bx+a)) \ln(d\coth(bx+a)-d)}{2b}+\frac{\operatorname{arccot}(c+d\coth(bx+a)) \ln(d\coth(bx+a)+d)}{2b}$$

$$+\frac{I \ln(d\coth(bx+a)-d) \ln\left(\frac{I-d\coth(bx+a)-c}{I-c-d}\right)}{4b}-\frac{I \ln(d\coth(bx+a)-d) \ln\left(\frac{d\coth(bx+a)+c+I}{I+c+d}\right)}{4b}$$

$$+\frac{I \operatorname{dilog}\left(\frac{I-d\coth(bx+a)-c}{I-c-d}\right)}{4b}-\frac{I \operatorname{dilog}\left(\frac{d\coth(bx+a)+c+I}{I+c+d}\right)}{4b}-\frac{I \ln(d\coth(bx+a)+d) \ln\left(\frac{I-d\coth(bx+a)-c}{I-c+d}\right)}{4b}$$

$$+\frac{I \ln(d\coth(bx+a)+d) \ln\left(\frac{d\coth(bx+a)+c+I}{I+c-d}\right)}{4b}-\frac{I \operatorname{dilog}\left(\frac{I-d\coth(bx+a)-c}{I-c+d}\right)}{4b}+\frac{I \operatorname{dilog}\left(\frac{d\coth(bx+a)+c+I}{I+c-d}\right)}{4b}$$

```
Problem 56: Result more than twice size of optimal antiderivative.
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$$\int \frac{(a+b\operatorname{arccot}(c x^n))(d+e\ln(f x^m))}{x}\, dx$$

```
Optimal(type 4, 161 leaves, 13 steps):
```

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

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

Result(type 4, 1057 leaves):

$$\frac{I \operatorname{dilog}(1-I c x^{n}) b d}{2 n}-\frac{I \operatorname{dilog}(1+I c x^{n}) b d}{2 n}-\frac{I e b m \operatorname{polylog}(3, I c x^{n})}{2 n^{2}}+\frac{I e b \operatorname{dilog}(-I(c x^{n}+I)) \ln(x^{m})}{2 n}-\frac{I e b \ln(-I(c x^{n}+I)) \ln(x)^{2} m}{2}$$
$$+\frac{I e b \ln(-I(c x^{n}+I)) \ln(x^{m}) \ln(x)}{2}+\frac{I \operatorname{dilog}(1-I c x^{n}) \ln(f) b e}{2 n}-\frac{\operatorname{dilog}(1+I c x^{n}) \pi b e \operatorname{csgn}(I f) \operatorname{csgn}(I x^{m}) \operatorname{csgn}(I f x^{m})}{4 n}$$
$$+\frac{\operatorname{dilog}(1-I c x^{n}) \pi b e \operatorname{csgn}(I f) \operatorname{csgn}(I x^{m}) \operatorname{csgn}(I f x^{m})}{4 n}+\frac{I \pi^{2} \ln(x^{n}) b e \operatorname{csgn}(I f) \operatorname{csgn}(I f x^{m})^{2}}{4 n}+\frac{I \pi \ln(x^{n}) a e \operatorname{csgn}(I f) \operatorname{csgn}(I f x^{m})^{2}}{2 n}$$
$$+\frac{I \pi^{2} \ln(x^{n}) b e \operatorname{csgn}(I x^{m}) \operatorname{csgn}(I f x^{m})^{2}}{4 n}+\frac{I \pi \ln(x^{n}) a e \operatorname{csgn}(I x^{m}) \operatorname{csgn}(I f x^{m})^{2}}{2 n}-\frac{I e b \ln(-I(-c x^{n}+I)) \ln(-I c x^{n}) m \ln(x)}{2 n}+\frac{\ln(x^{n}) a d}{n}$$
$$+\frac{e \ln(x^{m})^{2} a}{2 m}-\frac{I \operatorname{dilog}(1+I c x^{n}) \ln(f) b e}{2 n}+\frac{\ln(x^{n}) \ln(f) a e}{n}+\frac{\pi \ln(x^{n}) b d}{2 n}+\frac{e \ln(x^{m})^{2} b \pi}{4 m}+\frac{\pi \ln(x^{n}) \ln(f) b e}{2 n}$$
