Mathematica 11.3 Integration Test Results

Test results for the 300 problems in "7.4.1 Inverse hyperbolic cotangent functions.m"

Problem 24: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4 \operatorname{ArcCoth}[a x]^3 \, dx$$

Optimal (type 4, 196 leaves, 22 steps):

$$\frac{x^2}{20 a^3}+\frac{9 x \operatorname{ArcCoth}[a x]}{10 a^4}+\frac{x^3 \operatorname{ArcCoth}[a x]}{10 a^2}-\frac{9 \operatorname{ArcCoth}[a x]^2}{20 a^5}+\frac{3 x^2 \operatorname{ArcCoth}[a x]^2}{10 a^3}+\frac{3 x^4 \operatorname{ArcCoth}[a x]^2}{20 a}+\frac{\operatorname{ArcCoth}[a x]^3}{5 a^5}+\frac{1}{5} x^5 \operatorname{ArcCoth}[a x]^3-\frac{3 \operatorname{ArcCoth}[a x]^2 \operatorname{Log}\left[\frac{2}{1-a x}\right]}{5 a^5}+\frac{\operatorname{Log}\left[1-a^2 x^2\right]}{2 a^5}-\frac{3 \operatorname{ArcCoth}[a x] \operatorname{PolyLog}\left[2, 1-\frac{2}{1-a x}\right]}{5 a^5}+\frac{3 \operatorname{PolyLog}\left[3, 1-\frac{2}{1-a x}\right]}{10 a^5}$$

Result (type 4, 175 leaves):

$$\frac{1}{40 a^5}\left(-2-i \pi^3+2 a^2 x^2+36 a x \operatorname{ArcCoth}[a x]+4 a^3 x^3 \operatorname{ArcCoth}[a x]-18 \operatorname{ArcCoth}[a x]^2+12 a^2 x^2 \operatorname{ArcCoth}[a x]^2+6 a^4 x^4 \operatorname{ArcCoth}[a x]^2+8 \operatorname{ArcCoth}[a x]^3+8 a^5 x^5 \operatorname{ArcCoth}[a x]^3-24 \operatorname{ArcCoth}[a x]^2 \operatorname{Log}\left[1-e^{2 \operatorname{ArcCoth}[a x]}\right]-40 \operatorname{Log}\left[\frac{1}{a \sqrt{1-\frac{1}{a^2 x^2}}\, x}\right]-24 \operatorname{ArcCoth}[a x] \operatorname{PolyLog}\left[2, e^{2 \operatorname{ArcCoth}[a x]}\right]+12 \operatorname{PolyLog}\left[3, e^{2 \operatorname{ArcCoth}[a x]}\right]\right)$$

Problem 26: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2 \operatorname{ArcCoth}[a x]^3 \, dx$$

Optimal (type 4, 149 leaves, 11 steps):

$$\frac{x\,\text{ArcCoth}[a\,x]}{a^2}-\frac{\text{ArcCoth}[a\,x]^2}{2\,a^3}+\frac{x^2\,\text{ArcCoth}[a\,x]^2}{2\,a}+\frac{\text{ArcCoth}[a\,x]^3}{3\,a^3}+\frac{1}{3}x^3\,\text{ArcCoth}[a\,x]^3-\frac{\text{ArcCoth}[a\,x]^2\,\text{Log}\left[\frac{2}{1-a\,x}\right]}{a^3}+\frac{\text{Log}\left[1-a^2\,x^2\right]}{2\,a^3}-\frac{\text{ArcCoth}[a\,x]\,\text{PolyLog}\left[2,1-\frac{2}{1-a\,x}\right]}{a^3}+\frac{\text{PolyLog}\left[3,1-\frac{2}{1-a\,x}\right]}{2\,a^3}$$

Result (type 4, 140 leaves) :

$$\frac{1}{24\,a^3}\left(-i\,\pi^3+24\,a\,x\,\text{ArcCoth}[a\,x]-12\,\text{ArcCoth}[a\,x]^2+12\,a^2\,x^2\,\text{ArcCoth}[a\,x]^2+8\,\text{ArcCoth}[a\,x]^3+8\,a^3\,x^3\,\text{ArcCoth}[a\,x]^3-24\,\text{ArcCoth}[a\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcCoth}[a\,x]}\right]-24\,\text{Log}\left[\frac{1}{a\sqrt{1-\frac{1}{a^2\,x^2}}\,x}\right]-24\,\text{ArcCoth}[a\,x]\,\text{PolyLog}\left[2,e^{2\,\text{ArcCoth}[a\,x]}\right]+12\,\text{PolyLog}\left[3,e^{2\,\text{ArcCoth}[a\,x]}\right]\right)$$

Problem 34: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{ArcCoth}[c\,x]^2}{d+e\,x}\,dx$$

Optimal (type 4, 164 leaves, 1 step) :

$$-\frac{\text{ArcCoth}[c\,x]^2\,\text{Log}\left[\frac{2}{1+c\,x}\right]}{e}+\frac{\text{ArcCoth}[c\,x]^2\,\text{Log}\left[\frac{2\,c\,(d+e\,x)}{(c\,d+e)\,(1+c\,x)}\right]}{e}+\frac{\text{ArcCoth}[c\,x]\,\text{PolyLog}\left[2,1-\frac{2}{1+c\,x}\right]}{e}-\frac{\text{ArcCoth}[c\,x]\,\text{PolyLog}\left[2,1-\frac{2\,c\,(d+e\,x)}{(c\,d+e)\,(1+c\,x)}\right]}{e}+\frac{\text{PolyLog}\left[3,1-\frac{2}{1+c\,x}\right]}{2\,e}-\frac{\text{PolyLog}\left[3,1-\frac{2\,c\,(d+e\,x)}{(c\,d+e)\,(1+c\,x)}\right]}{2\,e}$$

Result (type 4, 741 leaves) :

$$\frac{1}{24\,e^2}\Bigg(-\mathrm{i}\,e\,\pi^3+8\,c\,d\,\mathrm{ArcCoth}[c\,x]^3+8\,e\,\mathrm{ArcCoth}[c\,x]^3-$$

$$24\,e\,\mathrm{ArcCoth}[c\,x]^2\,\mathrm{Log}\left[1-e^{2\,\mathrm{ArcCoth}[c\,x]}\right]-24\,e\,\mathrm{ArcCoth}[c\,x]\,\mathrm{PolyLog}\left[2,\,e^{2\,\mathrm{ArcCoth}[c\,x]}\right]+$$

$$12\,e\,\mathrm{PolyLog}\left[3,\,e^{2\,\mathrm{ArcCoth}[c\,x]}\right]+\frac{1}{6\,c^2\,d^2-6\,e^2}\,24\,(-c\,d+e)\,(c\,d+e)$$

$$\Bigg(-2\,c\,d\,\mathrm{ArcCoth}[c\,x]^3+6\,e\,\mathrm{ArcCoth}[c\,x]^3+4\,c\,d\,\sqrt{1-\frac{e^2}{c^2\,d^2}}\;e^{-\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]}\,\mathrm{ArcCoth}[c\,x]^3+$$

$$6\,\mathrm{i}\,e\,\pi\,\mathrm{ArcCoth}[c\,x]\,\mathrm{Log}\left[\frac{1}{2}\left(e^{-\mathrm{ArcCoth}[c\,x]}+e^{\mathrm{ArcCoth}[c\,x]}\right)\right]+6\,e\,\mathrm{ArcCoth}[c\,x]^2$$

$$\mathrm{Log}\left[1+\frac{(c\,d+e)\,e^{2\,\mathrm{ArcCoth}[c\,x]}}{-c\,d+e}\right]-6\,e\,\mathrm{ArcCoth}[c\,x]^2\,\mathrm{Log}\left[1-e^{\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]}\right]-$$

$$6\,e\,\mathrm{ArcCoth}[c\,x]^2\,\mathrm{Log}\left[1+e^{\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]}\right]-$$

$$6\,e\,\mathrm{ArcCoth}[c\,x]^2\,\mathrm{Log}\left[1-e^{2\left(\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]\right)}\right]-12\,e\,\mathrm{ArcCoth}[c\,x]$$

$$\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]\,\mathrm{Log}\left[\frac{1}{2}\,\mathrm{i}\,e^{-\mathrm{ArcCoth}[c\,x]-\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]}\left(-1+e^{2\left(\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]\right)}\right)\right]-$$

$$6\,e\,\mathrm{ArcCoth}[c\,x]^2\,\mathrm{Log}\left[\frac{1}{2}\,e^{-\mathrm{ArcCoth}[c\,x]}\left(c\,d\left(-1+e^{2\,\mathrm{ArcCoth}[c\,x]}\right)+e\left(1+e^{2\,\mathrm{ArcCoth}[c\,x]}\right)\right)\right]-$$

$$6\,\mathrm{i}\,e\,\pi\,\mathrm{ArcCoth}[c\,x]\,\mathrm{Log}\left[\frac{1}{\sqrt{1-\frac{1}{c^2\,x^2}}}\right]+6\,e\,\mathrm{ArcCoth}[c\,x]^2\,\mathrm{Log}\left[\frac{d+e\,x}{\sqrt{1-\frac{1}{c^2\,x^2}}\;x}\right]+$$

$$12\,e\,\mathrm{ArcCoth}[c\,x]\,\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]\,\mathrm{Log}\left[\mathrm{i}\,\mathrm{Sinh}\left[\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]\right]\right]+$$

$$6\,e\,\mathrm{ArcCoth}[c\,x]\,\mathrm{PolyLog}\left[2,\,\frac{(c\,d+e)\,e^{2\,\mathrm{ArcCoth}[c\,x]}}{c\,d-e}\right]-12\,e\,\mathrm{ArcCoth}[c\,x]$$

$$\mathrm{PolyLog}\left[2,\,-e^{\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]}\right]-12\,e\,\mathrm{ArcCoth}[c\,x]\,\mathrm{PolyLog}\left[2,\,e^{\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]}\right]-$$

$$6\,e\,\mathrm{ArcCoth}[c\,x]\,\mathrm{PolyLog}\left[2,\,e^{2\left(\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]\right)}\right]-$$

$$3\,e\,\mathrm{PolyLog}\left[3,\,\frac{(c\,d+e)\,e^{2\,\mathrm{ArcCoth}[c\,x]}}{c\,d-e}\right]+12\,e\,\mathrm{PolyLog}\left[3,\,-e^{\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]}\right]+$$

$$12\,e\,\mathrm{PolyLog}\left[3,\,e^{\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]}\right]+3\,e\,\mathrm{PolyLog}\left[3,\,e^{2\left(\mathrm{ArcCoth}[c\,x]+\mathrm{ArcTanh}\left[\frac{e}{c\,d}\right]\right)}\right]\Bigg)\Bigg)$$

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

$$\int \frac{\text{ArcCoth}[a x]}{\left(c+d x^2\right)^3} \, dx$$

Optimal (type 4, 657 leaves, 23 steps):

$$\frac{a}{8 c \left(a^2 c+d\right) \left(c+d x^2\right)}+\frac{x \text{ArcCoth}[a x]}{4 c \left(c+d x^2\right)^2}+\frac{3 x \text{ArcCoth}[a x]}{8 c^2 \left(c+d x^2\right)}+\frac{3 \text{ArcCoth}[a x] \text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right]}{8 c^{5/2} \sqrt{d}}+$$
$$\frac{3 i \text{Log}\left[\frac{\sqrt{d} (1-a x)}{i a \sqrt{c}+\sqrt{d}}\right] \text{Log}\left[1-\frac{i \sqrt{d} x}{\sqrt{c}}\right]}{32 c^{5/2} \sqrt{d}}-\frac{3 i \text{Log}\left[-\frac{\sqrt{d} (1+a x)}{i a \sqrt{c}-\sqrt{d}}\right] \text{Log}\left[1-\frac{i \sqrt{d} x}{\sqrt{c}}\right]}{32 c^{5/2} \sqrt{d}}-$$
$$\frac{3 i \text{Log}\left[-\frac{\sqrt{d} (1-a x)}{i a \sqrt{c}-\sqrt{d}}\right] \text{Log}\left[1+\frac{i \sqrt{d} x}{\sqrt{c}}\right]}{32 c^{5/2} \sqrt{d}}+\frac{3 i \text{Log}\left[\frac{\sqrt{d} (1+a x)}{i a \sqrt{c}+\sqrt{d}}\right] \text{Log}\left[1+\frac{i \sqrt{d} x}{\sqrt{c}}\right]}{32 c^{5/2} \sqrt{d}}+$$
$$\frac{a \left(5 a^2 c+3 d\right) \text{Log}\left[1-a^2 x^2\right]}{16 c^2 \left(a^2 c+d\right)^2}-\frac{a \left(5 a^2 c+3 d\right) \text{Log}\left[c+d x^2\right]}{16 c^2 \left(a^2 c+d\right)^2}+\frac{3 i \text{PolyLog}\left[2,\frac{a \left(\sqrt{c}-i \sqrt{d} x\right)}{a \sqrt{c}-i \sqrt{d}}\right]}{32 c^{5/2} \sqrt{d}}-$$
$$\frac{3 i \text{PolyLog}\left[2,\frac{a \left(\sqrt{c}-i \sqrt{d} x\right)}{a \sqrt{c}+i \sqrt{d}}\right]}{32 c^{5/2} \sqrt{d}}+\frac{3 i \text{PolyLog}\left[2,\frac{a \left(\sqrt{c}+i \sqrt{d} x\right)}{a \sqrt{c}-i \sqrt{d}}\right]}{32 c^{5/2} \sqrt{d}}-\frac{3 i \text{PolyLog}\left[2,\frac{a \left(\sqrt{c}+i \sqrt{d} x\right)}{a \sqrt{c}+i \sqrt{d}}\right]}{32 c^{5/2} \sqrt{d}}$$

Result (type 4, 1838 leaves):

$$a^5 \left(-\frac{5 \text{Log}\left[1+\frac{\left(a^2 c+d\right) \text{Cosh}[2 \text{ArcCoth}[a x]]}{-a^2 c+d}\right]}{16 a^2 c \left(a^2 c+d\right)^2}-\frac{3 d \text{Log}\left[1+\frac{\left(a^2 c+d\right) \text{Cosh}[2 \text{ArcCoth}[a x]]}{-a^2 c+d}\right]}{16 a^4 c^2 \left(a^2 c+d\right)^2}+\right.$$
$$\frac{1}{32 a^2 c \sqrt{a^2 c d} \left(a^2 c+d\right)} 3 \left(-2 i \text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right] \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d} x}\right]+\right.$$
$$4 \text{ArcCoth}[a x] \text{ArcTan}\left[\frac{a d x}{\sqrt{a^2 c d}}\right]-\left(\text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right]-2 \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d} x}\right]\right)$$
$$\text{Log}\left[1-\frac{\left(-a^2 c+d-2 i \sqrt{a^2 c d}\right) \left(2 d-\frac{2 i \sqrt{a^2 c d}}{a x}\right)}{\left(a^2 c+d\right) \left(2 d+\frac{2 i \sqrt{a^2 c d}}{a x}\right)}\right]+\left(-\text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right]-\right.$$
$$\left.2 \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d} x}\right]\right) \text{Log}\left[1-\frac{\left(-a^2 c+d+2 i \sqrt{a^2 c d}\right) \left(2 d-\frac{2 i \sqrt{a^2 c d}}{a x}\right)}{\left(a^2 c+d\right) \left(2 d+\frac{2 i \sqrt{a^2 c d}}{a x}\right)}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right]+2 i \left(-i \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d}\, x}\right]-i \text{ArcTan}\left[\frac{a d x}{\sqrt{a^2 c d}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\sqrt{2}\, \sqrt{a^2 c d}\, e^{-\text{ArcCoth}[a x]}}{\sqrt{a^2 c+d}\, \sqrt{-a^2 c+d+\left(a^2 c+d\right) \text{Cosh}[2 \text{ArcCoth}[a x]]}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right]-2 i \left(-i \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d}\, x}\right]-i \text{ArcTan}\left[\frac{a d x}{\sqrt{a^2 c d}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\sqrt{2}\, \sqrt{a^2 c d}\, e^{\text{ArcCoth}[a x]}}{\sqrt{a^2 c+d}\, \sqrt{-a^2 c+d+\left(a^2 c+d\right) \text{Cosh}[2 \text{ArcCoth}[a x]]}}\right]+$$

$$i \left(\text{PolyLog}\left[2,\frac{\left(-a^2 c+d-2 i \sqrt{a^2 c d}\right) \left(2 d-\frac{2 i \sqrt{a^2 c d}}{a x}\right)}{\left(a^2 c+d\right) \left(2 d+\frac{2 i \sqrt{a^2 c d}}{a x}\right)}\right]-\right.$$

$$\left.\text{PolyLog}\left[2,\frac{\left(-a^2 c+d+2 i \sqrt{a^2 c d}\right) \left(2 d-\frac{2 i \sqrt{a^2 c d}}{a x}\right)}{\left(a^2 c+d\right) \left(2 d+\frac{2 i \sqrt{a^2 c d}}{a x}\right)}\right]\right)\Bigg)+$$

$$\frac{1}{32 a^4 c^2 \sqrt{a^2 c d}\, \left(a^2 c+d\right)} 3 d \left(-2 i \text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right] \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d}\, x}\right]+\right.$$

$$4 \text{ArcCoth}[a x] \text{ArcTan}\left[\frac{a d x}{\sqrt{a^2 c d}}\right]-\left(\text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right]-2 \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d}\, x}\right]\right)$$

$$\text{Log}\left[1-\frac{\left(-a^2 c+d-2 i \sqrt{a^2 c d}\right) \left(2 d-\frac{2 i \sqrt{a^2 c d}}{a x}\right)}{\left(a^2 c+d\right) \left(2 d+\frac{2 i \sqrt{a^2 c d}}{a x}\right)}\right]+$$

$$\left(-\text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right]-2 \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d}\, x}\right]\right)$$

$$\text{Log}\left[1-\frac{\left(-a^2 c+d+2 i \sqrt{a^2 c d}\right) \left(2 d-\frac{2 i \sqrt{a^2 c d}}{a x}\right)}{\left(a^2 c+d\right) \left(2 d+\frac{2 i \sqrt{a^2 c d}}{a x}\right)}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right]+2 i \left(-i \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d}\, x}\right]-i \text{ArcTan}\left[\frac{a d x}{\sqrt{a^2 c d}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\sqrt{2}\, \sqrt{a^2 c d}\, e^{-\text{ArcCoth}[a x]}}{\sqrt{a^2 c+d}\, \sqrt{-a^2 c+d+\left(a^2 c+d\right) \text{Cosh}[2 \text{ArcCoth}[a x]]}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{-a^2 c+d}{a^2 c+d}\right]-2 i \left(-i \text{ArcTan}\left[\frac{a c}{\sqrt{a^2 c d}\; x}\right]-i \text{ArcTan}\left[\frac{a d x}{\sqrt{a^2 c d}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\sqrt{2}\sqrt{a^2 c d}\; e^{\text{ArcCoth}[a x]}}{\sqrt{a^2 c+d}\sqrt{-a^2 c+d+\left(a^2 c+d\right)\text{Cosh}[2\,\text{ArcCoth}[a x]]}}\right]+$$

$$i\left(\text{PolyLog}\left[2,\frac{\left(-a^2 c+d-2 i\sqrt{a^2 c d}\right)\left(2 d-\frac{2 i\sqrt{a^2 c d}}{a x}\right)}{\left(a^2 c+d\right)\left(2 d+\frac{2 i\sqrt{a^2 c d}}{a x}\right)}\right]-\right.$$

$$\left.\left.\text{PolyLog}\left[2,\frac{\left(-a^2 c+d+2 i\sqrt{a^2 c d}\right)\left(2 d-\frac{2 i\sqrt{a^2 c d}}{a x}\right)}{\left(a^2 c+d\right)\left(2 d+\frac{2 i\sqrt{a^2 c d}}{a x}\right)}\right]\right)\right)-$$

$$\left(d\,\text{ArcCoth}[a x]\,\text{Sinh}[2\,\text{ArcCoth}[a x]]\right)\Big/\left(2 a^2 c\left(a^2 c+d\right)\right.$$
$$\left.\left(-a^2 c+d+a^2 c\,\text{Cosh}[2\,\text{ArcCoth}[a x]]+d\,\text{Cosh}[2\,\text{ArcCoth}[a x]]\right)^2\right)-$$
$$\left(2 a^2 c d-5 a^4 c^2\,\text{ArcCoth}[a x]\,\text{Sinh}[2\,\text{ArcCoth}[a x]]-\right.$$
$$\left.8 a^2 c d\,\text{ArcCoth}[a x]\,\text{Sinh}[2\,\text{ArcCoth}[a x]]-3 d^2\,\text{ArcCoth}[a x]\,\text{Sinh}[2\,\text{ArcCoth}[a x]]\right)\Big/$$

$$\left(8 a^4 c^2\left(a^2 c+d\right)^2\left(-a^2 c+d+a^2 c\,\text{Cosh}[2\,\text{ArcCoth}[a x]]+d\,\text{Cosh}[2\,\text{ArcCoth}[a x]]\right)\right)$$

Problem 66: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{ArcCoth}[a+b x]}{x}\,dx$$

Optimal (type 4, 92 leaves, 5 steps):

$$-\text{ArcCoth}[a+b x]\,\text{Log}\left[\frac{2}{1+a+b x}\right]+\text{ArcCoth}[a+b x]\,\text{Log}\left[\frac{2 b x}{(1-a)\,(1+a+b x)}\right]+$$
$$\frac{1}{2}\text{PolyLog}\left[2,1-\frac{2}{1+a+b x}\right]-\frac{1}{2}\text{PolyLog}\left[2,1-\frac{2 b x}{(1-a)\,(1+a+b x)}\right]$$

Result (type 4, 259 leaves):

$$\left(\text{ArcCoth}[a+b\,x]-\text{ArcTanh}[a+b\,x]\right)\text{Log}[x]+$$
$$\text{ArcTanh}[a+b\,x]\left(-\text{Log}\left[\frac{1}{\sqrt{1-(a+b\,x)^2}}\right]+\text{Log}\left[-i\,\text{Sinh}[\text{ArcTanh}[a]-\text{ArcTanh}[a+b\,x]]\right]\right)+$$
$$\frac{1}{8}\Bigg(4\left(\text{ArcTanh}[a]-\text{ArcTanh}[a+b\,x]\right)^2-\left(\pi-2\,i\,\text{ArcTanh}[a+b\,x]\right)^2-$$
$$8\left(\text{ArcTanh}[a]-\text{ArcTanh}[a+b\,x]\right)\text{Log}\left[1-e^{2\,\text{ArcTanh}[a]-2\,\text{ArcTanh}[a+b\,x]}\right]-$$
$$4\,i\left(\pi-2\,i\,\text{ArcTanh}[a+b\,x]\right)\text{Log}\left[1+e^{2\,\text{ArcTanh}[a+b\,x]}\right]+$$
$$4\left(i\,\pi+2\,\text{ArcTanh}[a+b\,x]\right)\text{Log}\left[\frac{2}{\sqrt{1-(a+b\,x)^2}}\right]+$$
$$8\left(\text{ArcTanh}[a]-\text{ArcTanh}[a+b\,x]\right)\text{Log}\left[-2\,i\,\text{Sinh}[\text{ArcTanh}[a]-\text{ArcTanh}[a+b\,x]]\right]-$$
$$4\,\text{PolyLog}\left[2,e^{2\,\text{ArcTanh}[a]-2\,\text{ArcTanh}[a+b\,x]}\right]-4\,\text{PolyLog}\left[2,-e^{2\,\text{ArcTanh}[a+b\,x]}\right]\Bigg)$$

Problem 70: Result more than twice size of optimal antiderivative.

$$\int x^2\,\text{ArcCoth}[a+b\,x]^2\,dx$$

Optimal (type 4, 204 leaves, 15 steps):

$$\frac{x}{3\,b^2}-\frac{2\,a\,(a+b\,x)\,\text{ArcCoth}[a+b\,x]}{b^3}+\frac{(a+b\,x)^2\,\text{ArcCoth}[a+b\,x]}{3\,b^3}+\frac{a\,(3+a^2)\,\text{ArcCoth}[a+b\,x]^2}{3\,b^3}+$$
$$\frac{(1+3\,a^2)\,\text{ArcCoth}[a+b\,x]^2}{3\,b^3}+\frac{1}{3}x^3\,\text{ArcCoth}[a+b\,x]^2-\frac{\text{ArcTanh}[a+b\,x]}{3\,b^3}-$$
$$\frac{2\,(1+3\,a^2)\,\text{ArcCoth}[a+b\,x]\,\text{Log}\left[\frac{2}{1-a-b\,x}\right]}{3\,b^3}-\frac{a\,\text{Log}\left[1-(a+b\,x)^2\right]}{b^3}-\frac{(1+3\,a^2)\,\text{PolyLog}\left[2,-\frac{1+a+b\,x}{1-a-b\,x}\right]}{3\,b^3}$$

Result (type 4, 615 leaves):

$$-\frac{1}{12\,b^3}\,(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}\,\left(1-(a+b\,x)^2\right)\left(\frac{4\,\text{ArcCoth}[a+b\,x]}{(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}}+\right.$$

$$\frac{3\,\text{ArcCoth}[a+b\,x]^2}{(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}}-\frac{12\,a\,\text{ArcCoth}[a+b\,x]^2}{(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}}+\frac{9\,a^2\,\text{ArcCoth}[a+b\,x]^2}{(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}}+$$

$$\frac{1}{\sqrt{1-\frac{1}{(a+b\,x)^2}}}\left(-1+6\,a\,\text{ArcCoth}[a+b\,x]+3\,\text{ArcCoth}[a+b\,x]^2-3\,a^2\,\text{ArcCoth}[a+b\,x]^2\right)+$$

$$\text{Cosh}[3\,\text{ArcCoth}[a+b\,x]]-6\,a\,\text{ArcCoth}[a+b\,x]\,\text{Cosh}[3\,\text{ArcCoth}[a+b\,x]]+$$

$$\text{ArcCoth}[a+b\,x]^2\,\text{Cosh}[3\,\text{ArcCoth}[a+b\,x]]+3\,a^2\,\text{ArcCoth}[a+b\,x]^2\,\text{Cosh}[3\,\text{ArcCoth}[a+b\,x]]+$$

$$\frac{6\,\text{ArcCoth}[a+b\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[a+b\,x]}\right]}{(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}}+\frac{18\,a^2\,\text{ArcCoth}[a+b\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[a+b\,x]}\right]}{(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}}-$$

$$\frac{18\,a\,\text{Log}\left[\frac{1}{(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}}\right]}{(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}}+\frac{4\,\left(1+3\,a^2\right)\,\text{PolyLog}\left[2,\,e^{-2\,\text{ArcCoth}[a+b\,x]}\right]}{(a+b\,x)^3\,\left(1-\frac{1}{(a+b\,x)^2}\right)^{3/2}}-$$

$$\text{ArcCoth}[a+b\,x]^2\,\text{Sinh}[3\,\text{ArcCoth}[a+b\,x]]-3\,a^2\,\text{ArcCoth}[a+b\,x]^2\,\text{Sinh}[3\,\text{ArcCoth}[a+b\,x]]-$$

$$2\,\text{ArcCoth}[a+b\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[a+b\,x]}\right]\,\text{Sinh}[3\,\text{ArcCoth}[a+b\,x]]-$$

$$6\,a^2\,\text{ArcCoth}[a+b\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[a+b\,x]}\right]\,\text{Sinh}[3\,\text{ArcCoth}[a+b\,x]]+$$

$$\left.6\,a\,\text{Log}\left[\frac{1}{(a+b\,x)\,\sqrt{1-\frac{1}{(a+b\,x)^2}}}\right]\,\text{Sinh}[3\,\text{ArcCoth}[a+b\,x]]\right)$$

Problem 73: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcCoth}[a+b\,x]^2}{x}\,dx$$

Optimal (type 4, 148 leaves, 2 steps):

$$-\text{ArcCoth}[a+b x]^2 \text{Log}\left[\frac{2}{1+a+b x}\right]+\text{ArcCoth}[a+b x]^2 \text{Log}\left[\frac{2 b x}{(1-a) (1+a+b x)}\right]+ \text{ArcCoth}[a+b x] \text{PolyLog}\left[2,1-\frac{2}{1+a+b x}\right]-\text{ArcCoth}[a+b x] \text{PolyLog}\left[2,1-\frac{2 b x}{(1-a) (1+a+b x)}\right]+ \frac{1}{2} \text{PolyLog}\left[3,1-\frac{2}{1+a+b x}\right]-\frac{1}{2} \text{PolyLog}\left[3,1-\frac{2 b x}{(1-a) (1+a+b x)}\right]$$

Result (type 4, 675 leaves) :

$$-\frac{i \pi^3}{24}-\frac{2}{3} \text{ArcCoth}[a+b x]^3-\frac{2}{3} a \text{ArcCoth}[a+b x]^3+\frac{2}{3} \sqrt{1-\frac{1}{a^2}}\, a\, e^{\text{ArcTanh}\left[\frac{1}{a}\right]} \text{ArcCoth}[a+b x]^3- i \pi \text{ArcCoth}[a+b x] \text{Log}\left[\frac{1}{2}\left(e^{-\text{ArcCoth}[a+b x]}+e^{\text{ArcCoth}[a+b x]}\right)\right]- \text{ArcCoth}[a+b x]^2 \text{Log}\left[1-e^{2 \text{ArcCoth}[a+b x]}\right]-\text{ArcCoth}[a+b x]^2 \text{Log}\left[1-\frac{(-1+a)\, e^{2 \text{ArcCoth}[a+b x]}}{1+a}\right]+ \text{ArcCoth}[a+b x]^2 \text{Log}\left[1-e^{2 \text{ArcCoth}[a+b x]-2 \text{ArcTanh}\left[\frac{1}{a}\right]}\right]+ \text{ArcCoth}[a+b x]^2 \text{Log}\left[1-e^{\text{ArcCoth}[a+b x]-\text{ArcTanh}\left[\frac{1}{a}\right]}\right]+ \text{ArcCoth}[a+b x]^2 \text{Log}\left[1+e^{\text{ArcCoth}[a+b x]-\text{ArcTanh}\left[\frac{1}{a}\right]}\right]- 2 \text{ArcCoth}[a+b x] \text{ArcTanh}\left[\frac{1}{a}\right] \text{Log}\left[\frac{1}{2} i \left(e^{\text{ArcCoth}[a+b x]-\text{ArcTanh}\left[\frac{1}{a}\right]}-e^{-\text{ArcCoth}[a+b x]+\text{ArcTanh}\left[\frac{1}{a}\right]}\right)\right]+ \text{ArcCoth}[a+b x]^2 \text{Log}\left[\frac{1}{2} e^{-\text{ArcCoth}[a+b x]}\left(-1-e^{2 \text{ArcCoth}[a+b x]}+a\left(-1+e^{2 \text{ArcCoth}[a+b x]}\right)\right)\right]+ i \pi \text{ArcCoth}[a+b x] \text{Log}\left[\frac{1}{\sqrt{1-\frac{1}{(a+b x)^2}}}\right]-\text{ArcCoth}[a+b x]^2 \text{Log}\left[-\frac{b x}{(a+b x) \sqrt{1-\frac{1}{(a+b x)^2}}}\right]+ 2 \text{ArcCoth}[a+b x] \text{ArcTanh}\left[\frac{1}{a}\right] \text{Log}\left[i \text{Sinh}\left[\text{ArcCoth}[a+b x]-\text{ArcTanh}\left[\frac{1}{a}\right]\right]\right]- \text{ArcCoth}[a+b x] \text{PolyLog}\left[2,e^{2 \text{ArcCoth}[a+b x]}\right]- \text{ArcCoth}[a+b x] \text{PolyLog}\left[2,\frac{(-1+a)\, e^{2 \text{ArcCoth}[a+b x]}}{1+a}\right]+ \text{ArcCoth}[a+b x] \text{PolyLog}\left[2,e^{2 \text{ArcCoth}[a+b x]-2 \text{ArcTanh}\left[\frac{1}{a}\right]}\right]+ 2 \text{ArcCoth}[a+b x] \text{PolyLog}\left[2,-e^{\text{ArcCoth}[a+b x]-\text{ArcTanh}\left[\frac{1}{a}\right]}\right]+ 2 \text{ArcCoth}[a+b x] \text{PolyLog}\left[2,e^{\text{ArcCoth}[a+b x]-\text{ArcTanh}\left[\frac{1}{a}\right]}\right]+\frac{1}{2} \text{PolyLog}\left[3,e^{2 \text{ArcCoth}[a+b x]}\right]+ \frac{1}{2} \text{PolyLog}\left[3,\frac{(-1+a)\, e^{2 \text{ArcCoth}[a+b x]}}{1+a}\right]-\frac{1}{2} \text{PolyLog}\left[3,e^{2 \text{ArcCoth}[a+b x]-2 \text{ArcTanh}\left[\frac{1}{a}\right]}\right]- 2 \text{PolyLog}\left[3,-e^{\text{ArcCoth}[a+b x]-\text{ArcTanh}\left[\frac{1}{a}\right]}\right]-2 \text{PolyLog}\left[3,e^{\text{ArcCoth}[a+b x]-\text{ArcTanh}\left[\frac{1}{a}\right]}\right]$$

Problem 74: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{ArcCoth}[a+b x]^2}{x^2}\, dx$$

Optimal (type 4, 251 leaves, 17 steps):

$$-\frac{\text{ArcCoth}[a+b x]^2}{x}+\frac{b\,\text{ArcCoth}[a+b x]\,\text{Log}\left[\frac{2}{1-a-b x}\right]}{1-a}+\frac{b\,\text{ArcCoth}[a+b x]\,\text{Log}\left[\frac{2}{1+a+b x}\right]}{1+a}-\frac{2\,b\,\text{ArcCoth}[a+b x]\,\text{Log}\left[\frac{2}{1+a+b x}\right]}{1-a^2}+\frac{2\,b\,\text{ArcCoth}[a+b x]\,\text{Log}\left[\frac{2 b x}{(1-a)\,(1+a+b x)}\right]}{1-a^2}+\frac{b\,\text{PolyLog}\left[2,-\frac{1+a+b x}{1-a-b x}\right]}{2\,(1-a)}-\frac{b\,\text{PolyLog}\left[2,1-\frac{2}{1+a+b x}\right]}{2\,(1+a)}+\frac{b\,\text{PolyLog}\left[2,1-\frac{2}{1+a+b x}\right]}{1-a^2}-\frac{b\,\text{PolyLog}\left[2,1-\frac{2 b x}{(1-a)\,(1+a+b x)}\right]}{1-a^2}$$

Result (type 4, 206 leaves):

$$\frac{1}{\left(-1+a^2\right) x}\left(-\left(-1+a^2+\sqrt{1-\frac{1}{a^2}}\;a\,b\,e^{\text{ArcTanh}\left[\frac{1}{a}\right]}\,x\right)\text{ArcCoth}[a+b x]^2+b\,x\,\text{ArcCoth}[a+b x]\left(-i\,\pi+2\,\text{ArcTanh}\left[\frac{1}{a}\right]-2\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[a+b x]+2\,\text{ArcTanh}\left[\frac{1}{a}\right]}\right]\right)+b\,x\left(i\,\pi\left(\text{Log}\left[1+e^{2\,\text{ArcCoth}[a+b x]}\right]-\text{Log}\left[\frac{1}{\sqrt{1-\frac{1}{(a+b x)^2}}}\right]\right)+2\,\text{ArcTanh}\left[\frac{1}{a}\right]\left(\text{Log}\left[1-e^{-2\,\text{ArcCoth}[a+b x]+2\,\text{ArcTanh}\left[\frac{1}{a}\right]}\right]-\text{Log}\left[i\,\text{Sinh}\left[\text{ArcCoth}[a+b x]-\text{ArcTanh}\left[\frac{1}{a}\right]\right]\right]\right)\right)+b\,x\,\text{PolyLog}\left[2,e^{-2\,\text{ArcCoth}[a+b x]+2\,\text{ArcTanh}\left[\frac{1}{a}\right]}\right]\right)$$

Problem 75: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{ArcCoth}[a+b x]^2}{x^3}\,dx$$

Optimal (type 4, 370 leaves, 21 steps):

$$-\frac{b\,\text{ArcCoth}[a+b\,x]}{(1-a^2)\,x}-\frac{\text{ArcCoth}[a+b\,x]^2}{2\,x^2}+\frac{b^2\,\text{Log}[x]}{(1-a^2)^2}+\frac{b^2\,\text{ArcCoth}[a+b\,x]\,\text{Log}\left[\frac{2}{1-a-b\,x}\right]}{2\,(1-a)^2}-$$
$$\frac{b^2\,\text{Log}[1-a-b\,x]}{2\,(1-a)^2\,(1+a)}-\frac{b^2\,\text{ArcCoth}[a+b\,x]\,\text{Log}\left[\frac{2}{1+a+b\,x}\right]}{2\,(1+a)^2}-\frac{2\,a\,b^2\,\text{ArcCoth}[a+b\,x]\,\text{Log}\left[\frac{2}{1+a+b\,x}\right]}{(1-a^2)^2}+$$
$$\frac{2\,a\,b^2\,\text{ArcCoth}[a+b\,x]\,\text{Log}\left[\frac{2\,b\,x}{(1-a)\,(1+a+b\,x)}\right]}{(1-a^2)^2}-\frac{b^2\,\text{Log}[1+a+b\,x]}{2\,(1-a)\,(1+a)^2}+\frac{b^2\,\text{PolyLog}\left[2,-\frac{1+a+b\,x}{1-a-b\,x}\right]}{4\,(1-a)^2}+$$
$$\frac{b^2\,\text{PolyLog}\left[2,1-\frac{2}{1+a+b\,x}\right]}{4\,(1+a)^2}+\frac{a\,b^2\,\text{PolyLog}\left[2,1-\frac{2}{1+a+b\,x}\right]}{(1-a^2)^2}-\frac{a\,b^2\,\text{PolyLog}\left[2,1-\frac{2\,b\,x}{(1-a)\,(1+a+b\,x)}\right]}{(1-a^2)^2}$$

Result (type 4, 291 leaves):

$$\frac{1}{2\,(-1+a^2)^2\,x^2}\Bigg(\left(-1-a^4+b^2\,x^2+a^2\left(2+b^2\left(-1+2\sqrt{1-\frac{1}{a^2}}\;e^{\text{ArcTanh}\left[\frac{1}{a}\right]}\right)x^2\right)\right)\text{ArcCoth}[a+b\,x]^2+$$
$$2\,b\,x\,\text{ArcCoth}[a+b\,x]\left(-1+a^2+a\,b\,x+i\,a\,b\,\pi\,x-2\,a\,b\,x\,\text{ArcTanh}\left[\frac{1}{a}\right]+2\,a\,b\,x\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[a+b\,x]+2\,\text{ArcTanh}\left[\frac{1}{a}\right]}\right]\right)+$$
$$2\,b^2\,x^2\left(-i\,a\,\pi\,\text{Log}\left[1+e^{2\,\text{ArcCoth}[a+b\,x]}\right]+i\,a\,\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\frac{1}{(a+b\,x)^2}}}\right]+\right.$$
$$\text{Log}\left[-\frac{b\,x}{(a+b\,x)\sqrt{1-\frac{1}{(a+b\,x)^2}}}\right]-2\,a\,\text{ArcTanh}\left[\frac{1}{a}\right]$$
$$\left.\left(\text{Log}\left[1-e^{-2\,\text{ArcCoth}[a+b\,x]+2\,\text{ArcTanh}\left[\frac{1}{a}\right]}\right]-\text{Log}\left[i\,\text{Sinh}\left[\text{ArcCoth}[a+b\,x]-\text{ArcTanh}\left[\frac{1}{a}\right]\right]\right]\right)\right)-$$
$$2\,a\,b^2\,x^2\,\text{PolyLog}\left[2,e^{-2\,\text{ArcCoth}[a+b\,x]+2\,\text{ArcTanh}\left[\frac{1}{a}\right]}\right]\Bigg)$$

Problem 76: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcCoth}[a+b\,x]}{c+d\,x^2}\,dx$$

Optimal (type 4, 673 leaves, 15 steps):

$$\frac{\text{Log}\left[-\frac{1-a-b\,x}{a+b\,x}\right]\,\text{Log}\left[1+\frac{\left(b^2\,c+a^2\,d\right)\,(1-a-b\,x)}{\left(b^2\,c-b\,\sqrt{-c}\,\sqrt{d}-(1-a)\,a\,d\right)\,(a+b\,x)}\right]}{4\,\sqrt{-c}\,\sqrt{d}}-\frac{\text{Log}\left[-\frac{1-a-b\,x}{a+b\,x}\right]\,\text{Log}\left[1+\frac{\left(b^2\,c+a^2\,d\right)\,(1-a-b\,x)}{\left(b^2\,c+b\,\sqrt{-c}\,\sqrt{d}-(1-a)\,a\,d\right)\,(a+b\,x)}\right]}{4\,\sqrt{-c}\,\sqrt{d}}+\frac{\text{Log}\left[\frac{1+a+b\,x}{a+b\,x}\right]\,\text{Log}\left[1-\frac{\left(b^2\,c+a^2\,d\right)\,(1+a+b\,x)}{\left(b^2\,c-b\,\sqrt{-c}\,\sqrt{d}+a\,(1+a)\,d\right)\,(a+b\,x)}\right]}{4\,\sqrt{-c}\,\sqrt{d}}-\frac{\text{Log}\left[\frac{1+a+b\,x}{a+b\,x}\right]\,\text{Log}\left[1-\frac{\left(b^2\,c+a^2\,d\right)\,(1+a+b\,x)}{\left(b^2\,c+b\,\sqrt{-c}\,\sqrt{d}+a\,(1+a)\,d\right)\,(a+b\,x)}\right]}{4\,\sqrt{-c}\,\sqrt{d}}+\frac{\text{PolyLog}\left[2,-\frac{\left(b^2\,c+a^2\,d\right)\,(1-a-b\,x)}{\left(b^2\,c-b\,\sqrt{-c}\,\sqrt{d}-(1-a)\,a\,d\right)\,(a+b\,x)}\right]}{4\,\sqrt{-c}\,\sqrt{d}}-\frac{\text{PolyLog}\left[2,-\frac{\left(b^2\,c+a^2\,d\right)\,(1-a-b\,x)}{\left(b^2\,c+b\,\sqrt{-c}\,\sqrt{d}-(1-a)\,a\,d\right)\,(a+b\,x)}\right]}{4\,\sqrt{-c}\,\sqrt{d}}+\frac{\text{PolyLog}\left[2,\frac{\left(b^2\,c+a^2\,d\right)\,(1+a+b\,x)}{\left(b^2\,c-b\,\sqrt{-c}\,\sqrt{d}+a\,(1+a)\,d\right)\,(a+b\,x)}\right]}{4\,\sqrt{-c}\,\sqrt{d}}-\frac{\text{PolyLog}\left[2,\frac{\left(b^2\,c+a^2\,d\right)\,(1+a+b\,x)}{\left(b^2\,c+b\,\sqrt{-c}\,\sqrt{d}+a\,(1+a)\,d\right)\,(a+b\,x)}\right]}{4\,\sqrt{-c}\,\sqrt{d}}$$

Result (type 4, 1450 leaves):

$$-\frac{1}{4\left(1-a^2\right)\sqrt{c}\,d\,(a+b\,x)^2\left(1-\frac{1}{(a+b\,x)^2}\right)}\left(1-(a+b\,x)^2\right)\Bigg(-4\left(-1+a^2\right)\sqrt{d}\,\text{ArcCoth}[a+b\,x]\,\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]+2\,i\,\sqrt{d}\,\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]-2\,i\,a^2\sqrt{d}\,\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]-2\,i\,\sqrt{d}\,\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]+2\,i\,a^2\sqrt{d}\,\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]-2\,b\sqrt{c}\,\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]^2+b\sqrt{c}\sqrt{\frac{b^2\,c+(-1+a)^2\,d}{b^2\,c}}\,e^{-i\,\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]}\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]^2+$$

$$a\,b\,\sqrt{c}\,\sqrt{\frac{b^2 c+(-1+a)^2 d}{b^2 c}}\;e^{-i\,\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]}\,\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]^2+$$

$$b\,\sqrt{c}\,\sqrt{\frac{b^2 c+(1+a)^2 d}{b^2 c}}\;e^{-i\,\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]}\,\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]^2-$$

$$a\,b\,\sqrt{c}\,\sqrt{\frac{b^2 c+(1+a)^2 d}{b^2 c}}\;e^{-i\,\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]}\,\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]^2+$$

$$2\sqrt{d}\,\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{Log}\left[1-e^{-2i\left(\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right)}\right]-$$

$$2a^2\sqrt{d}\,\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{Log}\left[1-e^{-2i\left(\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right)}\right]+$$

$$2\sqrt{d}\,\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\text{Log}\left[1-e^{-2i\left(\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right)}\right]-$$

$$2a^2\sqrt{d}\,\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\text{Log}\left[1-e^{-2i\left(\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right)}\right]-$$

$$2\sqrt{d}\,\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{Log}\left[1-e^{-2i\left(\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right)}\right]+$$

$$2a^2\sqrt{d}\,\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{Log}\left[1-e^{-2i\left(\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right)}\right]-$$

$$2\sqrt{d}\,\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\text{Log}\left[1-e^{-2i\left(\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right)}\right]+$$

$$2a^2\sqrt{d}\,\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\text{Log}\left[1-e^{-2i\left(\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right)}\right]-$$

$$2\sqrt{d}\,\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right]\right]+$$

$$2a^2\sqrt{d}\,\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right]\right]+$$

$$2\sqrt{d}\,\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right]\right]-$$

$$2a^2\sqrt{d}\,\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right]\right]-$$

$$i\,(-1+a^2)\sqrt{d}\,\text{PolyLog}\left[2,\,e^{-2i\left(\text{ArcTan}\left[\frac{(-1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right]\right)}\right]+$$

$$i\left(-1+a^2\right)\sqrt{d}\ \text{PolyLog}\left[2,\ e^{-2 i\left(\text{ArcTan}\left[\frac{(1+a)\sqrt{d}}{b\sqrt{c}}\right]+\text{ArcTan}\left[\frac{\sqrt{d}\ x}{\sqrt{c}}\right]\right)}\right]\Bigg)$$

Problem 77: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcCoth}[a+b x]}{c+d x}\,dx$$

Optimal (type 4, 120 leaves, 5 steps):

$$-\frac{\text{ArcCoth}[a+b x]\ \text{Log}\left[\frac{2}{1+a+b x}\right]}{d}+\frac{\text{ArcCoth}[a+b x]\ \text{Log}\left[\frac{2 b (c+d x)}{(b c+d-a d)(1+a+b x)}\right]}{d}+\frac{\text{PolyLog}\left[2,1-\frac{2}{1+a+b x}\right]}{2 d}-\frac{\text{PolyLog}\left[2,1-\frac{2 b (c+d x)}{(b c+d-a d)(1+a+b x)}\right]}{2 d}$$

Result (type 4, 330 leaves):

$$\frac{1}{d}\Bigg((\text{ArcCoth}[a+b x]-\text{ArcTanh}[a+b x])\ \text{Log}[c+d x]+\text{ArcTanh}[a+b x]\left(-\text{Log}\left[\frac{1}{\sqrt{1-(a+b x)^2}}\right]+\text{Log}\left[i\ \text{Sinh}\left[\text{ArcTanh}\left[\frac{b c-a d}{d}\right]+\text{ArcTanh}[a+b x]\right]\right]\right)+$$
$$\frac{1}{8}\Bigg(-(\pi-2 i\ \text{ArcTanh}[a+b x])^2+4\left(\text{ArcTanh}\left[\frac{b c-a d}{d}\right]+\text{ArcTanh}[a+b x]\right)^2-$$
$$4 i(\pi-2 i\ \text{ArcTanh}[a+b x])\ \text{Log}\left[1+e^{2 \text{ArcTanh}[a+b x]}\right]+$$
$$8\left(\text{ArcTanh}\left[\frac{b c-a d}{d}\right]+\text{ArcTanh}[a+b x]\right)\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{b c-a d}{d}\right]+\text{ArcTanh}[a+b x]\right)}\right]+$$
$$4(i\pi+2\ \text{ArcTanh}[a+b x])\ \text{Log}\left[\frac{2}{\sqrt{1-(a+b x)^2}}\right]-8\left(\text{ArcTanh}\left[\frac{b c-a d}{d}\right]+\text{ArcTanh}[a+b x]\right)$$
$$\text{Log}\left[2 i\ \text{Sinh}\left[\text{ArcTanh}\left[\frac{b c-a d}{d}\right]+\text{ArcTanh}[a+b x]\right]\right]-$$
$$4\ \text{PolyLog}\left[2,-e^{2 \text{ArcTanh}[a+b x]}\right]-4\ \text{PolyLog}\left[2,e^{-2\left(\text{ArcTanh}\left[\frac{b c-a d}{d}\right]+\text{ArcTanh}[a+b x]\right)}\right]\Bigg)\Bigg)$$

Problem 78: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{ArcCoth}[a+b x]}{c+\frac{d}{x}}\,dx$$

Optimal (type 4, 292 leaves, 37 steps):

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

Result (type 4, 502 leaves):

$$\frac{1}{2 b c^3}\left(2 a c^2 \operatorname{ArcCoth}[a+b x]-i b c d \pi \operatorname{ArcCoth}[a+b x]+2 b c^2 x \operatorname{ArcCoth}[a+b x]+b c d \operatorname{ArcCoth}[a+b x]^2+a b c d \operatorname{ArcCoth}[a+b x]^2-b^2 d^2 \operatorname{ArcCoth}[a+b x]^2-a b c d \sqrt{1-\frac{c^2}{(a c-b d)^2}}\, e^{\operatorname{ArcTanh}\left[\frac{c}{a c-b d}\right]} \operatorname{ArcCoth}[a+b x]^2+b^2 d^2 \sqrt{1-\frac{c^2}{(a c-b d)^2}}\, e^{\operatorname{ArcTanh}\left[\frac{c}{a c-b d}\right]} \operatorname{ArcCoth}[a+b x]^2+2 b c d \operatorname{ArcCoth}[a+b x] \operatorname{ArcTanh}\left[\frac{c}{a c-b d}\right]+2 b c d \operatorname{ArcCoth}[a+b x] \operatorname{Log}\left[1-e^{-2 \operatorname{ArcCoth}[a+b x]}\right]+i b c d \pi \operatorname{Log}\left[1+e^{2 \operatorname{ArcCoth}[a+b x]}\right]-2 b c d \operatorname{ArcCoth}[a+b x] \operatorname{Log}\left[1-e^{-2 \operatorname{ArcCoth}[a+b x]+2 \operatorname{ArcTanh}\left[\frac{c}{a c-b d}\right]}\right]+2 b c d \operatorname{ArcTanh}\left[\frac{c}{a c-b d}\right] \operatorname{Log}\left[1-e^{-2 \operatorname{ArcCoth}[a+b x]+2 \operatorname{ArcTanh}\left[\frac{c}{a c-b d}\right]}\right]-i b c d \pi \operatorname{Log}\left[\frac{1}{\sqrt{1-\frac{1}{(a+b x)^2}}}\right]-2 c^2 \operatorname{Log}\left[\frac{1}{(a+b x) \sqrt{1-\frac{1}{(a+b x)^2}}}\right]-2 b c d \operatorname{ArcTanh}\left[\frac{c}{a c-b d}\right] \operatorname{Log}\left[i \operatorname{Sinh}\left[\operatorname{ArcCoth}[a+b x]-\operatorname{ArcTanh}\left[\frac{c}{a c-b d}\right]\right]\right]-b c d \operatorname{PolyLog}\left[2, e^{-2 \operatorname{ArcCoth}[a+b x]}\right]+b c d \operatorname{PolyLog}\left[2, e^{-2 \operatorname{ArcCoth}[a+b x]+2 \operatorname{ArcTanh}\left[\frac{c}{a c-b d}\right]}\right]\right)$$