$$+\frac{\operatorname{dilog}(1-I c x^{n}) \pi b e \operatorname{csgn}(I f x^{m})^{3}}{4 n}-\frac{\operatorname{dilog}(1+I c x^{n}) \pi b e \operatorname{csgn}(I f x^{m})^{3}}{4 n}-\frac{I e b \ln(1+I c x^{n}) m \ln(x)^{2}}{2}+\frac{I e b \ln(1+I c x^{n}) \ln(x^{m}) \ln(x)}{2}$$
$$+\frac{I e b m \operatorname{polylog}(3, -I c x^{n})}{2 n^{2}}+\frac{I e b \ln(-I(-c x^{n}+I)) \ln(x)^{2} m}{2}-\frac{I e b \ln(-I(-c x^{n}+I)) \ln(x^{m}) \ln(x)}{2}+\frac{I e b \operatorname{dilog}(-I c x^{n}) \ln(x^{m})}{2 n}$$
$$+\frac{I e b \ln(1-I c x^{n}) m \ln(x)^{2}}{2}-\frac{I e b \ln(1-I c x^{n}) \ln(x^{m}) \ln(x)}{2}-\frac{\operatorname{dilog}(1-I c x^{n}) \pi b e \operatorname{csgn}(I x^{m}) \operatorname{csgn}(I f x^{m})^{2}}{4 n}$$
$$+\frac{\operatorname{dilog}(1+I c x^{n}) \pi b e \operatorname{csgn}(I x^{m}) \operatorname{csgn}(I f x^{m})^{2}}{4 n}-\frac{\operatorname{dilog}(1-I c x^{n}) \pi b e \operatorname{csgn}(I f) \operatorname{csgn}(I f x^{m})^{2}}{4 n}+\frac{\operatorname{dilog}(1+I c x^{n}) \pi b e \operatorname{csgn}(I f) \operatorname{csgn}(I f x^{m})^{2}}{4 n}$$
$$-\frac{I \pi \ln(x^{n}) a e \operatorname{csgn}(I f x^{m})^{3}}{2 n}-\frac{I \pi^{2} \ln(x^{n}) b e \operatorname{csgn}(I f x^{m})^{3}}{4 n}-\frac{I e b \operatorname{dilog}(-I(c x^{n}+I)) m \ln(x)}{2 n}-\frac{I e b m \ln(x) \operatorname{polylog}(2, -I c x^{n})}{2 n}$$
$$+\frac{I e b \ln(-I(-c x^{n}+I)) \ln(-I c x^{n}) \ln(x^{m})}{2 n}-\frac{I e b \operatorname{dilog}(-I c x^{n}) m \ln(x)}{2 n}+\frac{I e b m \ln(x) \operatorname{polylog}(2, I c x^{n})}{2 n}$$
$$-\frac{I \pi^{2} \ln(x^{n}) b e \operatorname{csgn}(I f) \operatorname{csgn}(I x^{m}) \operatorname{csgn}(I f x^{m})}{4 n}-\frac{I \pi \ln(x^{n}) a e \operatorname{csgn}(I f) \operatorname{csgn}(I x^{m}) \operatorname{csgn}(I f x^{m})}{2 n}$$

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

$$\int \operatorname{arccot}(e^{b x+a})\, dx$$

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

$$-\frac{I \operatorname{polylog}(2, -I e^{-b x-a})}{2 b}+\frac{I \operatorname{polylog}(2, I e^{-b x-a})}{2 b}$$

Result(type 4, 105 leaves):

$$\frac{\ln(e^{bx+a})\operatorname{arccot}(e^{bx+a})}{b}-\frac{I\ln(e^{bx+a})\ln(1+Ie^{bx+a})}{2b}+\frac{I\ln(e^{bx+a})\ln(1-Ie^{bx+a})}{2b}-\frac{I\operatorname{dilog}(1+Ie^{bx+a})}{2b}+\frac{I\operatorname{dilog}(1-Ie^{bx+a})}{2b}$$

Problem 59: Result more than twice size of optimal antiderivative.