Problem 79: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{ArcCoth}[a+b x]}{c+\frac{d}{x^2}} \, dx$$

Optimal (type 4, 738 leaves, 57 steps):

$$\frac{(1-a-b x)\,\text{Log}[-1+a+b x]}{2 b c}+\frac{x\left(\text{Log}[-1+a+b x]-\text{Log}\left[-\frac{1-a-b x}{a+b x}\right]-\text{Log}[a+b x]\right)}{2 c}-$$

$$\frac{\sqrt{d}\,\text{ArcTan}\left[\frac{\sqrt{c}\,x}{\sqrt{d}}\right]\left(\text{Log}[-1+a+b x]-\text{Log}\left[-\frac{1-a-b x}{a+b x}\right]-\text{Log}[a+b x]\right)}{2 c^{3/2}}+$$

$$\frac{(1+a+b x)\,\text{Log}[1+a+b x]}{2 b c}+\frac{x\left(\text{Log}[a+b x]-\text{Log}[1+a+b x]+\text{Log}\left[\frac{1+a+b x}{a+b x}\right]\right)}{2 c}-$$

$$\frac{\sqrt{d}\,\text{ArcTan}\left[\frac{\sqrt{c}\,x}{\sqrt{d}}\right]\left(\text{Log}[a+b x]-\text{Log}[1+a+b x]+\text{Log}\left[\frac{1+a+b x}{a+b x}\right]\right)}{2 c^{3/2}}+$$

$$\frac{\sqrt{d}\,\text{Log}[-1+a+b x]\,\text{Log}\left[-\frac{b\left(\sqrt{d}-\sqrt{-c}\,x\right)}{(1-a)\sqrt{-c}-b\sqrt{d}}\right]}{4(-c)^{3/2}}-\frac{\sqrt{d}\,\text{Log}[1+a+b x]\,\text{Log}\left[\frac{b\left(\sqrt{d}-\sqrt{-c}\,x\right)}{(1+a)\sqrt{-c}+b\sqrt{d}}\right]}{4(-c)^{3/2}}+$$

$$\frac{\sqrt{d}\,\text{Log}[1+a+b x]\,\text{Log}\left[-\frac{b\left(\sqrt{d}+\sqrt{-c}\,x\right)}{(1+a)\sqrt{-c}-b\sqrt{d}}\right]}{4(-c)^{3/2}}-\frac{\sqrt{d}\,\text{Log}[-1+a+b x]\,\text{Log}\left[\frac{b\left(\sqrt{d}+\sqrt{-c}\,x\right)}{(1-a)\sqrt{-c}+b\sqrt{d}}\right]}{4(-c)^{3/2}}+$$

$$\frac{\sqrt{d}\,\text{PolyLog}\left[2,\frac{\sqrt{-c}\,(1-a-b x)}{(1-a)\sqrt{-c}-b\sqrt{d}}\right]}{4(-c)^{3/2}}-\frac{\sqrt{d}\,\text{PolyLog}\left[2,\frac{\sqrt{-c}\,(1-a-b x)}{(1-a)\sqrt{-c}+b\sqrt{d}}\right]}{4(-c)^{3/2}}+$$

$$\frac{\sqrt{d}\,\text{PolyLog}\left[2,\frac{\sqrt{-c}\,(1+a+b x)}{(1+a)\sqrt{-c}-b\sqrt{d}}\right]}{4(-c)^{3/2}}-\frac{\sqrt{d}\,\text{PolyLog}\left[2,\frac{\sqrt{-c}\,(1+a+b x)}{(1+a)\sqrt{-c}+b\sqrt{d}}\right]}{4(-c)^{3/2}}$$

Result (type 4, 15460 leaves):

$$-\frac{1}{(a+b x)^2\left(1-\frac{1}{(a+b x)^2}\right)}\left(1-(a+b x)^2\right)\left(\frac{(a+b x)\,\text{ArcCoth}[a+b x]-\text{Log}\left[\frac{1}{(a+b x)\sqrt{1-\frac{1}{(a+b x)^2}}}\right]}{b c}+\right.$$

$$\frac{1}{c}\,2 b d\left(\frac{\text{ArcCoth}[a+b x]\,\text{ArcTan}\left[\frac{-a c+\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\right]}{2 b\sqrt{c}\,\sqrt{d}}+\frac{1}{2\left(a^2 c+b^2 d\right)\left(-1+\frac{1}{(a+b x)^2}\right)}\right.$$

$$\left(-1+\frac{c\left(a\sqrt{c}-b\sqrt{d}\left(\frac{a\sqrt{c}}{b\sqrt{d}}-\frac{a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}\,(a+b x)}\right)\right)^2}{\left(a^2 c+b^2 d\right)^2}\right)\left(-\frac{\left(a^2 c+b^2 d\right)^2\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\right]^2}{2\left(a^4 c^2+b^4 d^2-a^2 c\left(c-2 b^2 d\right)\right)}+\right.$$

$$\frac{1}{2} a^2 \sqrt{c} \left(\frac{\sqrt{c}\, e^{i \,\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]} \,\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]^2}{\left(-a c+a^2 c+b^2 d\right) \sqrt{1+\frac{\left(-a c+a^2 c+b^2 d\right)^2}{b^2 c d}}}+\frac{1}{b \sqrt{d} \left(1+\frac{\left(-a c+a^2 c+b^2 d\right)^2}{b^2 c d}\right)}\right.$$

$$\left(-\pi \,\text{Log}\left[1+e^{-2 i \,\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]}\right]-i \,\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right] \left(\pi-2 \,\text{ArcTan}\left[\right.\right.\right.$$

$$\left.\left.\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]-2 i \,\text{Log}\left[1-e^{2 i \left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]\right)}\right]\right)-$$

$$2 \,\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right] \text{Log}\left[1-e^{2 i \left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]\right)}\right]+$$

$$\pi \,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2 c+b^2 d\right) \left(c+\frac{a^2 c+b^2 d}{(a+b x)^2}-\frac{2 a c}{a+b x}\right)}{b^2 c d}}}\right]+2 \,\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]$$

$$\text{Log}\left[\text{Sin}\left[\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]\right]\right]+$$

$$\left.\left.i \,\text{PolyLog}\left[2, e^{2 i \left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]\right)}\right]\right)\right)-$$

$$\frac{1}{\left(-a c+a^2 c+b^2 d\right) \sqrt{1+\frac{\left(-a c+a^2 c+b^2 d\right)^2}{b^2 c d}}} a^3 c \left(e^{i \,\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]^2+\frac{1}{b \sqrt{c} \sqrt{d} \sqrt{1+\frac{\left(-a c+a^2 c+b^2 d\right)^2}{b^2 c d}}} \left(-a c+a^2 c+b^2 d\right)$$

$$\left(-\pi \,\text{Log}\left[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]}\right]-i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\left(\pi-2\,\text{ArcTan}\left[\frac{-a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]-2\,i\,\text{Log}\left[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)-\right.$$

$$2\,\text{ArcTan}\left[\frac{-a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]\text{Log}\left[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2 c+b^2 d\right)\left(c+\frac{a^2 c+b^2 d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2 c\,d}}}\right]+2\,\text{ArcTan}\left[\frac{-a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[\text{Sin}\left[\text{ArcTan}\left[\frac{-a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.i\,\text{PolyLog}\left[2,e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\left(-a\,c+a^2 c+b^2 d\right)\sqrt{1+\frac{\left(-a\,c+a^2 c+b^2 d\right)^2}{b^2 c\,d}}}\,3\,a^4 c\left(e^{i\,\text{ArcTan}\left[\frac{-a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]^2+\frac{1}{b\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(-a\,c+a^2 c+b^2 d\right)^2}{b^2 c\,d}}}\left(-a\,c+a^2 c+b^2 d\right)$$

$$\left(-\pi\,\text{Log}\left[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]}\right]-i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\left(\pi-2\,\text{ArcTan}\left[\right.\right.\right.$$

$$\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\Big] - 2\,i\,\text{Log}\Big[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\Big]\Bigg) -$$

$$2\,\text{ArcTan}\Big[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\Big]\,\text{Log}\Big[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\Big] +$$

$$\pi\,\text{Log}\Big[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\Big] + 2\,\text{ArcTan}\Big[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\Big]$$

$$\text{Log}\Big[\text{Sin}\Big[\text{ArcTan}\Big[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\Big]+\text{ArcTan}\Big[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\Big]\Big]\Big] +$$

$$i\,\text{PolyLog}\Big[2,\,e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\Big]\Bigg)\Bigg) +$$

$$\frac{1}{4\,b^2\,d\,\left(-a\,c+a^2\,c+b^2\,d\right)\sqrt{1+\frac{\left(-a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,a^4\,c^2\,\Bigg(e^{i\,\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}$$

$$\text{ArcTan}\Big[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\Big]^2 + \frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(-a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\left(-a\,c+a^2\,c+b^2\,d\right)$$

$$\Bigg(-\pi\,\text{Log}\Big[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\Big] - i\,\text{ArcTan}\Big[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\Big]\Big(\pi - 2\,\text{ArcTan}\Big[$$

$$\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\Big] - 2\,i\,\text{Log}\Big[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\Big]\Bigg) -$$

$$2\,\text{ArcTan}\Big[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\Big]\,\text{Log}\Big[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\Big] +$$

$$\pi \,\text{Log}\Big[\frac{1}{\sqrt{\frac{(a^2 c+b^2 d)\left(c+\frac{a^2 c+b^2 d}{(a+b x)^2}-\frac{2 a c}{a+b x}\right)}{b^2 c d}}}\Big] + 2\,\text{ArcTan}\Big[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big]$$

$$\text{Log}\Big[\text{Sin}\Big[\text{ArcTan}\Big[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big]+\text{ArcTan}\Big[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\Big]\Big]\Big] +$$

$$\mathrm{i}\,\text{PolyLog}\Big[2,\, e^{2\mathrm{i}\left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]\right)}\Big]\Bigg)\Bigg) -$$

$$\frac{1}{2 b^2 d\left(-a c+a^2 c+b^2 d\right)\sqrt{1+\frac{(-a c+a^2 c+b^2 d)^2}{b^2 c d}}}\, a^5 c^2 \left(e^{\mathrm{i}\,\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\Big[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\Big]^2 + \frac{1}{b\sqrt{c}\,\sqrt{d}\sqrt{1+\frac{(-a c+a^2 c+b^2 d)^2}{b^2 c d}}}\left(-a c+a^2 c+b^2 d\right)$$

$$\left(-\pi\,\text{Log}\Big[1+e^{-2\mathrm{i}\,\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]}\Big] - \mathrm{i}\,\text{ArcTan}\Big[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\Big]\left(\pi - 2\,\text{ArcTan}\Big[\right.\right.$$

$$\left.\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big] - 2\,\mathrm{i}\,\text{Log}\Big[1-e^{2\mathrm{i}\left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]\right)}\Big]\right) -$$

$$2\,\text{ArcTan}\Big[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big]\,\text{Log}\Big[1-e^{2\mathrm{i}\left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]\right)}\Big] +$$

$$\pi \,\text{Log}\Big[\frac{1}{\sqrt{\frac{(a^2 c+b^2 d)\left(c+\frac{a^2 c+b^2 d}{(a+b x)^2}-\frac{2 a c}{a+b x}\right)}{b^2 c d}}}\Big] + 2\,\text{ArcTan}\Big[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big]$$

$$\text{Log}\left[\text{Sin}\left[\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$i\,\text{PolyLog}\left[2,\,e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\Bigg)\Bigg)+$$

$$\frac{1}{4\,b^2\,d\left(-a\,c+a^2\,c+b^2\,d\right)\sqrt{1+\frac{\left(-a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,a^6\,c^2\left(e^{i\,\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]^2+\frac{1}{b\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(-a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\left(-a\,c+a^2\,c+b^2\,d\right)$$

$$\left(-\pi\,\text{Log}\left[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]}\right]-i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\left(\pi-2\,\text{ArcTan}\left[\right.\right.\right.$$

$$\left.\frac{-a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]-2\,i\,\text{Log}\left[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\Bigg)-$$

$$2\,\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]\text{Log}\left[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]+2\,\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[\text{Sin}\left[\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.\mathrm{i}\,\mathrm{PolyLog}\left[2,\,e^{2\,\mathrm{i}\left(\mathrm{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\left(-a\,c+a^2\,c+b^2\,d\right)\sqrt{1+\frac{\left(-a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,b^2\,d\left(e^{\mathrm{i}\,\mathrm{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2+\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(-a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\left(-a\,c+a^2\,c+b^2\,d\right)$$

$$\left(-\pi\,\mathrm{Log}\left[1+e^{-2\,\mathrm{i}\,\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-\mathrm{i}\,\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\left(\pi-2\,\mathrm{ArcTan}\left[\right.\right.\right.$$

$$\left.\left.\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]-2\,\mathrm{i}\,\mathrm{Log}\left[1-e^{2\,\mathrm{i}\left(\mathrm{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)-$$

$$2\,\mathrm{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\mathrm{Log}\left[1-e^{2\,\mathrm{i}\left(\mathrm{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\mathrm{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]+2\,\mathrm{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]$$

$$\mathrm{Log}\left[\mathrm{Sin}\left[\mathrm{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.\mathrm{i}\,\mathrm{PolyLog}\left[2,\,e^{2\,\mathrm{i}\left(\mathrm{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)-$$

$$\frac{1}{2\left(-a c+a^2 c+b^2 d\right)\sqrt{1+\frac{\left(-a c+a^2 c+b^2 d\right)^2}{b^2 c d}}}\, a b^2 d \left(e^{i\,\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]^2+\frac{1}{b\sqrt{c}\sqrt{d}\sqrt{1+\frac{\left(-a c+a^2 c+b^2 d\right)^2}{b^2 c d}}}\left(-a c+a^2 c+b^2 d\right)$$

$$\left(-\pi\,\text{Log}\left[1+e^{-2 i\,\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]}\right]-i\,\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]\left(\pi-2\,\text{ArcTan}\left[\right.\right.\right.$$

$$\left.\left.\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]-2 i\,\text{Log}\left[1-e^{2 i\left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]\right)}\right]\right)-$$

$$2\,\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]\text{Log}\left[1-e^{2 i\left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2 c+b^2 d\right)\left(c+\frac{a^2 c+b^2 d}{(a+b x)^2}-\frac{2 a c}{a+b x}\right)}{b^2 c d}}}\right]+2\,\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]$$

$$\text{Log}\left[\text{Sin}\left[\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.i\,\text{PolyLog}\left[2, e^{2 i\left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\left(-a c+a^2 c+b^2 d\right)\sqrt{1+\frac{\left(-a c+a^2 c+b^2 d\right)^2}{b^2 c d}}}\, 3 a^2 b^2 d \left(e^{i\,\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b\sqrt{c}\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2+\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(-a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\left(-a\,c+a^2\,c+b^2\,d\right)$$

$$\left(-\pi\,\text{Log}\left[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\left(\pi-2\,\text{ArcTan}\left[\right.\right.\right.$$

$$\left.\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]-2\,i\,\text{Log}\left[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\Bigg)-$$

$$2\,\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\text{Log}\left[1-e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]+2\,\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[\text{Sin}\left[\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.i\,\text{PolyLog}\left[2,\,e^{2\,i\left(\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\,c\left(-a\,c+a^2\,c+b^2\,d\right)\sqrt{1+\frac{\left(-a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,b^4\,d^2\left(e^{i\,\text{ArcTan}\left[\frac{-a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2+\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(-a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\left(-a\,c+a^2\,c+b^2\,d\right)$$

$$\left(-\pi \text{Log}\left[1+e^{-2 i \text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]}\right]-i \text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right] \left(\pi-2 \text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]-2 i \text{Log}\left[1-e^{2 i \left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]\right)}\right]\right)-\right.$$

$$2 \text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right] \text{Log}\left[1-e^{2 i \left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]\right)}\right]+$$

$$\pi \text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2 c+b^2 d\right) \left(c+\frac{a^2 c+b^2 d}{(a+b x)^2}-\frac{2 a c}{a+b x}\right)}{b^2 c d}}}\right]+2 \text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]$$

$$\text{Log}\left[\text{Sin}\left[\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]\right]\right]+$$

$$\left.\left.i \text{PolyLog}\left[2, e^{2 i \left(\text{ArcTan}\left[\frac{-a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{2 \left(a c+a^2 c+b^2 d\right) \sqrt{\frac{b^2 c d+\left(a c+a^2 c+b^2 d\right)^2}{b^2 c d}}} a^2 c \left(e^{-i \text{ArcTan}\left[\frac{a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]^2-\frac{1}{b \sqrt{c} \sqrt{d} \sqrt{1+\frac{\left(a c+a^2 c+b^2 d\right)^2}{b^2 c d}}}$$

$$\left(a c+a^2 c+b^2 d\right) \left(i \left(-\pi-2 \text{ArcTan}\left[\frac{a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]\right) \text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]-\right.$$

$$\pi\,\text{Log}\left[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-2\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\right.$$

$$\left.\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{Log}\left[1-e^{2\,i\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]-\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.i\,\text{PolyLog}\left[2,\,e^{2\,i\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{\left(a\,c+a^2\,c+b^2\,d\right)\sqrt{\frac{b^2\,c\,d+\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,a^3\,c\left(e^{-i\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2-\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}$$

$$\left(a\,c+a^2\,c+b^2\,d\right)\left(i\left(-\pi-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]-\right.$$

$$\pi\,\text{Log}\left[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-2\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\right.$$

$$\left.\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{Log}\left[1-e^{2\,i\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\Big[\frac{1}{\sqrt{\frac{\left(a^2 c+b^2 d\right)\left(c+\frac{a^2 c+b^2 d}{(a+b x)^2}-\frac{2 a c}{a+b x}\right)}{b^2 c d}}}\Big]-2\,\text{ArcTan}\Big[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big]$$

$$\text{Log}\Big[-\text{Sin}\Big[\text{ArcTan}\Big[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big]-\text{ArcTan}\Big[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\Big]\Big]\Big]+$$

$$\mathrm{i}\,\text{PolyLog}\Big[2,\,e^{2\,\mathrm{i}\left(-\text{ArcTan}\left[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\Big]\Bigg)\Bigg)+$$

$$\frac{1}{4\left(a c+a^2 c+b^2 d\right)\sqrt{\frac{b^2 c d+\left(a c+a^2 c+b^2 d\right)^2}{b^2 c d}}}\,3\,a^4\,c\,\Bigg(e^{-\mathrm{i}\,\text{ArcTan}\left[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]}$$

$$\text{ArcTan}\Big[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\Big]^2-\frac{1}{b\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(a c+a^2 c+b^2 d\right)^2}{b^2 c d}}}$$

$$\left(a c+a^2 c+b^2 d\right)\Bigg(\mathrm{i}\left(-\pi-2\,\text{ArcTan}\Big[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big]\right)\text{ArcTan}\Big[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\Big]-$$

$$\pi\,\text{Log}\Big[1+e^{-2\,\mathrm{i}\,\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\right]}\Big]-2\left(-\text{ArcTan}\Big[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big]+\right.$$

$$\left.\text{ArcTan}\Big[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\Big]\right)\text{Log}\Big[1-e^{2\,\mathrm{i}\left(-\text{ArcTan}\left[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\Big]+$$

$$\pi\,\text{Log}\Big[\frac{1}{\sqrt{\frac{\left(a^2 c+b^2 d\right)\left(c+\frac{a^2 c+b^2 d}{(a+b x)^2}-\frac{2 a c}{a+b x}\right)}{b^2 c d}}}\Big]-2\,\text{ArcTan}\Big[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\Big]$$

$$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]-\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.\text{i}\,\text{PolyLog}\left[2,\,e^{2\,\text{i}\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\,b^2\,d\,\left(a\,c+a^2\,c+b^2\,d\right)\,\sqrt{\frac{b^2\,c\,d+\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,a^4\,c^2\,\left(e^{-\text{i}\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2-\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}$$

$$\left(a\,c+a^2\,c+b^2\,d\right)\left(\text{i}\,\left(-\pi-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]-\right.$$

$$\pi\,\text{Log}\left[1+e^{-2\,\text{i}\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-2\,\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\right.$$

$$\left.\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\,\text{Log}\left[1-e^{2\,\text{i}\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\,\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]-\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.\mathbb{i}\,\text{PolyLog}\left[2,\,e^{2\,\mathbb{i}\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{2\,b^2\,d\,\left(a\,c+a^2\,c+b^2\,d\right)\sqrt{\frac{b^2\,c\,d+\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,a^5\,c^2\left(e^{-\mathbb{i}\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]^2-\frac{1}{b\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}$$

$$\left(a\,c+a^2\,c+b^2\,d\right)\left(\mathbb{i}\left(-\pi-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]\right)\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]-\right.$$

$$\pi\,\text{Log}\left[1+e^{-2\,\mathbb{i}\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]}\right]-2\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]+\right.$$

$$\left.\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)\text{Log}\left[1-e^{2\,\mathbb{i}\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]-\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.\mathbb{i}\,\text{PolyLog}\left[2,\,e^{2\,\mathbb{i}\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\,b^2\,d\,\left(a\,c+a^2\,c+b^2\,d\right)\,\sqrt{\frac{b^2\,c\,d+\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,a^6\,c^2\,\left(e^{-i\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2-\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}$$

$$\left(a\,c+a^2\,c+b^2\,d\right)\,\left(i\,\left(-\pi-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]-\right.$$

$$\pi\,\text{Log}\left[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-2\,\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\right.$$

$$\left.\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\,\text{Log}\left[1-e^{2\,i\,\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\,\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]-\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.i\,\text{PolyLog}\left[2,\,e^{2\,i\,\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\,\left(a\,c+a^2\,c+b^2\,d\right)\,\sqrt{\frac{b^2\,c\,d+\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,b^2\,d\,\left(e^{-i\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2-\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{(a\,c+a^2\,c+b^2\,d)^2}{b^2\,c\,d}}}$$

$$\left(a\,c+a^2\,c+b^2\,d\right)\left(\mathbb{i}\left(-\pi-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]-\right.$$

$$\pi\,\text{Log}\left[1+e^{-2\,\mathbb{i}\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-2\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\right.$$

$$\left.\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{Log}\left[1-e^{2\,\mathbb{i}\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{(a^2\,c+b^2\,d)\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]-\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.\mathbb{i}\,\text{PolyLog}\left[2,\,e^{2\,\mathbb{i}\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{2\left(a\,c+a^2\,c+b^2\,d\right)\sqrt{\frac{b^2\,c\,d+(a\,c+a^2\,c+b^2\,d)^2}{b^2\,c\,d}}}\,a\,b^2\,d\left(e^{-\mathbb{i}\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2-\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{(a\,c+a^2\,c+b^2\,d)^2}{b^2\,c\,d}}}$$

$$\left(a\,c+a^2\,c+b^2\,d\right)\left(\mathbb{i}\left(-\pi-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]-\right.$$

$$\pi\,\text{Log}\left[1+e^{-2\,\mathbb{i}\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-2\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\right.$$

$$\left.\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{Log}\left[1-e^{2\,\mathbb{i}\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]-\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.\mathbb{i}\,\text{PolyLog}\left[2,\,e^{2\,\mathbb{i}\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\left(a\,c+a^2\,c+b^2\,d\right)\sqrt{\frac{b^2\,c\,d+\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,3\,a^2\,b^2\,d\left(e^{-\mathbb{i}\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2-\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}$$

$$\left(a\,c+a^2\,c+b^2\,d\right)\left(\mathbb{i}\left(-\pi-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]-\right.$$

$$\pi\,\text{Log}\left[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-2\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\right.$$

$$\left.\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{Log}\left[1-e^{2\,i\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2\,c+b^2\,d\right)\left(c+\frac{a^2\,c+b^2\,d}{(a+b\,x)^2}-\frac{2\,a\,c}{a+b\,x}\right)}{b^2\,c\,d}}}\right]-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]-\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$\left.\left.i\,\text{PolyLog}\left[2,\,e^{2\,i\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\,c\,\left(a\,c+a^2\,c+b^2\,d\right)\sqrt{\frac{b^2\,c\,d+\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,b^4\,d^2\left(e^{-i\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right.$$

$$\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2-\frac{1}{b\,\sqrt{c}\,\sqrt{d}\,\sqrt{1+\frac{\left(a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}$$

$$\left(a\,c+a^2\,c+b^2\,d\right)\left(i\left(-\pi-2\,\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]-\right.$$

$$\pi\,\text{Log}\left[1+e^{-2\,i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]}\right]-2\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\right.$$

$$\left.\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)\text{Log}\left[1-e^{2\,i\left(-\text{ArcTan}\left[\frac{a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{\frac{\left(a^2 c+b^2 d\right)\left(c+\frac{a^2 c+b^2 d}{(a+b x)^2}-\frac{2 a c}{a+b x}\right)}{b^2 c d}}}\right]-2\,\text{ArcTan}\left[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]$$

$$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}\left[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]-\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\right]\right]\right]+$$

$$i\,\text{PolyLog}\left[2,\,e^{2 i\left(-\text{ArcTan}\left[\frac{a c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b\sqrt{c}\,\sqrt{d}}\right]\right)}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 80: Unable to integrate problem.

$$\int\frac{\text{ArcCoth}[a+b x]}{c+d\sqrt{x}}\,dx$$

Optimal (type 4, 619 leaves, 55 steps):

$$\frac{2\sqrt{1+a}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{x}}{\sqrt{1+a}}\right]}{\sqrt{b}\,d}-\frac{2\sqrt{1-a}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\sqrt{x}}{\sqrt{1-a}}\right]}{\sqrt{b}\,d}+\frac{c\,\text{Log}\left[\frac{d\left(\sqrt{-1-a}-\sqrt{b}\,\sqrt{x}\right)}{\sqrt{b}\,c+\sqrt{-1-a}\,d}\right]\text{Log}\left[c+d\sqrt{x}\right]}{d^2}-$$

$$\frac{c\,\text{Log}\left[\frac{d\left(\sqrt{1-a}-\sqrt{b}\,\sqrt{x}\right)}{\sqrt{b}\,c+\sqrt{1-a}\,d}\right]\text{Log}\left[c+d\sqrt{x}\right]}{d^2}+\frac{c\,\text{Log}\left[-\frac{d\left(\sqrt{-1-a}+\sqrt{b}\,\sqrt{x}\right)}{\sqrt{b}\,c-\sqrt{-1-a}\,d}\right]\text{Log}\left[c+d\sqrt{x}\right]}{d^2}-$$

$$\frac{c\,\text{Log}\left[-\frac{d\left(\sqrt{1-a}+\sqrt{b}\,\sqrt{x}\right)}{\sqrt{b}\,c-\sqrt{1-a}\,d}\right]\text{Log}\left[c+d\sqrt{x}\right]}{d^2}-\frac{\sqrt{x}\,\text{Log}\left[-\frac{1-a-b x}{a+b x}\right]}{d}+\frac{c\,\text{Log}\left[c+d\sqrt{x}\right]\text{Log}\left[-\frac{1-a-b x}{a+b x}\right]}{d^2}+$$

$$\frac{\sqrt{x}\,\text{Log}\left[\frac{1+a+b x}{a+b x}\right]}{d}-\frac{c\,\text{Log}\left[c+d\sqrt{x}\right]\text{Log}\left[\frac{1+a+b x}{a+b x}\right]}{d^2}+\frac{c\,\text{PolyLog}\left[2,\frac{\sqrt{b}\left(c+d\sqrt{x}\right)}{\sqrt{b}\,c-\sqrt{-1-a}\,d}\right]}{d^2}+$$

$$\frac{c\,\text{PolyLog}\left[2,\frac{\sqrt{b}\left(c+d\sqrt{x}\right)}{\sqrt{b}\,c+\sqrt{-1-a}\,d}\right]}{d^2}-\frac{c\,\text{PolyLog}\left[2,\frac{\sqrt{b}\left(c+d\sqrt{x}\right)}{\sqrt{b}\,c-\sqrt{1-a}\,d}\right]}{d^2}-\frac{c\,\text{PolyLog}\left[2,\frac{\sqrt{b}\left(c+d\sqrt{x}\right)}{\sqrt{b}\,c+\sqrt{1-a}\,d}\right]}{d^2}$$

Result (type 8, 20 leaves):

$$\int\frac{\text{ArcCoth}[a+b x]}{c+d\sqrt{x}}\,dx$$

Problem 81: Attempted integration timed out after 120 seconds.

$$\int \frac{\text{ArcCoth}[a+b\,x]}{c+\frac{d}{\sqrt{x}}}\,dx$$

Optimal (type 4, 738 leaves, 65 steps):

$$-\frac{2\sqrt{1+a}\;d\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{x}}{\sqrt{1+a}}\right]}{\sqrt{b}\;c^2}+\frac{2\sqrt{1-a}\;d\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\sqrt{x}}{\sqrt{1-a}}\right]}{\sqrt{b}\;c^2}-$$
$$\frac{d^2\,\text{Log}\left[\frac{c\left(\sqrt{-1-a}-\sqrt{b}\,\sqrt{x}\right)}{\sqrt{-1-a}\;c+\sqrt{b}\;d}\right]\text{Log}\left[d+c\sqrt{x}\right]}{c^3}+\frac{d^2\,\text{Log}\left[\frac{c\left(\sqrt{1-a}-\sqrt{b}\,\sqrt{x}\right)}{\sqrt{1-a}\;c+\sqrt{b}\;d}\right]\text{Log}\left[d+c\sqrt{x}\right]}{c^3}-$$
$$\frac{d^2\,\text{Log}\left[\frac{c\left(\sqrt{-1-a}+\sqrt{b}\,\sqrt{x}\right)}{\sqrt{-1-a}\;c-\sqrt{b}\;d}\right]\text{Log}\left[d+c\sqrt{x}\right]}{c^3}+\frac{d^2\,\text{Log}\left[\frac{c\left(\sqrt{1-a}+\sqrt{b}\,\sqrt{x}\right)}{\sqrt{1-a}\;c-\sqrt{b}\;d}\right]\text{Log}\left[d+c\sqrt{x}\right]}{c^3}+$$
$$\frac{(1-a)\,\text{Log}[1-a-b\,x]}{2\,b\,c}+\frac{d\sqrt{x}\;\text{Log}\left[-\frac{1-a-b\,x}{a+b\,x}\right]}{c^2}-\frac{x\,\text{Log}\left[-\frac{1-a-b\,x}{a+b\,x}\right]}{2\,c}-$$
$$\frac{d^2\,\text{Log}\left[d+c\sqrt{x}\right]\text{Log}\left[-\frac{1-a-b\,x}{a+b\,x}\right]}{c^3}+\frac{(1+a)\,\text{Log}[1+a+b\,x]}{2\,b\,c}-\frac{d\sqrt{x}\;\text{Log}\left[\frac{1+a+b\,x}{a+b\,x}\right]}{c^2}+$$
$$\frac{x\,\text{Log}\left[\frac{1+a+b\,x}{a+b\,x}\right]}{2\,c}+\frac{d^2\,\text{Log}\left[d+c\sqrt{x}\right]\text{Log}\left[\frac{1+a+b\,x}{a+b\,x}\right]}{c^3}-\frac{d^2\,\text{PolyLog}\left[2,-\frac{\sqrt{b}\left(d+c\sqrt{x}\right)}{\sqrt{-1-a}\;c-\sqrt{b}\;d}\right]}{c^3}+$$
$$\frac{d^2\,\text{PolyLog}\left[2,-\frac{\sqrt{b}\left(d+c\sqrt{x}\right)}{\sqrt{1-a}\;c-\sqrt{b}\;d}\right]}{c^3}-\frac{d^2\,\text{PolyLog}\left[2,\frac{\sqrt{b}\left(d+c\sqrt{x}\right)}{\sqrt{-1-a}\;c+\sqrt{b}\;d}\right]}{c^3}+\frac{d^2\,\text{PolyLog}\left[2,\frac{\sqrt{b}\left(d+c\sqrt{x}\right)}{\sqrt{1-a}\;c+\sqrt{b}\;d}\right]}{c^3}$$

Result (type 1, 1 leaves):

???

Problem 82: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcCoth}[d+e\,x]}{a+b\,x+c\,x^2}\,dx$$

Optimal (type 4, 335 leaves, 12 steps):

$$\frac{\text{ArcCoth}[d+e x]\,\text{Log}\left[\frac{2 e\left(b-\sqrt{b^2-4 a c}+2 c x\right)}{\left(2 c (1-d)+\left(b-\sqrt{b^2-4 a c}\right) e\right)(1+d+e x)}\right]}{\sqrt{b^2-4 a c}}-$$

$$\frac{\text{ArcCoth}[d+e x]\,\text{Log}\left[\frac{2 e\left(b+\sqrt{b^2-4 a c}+2 c x\right)}{\left(2 c (1-d)+\left(b+\sqrt{b^2-4 a c}\right) e\right)(1+d+e x)}\right]}{\sqrt{b^2-4 a c}}-$$

$$\frac{\text{PolyLog}\left[2,1+\frac{2\left(2 c d-\left(b-\sqrt{b^2-4 a c}\right) e-2 c (d+e x)\right)}{\left(2 c-2 c d+b e-\sqrt{b^2-4 a c}\, e\right)(1+d+e x)}\right]}{2\sqrt{b^2-4 a c}}+\frac{\text{PolyLog}\left[2,1+\frac{2\left(2 c d-\left(b+\sqrt{b^2-4 a c}\right) e-2 c (d+e x)\right)}{\left(2 c (1-d)+\left(b+\sqrt{b^2-4 a c}\right) e\right)(1+d+e x)}\right]}{2\sqrt{b^2-4 a c}}$$

Result (type 4, 8833 leaves):

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

$$\left(1-(d+e x)^2\right)\left(-\frac{2\,\text{ArcCoth}[d+e x]\,\text{ArcTanh}\left[\frac{-2 c d+b e+2 c (d+e x)}{\sqrt{b^2-4 a c}\, e}\right]}{\sqrt{b^2-4 a c}}-\frac{1}{c\left(-1+(d+e x)^2\right)}\right.$$

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

$$\left(\frac{2 c^2\,\text{ArcTanh}\left[\frac{-2 c d+b e+2 c (d+e x)}{\sqrt{b^2-4 a c}\, e}\right]^2}{4 c^2\left(-1+d^2\right)-4 b c d e+b^2 e^2}+\right.$$

$$\frac{1}{\left(b^2-4 a c\right)(2 c-2 c d+b e)\sqrt{\frac{\left(b^2-4 a c\right) e^2-(2 c (-1+d)-b e)^2}{\left(b^2-4 a c\right) e^2}}}\,2 a c^2\left(-e^{-\text{ArcTanh}\left[\frac{2 c (-1+d)-b e}{\sqrt{b^2-4 a c}\, e}\right]}\right.$$

$$\text{ArcTanh}\left[\frac{-2 c d+b e+2 c (d+e x)}{\sqrt{b^2-4 a c}\, e}\right]^2+\frac{1}{\sqrt{b^2-4 a c}\, e\sqrt{1-\frac{(2 c (-1+d)-b e)^2}{\left(b^2-4 a c\right) e^2}}}$$

$$\mathbb{i}\left(2c\left(-1+d\right)-b\,e\right)\left(-\left(-\pi+2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{2c\left(-1+d\right)-b\,e}{\sqrt{b^2-4ac}\;e}\right]\right)\right.$$

$$\text{ArcTanh}\left[\frac{-2cd+b\,e+2c\left(d+e\,x\right)}{\sqrt{b^2-4ac}\;e}\right]-\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]}\right]-$$

$$2\left(\mathbb{i}\,\text{ArcTanh}\left[\frac{2c\left(-1+d\right)-b\,e}{\sqrt{b^2-4ac}\;e}\right]+\mathbb{i}\,\text{ArcTanh}\left[\frac{-2cd+b\,e+2c\left(d+e\,x\right)}{\sqrt{b^2-4ac}\;e}\right]\right)$$

$$\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4ac}}-\frac{2cd}{\sqrt{b^2-4ac}\;e}+\frac{2c\,(d+e\,x)}{\sqrt{b^2-4ac}\;e}\right)^2}}\right]+$$

$$2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{2c\left(-1+d\right)-b\,e}{\sqrt{b^2-4ac}\;e}\right]\text{Log}\left[\right.$$

$$\left.\mathbb{i}\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{2c\left(-1+d\right)-b\,e}{\sqrt{b^2-4ac}\;e}\right]+\text{ArcTanh}\left[\frac{-2cd+b\,e+2c\left(d+e\,x\right)}{\sqrt{b^2-4ac}\;e}\right]\right]\right]+$$

$$\left.\left.\mathbb{i}\,\text{PolyLog}\left[2,\,e^{-2\left(\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{\left(b^2-4ac\right)e^2\left(2c-2cd+b\,e\right)\sqrt{\frac{\left(b^2-4ac\right)e^2-\left(2c\,(-1+d)-b\,e\right)^2}{\left(b^2-4ac\right)e^2}}}\,2c^3\left(-e^{-\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]}\right.$$

$$\text{ArcTanh}\left[\frac{-2cd+b\,e+2c\left(d+e\,x\right)}{\sqrt{b^2-4ac}\;e}\right]^2+\frac{1}{\sqrt{b^2-4ac}\;e\,\sqrt{1-\frac{(2c\,(-1+d)-b\,e)^2}{\left(b^2-4ac\right)e^2}}}$$

$$i\,\left(2\,c\,(-1+d)-b\,e\right)\left(-\left(-\pi+2\,i\,\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)\right.$$

$$\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]-\pi\,\text{Log}\left[1+\mathrm{e}^{2\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]}\right]-$$

$$2\left(i\,\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+i\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)$$

$$\text{Log}\left[1-\mathrm{e}^{-2\left(\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4\,a\,c}}-\frac{2\,c\,d}{\sqrt{b^2-4\,a\,c}\;e}+\frac{2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right)^2}}\right]+$$

$$2\,i\,\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]\text{Log}\left[\right.$$

$$\left.i\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right]\right]+$$

$$\left.\left.i\,\text{PolyLog}\left[2,\mathrm{e}^{-2\left(\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)}\right]\right)\right)-$$

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

$$4\,c^3\,d\left(-\mathrm{e}^{-\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]}\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]^2+\right.$$

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

$$i\,(2c(-1+d)-be)\Bigg(-\left(-\pi+2i\,\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]\right)$$

$$\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]-\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]}\right]-$$

$$2\left(i\,\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+i\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)$$

$$\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4ac}}-\frac{2cd}{\sqrt{b^2-4ac}\;e}+\frac{2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right)^2}}\right]+$$

$$2i\,\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]\text{Log}\Bigg[$$

$$i\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right]\Bigg]+$$

$$i\,\text{PolyLog}\left[2,\,e^{-2\left(\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)}\right]\Bigg)\Bigg)+$$

$$\frac{1}{(b^2-4ac)\,e^2\,(2c-2cd+be)\sqrt{\frac{(b^2-4ac)\,e^2-(2c(-1+d)-be)^2}{(b^2-4ac)\,e^2}}}$$

$$2c^3d^2\Bigg(-e^{-\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\;e}\right]}\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]^2+$$

$$\frac{1}{\sqrt{b^2-4ac}\;e\sqrt{1-\frac{(2c(-1+d)-be)^2}{(b^2-4ac)\,e^2}}}$$

$$\mathrm{i}\,\left(2\,c\,\left(-1+d\right)-b\,e\right)\left(-\left(-\pi+2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{2\,c\,\left(-1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)\right.$$

$$\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\;e}\right]-\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]}\right]-$$

$$2\left(\mathrm{i}\,\text{ArcTanh}\left[\frac{2\,c\,\left(-1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\mathrm{i}\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)$$

$$\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4\,a\,c}}-\frac{2\,c\,d}{\sqrt{b^2-4\,a\,c}\;e}+\frac{2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right)^2}}\right]+$$

$$2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{2\,c\,\left(-1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]\text{Log}\left[\right.$$

$$\left.\mathrm{i}\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{2\,c\,\left(-1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right]\right]+$$

$$\left.\left.\mathrm{i}\,\text{PolyLog}\left[2,\,e^{-2\left(\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)}\right]\right)\right)+$$

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

$$2\,b\,c^2\left(-e^{-\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]}\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\;e}\right]^2+\right.$$

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

$$\mathbb{i}\,\left(2\,c\,\left(-1+d\right)-b\,e\right)\left(-\left(-\pi+2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{2\,c\,\left(-1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)\right.$$

$$\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\;e}\right]-\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]}\right]-$$

$$2\left(\mathbb{i}\,\text{ArcTanh}\left[\frac{2\,c\,\left(-1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\mathbb{i}\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)$$

$$\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4\,a\,c}}-\frac{2\,c\,d}{\sqrt{b^2-4\,a\,c}\;e}+\frac{2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right)^2}}\right]+$$

$$2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{2\,c\,\left(-1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]\text{Log}\left[\right.$$

$$\left.\mathbb{i}\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{2\,c\,\left(-1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right]\right]+$$

$$\left.\left.\mathbb{i}\,\text{PolyLog}\left[2,\,e^{-2\left(\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right]\right)}\right]\right)\right)-$$

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

$$\left(-e^{-\text{ArcTanh}\left[\frac{2\,c\,(-1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]}\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\;e}\right]^2+\right.$$

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

$$i\left(2c(-1+d)-be\right)\left(-\left(-\pi+2 i \text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\,e}\right]\right)\right.$$

$$\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]-\pi \text{Log}\left[1+e^{2\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]}\right]-$$

$$2\left(i \text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+i \text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right)$$

$$\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right)}\right]+$$

$$\pi \text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4ac}}-\frac{2cd}{\sqrt{b^2-4ac}\,e}+\frac{2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right)^2}}\right]+$$

$$2 i \text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\,e}\right]\text{Log}\left[\right.$$

$$\left. i \text{Sinh}\left[\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right]\right]+$$

$$\left.\left. i \text{PolyLog}\left[2, e^{-2\left(\text{ArcTanh}\left[\frac{2c(-1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right)}\right]\right)\right)-$$

$$\frac{1}{\left(b^2-4ac\right)\left(-2c-2cd+be\right)\sqrt{\frac{\left(b^2-4ac\right)e^2-\left(2c(1+d)-be\right)^2}{\left(b^2-4ac\right)e^2}}}$$

$$2ac^2\left(-e^{-\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]}\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]^2+\right.$$

$$\frac{1}{\sqrt{b^2-4ac}\,e\sqrt{1-\frac{\left(2c(1+d)-be\right)^2}{\left(b^2-4ac\right)e^2}}}$$

$$i\left(2c(1+d)-be\right)\left(-\left(-\pi+2i\,\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]\right)\right.$$

$$\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]-\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]}\right]-$$

$$2\left(i\,\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+i\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right)$$

$$\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4ac}}-\frac{2cd}{\sqrt{b^2-4ac}\,e}+\frac{2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right)^2}}\right]+$$

$$2i\,\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]\text{Log}\left[\right.$$

$$\left.i\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right]\right]+$$

$$\left.\left.i\,\text{PolyLog}\left[2,e^{-2\left(\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right)}\right]\right)\right)-$$

$$\frac{1}{\left(b^2-4ac\right)e^2\left(-2c-2cd+be\right)\sqrt{\frac{\left(b^2-4ac\right)e^2-(2c(1+d)-be)^2}{\left(b^2-4ac\right)e^2}}}$$

$$2c^3\left(-e^{-\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]}\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]^2+\right.$$

$$\frac{1}{\sqrt{b^2-4ac}\,e\sqrt{1-\frac{(2c(1+d)-be)^2}{\left(b^2-4ac\right)e^2}}}$$

$$\mathbb{i}\,\left(2\,c\,\left(1+d\right)-b\,e\right)\left(-\left(-\pi+2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{2\,c\,\left(1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\,\,e}\right]\right)\right.$$

$$\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\,\,e}\right]-\pi\,\text{Log}\left[1+\mathbb{e}^{2\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\,\,e}\right]}\right]-$$

$$2\,\left(\mathbb{i}\,\text{ArcTanh}\left[\frac{2\,c\,\left(1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\,\,e}\right]+\mathbb{i}\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\,\,e}\right]\right)$$

$$\text{Log}\left[1-\mathbb{e}^{-2\,\left(\text{ArcTanh}\left[\frac{2\,c\,\left(1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\,\,e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\,\,e}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4\,a\,c}}-\frac{2\,c\,d}{\sqrt{b^2-4\,a\,c}\,\,e}+\frac{2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\,\,e}\right)^2}}\right]+$$

$$2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{2\,c\,\left(1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\,\,e}\right]\,\text{Log}\left[\right.$$

$$\left.\mathbb{i}\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{2\,c\,\left(1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\,\,e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\,\,e}\right]\right]\right]+$$

$$\left.\left.\mathbb{i}\,\text{PolyLog}\left[2,\,\mathbb{e}^{-2\,\left(\text{ArcTanh}\left[\frac{2\,c\,\left(1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\,\,e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\,\,e}\right]\right)}\right]\right)\right)-$$

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

$$4\,c^3\,d\,\left(-\mathbb{e}^{-\text{ArcTanh}\left[\frac{2\,c\,\left(1+d\right)-b\,e}{\sqrt{b^2-4\,a\,c}\,\,e}\right]}\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,\left(d+e\,x\right)}{\sqrt{b^2-4\,a\,c}\,\,e}\right]^2+\right.$$

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

$$\mathbb{i}\left(2c(1+d)-be\right)\left(-\left(-\pi+2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]\right)\right.$$

$$\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]-\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]}\right]-$$

$$2\left(\mathbb{i}\,\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\mathbb{i}\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right)$$

$$\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4ac}}-\frac{2cd}{\sqrt{b^2-4ac}\,e}+\frac{2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right)^2}}\right]+$$

$$2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]\text{Log}\left[\right.$$

$$\left.\mathbb{i}\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right]\right]+$$

$$\left.\left.\mathbb{i}\,\text{PolyLog}\left[2,e^{-2\left(\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]+\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]\right)}\right]\right)\right)-$$

$$\frac{1}{(b^2-4ac)\,e^2\,(-2c-2cd+be)\sqrt{\frac{(b^2-4ac)e^2-(2c(1+d)-be)^2}{(b^2-4ac)e^2}}}$$

$$2c^3d^2\left(-e^{-\text{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\,e}\right]}\,\text{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\,e}\right]^2+\right.$$

$$\frac{1}{\sqrt{b^2-4ac}\,e\sqrt{1-\frac{(2c(1+d)-be)^2}{(b^2-4ac)e^2}}}$$

$$\mathrm{i}\,(2\,c\,(1+d)-b\,e)\left(-\left(-\pi+2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{2\,c\,(1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\,e}\right]\right)\right.$$

$$\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\,e}\right]-\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\,e}\right]}\right]-$$

$$2\left(\mathrm{i}\,\text{ArcTanh}\left[\frac{2\,c\,(1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\,e}\right]+\mathrm{i}\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\,e}\right]\right)$$

$$\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{2\,c\,(1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\,e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\,e}\right]\right)}\right]+$$

$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4\,a\,c}}-\frac{2\,c\,d}{\sqrt{b^2-4\,a\,c}\,e}+\frac{2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\,e}\right)^2}}\right]+$$

$$2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{2\,c\,(1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\,e}\right]\,\text{Log}\Big[$$

$$\mathrm{i}\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{2\,c\,(1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\,e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\,e}\right]\right]\Big]+$$

$$\left.\left.\mathrm{i}\,\text{PolyLog}\left[2,\,e^{-2\left(\text{ArcTanh}\left[\frac{2\,c\,(1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\,e}\right]+\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\,e}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{(b^2-4\,a\,c)\,e\,(-2\,c-2\,c\,d+b\,e)\,\sqrt{\frac{(b^2-4\,a\,c)\,e^2-(2\,c\,(1+d)-b\,e)^2}{(b^2-4\,a\,c)\,e^2}}}$$

$$2\,b\,c^2\left(-e^{-\text{ArcTanh}\left[\frac{2\,c\,(1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\,e}\right]}\,\text{ArcTanh}\left[\frac{-2\,c\,d+b\,e+2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\,e}\right]^2+\right.$$

$$\frac{1}{\sqrt{b^2-4\,a\,c}\,e\,\sqrt{1-\frac{(2\,c\,(1+d)-b\,e)^2}{(b^2-4\,a\,c)\,e^2}}}$$

$$\mathrm{i}\left(2c\left(1+d\right)-b e\right)\left(-\left(-\pi+2\,\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{2c\left(1+d\right)-b e}{\sqrt{b^2-4ac}\;e}\right]\right)\right.$$

$$\mathrm{ArcTanh}\left[\frac{-2cd+be+2c\left(d+ex\right)}{\sqrt{b^2-4ac}\;e}\right]-\pi\,\mathrm{Log}\left[1+e^{2\,\mathrm{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]}\right]-$$

$$2\left(\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{2c\left(1+d\right)-be}{\sqrt{b^2-4ac}\;e}\right]+\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{-2cd+be+2c\left(d+ex\right)}{\sqrt{b^2-4ac}\;e}\right]\right)$$

$$\mathrm{Log}\left[1-e^{-2\left(\mathrm{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\mathrm{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)}\right]+$$

$$\pi\,\mathrm{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4ac}}-\frac{2cd}{\sqrt{b^2-4ac}\;e}+\frac{2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right)^2}}\right]+$$

$$2\,\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{2c\left(1+d\right)-be}{\sqrt{b^2-4ac}\;e}\right]\mathrm{Log}\left[\right.$$

$$\left.\mathrm{i}\,\mathrm{Sinh}\left[\mathrm{ArcTanh}\left[\frac{2c\left(1+d\right)-be}{\sqrt{b^2-4ac}\;e}\right]+\mathrm{ArcTanh}\left[\frac{-2cd+be+2c\left(d+ex\right)}{\sqrt{b^2-4ac}\;e}\right]\right]\right]+$$

$$\left.\left.\mathrm{i}\,\mathrm{PolyLog}\left[2,e^{-2\left(\mathrm{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\mathrm{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{\left(b^2-4ac\right)e\left(-2c-2cd+be\right)\sqrt{\frac{\left(b^2-4ac\right)e^2-\left(2c\left(1+d\right)-be\right)^2}{\left(b^2-4ac\right)e^2}}}$$

$$2bc^2d\left(-e^{-\mathrm{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\;e}\right]}\mathrm{ArcTanh}\left[\frac{-2cd+be+2c\left(d+ex\right)}{\sqrt{b^2-4ac}\;e}\right]^2+\right.$$

$$\frac{1}{\sqrt{b^2-4ac}\;e\sqrt{1-\frac{\left(2c\left(1+d\right)-be\right)^2}{\left(b^2-4ac\right)e^2}}}$$

$$\mathrm{i}\,(2c(1+d)-be)\left(-\left(-\pi+2\,\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\;e}\right]\right)\right.$$

$$\mathrm{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]-\pi\,\mathrm{Log}\left[1+e^{2\,\mathrm{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]}\right]-$$

$$2\left(\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)$$

$$\mathrm{Log}\left[1-e^{-2\left(\mathrm{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\mathrm{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)}\right]+$$

$$\pi\,\mathrm{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4ac}}-\frac{2cd}{\sqrt{b^2-4ac}\;e}+\frac{2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right)^2}}\right]+$$

$$2\,\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\;e}\right]\mathrm{Log}\left[\right.$$

$$\left.\left.\mathrm{i}\,\mathrm{Sinh}\left[\mathrm{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\mathrm{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right]\right]\right]+$$

$$\left.\mathrm{i}\,\mathrm{PolyLog}\left[2,\,e^{-2\left(\mathrm{ArcTanh}\left[\frac{2c(1+d)-be}{\sqrt{b^2-4ac}\;e}\right]+\mathrm{ArcTanh}\left[\frac{-2cd+be+2c(d+ex)}{\sqrt{b^2-4ac}\;e}\right]\right)}\right]\right)\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 95: Result unnecessarily involves higher level functions.