$$\int x\operatorname{arccot}(a+bf^{dx+c})\,dx$$

Optimal(type 4, 218 leaves, 25 steps):

$$-\frac{Ix^2\ln\left(1-\frac{bf^{dx+c}}{I-a}\right)}{4}+\frac{Ix^2\ln\left(1+\frac{bf^{dx+c}}{I+a}\right)}{4}+\frac{Ix^2\ln\left(1-\frac{I}{a+bf^{dx+c}}\right)}{4}-\frac{Ix^2\ln\left(1+\frac{I}{a+bf^{dx+c}}\right)}{4}-\frac{Ix\operatorname{polylog}\left(2,\frac{bf^{dx+c}}{I-a}\right)}{2d\ln(f)}$$
$$+\frac{Ix\operatorname{polylog}\left(2,-\frac{bf^{dx+c}}{I+a}\right)}{2d\ln(f)}+\frac{I\operatorname{polylog}\left(3,\frac{bf^{dx+c}}{I-a}\right)}{2d^2\ln(f)^2}-\frac{I\operatorname{polylog}\left(3,-\frac{bf^{dx+c}}{I+a}\right)}{2d^2\ln(f)^2}$$

Result(type 4, 657 leaves):

$$\frac{I\operatorname{polylog}\left(3,\frac{Ibf^{dx+c}}{-Ia-1}\right)}{2d^2\ln(f)^2}+\frac{\pi x^2}{4}-\frac{I\operatorname{polylog}\left(3,\frac{Ibf^{dx+c}}{-Ia+1}\right)}{2d^2\ln(f)^2}+\frac{Ix^2\ln(1+I(a+bf^{dx+c}))}{4}+\frac{I\operatorname{polylog}\left(2,\frac{Ibf^{dx+c}}{-Ia+1}\right)x}{2d\ln(f)}-\frac{Ic\ln\left(\frac{bf^{dx+c}+a+I}{I+a}\right)x}{2d}$$
$$-\frac{I\ln\left(1-\frac{Ibf^{dx+c}}{-Ia-1}\right)c^2}{4d^2}-\frac{I\ln\left(1-\frac{Ibf^{dx+c}}{-Ia-1}\right)xc}{2d}+\frac{Ic\ln\left(\frac{bf^{dx+c}+a-I}{-I+a}\right)x}{2d}+\frac{Ic\operatorname{dilog}\left(\frac{bf^{dx+c}+a-I}{-I+a}\right)}{2d^2\ln(f)}+\frac{I\ln\left(1-\frac{Ibf^{dx+c}}{-Ia+1}\right)xc}{2d}$$
$$-\frac{Ix^2\ln(1-I(a+bf^{dx+c}))}{4}+\frac{Ic^2\ln\left(\frac{bf^{dx+c}+a-I}{-I+a}\right)}{2d^2}+\frac{I\ln\left(1-\frac{Ibf^{dx+c}}{-Ia+1}\right)x^2}{4}-\frac{Ic\operatorname{dilog}\left(\frac{bf^{dx+c}+a+I}{I+a}\right)}{2d^2\ln(f)}-\frac{I\operatorname{polylog}\left(2,\frac{Ibf^{dx+c}}{-Ia-1}\right)c}{2d^2\ln(f)}$$
$$+\frac{I\operatorname{polylog}\left(2,\frac{Ibf^{dx+c}}{-Ia+1}\right)c}{2d^2\ln(f)}-\frac{I\operatorname{polylog}\left(2,\frac{Ibf^{dx+c}}{-Ia-1}\right)x}{2d\ln(f)}-\frac{Ic^2\ln\left(\frac{bf^{dx+c}+a+I}{I+a}\right)}{2d^2}-\frac{I\ln\left(1-\frac{Ibf^{dx+c}}{-Ia-1}\right)x^2}{4}-\frac{Ic^2\ln(Ibf^{dx+c}+Ia+1)}{4d^2}$$
$$+\frac{Ic^2\ln(1-Ia-Ibf^{dx+c})}{4d^2}+\frac{I\ln\left(1-\frac{Ibf^{dx+c}}{-Ia+1}\right)c^2}{4d^2}$$

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

$$\int e^{c(bx+a)}\operatorname{arccot}(\cosh(bcx+ac))\,dx$$

Optimal(type 3, 88 leaves, 8 steps):

$$\frac{e^{bcx+ac}\operatorname{arccot}(\cosh(c(bx+a)))}{bc}+\frac{\ln\left(3+e^{2c(bx+a)}-2\sqrt{2}\right)\left(1-\sqrt{2}\right)}{2bc}+\frac{\ln\left(3+e^{2c(bx+a)}+2\sqrt{2}\right)\left(1+\sqrt{2}\right)}{2bc}$$

Result(type 3, 1333 leaves):

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

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