$$\int\frac{\mathrm{ArcCoth}[a\,x^n]}{x}\,dx$$

Optimal (type 4, 38 leaves, 2 steps):

$$\frac{\mathrm{PolyLog}\left[2,-\frac{x^{-n}}{a}\right]}{2n}-\frac{\mathrm{PolyLog}\left[2,\frac{x^{-n}}{a}\right]}{2n}$$

Result (type 5, 52 leaves):

$$\frac{a\,x^n\,\mathrm{HypergeometricPFQ}\left[\left\{\frac{1}{2},\frac{1}{2},1\right\},\left\{\frac{3}{2},\frac{3}{2}\right\},a^2x^{2n}\right]}{n}+\left(\mathrm{ArcCoth}[a\,x^n]-\mathrm{ArcTanh}[a\,x^n]\right)\mathrm{Log}[x]$$

Problem 100: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

$$\int \frac{\text{ArcCoth}[1+x]}{2+2x}\,dx$$

Optimal (type 4, 25 leaves, 3 steps):

$$\frac{1}{4}\,\text{PolyLog}\left[2,-\frac{1}{1+x}\right]-\frac{1}{4}\,\text{PolyLog}\left[2,\frac{1}{1+x}\right]$$

Result (type 4, 227 leaves):

$$\frac{1}{16}\left(-\pi^2+4\,i\,\pi\,\text{ArcTanh}[1+x]+8\,\text{ArcTanh}[1+x]^2+8\,\text{ArcTanh}[1+x]\,\text{Log}\left[1-e^{-2\,\text{ArcTanh}[1+x]}\right]-\right.$$
$$4\,i\,\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}[1+x]}\right]-8\,\text{ArcTanh}[1+x]\,\text{Log}\left[1+e^{2\,\text{ArcTanh}[1+x]}\right]+$$
$$8\,\text{ArcCoth}[1+x]\,\text{Log}[1+x]-8\,\text{ArcTanh}[1+x]\,\text{Log}[1+x]-8\,\text{ArcTanh}[1+x]\,\text{Log}\left[\frac{1}{\sqrt{-x\,(2+x)}}\right]+$$
$$4\,i\,\pi\,\text{Log}\left[\frac{2}{\sqrt{-x\,(2+x)}}\right]+8\,\text{ArcTanh}[1+x]\,\text{Log}\left[\frac{2}{\sqrt{-x\,(2+x)}}\right]+$$
$$8\,\text{ArcTanh}[1+x]\,\text{Log}\left[\frac{i\,(1+x)}{\sqrt{-x\,(2+x)}}\right]-8\,\text{ArcTanh}[1+x]\,\text{Log}\left[\frac{2\,i\,(1+x)}{\sqrt{-x\,(2+x)}}\right]-$$
$$\left.4\,\text{PolyLog}\left[2,e^{-2\,\text{ArcTanh}[1+x]}\right]-4\,\text{PolyLog}\left[2,-e^{2\,\text{ArcTanh}[1+x]}\right]\right)$$

Problem 101: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcCoth}[a+b\,x]}{\frac{a\,d}{b}+d\,x}\,dx$$

Optimal (type 4, 35 leaves, 3 steps):

$$\frac{\text{PolyLog}\left[2,-\frac{1}{a+b\,x}\right]}{2\,d}-\frac{\text{PolyLog}\left[2,\frac{1}{a+b\,x}\right]}{2\,d}$$

Result (type 4, 291 leaves):

$$-\frac{1}{8 d}\Bigg(\pi^2 - 4 i \pi \text{ArcTanh}[a+b x] - 8 \text{ArcTanh}[a+b x]^2 - 8 \text{ArcTanh}[a+b x] \text{Log}\left[1-e^{-2 \text{ArcTanh}[a+b x]}\right] + 4 i \pi \text{Log}\left[1+e^{2 \text{ArcTanh}[a+b x]}\right] + 8 \text{ArcTanh}[a+b x] \text{Log}\left[1+e^{2 \text{ArcTanh}[a+b x]}\right] - 8 \text{ArcCoth}[a+b x] \text{Log}[a+b x] + 8 \text{ArcTanh}[a+b x] \text{Log}[a+b x] + 8 \text{ArcTanh}[a+b x] \text{Log}\left[\frac{1}{\sqrt{1-(a+b x)^2}}\right] - 4 i \pi \text{Log}\left[\frac{2}{\sqrt{1-(a+b x)^2}}\right] - 8 \text{ArcTanh}[a+b x] \text{Log}\left[\frac{2}{\sqrt{1-(a+b x)^2}}\right] - 8 \text{ArcTanh}[a+b x] \text{Log}\left[\frac{i (a+b x)}{\sqrt{1-(a+b x)^2}}\right] + 8 \text{ArcTanh}[a+b x] \text{Log}\left[\frac{2 i (a+b x)}{\sqrt{1-(a+b x)^2}}\right] + 4 \text{PolyLog}\left[2, e^{-2 \text{ArcTanh}[a+b x]}\right] + 4 \text{PolyLog}\left[2, -e^{2 \text{ArcTanh}[a+b x]}\right]\Bigg)$$

Problem 106: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{a+b \text{ArcCoth}[c+d x]}{e+f x} \, dx$$

Optimal (type 4, 130 leaves, 5 steps):

$$-\frac{(a+b \text{ArcCoth}[c+d x]) \text{Log}\left[\frac{2}{1+c+d x}\right]}{f} + \frac{(a+b \text{ArcCoth}[c+d x]) \text{Log}\left[\frac{2 d (e+f x)}{(d e+f-c f)(1+c+d x)}\right]}{f} + \frac{b \text{PolyLog}\left[2, 1-\frac{2}{1+c+d x}\right]}{2 f} - \frac{b \text{PolyLog}\left[2, 1-\frac{2 d (e+f x)}{(d e+f-c f)(1+c+d x)}\right]}{2 f}$$

Result (type 4, 352 leaves):

$$\frac{1}{f}\Bigg(a\,\text{Log}[e+f x]+b\,(\text{ArcCoth}[c+d x]-\text{ArcTanh}[c+d x])\,\text{Log}[e+f x]+b\,\text{ArcTanh}[c+d x]\left(-\text{Log}\left[\frac{1}{\sqrt{1-(c+d x)^2}}\right]+\text{Log}\left[i\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{d e-c f}{f}\right]+\text{ArcTanh}[c+d x]\right]\right]\right)-\frac{1}{2} i b\Bigg(-\frac{1}{4} i\,(\pi-2 i\,\text{ArcTanh}[c+d x])^2+i\left(\text{ArcTanh}\left[\frac{d e-c f}{f}\right]+\text{ArcTanh}[c+d x]\right)^2+(\pi-2 i\,\text{ArcTanh}[c+d x])\,\text{Log}\left[1+e^{2\,\text{ArcTanh}[c+d x]}\right]+2 i\left(\text{ArcTanh}\left[\frac{d e-c f}{f}\right]+\text{ArcTanh}[c+d x]\right)\text{Log}\left[1-e^{-2\left(\text{ArcTanh}\left[\frac{d e-c f}{f}\right]+\text{ArcTanh}[c+d x]\right)}\right]-(\pi-2 i\,\text{ArcTanh}[c+d x])\,\text{Log}\left[\frac{2}{\sqrt{1-(c+d x)^2}}\right]-2 i\left(\text{ArcTanh}\left[\frac{d e-c f}{f}\right]+\text{ArcTanh}[c+d x]\right)\text{Log}\left[2 i\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{d e-c f}{f}\right]+\text{ArcTanh}[c+d x]\right]\right]-i\,\text{PolyLog}\left[2,-e^{2\,\text{ArcTanh}[c+d x]}\right]-i\,\text{PolyLog}\left[2,e^{-2\left(\text{ArcTanh}\left[\frac{d e-c f}{f}\right]+\text{ArcTanh}[c+d x]\right)}\right]\Bigg)\Bigg)$$

Problem 109: Result more than twice size of optimal antiderivative.

$$\int (e+f x)^2\,(a+b\,\text{ArcCoth}[c+d x])^2\,dx$$

Optimal (type 4, 374 leaves, 16 steps):

$$\frac{b^2 f^2 x}{3 d^2}+\frac{2 a b f (d e-c f) x}{d^2}+\frac{2 b^2 f (d e-c f)(c+d x)\,\text{ArcCoth}[c+d x]}{d^3}+\frac{b f^2 (c+d x)^2 (a+b\,\text{ArcCoth}[c+d x])}{3 d^3}-\frac{(d e-c f)\left(d^2 e^2-2 c d e f+(3+c^2) f^2\right)(a+b\,\text{ArcCoth}[c+d x])^2}{3 d^3 f}+\frac{\left(3 d^2 e^2-6 c d e f+(1+3 c^2) f^2\right)(a+b\,\text{ArcCoth}[c+d x])^2}{3 d^3}+\frac{(e+f x)^3 (a+b\,\text{ArcCoth}[c+d x])^2}{3 f}-\frac{b^2 f^2\,\text{ArcTanh}[c+d x]}{3 d^3}-\frac{1}{3 d^3}2 b\left(3 d^2 e^2-6 c d e f+(1+3 c^2) f^2\right)(a+b\,\text{ArcCoth}[c+d x])\,\text{Log}\left[\frac{2}{1-c-d x}\right]+\frac{b^2 f (d e-c f)\,\text{Log}\left[1-(c+d x)^2\right]}{d^3}-\frac{b^2\left(3 d^2 e^2-6 c d e f+(1+3 c^2) f^2\right)\text{PolyLog}\left[2,-\frac{1+c+d x}{1-c-d x}\right]}{3 d^3}$$

Result (type 4, 1054 leaves):

$$a^2 e^2 x+a^2 e f x^2+\frac{1}{3} a^2 f^2 x^3+\frac{1}{3} a b\Big(2 x\,(3 e^2+3 e f x+f^2 x^2)\,\text{ArcCoth}[c+d x]+\frac{1}{d^3}$$

$$\left(d f x \left(6 d e-4 c f+d f x\right)-\left(-1+c\right) \left(3 d^2 e^2-3 \left(-1+c\right) d e f+\left(-1+c\right)^2 f^2\right) \text{Log}[1-c-d x]+\left(1+c\right) \left(3 d^2 e^2-3 \left(1+c\right) d e f+\left(1+c\right)^2 f^2\right) \text{Log}[1+c+d x]\right)\Big)+\left(b^2 e^2 \left(1-\left(c+d x\right)^2\right) \left(\text{ArcCoth}[c+d x] \left(\text{ArcCoth}[c+d x]-\left(c+d x\right) \text{ArcCoth}[c+d x]+2 \text{Log}\left[1-e^{-2 \text{ArcCoth}[c+d x]}\right]\right)-\text{PolyLog}\left[2, e^{-2 \text{ArcCoth}[c+d x]}\right]\right)\right)\Big/\left(d \left(c+d x\right)^2 \left(1-\frac{1}{\left(c+d x\right)^2}\right)\right)-$$

$$\left(b^2 e f \left(1-\left(c+d x\right)^2\right) \left(2 c \text{ArcCoth}[c+d x]^2+\left(c+d x\right)^2 \left(1-\frac{1}{\left(c+d x\right)^2}\right) \text{ArcCoth}[c+d x]^2-2 \left(c+d x\right) \text{ArcCoth}[c+d x] \left(-1+c \text{ArcCoth}[c+d x]\right)+4 c \text{ArcCoth}[c+d x] \text{Log}\left[1-e^{-2 \text{ArcCoth}[c+d x]}\right]-2 \text{Log}\left[\frac{1}{\left(c+d x\right) \sqrt{1-\frac{1}{(c+d x)^2}}}\right]-2 c \text{PolyLog}\left[2, e^{-2 \text{ArcCoth}[c+d x]}\right]\right)\right)\Big/$$

$$\left(d^2 \left(c+d x\right)^2 \left(1-\frac{1}{\left(c+d x\right)^2}\right)\right)-\frac{1}{12 d^3} b^2 f^2 \left(c+d x\right) \sqrt{1-\frac{1}{\left(c+d x\right)^2}} \left(1-\left(c+d x\right)^2\right)$$

$$\Bigg(\frac{4 \text{ArcCoth}[c+d x]}{\left(c+d x\right) \sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{3 \text{ArcCoth}[c+d x]^2}{\left(c+d x\right) \sqrt{1-\frac{1}{(c+d x)^2}}}-$$

$$\frac{12 c \text{ArcCoth}[c+d x]^2}{\left(c+d x\right) \sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{9 c^2 \text{ArcCoth}[c+d x]^2}{\left(c+d x\right) \sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{1}{\sqrt{1-\frac{1}{(c+d x)^2}}}$$

$$\left(-1+6 c \text{ArcCoth}[c+d x]+3 \text{ArcCoth}[c+d x]^2-3 c^2 \text{ArcCoth}[c+d x]^2\right)+$$

$$\text{Cosh}[3 \text{ArcCoth}[c+d x]]-6 c \text{ArcCoth}[c+d x] \text{Cosh}[3 \text{ArcCoth}[c+d x]]+$$

$$\text{ArcCoth}[c+d x]^2 \text{Cosh}[3 \text{ArcCoth}[c+d x]]+3 c^2 \text{ArcCoth}[c+d x]^2 \text{Cosh}[3 \text{ArcCoth}[c+d x]]+$$

$$\frac{6 \text{ArcCoth}[c+d x] \text{Log}\left[1-e^{-2 \text{ArcCoth}[c+d x]}\right]}{\left(c+d x\right) \sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{18 c^2 \text{ArcCoth}[c+d x] \text{Log}\left[1-e^{-2 \text{ArcCoth}[c+d x]}\right]}{\left(c+d x\right) \sqrt{1-\frac{1}{(c+d x)^2}}}-$$

$$\frac{18 c \text{Log}\left[\frac{1}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}\right]}{\left(c+d x\right) \sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{4 \left(1+3 c^2\right) \text{PolyLog}\left[2, e^{-2 \text{ArcCoth}[c+d x]}\right]}{\left(c+d x\right)^3 \left(1-\frac{1}{(c+d x)^2}\right)^{3/2}}-$$

$$\text{ArcCoth}[c+d x]^2 \text{Sinh}[3 \text{ArcCoth}[c+d x]]-3 c^2 \text{ArcCoth}[c+d x]^2 \text{Sinh}[3 \text{ArcCoth}[c+d x]]-$$

$$2 \text{ArcCoth}[c+d x] \text{Log}\left[1-e^{-2 \text{ArcCoth}[c+d x]}\right] \text{Sinh}[3 \text{ArcCoth}[c+d x]]-$$

$$6 c^2 \text{ArcCoth}[c+d x] \text{Log}\left[1-e^{-2 \text{ArcCoth}[c+d x]}\right] \text{Sinh}[3 \text{ArcCoth}[c+d x]]+$$

$$6\,c\,\text{Log}\left[\frac{1}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right]\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]\Bigg)$$

Problem 112: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,\text{ArcCoth}[c+d\,x])^2}{e+f\,x}\,dx$$

Optimal (type 4, 214 leaves, 2 steps):

$$-\frac{(a+b\,\text{ArcCoth}[c+d\,x])^2\,\text{Log}\left[\frac{2}{1+c+d\,x}\right]}{f}+\frac{(a+b\,\text{ArcCoth}[c+d\,x])^2\,\text{Log}\left[\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{f}+\frac{b\,(a+b\,\text{ArcCoth}[c+d\,x])\,\text{PolyLog}\left[2,1-\frac{2}{1+c+d\,x}\right]}{f}-\frac{b\,(a+b\,\text{ArcCoth}[c+d\,x])\,\text{PolyLog}\left[2,1-\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{f}+\frac{b^2\,\text{PolyLog}\left[3,1-\frac{2}{1+c+d\,x}\right]}{2\,f}-\frac{b^2\,\text{PolyLog}\left[3,1-\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{2\,f}$$

Result (type 4, 1640 leaves):

$$\frac{a^2\,\text{Log}[e+f\,x]}{f}+2\,a\,b\left(\frac{(\text{ArcCoth}[c+d\,x]-\text{ArcTanh}[c+d\,x])\,\text{Log}[e+f\,x]}{f}-\frac{1}{f}\,i\left(i\,\text{ArcTanh}[c+d\,x]\left(-\text{Log}\left[\frac{1}{\sqrt{1-(c+d\,x)^2}}\right]+\text{Log}\left[i\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{d\,e-c\,f}{f}\right]+\text{ArcTanh}[c+d\,x]\right]\right]\right)+\frac{1}{2}\left(-i\left(i\,\text{ArcTanh}\left[\frac{d\,e-c\,f}{f}\right]+i\,\text{ArcTanh}[c+d\,x]\right)^2-\frac{1}{4}\,i\,(\pi-2\,i\,\text{ArcTanh}[c+d\,x])^2+2\left(i\,\text{ArcTanh}\left[\frac{d\,e-c\,f}{f}\right]+i\,\text{ArcTanh}[c+d\,x]\right)\text{Log}\left[1-e^{2\,i\left(i\,\text{ArcTanh}\left[\frac{d\,e-c\,f}{f}\right]+i\,\text{ArcTanh}[c+d\,x]\right)}\right]+(\pi-2\,i\,\text{ArcTanh}[c+d\,x])\,\text{Log}\left[1-e^{i\,(\pi-2\,i\,\text{ArcTanh}[c+d\,x])}\right]-(\pi-2\,i\,\text{ArcTanh}[c+d\,x])\,\text{Log}\left[2\,\text{Sin}\left[\frac{1}{2}\,(\pi-2\,i\,\text{ArcTanh}[c+d\,x])\right]\right]-2\left(i\,\text{ArcTanh}\left[\frac{d\,e-c\,f}{f}\right]+i\,\text{ArcTanh}[c+d\,x]\right)\text{Log}\left[2\,i\,\text{Sinh}\left[\text{ArcTanh}\left[\frac{d\,e-c\,f}{f}\right]+\text{ArcTanh}[c+d\,x]\right]\right]-i\,\text{PolyLog}\left[2,e^{2\,i\left(i\,\text{ArcTanh}\left[\frac{d\,e-c\,f}{f}\right]+i\,\text{ArcTanh}[c+d\,x]\right)}\right]-i\,\text{PolyLog}\left[2,e^{i\,(\pi-2\,i\,\text{ArcTanh}[c+d\,x])}\right]\right)\right)\right)-$$

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

$$\left(1-(c+d\,x)^2\right)$$

$$\left(-\frac{1}{24\,f^2}\left(i\,f\,\pi^3-8\,d\,e\,\text{ArcCoth}[c+d\,x]^3-8\,f\,\text{ArcCoth}[c+d\,x]^3+8\,c\,f\,\text{ArcCoth}[c+d\,x]^3+24\,f\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcCoth}[c+d\,x]}\right]+24\,f\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,e^{2\,\text{ArcCoth}[c+d\,x]}\right]-12\,f\,\text{PolyLog}\left[3,e^{2\,\text{ArcCoth}[c+d\,x]}\right]\right)+\right.$$

$$\frac{1}{6\,f^2\,(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}\,(-d\,e-f+c\,f)\,(-d\,e+f+c\,f)$$

$$\left(2\,d\,e\,\text{ArcCoth}[c+d\,x]^3-6\,f\,\text{ArcCoth}[c+d\,x]^3-2\,c\,f\,\text{ArcCoth}[c+d\,x]^3-\right.$$

$$4\,d\,e\,e^{-\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]}\sqrt{\frac{d^2\,e^2-2\,c\,d\,e\,f+(-1+c^2)\,f^2}{(d\,e-c\,f)^2}}\,\text{ArcCoth}[c+d\,x]^3+4\,c\,e^{-\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]}$$

$$f\sqrt{\frac{d^2\,e^2-2\,c\,d\,e\,f+(-1+c^2)\,f^2}{(d\,e-c\,f)^2}}\,\text{ArcCoth}[c+d\,x]^3+6\,i\,f\,\pi\,\text{ArcCoth}[c+d\,x]\,\text{Log}[2]-$$

$$f\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}[64]-6\,i\,f\,\pi\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[e^{-\text{ArcCoth}[c+d\,x]}+e^{\text{ArcCoth}[c+d\,x]}\right]+$$

$$6\,f\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[1-e^{\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]}\right]+$$

$$6\,f\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[1+e^{\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]}\right]+6\,f\,\text{ArcCoth}[c+d\,x]^2$$

$$\text{Log}\left[1-e^{2\left(\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\right)}\right]+12\,f\,\text{ArcCoth}[c+d\,x]\,\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]$$

$$\text{Log}\left[\frac{1}{2}\,i\,e^{-\text{ArcCoth}[c+d\,x]-\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]}\left(-1+e^{2\left(\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\right)}\right)\right]+$$

$$6\,f\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[-e^{-\text{ArcCoth}[c+d\,x]}\left(d\,e\left(-1+e^{2\,\text{ArcCoth}[c+d\,x]}\right)+\left(1+c+e^{2\,\text{ArcCoth}[c+d\,x]}-c\,e^{2\,\text{ArcCoth}[c+d\,x]}\right)f\right)\right]-6\,f\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[\frac{1}{d\,e-(1+c)\,f}\right.$$

$$\left.\left(-d\,e\left(-1+e^{2\,\text{ArcCoth}[c+d\,x]}\right)+\left(-1-e^{2\,\text{ArcCoth}[c+d\,x]}+c\left(-1+e^{2\,\text{ArcCoth}[c+d\,x]}\right)\right)f\right)\right]+$$

$$6\,i\,f\,\pi\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[\frac{1}{\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right]-6\,f\,\text{ArcCoth}[c+d\,x]^2$$

$$\text{Log}\left[-\frac{f}{\sqrt{1-\frac{1}{(c+d\,x)^2}}}-\frac{d\,e}{(c+d\,x)\sqrt{1-\frac{1}{(c+d\,x)^2}}}+\frac{c\,f}{(c+d\,x)\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right]-12\,f\,\text{ArcCoth}[$$

$$c+d\,x]\,\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\,\text{Log}\left[i\,\text{Sinh}\left[\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\right]\right]+$$

$$12\,f\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,-e^{\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]}\right]+$$

$$12\,f\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,\,e^{\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]}\right]+$$
$$6\,f\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,\,e^{2\left(\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\right)}\right]-6\,f\,\text{ArcCoth}[c+d\,x]$$
$$\text{PolyLog}\left[2,\,\frac{e^{2\,\text{ArcCoth}[c+d\,x]}\,(d\,e+f-c\,f)}{d\,e-(1+c)\,f}\right]-12\,f\,\text{PolyLog}\left[3,\,-e^{\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]}\right]-$$
$$12\,f\,\text{PolyLog}\left[3,\,e^{\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]}\right]-3\,f\,\text{PolyLog}\left[3,\,e^{2\left(\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\right)}\right]+$$
$$\left.\left.3\,f\,\text{PolyLog}\left[3,\,\frac{e^{2\,\text{ArcCoth}[c+d\,x]}\,(d\,e+f-c\,f)}{d\,e-(1+c)\,f}\right]\right)\right)$$

Problem 113: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(a+b\,\text{ArcCoth}[c+d\,x])^2}{(e+f\,x)^2}\,dx$$

Optimal (type 4, 480 leaves, 24 steps):

$$-\frac{(a+b\,\text{ArcCoth}[c+d\,x])^2}{f\,(e+f\,x)}+\frac{b^2\,d\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[\frac{2}{1-c-d\,x}\right]}{f\,(d\,e+f-c\,f)}-\frac{a\,b\,d\,\text{Log}[1-c-d\,x]}{f\,(d\,e+f-c\,f)}-$$
$$\frac{b^2\,d\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[\frac{2}{1+c+d\,x}\right]}{f\,(d\,e-f-c\,f)}+\frac{2\,b^2\,d\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[\frac{2}{1+c+d\,x}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}+\frac{a\,b\,d\,\text{Log}[1+c+d\,x]}{f\,(d\,e-f-c\,f)}+$$
$$\frac{2\,a\,b\,d\,\text{Log}[e+f\,x]}{f^2-(d\,e-c\,f)^2}-\frac{2\,b^2\,d\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}+\frac{b^2\,d\,\text{PolyLog}\left[2,\,-\frac{1+c+d\,x}{1-c-d\,x}\right]}{2\,f\,(d\,e+f-c\,f)}+$$
$$\frac{b^2\,d\,\text{PolyLog}\left[2,\,1-\frac{2}{1+c+d\,x}\right]}{2\,f\,(d\,e-f-c\,f)}-\frac{b^2\,d\,\text{PolyLog}\left[2,\,1-\frac{2}{1+c+d\,x}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}+\frac{b^2\,d\,\text{PolyLog}\left[2,\,1-\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}$$

Result (type 4, 806 leaves):

$$-\frac{a^2}{f\,(e+f\,x)}+\frac{1}{d\,(e+f\,x)^2}2\,a\,b\,\left(1-(c+d\,x)^2\right)\left(\frac{f}{\sqrt{1-\frac{1}{(c+d\,x)^2}}}+\frac{d\,e-c\,f}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right)^2$$
$$\left(\frac{(-d\,e+c\,f)\,\text{ArcCoth}[c+d\,x]}{f\,(-d\,e-f+c\,f)\,(-d\,e+f+c\,f)}-\text{ArcCoth}[c+d\,x]\middle/\left(f\,(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}\right.\right.$$

$$\left(-\frac{f}{\sqrt{1-\frac{1}{(c+d x)^2}}}-\frac{d e}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{c f}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}\right)\Bigg)+$$

$$\left.\frac{\text{Log}\left[-\frac{f}{\sqrt{1-\frac{1}{(c+d x)^2}}}-\frac{d e}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{c f}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}\right]}{d^2 e^2-2 c d e f-f^2+c^2 f^2}\right)+$$

$$\frac{1}{d f (e+f x)^2} b^2 \left(1-(c+d x)^2\right) \left(\frac{f}{\sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{d e-c f}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}\right)^2$$

$$\left(\frac{e^{\text{ArcTanh}\left[\frac{f}{-d e+c f}\right]} \text{ArcCoth}[c+d x]^2}{(-d e+c f) \sqrt{1-\frac{f^2}{(d e-c f)^2}}}+\frac{\text{ArcCoth}[c+d x]^2}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}} \left(\frac{f}{\sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{d e-c f}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}\right)}+\right.$$

$$\frac{1}{d^2 e^2-2 c d e f+\left(-1+c^2\right) f^2} f \left(i \pi \text{ArcCoth}[c+d x]+2 \text{ArcCoth}[c+d x] \text{ArcTanh}\left[\frac{f}{d e-c f}\right]-\right.$$

$$i \pi \text{Log}\left[1+e^{2 \text{ArcCoth}[c+d x]}\right]+2 \text{ArcCoth}[c+d x] \text{Log}\left[1-e^{-2 \left(\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]\right)}\right]-$$

$$2 \text{ArcTanh}\left[\frac{f}{-d e+c f}\right] \text{Log}\left[1-e^{-2 \left(\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]\right)}\right]+i \pi \text{Log}\left[\frac{1}{\sqrt{1-\frac{1}{(c+d x)^2}}}\right]+$$

$$2 \text{ArcTanh}\left[\frac{f}{-d e+c f}\right] \text{Log}\left[i \text{Sinh}\left[\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]\right]\right]-$$

$$\left.\left.\text{PolyLog}\left[2, e^{-2 \left(\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]\right)}\right]\right)\right)$$

Problem 114: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

$$\int (e+f x)^2 (a+b \text{ArcCoth}[c+d x])^3 \, dx$$

Optimal (type 4, 546 leaves, 21 steps):

$$\frac{a b^2 f^2 x}{d^2}+\frac{b^3 f^2 (c+d x) \text{ArcCoth}[c+d x]}{d^3}-\frac{b f^2 (a+b \text{ArcCoth}[c+d x])^2}{2 d^3}+\frac{3 b f (d e-c f) (a+b \text{ArcCoth}[c+d x])^2}{d^3}+\frac{3 b f (d e-c f) (c+d x) (a+b \text{ArcCoth}[c+d x])^2}{d^3}+\frac{b f^2 (c+d x)^2 (a+b \text{ArcCoth}[c+d x])^2}{2 d^3}-\frac{(d e-c f) \left(d^2 e^2-2 c d e f+(3+c^2) f^2\right) (a+b \text{ArcCoth}[c+d x])^3}{3 d^3 f}+\frac{\left(3 d^2 e^2-6 c d e f+(1+3 c^2) f^2\right) (a+b \text{ArcCoth}[c+d x])^3}{3 d^3}+\frac{(e+f x)^3 (a+b \text{ArcCoth}[c+d x])^3}{3 f}-\frac{6 b^2 f (d e-c f) (a+b \text{ArcCoth}[c+d x]) \text{Log}\left[\frac{2}{1-c-d x}\right]}{d^3}-\frac{1}{d^3} b \left(3 d^2 e^2-6 c d e f+(1+3 c^2) f^2\right) (a+b \text{ArcCoth}[c+d x])^2 \text{Log}\left[\frac{2}{1-c-d x}\right]+\frac{b^3 f^2 \text{Log}\left[1-(c+d x)^2\right]}{2 d^3}-\frac{3 b^3 f (d e-c f) \text{PolyLog}\left[2,-\frac{1+c+d x}{1-c-d x}\right]}{d^3}-\frac{1}{d^3} b^2 \left(3 d^2 e^2-6 c d e f+(1+3 c^2) f^2\right) (a+b \text{ArcCoth}[c+d x]) \text{PolyLog}\left[2,1-\frac{2}{1-c-d x}\right]+\frac{b^3 \left(3 d^2 e^2-6 c d e f+(1+3 c^2) f^2\right) \text{PolyLog}\left[3,1-\frac{2}{1-c-d x}\right]}{2 d^3}$$

Result (type 4, 2594 leaves):

$$\frac{a^2 \left(a d^2 e^2+3 b d e f-2 b c f^2\right) x}{d^2}+\frac{a^2 f (2 a d e+b f) x^2}{2 d}+\frac{1}{3} a^3 f^2 x^3+a^2 b x \left(3 e^2+3 e f x+f^2 x^2\right) \text{ArcCoth}[c+d x]+\frac{1}{2 d^3}\left(3 a^2 b d^2 e^2-3 a^2 b c d^2 e^2+3 a^2 b d e f-6 a^2 b c d e f+3 a^2 b c^2 d e f+a^2 b f^2-3 a^2 b c f^2+3 a^2 b c^2 f^2-a^2 b c^3 f^2\right) \text{Log}[1-c-d x]+\frac{1}{2 d^3}\left(3 a^2 b d^2 e^2+3 a^2 b c d^2 e^2-3 a^2 b d e f-6 a^2 b c d e f-3 a^2 b c^2 d e f+a^2 b f^2+3 a^2 b c f^2+3 a^2 b c^2 f^2+a^2 b c^3 f^2\right) \text{Log}[1+c+d x]+\left(3 a b^2 e^2 \left(1-(c+d x)^2\right) \left(\text{ArcCoth}[c+d x] \left(\text{ArcCoth}[c+d x]-(c+d x) \text{ArcCoth}[c+d x]+2 \text{Log}\left[1-e^{-2 \text{ArcCoth}[c+d x]}\right]\right)-\text{PolyLog}\left[2,e^{-2 \text{ArcCoth}[c+d x]}\right]\right)\right) \Big/ \left(d (c+d x)^2 \left(1-\frac{1}{(c+d x)^2}\right)\right)-$$

$$\left(3 a b^2 e f \left(1-(c+d x)^2\right) \left(2 c \text{ArcCoth}[c+d x]^2+(c+d x)^2 \left(1-\frac{1}{(c+d x)^2}\right) \text{ArcCoth}[c+d x]^2-\right.\right.$$

$$2 (c+d x) \text{ArcCoth}[c+d x] (-1+c \text{ArcCoth}[c+d x])+$$

$$4 c \text{ArcCoth}[c+d x] \text{Log}\left[1-e^{-2 \text{ArcCoth}[c+d x]}\right]-2 \text{Log}\left[\frac{1}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}\right]-$$

$$\left.\left.2 c \text{PolyLog}\left[2, e^{-2 \text{ArcCoth}[c+d x]}\right]\right)\right) \Big/ \left(d^2 (c+d x)^2 \left(1-\frac{1}{(c+d x)^2}\right)\right)+$$

$$\left(b^3 e^2 \left(1-(c+d x)^2\right) \left(\frac{i \pi^3}{8}-\text{ArcCoth}[c+d x]^3-(c+d x) \text{ArcCoth}[c+d x]^3+\right.\right.$$

$$3 \text{ArcCoth}[c+d x]^2 \text{Log}\left[1-e^{2 \text{ArcCoth}[c+d x]}\right]+3 \text{ArcCoth}[c+d x] \text{PolyLog}\left[2, e^{2 \text{ArcCoth}[c+d x]}\right]-$$

$$\left.\left.\frac{3}{2} \text{PolyLog}\left[3, e^{2 \text{ArcCoth}[c+d x]}\right]\right)\right) \Big/ \left(d (c+d x)^2 \left(1-\frac{1}{(c+d x)^2}\right)\right)-$$

$$\frac{1}{4 d^2 (c+d x)^2 \left(1-\frac{1}{(c+d x)^2}\right)} b^3 e f \left(1-(c+d x)^2\right) \left(i c \pi^3-12 \text{ArcCoth}[c+d x]^2+\right.$$

$$12 (c+d x) \text{ArcCoth}[c+d x]^2-8 c \text{ArcCoth}[c+d x]^3-8 c (c+d x) \text{ArcCoth}[c+d x]^3+$$

$$4 (c+d x)^2 \left(1-\frac{1}{(c+d x)^2}\right) \text{ArcCoth}[c+d x]^3-24 \text{ArcCoth}[c+d x] \text{Log}\left[1-e^{-2 \text{ArcCoth}[c+d x]}\right]+$$

$$24 c \text{ArcCoth}[c+d x]^2 \text{Log}\left[1-e^{2 \text{ArcCoth}[c+d x]}\right]+12 \text{PolyLog}\left[2, e^{-2 \text{ArcCoth}[c+d x]}\right]+$$

$$\left.24 c \text{ArcCoth}[c+d x] \text{PolyLog}\left[2, e^{2 \text{ArcCoth}[c+d x]}\right]-12 c \text{PolyLog}\left[3, e^{2 \text{ArcCoth}[c+d x]}\right]\right)-$$

$$\frac{1}{4 d^3} a b^2 f^2 (c+d x) \sqrt{1-\frac{1}{(c+d x)^2}} \left(1-(c+d x)^2\right) \left(\frac{4 \text{ArcCoth}[c+d x]}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}+\right.$$

$$\frac{3 \text{ArcCoth}[c+d x]^2}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}-\frac{12 c \text{ArcCoth}[c+d x]^2}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{9 c^2 \text{ArcCoth}[c+d x]^2}{(c+d x) \sqrt{1-\frac{1}{(c+d x)^2}}}+$$

$$\frac{1}{\sqrt{1-\frac{1}{(c+d x)^2}}} \left(-1+6 c \text{ArcCoth}[c+d x]+3 \text{ArcCoth}[c+d x]^2-3 c^2 \text{ArcCoth}[c+d x]^2\right)+$$

$$\text{Cosh}[3 \text{ArcCoth}[c+d x]]-6 c \text{ArcCoth}[c+d x] \text{Cosh}[3 \text{ArcCoth}[c+d x]]+$$

$$\text{ArcCoth}[c+d x]^2 \text{Cosh}[3 \text{ArcCoth}[c+d x]]+3 c^2 \text{ArcCoth}[c+d x]^2 \text{Cosh}[3 \text{ArcCoth}[c+d x]]+$$

$$\frac{6\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[c+d\,x]}\right]}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}+\frac{18\,c^2\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[c+d\,x]}\right]}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}-$$

$$\frac{18\,c\,\text{Log}\left[\frac{1}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right]}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}+\frac{4\,(1+3\,c^2)\,\text{PolyLog}\left[2,\,e^{-2\,\text{ArcCoth}[c+d\,x]}\right]}{(c+d\,x)^3\,\left(1-\frac{1}{(c+d\,x)^2}\right)^{3/2}}-$$

$$\text{ArcCoth}[c+d\,x]^2\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]-3\,c^2\,\text{ArcCoth}[c+d\,x]^2\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]-$$
$$2\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[c+d\,x]}\right]\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]-$$
$$6\,c^2\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[c+d\,x]}\right]\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]+$$

$$\left.6\,c\,\text{Log}\left[\frac{1}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right]\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]\right)+$$

$$\frac{1}{d^3\,(c+d\,x)^2\,\left(1-\frac{1}{(c+d\,x)^2}\right)}\,b^3\,f^2\,\left(1-(c+d\,x)^2\right)\,\left(3\,c\,\text{PolyLog}\left[2,\,e^{-2\,\text{ArcCoth}[c+d\,x]}\right]+\right.$$

$$\frac{1}{96}\,(c+d\,x)^3\,\left(1-\frac{1}{(c+d\,x)^2}\right)^{3/2}\,\left(-\frac{3\,i\,\pi^3}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}-\frac{9\,i\,c^2\,\pi^3}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}+\right.$$

$$\frac{24\,\text{ArcCoth}[c+d\,x]}{\sqrt{1-\frac{1}{(c+d\,x)^2}}}-\frac{72\,c\,\text{ArcCoth}[c+d\,x]^2}{\sqrt{1-\frac{1}{(c+d\,x)^2}}}-\frac{48\,\text{ArcCoth}[c+d\,x]^2}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}+$$

$$\frac{216\,c\,\text{ArcCoth}[c+d\,x]^2}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}-\frac{24\,\text{ArcCoth}[c+d\,x]^3}{\sqrt{1-\frac{1}{(c+d\,x)^2}}}+\frac{24\,c^2\,\text{ArcCoth}[c+d\,x]^3}{\sqrt{1-\frac{1}{(c+d\,x)^2}}}+$$

$$\frac{24\,\text{ArcCoth}[c+d\,x]^3}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}+\frac{96\,c\,\text{ArcCoth}[c+d\,x]^3}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}+\frac{72\,c^2\,\text{ArcCoth}[c+d\,x]^3}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}-24\,\text{ArcCoth}[$$

$$c+d\,x]\,\text{Cosh}[3\,\text{ArcCoth}[c+d\,x]]+72\,c\,\text{ArcCoth}[c+d\,x]^2\,\text{Cosh}[3\,\text{ArcCoth}[c+d\,x]]-$$
$$8\,\text{ArcCoth}[c+d\,x]^3\,\text{Cosh}[3\,\text{ArcCoth}[c+d\,x]]-24\,c^2\,\text{ArcCoth}[c+d\,x]^3$$

$$\text{Cosh}[3\,\text{ArcCoth}[c+d\,x]]+\frac{432\,c\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[c+d\,x]}\right]}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}-$$

$$\frac{72\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcCoth}[c+d\,x]}\right]}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}-$$

$$\frac{216\,c^2\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcCoth}[c+d\,x]}\right]}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}-\frac{72\,\text{Log}\left[\frac{1}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right]}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}+$$

$$\frac{96\,(1+3\,c^2)\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcCoth}[c+d\,x]}\right]}{(c+d\,x)^3\,\left(1-\frac{1}{(c+d\,x)^2}\right)^{3/2}}-$$

$$\frac{48\,(1+3\,c^2)\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcCoth}[c+d\,x]}\right]}{(c+d\,x)^3\,\left(1-\frac{1}{(c+d\,x)^2}\right)^{3/2}}+i\,\pi^3\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]+$$

$$3\,i\,c^2\,\pi^3\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]-72\,c\,\text{ArcCoth}[c+d\,x]^2\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]-$$
$$8\,\text{ArcCoth}[c+d\,x]^3\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]-$$
$$24\,c^2\,\text{ArcCoth}[c+d\,x]^3\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]-$$
$$144\,c\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[c+d\,x]}\right]\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]+$$
$$24\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcCoth}[c+d\,x]}\right]\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]+$$
$$72\,c^2\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcCoth}[c+d\,x]}\right]\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]+$$

$$\left.\left.24\,\text{Log}\left[\frac{1}{(c+d\,x)\,\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right]\,\text{Sinh}[3\,\text{ArcCoth}[c+d\,x]]\right)\right)$$

Problem 115: Result unnecessarily involves imaginary or complex numbers.

$$\int (e+f\,x)\,(a+b\,\text{ArcCoth}[c+d\,x])^3\,dx$$

Optimal (type 4, 326 leaves, 15 steps):

$$\frac{3\,b\,f\,\left(a+b\,\text{ArcCoth}[c+d\,x]\right)^2}{2\,d^2}+\frac{3\,b\,f\,\left(c+d\,x\right)\,\left(a+b\,\text{ArcCoth}[c+d\,x]\right)^2}{2\,d^2}+$$

$$\frac{\left(d\,e-c\,f\right)\,\left(a+b\,\text{ArcCoth}[c+d\,x]\right)^3}{d^2}-\frac{\left(d^2\,e^2-2\,c\,d\,e\,f+\left(1+c^2\right)\,f^2\right)\,\left(a+b\,\text{ArcCoth}[c+d\,x]\right)^3}{2\,d^2\,f}+$$

$$\frac{\left(e+f\,x\right)^2\,\left(a+b\,\text{ArcCoth}[c+d\,x]\right)^3}{2\,f}-\frac{3\,b^2\,f\,\left(a+b\,\text{ArcCoth}[c+d\,x]\right)\,\text{Log}\left[\frac{2}{1-c-d\,x}\right]}{d^2}-$$

$$\frac{3\,b\,\left(d\,e-c\,f\right)\,\left(a+b\,\text{ArcCoth}[c+d\,x]\right)^2\,\text{Log}\left[\frac{2}{1-c-d\,x}\right]}{d^2}-\frac{3\,b^3\,f\,\text{PolyLog}\left[2,\,-\frac{1+c+d\,x}{1-c-d\,x}\right]}{2\,d^2}-$$

$$\frac{3\,b^2\,\left(d\,e-c\,f\right)\,\left(a+b\,\text{ArcCoth}[c+d\,x]\right)\,\text{PolyLog}\left[2,\,1-\frac{2}{1-c-d\,x}\right]}{d^2}+$$

$$\frac{3\,b^3\,\left(d\,e-c\,f\right)\,\text{PolyLog}\left[3,\,1-\frac{2}{1-c-d\,x}\right]}{2\,d^2}$$

Result (type 4, 600 leaves) :

$$\frac{1}{4 d^2}\left(2 a^2 (2 a d e + 3 b f - 2 a c f)(c + d x) + 2 a^3 f (c + d x)^2 - \right.$$
$$6 a^2 b (c + d x)(c f - d (2 e + f x)) \text{ArcCoth}[c + d x] + 3 a^2 b (2 d e + f - 2 c f) \text{Log}[1 - c - d x] +$$
$$3 a^2 b (2 d e - (1 + 2 c) f) \text{Log}[1 + c + d x] + 12 a b^2 f \left((c + d x) \text{ArcCoth}[c + d x] + \right.$$
$$\left.\frac{1}{2}\left(-1 + (c + d x)^2\right) \text{ArcCoth}[c + d x]^2 - \text{Log}\left[\frac{1}{(c + d x)\sqrt{1 - \frac{1}{(c+d x)^2}}}\right]\right) +$$
$$12 a b^2 d e \left(\text{ArcCoth}[c + d x] \left((-1 + c + d x) \text{ArcCoth}[c + d x] - 2 \text{Log}\left[1 - e^{-2 \text{ArcCoth}[c+d x]}\right]\right) + \text{PolyLog}\left[2, e^{-2 \text{ArcCoth}[c+d x]}\right]\right) -$$
$$12 a b^2 c f \left(\text{ArcCoth}[c + d x] \left((-1 + c + d x) \text{ArcCoth}[c + d x] - 2 \text{Log}\left[1 - e^{-2 \text{ArcCoth}[c+d x]}\right]\right) + \text{PolyLog}\left[2, e^{-2 \text{ArcCoth}[c+d x]}\right]\right) +$$
$$2 b^3 f \left(\text{ArcCoth}[c + d x] \left(3 (-1 + c + d x) \text{ArcCoth}[c + d x] + (-1 + c^2 + 2 c d x + d^2 x^2) \text{ArcCoth}[c + d x]^2 - 6 \text{Log}\left[1 - e^{-2 \text{ArcCoth}[c+d x]}\right]\right) + 3 \text{PolyLog}\left[2, e^{-2 \text{ArcCoth}[c+d x]}\right]\right) +$$
$$4 b^3 d e \left(-\frac{i \pi^3}{8} + \text{ArcCoth}[c + d x]^3 + (c + d x) \text{ArcCoth}[c + d x]^3 - 3 \text{ArcCoth}[c + d x]^2 \text{Log}\left[1 - e^{2 \text{ArcCoth}[c+d x]}\right] - 3 \text{ArcCoth}[c + d x] \text{PolyLog}\left[2, e^{2 \text{ArcCoth}[c+d x]}\right] + \frac{3}{2} \text{PolyLog}\left[3, e^{2 \text{ArcCoth}[c+d x]}\right]\right) -$$
$$\left.4 b^3 c f \left(-\frac{i \pi^3}{8} + \text{ArcCoth}[c + d x]^3 + (c + d x) \text{ArcCoth}[c + d x]^3 - 3 \text{ArcCoth}[c + d x]^2 \text{Log}\left[1 - e^{2 \text{ArcCoth}[c+d x]}\right] - 3 \text{ArcCoth}[c + d x] \text{PolyLog}\left[2, e^{2 \text{ArcCoth}[c+d x]}\right] + \frac{3}{2} \text{PolyLog}\left[3, e^{2 \text{ArcCoth}[c+d x]}\right]\right)\right)$$

Problem 116: Result unnecessarily involves imaginary or complex numbers.

$$\int (a + b \text{ArcCoth}[c + d x])^3 \, dx$$

Optimal (type 4, 132 leaves, 6 steps):

$$\frac{(a+b\,\text{ArcCoth}[c+d\,x])^3}{d}+\frac{(c+d\,x)\,(a+b\,\text{ArcCoth}[c+d\,x])^3}{d}-\frac{3\,b\,(a+b\,\text{ArcCoth}[c+d\,x])^2\,\text{Log}\left[\frac{2}{1-c-d\,x}\right]}{d}-\frac{3\,b^2\,(a+b\,\text{ArcCoth}[c+d\,x])\,\text{PolyLog}\left[2,1-\frac{2}{1-c-d\,x}\right]}{d}+\frac{3\,b^3\,\text{PolyLog}\left[3,1-\frac{2}{1-c-d\,x}\right]}{2\,d}$$

Result (type 4, 208 leaves):

$$\frac{1}{2\,d}\Bigg(2\,a^3\,(c+d\,x)+6\,a^2\,b\,(c+d\,x)\,\text{ArcCoth}[c+d\,x]+3\,a^2\,b\,\text{Log}\left[1-(c+d\,x)^2\right]+6\,a\,b^2\,\Big(\text{ArcCoth}[c+d\,x]\,\left((-1+c+d\,x)\,\text{ArcCoth}[c+d\,x]-2\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[c+d\,x]}\right]\right)+\text{PolyLog}\left[2,e^{-2\,\text{ArcCoth}[c+d\,x]}\right]\Big)+2\,b^3\,\Big(-\frac{i\,\pi^3}{8}+\text{ArcCoth}[c+d\,x]^3+(c+d\,x)\,\text{ArcCoth}[c+d\,x]^3-3\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcCoth}[c+d\,x]}\right]-3\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,e^{2\,\text{ArcCoth}[c+d\,x]}\right]+\frac{3}{2}\,\text{PolyLog}\left[3,e^{2\,\text{ArcCoth}[c+d\,x]}\right]\Big)\Bigg)$$

Problem 117: Unable to integrate problem.

$$\int\frac{(a+b\,\text{ArcCoth}[c+d\,x])^3}{e+f\,x}\,dx$$

Optimal (type 4, 308 leaves, 2 steps):

$$-\frac{(a+b\,\text{ArcCoth}[c+d\,x])^3\,\text{Log}\left[\frac{2}{1+c+d\,x}\right]}{f}+\frac{(a+b\,\text{ArcCoth}[c+d\,x])^3\,\text{Log}\left[\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{f}+\frac{3\,b\,(a+b\,\text{ArcCoth}[c+d\,x])^2\,\text{PolyLog}\left[2,1-\frac{2}{1+c+d\,x}\right]}{2\,f}-\frac{3\,b\,(a+b\,\text{ArcCoth}[c+d\,x])^2\,\text{PolyLog}\left[2,1-\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{2\,f}+\frac{3\,b^2\,(a+b\,\text{ArcCoth}[c+d\,x])\,\text{PolyLog}\left[3,1-\frac{2}{1+c+d\,x}\right]}{2\,f}-\frac{3\,b^2\,(a+b\,\text{ArcCoth}[c+d\,x])\,\text{PolyLog}\left[3,1-\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{2\,f}+\frac{3\,b^3\,\text{PolyLog}\left[4,1-\frac{2}{1+c+d\,x}\right]}{4\,f}-\frac{3\,b^3\,\text{PolyLog}\left[4,1-\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{4\,f}$$

Result (type 8, 22 leaves):

$$\int\frac{(a+b\,\text{ArcCoth}[c+d\,x])^3}{e+f\,x}\,dx$$

Problem 118: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a+b\,\text{ArcCoth}[c+d\,x])^3}{(e+f\,x)^2}\,dx$$

Optimal (type 4, 1089 leaves, 33 steps):

$$-\frac{(a+b\,\text{ArcCoth}[c+d\,x])^3}{f\,(e+f\,x)}+\frac{3\,a\,b^2\,d\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[\frac{2}{1-c-d\,x}\right]}{f\,(d\,e+f-c\,f)}+\frac{3\,b^3\,d\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[\frac{2}{1-c-d\,x}\right]}{2\,f\,(d\,e+f-c\,f)}-\frac{3\,a^2\,b\,d\,\text{Log}[1-c-d\,x]}{2\,f\,(d\,e+f-c\,f)}-\frac{3\,a\,b^2\,d\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[\frac{2}{1+c+d\,x}\right]}{f\,(d\,e-f-c\,f)}+\frac{6\,a\,b^2\,d\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[\frac{2}{1+c+d\,x}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}-\frac{3\,b^3\,d\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[\frac{2}{1+c+d\,x}\right]}{2\,f\,(d\,e-f-c\,f)}+\frac{3\,b^3\,d\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[\frac{2}{1+c+d\,x}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}+\frac{3\,a^2\,b\,d\,\text{Log}[1+c+d\,x]}{2\,f\,(d\,e-f-c\,f)}+\frac{3\,a^2\,b\,d\,\text{Log}[e+f\,x]}{f^2-(d\,e-c\,f)^2}-\frac{6\,a\,b^2\,d\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}-\frac{3\,b^3\,d\,\text{ArcCoth}[c+d\,x]^2\,\text{Log}\left[\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}+\frac{3\,a\,b^2\,d\,\text{PolyLog}\left[2,-\frac{1+c+d\,x}{1-c-d\,x}\right]}{2\,f\,(d\,e+f-c\,f)}+\frac{3\,b^3\,d\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,1-\frac{2}{1-c-d\,x}\right]}{2\,f\,(d\,e+f-c\,f)}+\frac{3\,a\,b^2\,d\,\text{PolyLog}\left[2,1-\frac{2}{1+c+d\,x}\right]}{2\,f\,(d\,e-f-c\,f)}-\frac{3\,a\,b^2\,d\,\text{PolyLog}\left[2,1-\frac{2}{1+c+d\,x}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}+\frac{3\,b^3\,d\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,1-\frac{2}{1+c+d\,x}\right]}{2\,f\,(d\,e-f-c\,f)}-\frac{3\,b^3\,d\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,1-\frac{2}{1+c+d\,x}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}+\frac{3\,a\,b^2\,d\,\text{PolyLog}\left[2,1-\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}+\frac{3\,b^3\,d\,\text{ArcCoth}[c+d\,x]\,\text{PolyLog}\left[2,1-\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}-\frac{3\,b^3\,d\,\text{PolyLog}\left[3,1-\frac{2}{1-c-d\,x}\right]}{4\,f\,(d\,e+f-c\,f)}+\frac{3\,b^3\,d\,\text{PolyLog}\left[3,1-\frac{2}{1+c+d\,x}\right]}{4\,f\,(d\,e-f-c\,f)}-\frac{3\,b^3\,d\,\text{PolyLog}\left[3,1-\frac{2}{1+c+d\,x}\right]}{2\,(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}+\frac{3\,b^3\,d\,\text{PolyLog}\left[3,1-\frac{2\,d\,(e+f\,x)}{(d\,e+f-c\,f)\,(1+c+d\,x)}\right]}{2\,(d\,e+f-c\,f)\,(d\,e-(1+c)\,f)}$$