$$\int e^{c(bx+a)} \operatorname{arccot}(\tanh(bcx+ac))\, dx$$

Optimal(type 3, 153 leaves, 13 steps):

$$\frac{e^{b c x+a c} \operatorname{arccot}(\tanh(c (b x+a)))}{b c}+\frac{\arctan\left(e^{b c x+a c} \sqrt{2}-1\right) \sqrt{2}}{2 b c}+\frac{\arctan\left(1+e^{b c x+a c} \sqrt{2}\right) \sqrt{2}}{2 b c}+\frac{\ln\left(1+e^{2 c (b x+a)}-e^{b c x+a c} \sqrt{2}\right) \sqrt{2}}{4 b c}$$

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

Result(type 3, 1322 leaves):

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

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

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

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

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

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

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

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

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

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

$$-\frac{\ln\left(e^{c(bx+a)}+\left(\frac{1}{2}+\frac{I}{2}\right)\sqrt{2}\right)\sqrt{2}}{4cb}+\frac{\ln\left(e^{c(bx+a)}-\left(\frac{1}{2}+\frac{I}{2}\right)\sqrt{2}\right)\sqrt{2}}{4cb}+\frac{\ln\left(e^{c(bx+a)}+\left(-\frac{1}{2}+\frac{I}{2}\right)\sqrt{2}\right)\sqrt{2}}{4cb}+\frac{\pi e^{c(bx+a)}}{4cb}$$
$$-\frac{I e^{c(bx+a)}\ln\left(e^{2c(bx+a)}+I\right)}{2cb}$$

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

$$\int e^{c(bx+a)}\operatorname{arccot}(\operatorname{sech}(bcx+ac))\,dx$$

Optimal(type 3, 88 leaves, 8 steps):

$$\frac{e^{bcx+ac}\operatorname{arccot}(\operatorname{sech}(c(bx+a)))}{bc}-\frac{\ln\left(3+e^{2c(bx+a)}-2\sqrt{2}\right)\left(1-\sqrt{2}\right)}{2bc}-\frac{\ln\left(3+e^{2c(bx+a)}+2\sqrt{2}\right)\left(1+\sqrt{2}\right)}{2bc}$$

Result(type 3, 846 leaves):

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

$$-\frac{\ln\left(e^{2c(bx+a)}+\left(\sqrt{2}-1\right)^{2}\right)}{2cb}-\frac{\ln\left(e^{2c(bx+a)}+\left(1+\sqrt{2}\right)^{2}\right)}{2cb}$$

Test results for the 4 problems in "5.4.2 Exponentials of inverse cotangent.txt"

Problem 1: Unable to integrate problem.

$$\int e^{\operatorname{arccot}(x)}\,dx$$

Optimal(type 5, 57 leaves, 2 steps):

$$\left(\frac{4}{5}+\frac{8I}{5}\right)\left(\frac{x-I}{x}\right)^{1+\frac{I}{2}}\left(\frac{I+x}{x}\right)^{-1-\frac{I}{2}}\operatorname{hypergeom}\left(\left[2,1+\frac{I}{2}\right],\left[2+\frac{I}{2}\right],\frac{1-\frac{I}{x}}{1+\frac{I}{x}}\right)$$

Result(type 8, 5 leaves):

$$\int e^{\operatorname{arccot}(x)}\,dx$$

Problem 4: Unable to integrate problem.