Result (type 4, 1816 leaves):

$$-\frac{a^3}{f\,(e+f\,x)}-\frac{3\,a^2\,b\,\text{ArcCoth}[c+d\,x]}{f\,(e+f\,x)}+\frac{3\,a^2\,b\,d\,\text{Log}[1-c-d\,x]}{2\,f\,(-d\,e-f+c\,f)}-$$

$$\frac{3\,a^2\,b\,d\,\text{Log}[1+c+d\,x]}{2\,f\,\left(-d\,e+f+c\,f\right)}-\frac{3\,a^2\,b\,d\,\text{Log}[e+f\,x]}{d^2\,e^2-2\,c\,d\,e\,f-f^2+c^2\,f^2}+$$

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

$$\left(\frac{e^{\text{ArcTanh}\left[\frac{f}{-d\,e+c\,f}\right]}\,\text{ArcCoth}[c+d\,x]^2}{\left(-d\,e+c\,f\right)\sqrt{1-\frac{f^2}{(d\,e-c\,f)^2}}}+\frac{\text{ArcCoth}[c+d\,x]^2}{\left(c+d\,x\right)\sqrt{1-\frac{1}{(c+d\,x)^2}}\left(\frac{f}{\sqrt{1-\frac{1}{(c+d\,x)^2}}}+\frac{d\,e-c\,f}{(c+d\,x)\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right)}+\right.$$

$$\frac{1}{d^2\,e^2-2\,c\,d\,e\,f+\left(-1+c^2\right)\,f^2}\,f\left(i\,\pi\,\text{ArcCoth}[c+d\,x]+2\,\text{ArcCoth}[c+d\,x]\,\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]-\right.$$

$$i\,\pi\,\text{Log}\left[1+e^{2\,\text{ArcCoth}[c+d\,x]}\right]+2\,\text{ArcCoth}[c+d\,x]\,\text{Log}\left[1-e^{-2\left(\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\right)}\right]-$$

$$2\,\text{ArcTanh}\left[\frac{f}{-d\,e+c\,f}\right]\,\text{Log}\left[1-e^{-2\left(\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\right)}\right]+i\,\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\frac{1}{(c+d\,x)^2}}}\right]+$$

$$2\,\text{ArcTanh}\left[\frac{f}{-d\,e+c\,f}\right]\,\text{Log}\left[i\,\text{Sinh}\left[\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\right]\right]-$$

$$\left.\left.\text{PolyLog}\left[2,\,e^{-2\left(\text{ArcCoth}[c+d\,x]+\text{ArcTanh}\left[\frac{f}{d\,e-c\,f}\right]\right)}\right]\right)\right)+$$

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

$$\left(-\left(\text{ArcCoth}[c+d\,x]^3\middle/\left(f\,\left(c+d\,x\right)\sqrt{1-\frac{1}{\left(c+d\,x\right)^2}}\right.\right.\right.$$

$$\left(-\frac{f}{\sqrt{1-\frac{1}{(c+d x)^2}}}-\frac{d e}{(c+d x)\sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{c f}{(c+d x)\sqrt{1-\frac{1}{(c+d x)^2}}}\right)\Bigg)\Bigg)\Bigg)+$$

$$\frac{1}{2 f\left(d e+f-c f\right)\left(d e-(1+c) f\right)}\Bigg(2 d e \text{ArcCoth}[c+d x]^3-6 f \text{ArcCoth}[c+d x]^3-$$

$$2 c f \text{ArcCoth}[c+d x]^3-4 d e\, e^{-\text{ArcTanh}\left[\frac{f}{d e-c f}\right]}\sqrt{\frac{d^2 e^2-2 c d e f+\left(-1+c^2\right) f^2}{(d e-c f)^2}}$$

$$\text{ArcCoth}[c+d x]^3+4 c\, e^{-\text{ArcTanh}\left[\frac{f}{d e-c f}\right]} f\sqrt{\frac{d^2 e^2-2 c d e f+\left(-1+c^2\right) f^2}{(d e-c f)^2}}\ \text{ArcCoth}[c+d x]^3+$$

$$6 i f \pi \text{ArcCoth}[c+d x] \text{Log}[2]-f \text{ArcCoth}[c+d x]^2 \text{Log}[64]-6 i f \pi \text{ArcCoth}[c+d x] \text{Log}\Big[$$
$$e^{-\text{ArcCoth}[c+d x]}+e^{\text{ArcCoth}[c+d x]}\Big]+6 f \text{ArcCoth}[c+d x]^2 \text{Log}\left[1-e^{\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]}\right]+$$
$$6 f \text{ArcCoth}[c+d x]^2 \text{Log}\left[1+e^{\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]}\right]+6 f \text{ArcCoth}[c+d x]^2$$
$$\text{Log}\left[1-e^{2\left(\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]\right)}\right]+12 f \text{ArcCoth}[c+d x] \text{ArcTanh}\left[\frac{f}{d e-c f}\right]$$
$$\text{Log}\left[\frac{1}{2} i\, e^{-\text{ArcCoth}[c+d x]-\text{ArcTanh}\left[\frac{f}{d e-c f}\right]}\left(-1+e^{2\left(\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]\right)}\right)\right]+$$
$$6 f \text{ArcCoth}[c+d x]^2 \text{Log}\Big[-e^{-\text{ArcCoth}[c+d x]}\Big(d e\left(-1+e^{2 \text{ArcCoth}[c+d x]}\right)+\Big(1+c+$$
$$e^{2 \text{ArcCoth}[c+d x]}-c\, e^{2 \text{ArcCoth}[c+d x]}\Big) f\Big)\Big]-6 f \text{ArcCoth}[c+d x]^2 \text{Log}\Big[\frac{1}{d e-(1+c) f}$$
$$\left(-d e\left(-1+e^{2 \text{ArcCoth}[c+d x]}\right)+\left(-1-e^{2 \text{ArcCoth}[c+d x]}+c\left(-1+e^{2 \text{ArcCoth}[c+d x]}\right)\right) f\right)\Big]+$$
$$6 i f \pi \text{ArcCoth}[c+d x] \text{Log}\left[\frac{1}{\sqrt{1-\frac{1}{(c+d x)^2}}}\right]-6 f \text{ArcCoth}[c+d x]^2$$
$$\text{Log}\left[-\frac{f}{\sqrt{1-\frac{1}{(c+d x)^2}}}-\frac{d e}{(c+d x)\sqrt{1-\frac{1}{(c+d x)^2}}}+\frac{c f}{(c+d x)\sqrt{1-\frac{1}{(c+d x)^2}}}\right]-12 f$$
$$\text{ArcCoth}[c+d x] \text{ArcTanh}\left[\frac{f}{d e-c f}\right] \text{Log}\left[i \text{Sinh}\left[\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]\right]\right]+$$
$$12 f \text{ArcCoth}[c+d x] \text{PolyLog}\left[2,-e^{\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]}\right]+$$
$$12 f \text{ArcCoth}[c+d x] \text{PolyLog}\left[2, e^{\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]}\right]+$$
$$6 f \text{ArcCoth}[c+d x] \text{PolyLog}\left[2, e^{2\left(\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]\right)}\right]-6 f \text{ArcCoth}[c+d x]$$
$$\text{PolyLog}\left[2, \frac{e^{2 \text{ArcCoth}[c+d x]}(d e+f-c f)}{d e-(1+c) f}\right]-12 f \text{PolyLog}\left[3,-e^{\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]}\right]-$$
$$12 f \text{PolyLog}\left[3, e^{\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]}\right]-3 f \text{PolyLog}\left[3, e^{2\left(\text{ArcCoth}[c+d x]+\text{ArcTanh}\left[\frac{f}{d e-c f}\right]\right)}\right]+$$

$$3\,f\,\text{PolyLog}\left[3,\frac{e^{2\,\text{ArcCoth}[c+d\,x]}\left(d\,e+f-c\,f\right)}{d\,e-\left(1+c\right)\,f}\right]\Bigg)\Bigg)$$

Problem 119: Unable to integrate problem.

$$\int\left(e+f\,x\right)^m\left(a+b\,\text{ArcCoth}[c+d\,x]\right)\,dx$$

Optimal (type 5, 162 leaves, 6 steps):

$$\frac{\left(e+f\,x\right)^{1+m}\left(a+b\,\text{ArcCoth}[c+d\,x]\right)}{f\left(1+m\right)}+\frac{b\,d\left(e+f\,x\right)^{2+m}\,\text{Hypergeometric2F1}\left[1,2+m,3+m,\frac{d\,(e+f\,x)}{d\,e-f-c\,f}\right]}{2\,f\left(d\,e-\left(1+c\right)\,f\right)\left(1+m\right)\left(2+m\right)}-\frac{b\,d\left(e+f\,x\right)^{2+m}\,\text{Hypergeometric2F1}\left[1,2+m,3+m,\frac{d\,(e+f\,x)}{d\,e+f-c\,f}\right]}{2\,f\left(d\,e+f-c\,f\right)\left(1+m\right)\left(2+m\right)}$$

Result (type 8, 20 leaves):

$$\int\left(e+f\,x\right)^m\left(a+b\,\text{ArcCoth}[c+d\,x]\right)\,dx$$

Problem 123: Unable to integrate problem.

$$\int\frac{\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)^3}{1-c^2\,x^2}\,dx$$

Optimal (type 4, 460 leaves, 9 steps):

$$-\frac{2\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)^3\text{ArcCoth}\left[1-\frac{2}{1-\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}}\right]}{c}-\frac{3\,b\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)^2\text{PolyLog}\left[2,1-\frac{2}{1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}}\right]}{2\,c}+$$

$$\frac{3\,b\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)^2\text{PolyLog}\left[2,1-\frac{2\sqrt{1-c\,x}}{\sqrt{1+c\,x}\left(1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right)}\right]}{2\,c}-$$

$$\frac{3\,b^2\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)\text{PolyLog}\left[3,1-\frac{2}{1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}}\right]}{2\,c}+$$

$$\frac{3\,b^2\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)\text{PolyLog}\left[3,1-\frac{2\sqrt{1-c\,x}}{\sqrt{1+c\,x}\left(1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right)}\right]}{2\,c}-$$

$$\frac{3\,b^3\,\text{PolyLog}\left[4,1-\frac{2}{1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}}\right]}{4\,c}+\frac{3\,b^3\,\text{PolyLog}\left[4,1-\frac{2\sqrt{1-c\,x}}{\sqrt{1+c\,x}\left(1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right)}\right]}{4\,c}$$

Result (type 8, 42 leaves) :

$$\int\frac{\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)^3}{1-c^2\,x^2}\,dx$$

Problem 124: Unable to integrate problem.

$$\int\frac{\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)^2}{1-c^2\,x^2}\,dx$$

Optimal (type 4, 302 leaves, 7 steps) :

$$-\frac{2\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)^2\text{ArcCoth}\left[1-\frac{2}{1-\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}}\right]}{c}-\frac{b\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)\text{PolyLog}\left[2,1-\frac{2}{1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}}\right]}{c}+\frac{b\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)\text{PolyLog}\left[2,1-\frac{2\sqrt{1-c\,x}}{\sqrt{1+c\,x}\left(1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right)}\right]}{c}-\frac{b^2\,\text{PolyLog}\left[3,1-\frac{2}{1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}}\right]}{2\,c}+\frac{b^2\,\text{PolyLog}\left[3,1-\frac{2\sqrt{1-c\,x}}{\sqrt{1+c\,x}\left(1+\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right)}\right]}{2\,c}$$

Result (type 8, 42 leaves) :

$$\int\frac{\left(a+b\,\text{ArcCoth}\left[\frac{\sqrt{1-c\,x}}{\sqrt{1+c\,x}}\right]\right)^2}{1-c^2\,x^2}\,dx$$

Problem 139: Result more than twice size of optimal antiderivative.

$$\int x\,\text{ArcCoth}[\text{Tanh}[a+b\,x]]^2\,dx$$

Optimal (type 3, 34 leaves, 3 steps) :

$$\frac{x\,\text{ArcCoth}[\text{Tanh}[a+b\,x]]^3}{3\,b}-\frac{\text{ArcCoth}[\text{Tanh}[a+b\,x]]^4}{12\,b^2}$$

Result (type 3, 74 leaves) :

$$\frac{1}{12\,b^2}(a+b\,x)\,\left(-(3\,a-b\,x)\,(a+b\,x)^2+4\,\left(2\,a^2+a\,b\,x-b^2\,x^2\right)\,\text{ArcCoth}[\text{Tanh}[a+b\,x]]-6\,(a-b\,x)\,\text{ArcCoth}[\text{Tanh}[a+b\,x]]^2\right)$$

Problem 150: Result more than twice size of optimal antiderivative.

$$\int x\,\text{ArcCoth}[\text{Tanh}[a+b\,x]]^3\,dx$$

Optimal (type 3, 34 leaves, 3 steps) :

$$\frac{x\,\text{ArcCoth}[\text{Tanh}[a+b\,x]]^4}{4\,b}-\frac{\text{ArcCoth}[\text{Tanh}[a+b\,x]]^5}{20\,b^2}$$

Result (type 3, 99 leaves) :

$$\frac{1}{20 b^2}(a+b x)\left((4 a-b x)(a+b x)^3-5(3 a-b x)(a+b x)^2 \text{ArcCoth}[\text{Tanh}[a+b x]]+10\left(2 a^2+a b x-b^2 x^2\right) \text{ArcCoth}[\text{Tanh}[a+b x]]^2-10(a-b x) \text{ArcCoth}[\text{Tanh}[a+b x]]^3\right)$$

Problem 205: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCoth}[c+d \text{Tanh}[a+b x]] \, dx$$

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

$$x \text{ArcCoth}[c+d \text{Tanh}[a+b x]]+\frac{1}{2} x \text{Log}\left[1+\frac{(1-c-d) e^{2 a+2 b x}}{1-c+d}\right]-\frac{1}{2} x \text{Log}\left[1+\frac{(1+c+d) e^{2 a+2 b x}}{1+c-d}\right]+\frac{\text{PolyLog}\left[2,-\frac{(1-c-d) e^{2 a+2 b x}}{1-c+d}\right]}{4 b}-\frac{\text{PolyLog}\left[2,-\frac{(1+c+d) e^{2 a+2 b x}}{1+c-d}\right]}{4 b}$$

Result (type 4, 366 leaves):

$$x \text{ArcCoth}[c+d \text{Tanh}[a+b x]]+\frac{1}{2 b}\left((a+b x) \text{Log}\left[1-\frac{\sqrt{-1+c+d}\, e^{a+b x}}{\sqrt{1-c+d}}\right]+(a+b x) \text{Log}\left[1+\frac{\sqrt{-1+c+d}\, e^{a+b x}}{\sqrt{1-c+d}}\right]-(a+b x) \text{Log}\left[1-\frac{\sqrt{1+c+d}\, e^{a+b x}}{\sqrt{-1-c+d}}\right]-(a+b x) \text{Log}\left[1+\frac{\sqrt{1+c+d}\, e^{a+b x}}{\sqrt{-1-c+d}}\right]+a \text{Log}\left[1+c-d+e^{2 (a+b x)}+c e^{2 (a+b x)}+d e^{2 (a+b x)}\right]-a \text{Log}\left[1+d+e^{2 (a+b x)}-d e^{2 (a+b x)}-c\left(1+e^{2 (a+b x)}\right)\right]+\text{PolyLog}\left[2,-\frac{\sqrt{-1+c+d}\, e^{a+b x}}{\sqrt{1-c+d}}\right]+\text{PolyLog}\left[2,\frac{\sqrt{-1+c+d}\, e^{a+b x}}{\sqrt{1-c+d}}\right]-\text{PolyLog}\left[2,-\frac{\sqrt{1+c+d}\, e^{a+b x}}{\sqrt{-1-c+d}}\right]-\text{PolyLog}\left[2,\frac{\sqrt{1+c+d}\, e^{a+b x}}{\sqrt{-1-c+d}}\right]\right)$$

Problem 210: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCoth}[1+d+d \text{Tanh}[a+b x]] \, dx$$

Optimal (type 4, 69 leaves, 5 steps):

$$\frac{b x^2}{2}+x \text{ArcCoth}[1+d+d \text{Tanh}[a+b x]]-\frac{1}{2} x \text{Log}\left[1+(1+d) e^{2 a+2 b x}\right]-\frac{\text{PolyLog}\left[2,-(1+d) e^{2 a+2 b x}\right]}{4 b}$$

Result (type 4, 168 leaves):

$$x\,\text{ArcCoth}[1+d+d\,\text{Tanh}[a+b\,x]]-\frac{1}{2\,b}\left(b\,x\left(-b\,x-\text{Log}\left[e^{-a-b\,x}+(1+d)\,e^{a+b\,x}\right]+\text{Log}\left[1-e^{b\,x}\sqrt{-(1+d)\,e^{2\,a}}\right]+\text{Log}\left[1+e^{b\,x}\sqrt{-(1+d)\,e^{2\,a}}\right]+\text{Log}\left[(2+d)\,\text{Cosh}[a+b\,x]+d\,\text{Sinh}[a+b\,x]\right]\right)+\text{PolyLog}\left[2,-e^{b\,x}\sqrt{-(1+d)\,e^{2\,a}}\right]+\text{PolyLog}\left[2,e^{b\,x}\sqrt{-(1+d)\,e^{2\,a}}\right]\right)$$

Problem 215: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCoth}[1-d-d\,\text{Tanh}[a+b\,x]]\,dx$$

Optimal (type 4, 76 leaves, 5 steps):

$$\frac{b\,x^2}{2}+x\,\text{ArcCoth}[1-d-d\,\text{Tanh}[a+b\,x]]-\frac{1}{2}\,x\,\text{Log}\left[1+(1-d)\,e^{2\,a+2\,b\,x}\right]-\frac{\text{PolyLog}\left[2,-(1-d)\,e^{2\,a+2\,b\,x}\right]}{4\,b}$$

Result (type 4, 171 leaves):

$$x\,\text{ArcCoth}[1-d-d\,\text{Tanh}[a+b\,x]]-\frac{1}{2\,b}\left(b\,x\left(-b\,x-\text{Log}\left[e^{-a-b\,x}\left(-1+(-1+d)\,e^{2\,(a+b\,x)}\right)\right]+\text{Log}\left[1-e^{b\,x}\sqrt{(-1+d)\,e^{2\,a}}\right]+\text{Log}\left[1+e^{b\,x}\sqrt{(-1+d)\,e^{2\,a}}\right]+\text{Log}\left[(-2+d)\,\text{Cosh}[a+b\,x]+d\,\text{Sinh}[a+b\,x]\right]\right)+\text{PolyLog}\left[2,-e^{b\,x}\sqrt{(-1+d)\,e^{2\,a}}\right]+\text{PolyLog}\left[2,e^{b\,x}\sqrt{(-1+d)\,e^{2\,a}}\right]\right)$$

Problem 219: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCoth}[c+d\,\text{Coth}[a+b\,x]]\,dx$$

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

$$x\,\text{ArcCoth}[c+d\,\text{Coth}[a+b\,x]]+\frac{1}{2}\,x\,\text{Log}\left[1-\frac{(1-c-d)\,e^{2\,a+2\,b\,x}}{1-c+d}\right]-\frac{1}{2}\,x\,\text{Log}\left[1-\frac{(1+c+d)\,e^{2\,a+2\,b\,x}}{1+c-d}\right]+\frac{\text{PolyLog}\left[2,\frac{(1-c-d)\,e^{2\,a+2\,b\,x}}{1-c+d}\right]}{4\,b}-\frac{\text{PolyLog}\left[2,\frac{(1+c+d)\,e^{2\,a+2\,b\,x}}{1+c-d}\right]}{4\,b}$$

Result (type 4, 369 leaves):

$$x\,\text{ArcCoth}[c+d\,\text{Coth}[a+b\,x]]-\frac{1}{2\,b}\left(-(a+b\,x)\,\text{Log}\left[1-\frac{\sqrt{-1+c+d}\,e^{a+b\,x}}{\sqrt{-1+c-d}}\right]-(a+b\,x)\,\text{Log}\left[1+\frac{\sqrt{-1+c+d}\,e^{a+b\,x}}{\sqrt{-1+c-d}}\right]+(a+b\,x)\,\text{Log}\left[1-\frac{\sqrt{1+c+d}\,e^{a+b\,x}}{\sqrt{1+c-d}}\right]+(a+b\,x)\,\text{Log}\left[1+\frac{\sqrt{1+c+d}\,e^{a+b\,x}}{\sqrt{1+c-d}}\right]+a\,\text{Log}\left[1+d-e^{2\,(a+b\,x)}+d\,e^{2\,(a+b\,x)}+c\,\left(-1+e^{2\,(a+b\,x)}\right)\right]-a\,\text{Log}\left[1+c-e^{2\,(a+b\,x)}-c\,e^{2\,(a+b\,x)}-d\,\left(1+e^{2\,(a+b\,x)}\right)\right]-\text{PolyLog}\left[2,-\frac{\sqrt{-1+c+d}\,e^{a+b\,x}}{\sqrt{-1+c-d}}\right]-\text{PolyLog}\left[2,\frac{\sqrt{-1+c+d}\,e^{a+b\,x}}{\sqrt{-1+c-d}}\right]+\text{PolyLog}\left[2,-\frac{\sqrt{1+c+d}\,e^{a+b\,x}}{\sqrt{1+c-d}}\right]+\text{PolyLog}\left[2,\frac{\sqrt{1+c+d}\,e^{a+b\,x}}{\sqrt{1+c-d}}\right]\right)$$

Problem 224: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCoth}[1+d+d\,\text{Coth}[a+b\,x]]\,dx$$

Optimal (type 4, 69 leaves, 5 steps):

$$\frac{b\,x^2}{2}+x\,\text{ArcCoth}[1+d+d\,\text{Coth}[a+b\,x]]-\frac{1}{2}\,x\,\text{Log}\left[1-(1+d)\,e^{2\,a+2\,b\,x}\right]-\frac{\text{PolyLog}\left[2,(1+d)\,e^{2\,a+2\,b\,x}\right]}{4\,b}$$

Result (type 4, 168 leaves):

$$x\,\text{ArcCoth}[1+d+d\,\text{Coth}[a+b\,x]]-\frac{1}{2\,b}\left(b\,x\left(-b\,x-\text{Log}\left[e^{-a-b\,x}\left(-1+(1+d)\,e^{2\,(a+b\,x)}\right)\right]+\text{Log}\left[1-e^{b\,x}\sqrt{(1+d)\,e^{2\,a}}\right]+\text{Log}\left[1+e^{b\,x}\sqrt{(1+d)\,e^{2\,a}}\right]+\text{Log}[d\,\text{Cosh}[a+b\,x]+(2+d)\,\text{Sinh}[a+b\,x]]\right)+\text{PolyLog}\left[2,-e^{b\,x}\sqrt{(1+d)\,e^{2\,a}}\right]+\text{PolyLog}\left[2,e^{b\,x}\sqrt{(1+d)\,e^{2\,a}}\right]\right)$$

Problem 229: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCoth}[1-d-d\,\text{Coth}[a+b\,x]]\,dx$$

Optimal (type 4, 76 leaves, 5 steps):

$$\frac{b\,x^2}{2}+x\,\text{ArcCoth}[1-d-d\,\text{Coth}[a+b\,x]]-\frac{1}{2}\,x\,\text{Log}\left[1-(1-d)\,e^{2\,a+2\,b\,x}\right]-\frac{\text{PolyLog}\left[2,(1-d)\,e^{2\,a+2\,b\,x}\right]}{4\,b}$$

Result (type 4, 175 leaves):

$$x\,\text{ArcCoth}[1-d-d\,\text{Coth}[a+b\,x]]-\frac{1}{2\,b}\Bigg(b\,x\left(-b\,x-\text{Log}\left[e^{-a-b\,x}\left(1+(-1+d)\,e^{2\,(a+b\,x)}\right)\right]+\text{Log}\left[1-e^{b\,x}\sqrt{-(-1+d)\,e^{2\,a}}\right]+\text{Log}\left[1+e^{b\,x}\sqrt{-(-1+d)\,e^{2\,a}}\right]+\text{Log}\left[d\,\text{Cosh}[a+b\,x]+(-2+d)\,\text{Sinh}[a+b\,x]\right]\right)+\text{PolyLog}\left[2,-e^{b\,x}\sqrt{-(-1+d)\,e^{2\,a}}\right]+\text{PolyLog}\left[2,e^{b\,x}\sqrt{-(-1+d)\,e^{2\,a}}\right]\Bigg)$$

Problem 231: Result more than twice size of optimal antiderivative.