$$\int \frac{e^{n\operatorname{arccot}(ax)}}{\left(a^2cx^2+c\right)^{4/3}}\,dx$$

Optimal(type 5, 172 leaves, 4 steps):

$$-\frac{3e^{n\operatorname{arccot}(ax)}\left(-2ax+3n\right)}{ac\left(9n^2+4\right)\left(a^2cx^2+c\right)^{1/3}}$$

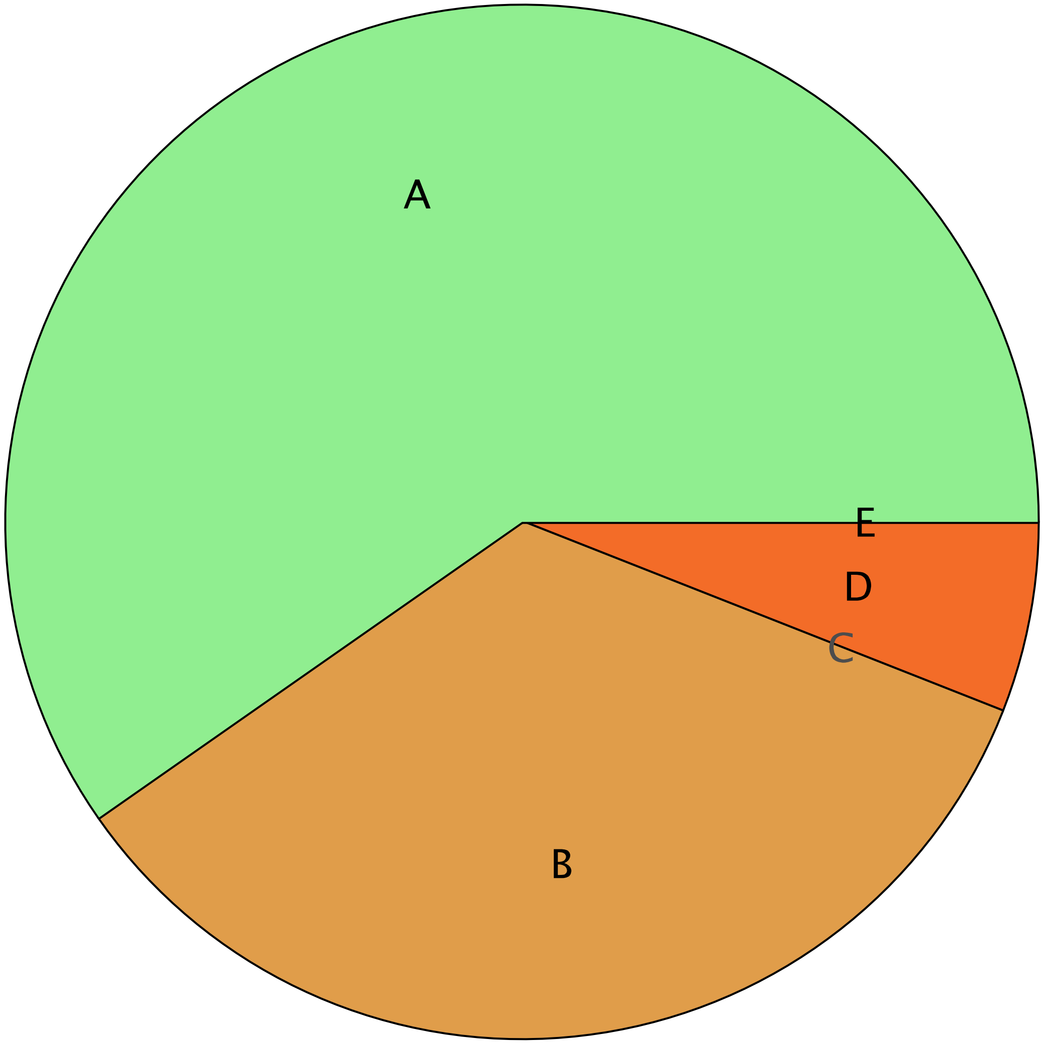
$$-\frac{6\left(1+\frac{1}{a^2x^2}\right)^{1/3}\left(\frac{a-\frac{I}{x}}{a+\frac{I}{x}}\right)^{\frac{1}{3}-\frac{In}{2}}\left(1-\frac{I}{ax}\right)^{-\frac{1}{3}+\frac{In}{2}}\left(1+\frac{I}{ax}\right)^{\frac{2}{3}-\frac{In}{2}}x\operatorname{hypergeom}\left(\left[-\frac{1}{3},\frac{1}{3}-\frac{In}{2}\right],\left[\frac{2}{3}\right],\frac{2I}{\left(a+\frac{I}{x}\right)x}\right)}{c\left(9n^2+4\right)\left(a^2cx^2+c\right)^{1/3}}$$

Result(type 8, 22 leaves):

$$\int \frac{e^{n\operatorname{arccot}(ax)}}{\left(a^2cx^2+c\right)^{4/3}}\,dx$$

Summary of Integration Test Results

67 integration problems



A - 40 optimal antiderivatives
B - 23 more than twice size of optimal antiderivatives
C - 0 unnecessarily complex antiderivatives
D - 4 unable to integrate problems
E - 0 integration timeouts