$$\int (e+f\,x)^3\,\text{ArcCoth}[\text{Tan}[a+b\,x]]\,dx$$

Optimal (type 4, 302 leaves, 12 steps):

$$\frac{(e+f\,x)^4\,\text{ArcCoth}[\text{Tan}[a+b\,x]]}{4\,f}+\frac{i\,(e+f\,x)^4\,\text{ArcTan}\left[e^{2\,i\,(a+b\,x)}\right]}{4\,f}-\frac{i\,(e+f\,x)^3\,\text{PolyLog}\left[2,-i\,e^{2\,i\,(a+b\,x)}\right]}{4\,b}+\frac{i\,(e+f\,x)^3\,\text{PolyLog}\left[2,i\,e^{2\,i\,(a+b\,x)}\right]}{4\,b}+\frac{3\,f\,(e+f\,x)^2\,\text{PolyLog}\left[3,-i\,e^{2\,i\,(a+b\,x)}\right]}{8\,b^2}-\frac{3\,f\,(e+f\,x)^2\,\text{PolyLog}\left[3,i\,e^{2\,i\,(a+b\,x)}\right]}{8\,b^2}+\frac{3\,i\,f^2\,(e+f\,x)\,\text{PolyLog}\left[4,-i\,e^{2\,i\,(a+b\,x)}\right]}{8\,b^3}-\frac{3\,i\,f^2\,(e+f\,x)\,\text{PolyLog}\left[4,i\,e^{2\,i\,(a+b\,x)}\right]}{8\,b^3}-\frac{3\,f^3\,\text{PolyLog}\left[5,-i\,e^{2\,i\,(a+b\,x)}\right]}{16\,b^4}+\frac{3\,f^3\,\text{PolyLog}\left[5,i\,e^{2\,i\,(a+b\,x)}\right]}{16\,b^4}$$

Result (type 4, 654 leaves):

$$\frac{1}{4}\,x\left(4\,e^3+6\,e^2\,f\,x+4\,e\,f^2\,x^2+f^3\,x^3\right)\text{ArcCoth}[\text{Tan}[a+b\,x]]+\frac{1}{16\,b^4}\Big(-8\,b^4\,e^3\,x\,\text{Log}\left[1-i\,e^{2\,i\,(a+b\,x)}\right]-12\,b^4\,e^2\,f\,x^2\,\text{Log}\left[1-i\,e^{2\,i\,(a+b\,x)}\right]-8\,b^4\,e\,f^2\,x^3\,\text{Log}\left[1-i\,e^{2\,i\,(a+b\,x)}\right]-2\,b^4\,f^3\,x^4\,\text{Log}\left[1-i\,e^{2\,i\,(a+b\,x)}\right]+8\,b^4\,e^3\,x\,\text{Log}\left[1+i\,e^{2\,i\,(a+b\,x)}\right]+12\,b^4\,e^2\,f\,x^2\,\text{Log}\left[1+i\,e^{2\,i\,(a+b\,x)}\right]+8\,b^4\,e\,f^2\,x^3\,\text{Log}\left[1+i\,e^{2\,i\,(a+b\,x)}\right]+2\,b^4\,f^3\,x^4\,\text{Log}\left[1+i\,e^{2\,i\,(a+b\,x)}\right]-4\,i\,b^3\,(e+f\,x)^3\,\text{PolyLog}\left[2,-i\,e^{2\,i\,(a+b\,x)}\right]+4\,i\,b^3\,(e+f\,x)^3\,\text{PolyLog}\left[2,i\,e^{2\,i\,(a+b\,x)}\right]+6\,b^2\,e^2\,f\,\text{PolyLog}\left[3,-i\,e^{2\,i\,(a+b\,x)}\right]+12\,b^2\,e\,f^2\,x\,\text{PolyLog}\left[3,-i\,e^{2\,i\,(a+b\,x)}\right]+6\,b^2\,f^3\,x^2\,\text{PolyLog}\left[3,-i\,e^{2\,i\,(a+b\,x)}\right]-6\,b^2\,e^2\,f\,\text{PolyLog}\left[3,i\,e^{2\,i\,(a+b\,x)}\right]-12\,b^2\,e\,f^2\,x\,\text{PolyLog}\left[3,i\,e^{2\,i\,(a+b\,x)}\right]-6\,b^2\,f^3\,x^2\,\text{PolyLog}\left[3,i\,e^{2\,i\,(a+b\,x)}\right]+6\,i\,b\,e\,f^2\,\text{PolyLog}\left[4,-i\,e^{2\,i\,(a+b\,x)}\right]+6\,i\,b\,f^3\,x\,\text{PolyLog}\left[4,-i\,e^{2\,i\,(a+b\,x)}\right]-6\,i\,b\,e\,f^2\,\text{PolyLog}\left[4,i\,e^{2\,i\,(a+b\,x)}\right]-6\,i\,b\,f^3\,x\,\text{PolyLog}\left[4,i\,e^{2\,i\,(a+b\,x)}\right]-3\,f^3\,\text{PolyLog}\left[5,-i\,e^{2\,i\,(a+b\,x)}\right]+3\,f^3\,\text{PolyLog}\left[5,i\,e^{2\,i\,(a+b\,x)}\right]\Big)$$

Problem 238: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCoth}[c+d\,\text{Tan}[a+b\,x]]\,dx$$

Optimal (type 4, 194 leaves, 7 steps):

$$x\,\text{ArcCoth}[c+d\,\text{Tan}[a+b\,x]]+\frac{1}{2}x\,\text{Log}\left[1+\frac{(1-c+i\,d)\,e^{2\,i\,a+2\,i\,b\,x}}{1-c-i\,d}\right]-\frac{1}{2}x\,\text{Log}\left[1+\frac{(1+c-i\,d)\,e^{2\,i\,a+2\,i\,b\,x}}{1+c+i\,d}\right]-\frac{i\,\text{PolyLog}\left[2,-\frac{(1-c+i\,d)\,e^{2\,i\,a+2\,i\,b\,x}}{1-c-i\,d}\right]}{4\,b}+\frac{i\,\text{PolyLog}\left[2,-\frac{(1+c-i\,d)\,e^{2\,i\,a+2\,i\,b\,x}}{1+c+i\,d}\right]}{4\,b}$$

Result (type 4, 4654 leaves):

$$x\,\text{ArcCoth}[c+d\,\text{Tan}[a+b\,x]]+$$

$$\Bigg(d\,\Bigg(-a\,\text{Log}\left[-\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2((-1+c)\,\text{Cos}[a+b\,x]+d\,\text{Sin}[a+b\,x])\right]+$$

$$a\,\text{Log}\left[\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2(\text{Cos}[a+b\,x]+c\,\text{Cos}[a+b\,x]+d\,\text{Sin}[a+b\,x])\right]+$$

$$(a+b\,x)\,\text{Log}\left[\frac{-d+\sqrt{1-2\,c+c^2+d^2}}{-1+c}+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]+$$

$$i\,\text{Log}\left[\frac{(-1+c)\left(1+i\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{-1+c+i\,d-i\sqrt{1-2\,c+c^2+d^2}}\right]\text{Log}\left[\frac{-d+\sqrt{1-2\,c+c^2+d^2}}{-1+c}+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]-$$

$$i\,\text{Log}\left[-\frac{(-1+c)\left(i+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{i-i\,c-d+\sqrt{1-2\,c+c^2+d^2}}\right]\text{Log}\left[\frac{-d+\sqrt{1-2\,c+c^2+d^2}}{-1+c}+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]+$$

$$(a+b\,x)\,\text{Log}\left[\frac{d+\sqrt{1-2\,c+c^2+d^2}}{1-c}+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]+$$

$$i\,\text{Log}\left[\frac{(-1+c)\left(-i+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{i-i\,c+d+\sqrt{1-2\,c+c^2+d^2}}\right]\text{Log}\left[\frac{d+\sqrt{1-2\,c+c^2+d^2}}{1-c}+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]-$$

$$i\,\text{Log}\left[\frac{(-1+c)\left(i+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{-i+i\,c+d+\sqrt{1-2\,c+c^2+d^2}}\right]\text{Log}\left[\frac{d+\sqrt{1-2\,c+c^2+d^2}}{1-c}+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]-$$

$$(a+b\,x)\,\text{Log}\left[-\frac{d+\sqrt{1+2\,c+c^2+d^2}}{1+c}+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]-$$

$$i\,\text{Log}\left[\frac{(1+c)\left(-i+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{-i-i\,c+d+\sqrt{1+2\,c+c^2+d^2}}\right]\text{Log}\left[-\frac{d+\sqrt{1+2\,c+c^2+d^2}}{1+c}+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]+$$

$$i\,\text{Log}\left[\frac{(1+c)\left(i+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{i+i\,c+d+\sqrt{1+2\,c+c^2+d^2}}\right]\text{Log}\left[-\frac{d+\sqrt{1+2\,c+c^2+d^2}}{1+c}+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]-$$

$$(a+b\,x)\,\text{Log}\left[\frac{-d+\sqrt{1+2\,c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{1+c}\right]+$$

$$i\,\text{Log}\left[\frac{(1+c)\left(1-i\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{1+c-i\,d+i\sqrt{1+2\,c+c^2+d^2}}\right]$$

$$\text{Log}\left[\frac{-d+\sqrt{1+2\,c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{1+c}\right]-i\,\text{Log}\Big[$$

$$\frac{(1+c)\left(1+i\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{1+c+i\,d-i\sqrt{1+2\,c+c^2+d^2}}\Big]\;\text{Log}\Big[\frac{-d+\sqrt{1+2\,c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{1+c}\Big]+$$

$$i\,\text{PolyLog}\Big[2,\frac{d+\sqrt{1-2\,c+c^2+d^2}-(-1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{i-i\,c+d+\sqrt{1-2\,c+c^2+d^2}}\Big]-$$

$$i\,\text{PolyLog}\Big[2,\frac{d+\sqrt{1-2\,c+c^2+d^2}-(-1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{-i+i\,c+d+\sqrt{1-2\,c+c^2+d^2}}\Big]-$$

$$i\,\text{PolyLog}\Big[2,\frac{-d+\sqrt{1-2\,c+c^2+d^2}+(-1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{i-i\,c-d+\sqrt{1-2\,c+c^2+d^2}}\Big]+$$

$$i\,\text{PolyLog}\Big[2,\frac{-d+\sqrt{1-2\,c+c^2+d^2}+(-1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{-i+i\,c-d+\sqrt{1-2\,c+c^2+d^2}}\Big]-$$

$$i\,\text{PolyLog}\Big[2,\frac{d+\sqrt{1+2\,c+c^2+d^2}-(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{-i-i\,c+d+\sqrt{1+2\,c+c^2+d^2}}\Big]+$$

$$i\,\text{PolyLog}\Big[2,\frac{d+\sqrt{1+2\,c+c^2+d^2}-(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{i+i\,c+d+\sqrt{1+2\,c+c^2+d^2}}\Big]+$$

$$i\,\text{PolyLog}\Big[2,\frac{-d+\sqrt{1+2\,c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{-i-i\,c-d+\sqrt{1+2\,c+c^2+d^2}}\Big]-$$

$$i\,\text{PolyLog}\Big[2,\frac{-d+\sqrt{1+2\,c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{i+i\,c-d+\sqrt{1+2\,c+c^2+d^2}}\Big]\Bigg)$$

$$\Big(-\big((2\,a)\,/\,(b\,(-1+c^2+d^2-\text{Cos}[2\,(a+b\,x)]+c^2\,\text{Cos}[2\,(a+b\,x)]-d^2\,\text{Cos}[2\,(a+b\,x)]+2\,c\,d\,\text{Sin}[2\,(a+b\,x)]))\big)+(2\,(a+b\,x))\,/\,(b\,(-1+c^2+d^2-\text{Cos}[2\,(a+b\,x)]+c^2\,\text{Cos}[2\,(a+b\,x)]-d^2\,\text{Cos}[2\,(a+b\,x)]+2\,c\,d\,\text{Sin}[2\,(a+b\,x)]))\Big)\Big/$$

$$\Bigg(\text{Log}\Big[\frac{-d+\sqrt{1-2\,c+c^2+d^2}}{-1+c}+\text{Tan}\Big[\frac{1}{2}(a+b\,x)\Big]\Big]+\text{Log}\Big[\frac{d+\sqrt{1-2\,c+c^2+d^2}}{1-c}+\text{Tan}\Big[\frac{1}{2}(a+b\,x)\Big]\Big]-$$

$$\text{Log}\Big[-\frac{d+\sqrt{1+2\,c+c^2+d^2}}{1+c}+\text{Tan}\Big[\frac{1}{2}(a+b\,x)\Big]\Big]-$$

$$\text{Log}\Big[\frac{-d+\sqrt{1+2\,c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{1+c}\Big]+$$

$$\frac{\text{Log}\Big[\frac{-d+\sqrt{1+2\,c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{1+c}\Big]\,\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(1-i\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}-$$

$$\frac{\text{Log}\left[\frac{-d+\sqrt{1-2c+c^2+d^2}}{-1+c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right]\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(1+i\,\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}+$$

$$\frac{\text{Log}\left[\frac{-d+\sqrt{1+2c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+bx)\right]}{1+c}\right]\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(1+i\,\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}+$$

$$\frac{i\,\text{Log}\left[\frac{d+\sqrt{1-2c+c^2+d^2}}{1-c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right]\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(-i+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}-$$

$$\frac{i\,\text{Log}\left[-\frac{d+\sqrt{1+2c+c^2+d^2}}{1+c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right]\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(-i+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}-$$

$$\frac{i\,\text{Log}\left[\frac{-d+\sqrt{1-2c+c^2+d^2}}{-1+c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right]\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(i+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}-$$

$$\frac{i\,\text{Log}\left[\frac{d+\sqrt{1-2c+c^2+d^2}}{1-c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right]\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(i+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}+$$

$$\frac{i\,\text{Log}\left[-\frac{d+\sqrt{1+2c+c^2+d^2}}{1+c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right]\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(i+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}+$$

$$\frac{(a+bx)\,\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(\frac{-d+\sqrt{1-2c+c^2+d^2}}{-1+c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}+$$

$$\frac{i\,\text{Log}\left[\frac{(-1+c)\left(1+i\,\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}{-1+c+i\,d-i\sqrt{1-2c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(\frac{-d+\sqrt{1-2c+c^2+d^2}}{-1+c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}-$$

$$\frac{i\,\text{Log}\left[-\frac{(-1+c)\left(i+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}{i-i\,c-d+\sqrt{1-2c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(\frac{-d+\sqrt{1-2c+c^2+d^2}}{-1+c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}+$$

$$\frac{(a+bx)\,\text{Sec}\left[\frac{1}{2}(a+bx)\right]^2}{2\left(\frac{d+\sqrt{1-2c+c^2+d^2}}{1-c}+\text{Tan}\left[\frac{1}{2}(a+bx)\right]\right)}+$$

$$\frac{i \operatorname{Log}\left[\frac{(-1+c)\left(-i+\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}{i-i c+d+\sqrt{1-2 c+c^2+d^2}}\right] \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{2\left(\frac{d+\sqrt{1-2 c+c^2+d^2}}{1-c}+\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}-$$

$$\frac{i \operatorname{Log}\left[\frac{(-1+c)\left(i+\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}{-i+i c+d+\sqrt{1-2 c+c^2+d^2}}\right] \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{2\left(\frac{d+\sqrt{1-2 c+c^2+d^2}}{1-c}+\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}-$$

$$\frac{(a+b x) \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{2\left(-\frac{d+\sqrt{1+2 c+c^2+d^2}}{1+c}+\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}-$$

$$\frac{i \operatorname{Log}\left[\frac{(1+c)\left(-i+\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}{-i-i c+d+\sqrt{1+2 c+c^2+d^2}}\right] \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{2\left(-\frac{d+\sqrt{1+2 c+c^2+d^2}}{1+c}+\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}+$$

$$\frac{i \operatorname{Log}\left[\frac{(1+c)\left(i+\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}{i+i c+d+\sqrt{1+2 c+c^2+d^2}}\right] \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{2\left(-\frac{d+\sqrt{1+2 c+c^2+d^2}}{1+c}+\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}+$$

$$\left(i(-1+c) \operatorname{Log}\left[1-\frac{d+\sqrt{1-2 c+c^2+d^2}-(-1+c) \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]}{i-i c+d+\sqrt{1-2 c+c^2+d^2}}\right] \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2\right)\Big/$$

$$\left(2\left(d+\sqrt{1-2 c+c^2+d^2}-(-1+c) \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right)-$$

$$\left(i(-1+c) \operatorname{Log}\left[1-\frac{d+\sqrt{1-2 c+c^2+d^2}-(-1+c) \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]}{-i+i c+d+\sqrt{1-2 c+c^2+d^2}}\right] \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2\right)\Big/$$

$$\left(2\left(d+\sqrt{1-2 c+c^2+d^2}-(-1+c) \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right)+$$

$$\left(i(-1+c) \operatorname{Log}\left[1-\frac{-d+\sqrt{1-2 c+c^2+d^2}+(-1+c) \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]}{i-i c-d+\sqrt{1-2 c+c^2+d^2}}\right] \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2\right)\Big/$$

$$\left(2\left(-d+\sqrt{1-2 c+c^2+d^2}+(-1+c) \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right)-$$

$$\left(i(-1+c) \operatorname{Log}\left[1-\frac{-d+\sqrt{1-2 c+c^2+d^2}+(-1+c) \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]}{-i+i c-d+\sqrt{1-2 c+c^2+d^2}}\right] \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2\right)\Big/$$

$$\left(2\left(-d+\sqrt{1-2 c+c^2+d^2}+(-1+c) \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right)-$$

$$\frac{i\,(1+c)\,\text{Log}\left[1-\frac{d+\sqrt{1+2c+c^2+d^2}-(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{-i-i\,c+d+\sqrt{1+2c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(d+\sqrt{1+2c+c^2+d^2}-(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}+$$

$$\frac{i\,(1+c)\,\text{Log}\left[1-\frac{d+\sqrt{1+2c+c^2+d^2}-(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{i+i\,c+d+\sqrt{1+2c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(d+\sqrt{1+2c+c^2+d^2}-(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}-$$

$$\frac{(1+c)\,(a+b\,x)\,\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(-d+\sqrt{1+2c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}+$$

$$\frac{i\,(1+c)\,\text{Log}\left[\frac{(1+c)\left(1-i\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{1+c-i\,d+i\sqrt{1+2c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(-d+\sqrt{1+2c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}-$$

$$\frac{i\,(1+c)\,\text{Log}\left[\frac{(1+c)\left(1+i\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{1+c+i\,d-i\sqrt{1+2c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(-d+\sqrt{1+2c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}-$$

$$\frac{i\,(1+c)\,\text{Log}\left[1-\frac{-d+\sqrt{1+2c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{-i-i\,c-d+\sqrt{1+2c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(-d+\sqrt{1+2c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}+$$

$$\frac{i\,(1+c)\,\text{Log}\left[1-\frac{-d+\sqrt{1+2c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{i+i\,c-d+\sqrt{1+2c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(-d+\sqrt{1+2c+c^2+d^2}+(1+c)\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}+$$

$$\left(a\,\text{Cos}\left[\frac{1}{2}(a+b\,x)\right]^2\left(-\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2(d\,\text{Cos}[a+b\,x]-(-1+c)\,\text{Sin}[a+b\,x])-\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2((-1+c)\,\text{Cos}[a+b\,x]+d\,\text{Sin}[a+b\,x])\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right)\Big/$$

$$((-1+c)\,\text{Cos}[a+b\,x]+d\,\text{Sin}[a+b\,x])+$$

$$\left(a\,\text{Cos}\left[\frac{1}{2}(a+b\,x)\right]^2\left(\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2(d\,\text{Cos}[a+b\,x]-\text{Sin}[a+b\,x]-c\,\text{Sin}[a+b\,x])+\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2(\text{Cos}[a+b\,x]+c\,\text{Cos}[a+b\,x]+d\,\text{Sin}[a+b\,x])\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right)\Big/$$

$$\left((\text{Cos}[a+b\,x]+c\,\text{Cos}[a+b\,x]+d\,\text{Sin}[a+b\,x])\right)$$

Problem 248: Result more than twice size of optimal antiderivative.

$$\int (e+f x)^3 \text{ArcCoth}[\text{Cot}[a+b x]] \, dx$$

Optimal (type 4, 302 leaves, 12 steps):

$$\frac{(e+f x)^4 \text{ArcCoth}[\text{Cot}[a+b x]]}{4 f}+\frac{i (e+f x)^4 \text{ArcTan}\left[e^{2 i (a+b x)}\right]}{4 f}-\frac{i (e+f x)^3 \text{PolyLog}\left[2,-i e^{2 i (a+b x)}\right]}{4 b}+\frac{i (e+f x)^3 \text{PolyLog}\left[2,i e^{2 i (a+b x)}\right]}{4 b}+\frac{3 f (e+f x)^2 \text{PolyLog}\left[3,-i e^{2 i (a+b x)}\right]}{8 b^2}-\frac{3 f (e+f x)^2 \text{PolyLog}\left[3,i e^{2 i (a+b x)}\right]}{8 b^2}+\frac{3 i f^2 (e+f x) \text{PolyLog}\left[4,-i e^{2 i (a+b x)}\right]}{8 b^3}-\frac{3 i f^2 (e+f x) \text{PolyLog}\left[4,i e^{2 i (a+b x)}\right]}{8 b^3}-\frac{3 f^3 \text{PolyLog}\left[5,-i e^{2 i (a+b x)}\right]}{16 b^4}+\frac{3 f^3 \text{PolyLog}\left[5,i e^{2 i (a+b x)}\right]}{16 b^4}$$

Result (type 4, 654 leaves):

$$\frac{1}{4} x \left(4 e^3+6 e^2 f x+4 e f^2 x^2+f^3 x^3\right) \text{ArcCoth}[\text{Cot}[a+b x]]+\frac{1}{16 b^4}\Big(-8 b^4 e^3 x \text{Log}\left[1-i e^{2 i (a+b x)}\right]-12 b^4 e^2 f x^2 \text{Log}\left[1-i e^{2 i (a+b x)}\right]-8 b^4 e f^2 x^3 \text{Log}\left[1-i e^{2 i (a+b x)}\right]-2 b^4 f^3 x^4 \text{Log}\left[1-i e^{2 i (a+b x)}\right]+8 b^4 e^3 x \text{Log}\left[1+i e^{2 i (a+b x)}\right]+12 b^4 e^2 f x^2 \text{Log}\left[1+i e^{2 i (a+b x)}\right]+8 b^4 e f^2 x^3 \text{Log}\left[1+i e^{2 i (a+b x)}\right]+2 b^4 f^3 x^4 \text{Log}\left[1+i e^{2 i (a+b x)}\right]-4 i b^3 (e+f x)^3 \text{PolyLog}\left[2,-i e^{2 i (a+b x)}\right]+4 i b^3 (e+f x)^3 \text{PolyLog}\left[2,i e^{2 i (a+b x)}\right]+6 b^2 e^2 f \text{PolyLog}\left[3,-i e^{2 i (a+b x)}\right]+12 b^2 e f^2 x \text{PolyLog}\left[3,-i e^{2 i (a+b x)}\right]+6 b^2 f^3 x^2 \text{PolyLog}\left[3,-i e^{2 i (a+b x)}\right]-6 b^2 e^2 f \text{PolyLog}\left[3,i e^{2 i (a+b x)}\right]-12 b^2 e f^2 x \text{PolyLog}\left[3,i e^{2 i (a+b x)}\right]-6 b^2 f^3 x^2 \text{PolyLog}\left[3,i e^{2 i (a+b x)}\right]+6 i b e f^2 \text{PolyLog}\left[4,-i e^{2 i (a+b x)}\right]+6 i b f^3 x \text{PolyLog}\left[4,-i e^{2 i (a+b x)}\right]-6 i b e f^2 \text{PolyLog}\left[4,i e^{2 i (a+b x)}\right]-6 i b f^3 x \text{PolyLog}\left[4,i e^{2 i (a+b x)}\right]-3 f^3 \text{PolyLog}\left[5,-i e^{2 i (a+b x)}\right]+3 f^3 \text{PolyLog}\left[5,i e^{2 i (a+b x)}\right]\Big)$$

Problem 255: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCoth}[c+d \text{Cot}[a+b x]] \, dx$$

Optimal (type 4, 194 leaves, 7 steps):

$$x \text{ArcCoth}[c+d \text{Cot}[a+b x]]+\frac{1}{2} x \text{Log}\left[1-\frac{(1-c-i d) e^{2 i a+2 i b x}}{1-c+i d}\right]-\frac{1}{2} x \text{Log}\left[1-\frac{(1+c+i d) e^{2 i a+2 i b x}}{1+c-i d}\right]-\frac{i \text{PolyLog}\left[2,\frac{(1-c-i d) e^{2 i a+2 i b x}}{1-c+i d}\right]}{4 b}+\frac{i \text{PolyLog}\left[2,\frac{(1+c+i d) e^{2 i a+2 i b x}}{1+c-i d}\right]}{4 b}$$

Result (type 4, 4463 leaves):

$$x \text{ArcCoth}[c+d \text{Cot}[a+b x]]-\Bigg(d \Bigg(a \text{Log}\left[-\text{Sec}\left[\frac{1}{2} (a+b x)\right]^2 (d \text{Cos}[a+b x]+(-1+c) \text{Sin}[a+b x])\right]-$$

$$a\,\text{Log}\left[-\text{Sec}\left[\frac{1}{2}\,(a+b\,x)\right]^2\,\left(d\,\text{Cos}[a+b\,x]+\text{Sin}[a+b\,x]+c\,\text{Sin}[a+b\,x]\right)\right]-$$

$$(a+b\,x)\,\text{Log}\left[-\frac{-1+c+\sqrt{1-2\,c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]-$$

$$\text{i}\,\text{Log}\left[\frac{d\,\left(-\text{i}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)}{-1+c-\text{i}\,d+\sqrt{1-2\,c+c^2+d^2}}\right]\,\text{Log}\left[-\frac{-1+c+\sqrt{1-2\,c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]+$$

$$\text{i}\,\text{Log}\left[\frac{d\,\left(\text{i}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)}{-1+c+\text{i}\,d+\sqrt{1-2\,c+c^2+d^2}}\right]\,\text{Log}\left[-\frac{-1+c+\sqrt{1-2\,c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]+$$

$$(a+b\,x)\,\text{Log}\left[-\frac{1+c+\sqrt{1+2\,c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]+$$

$$\text{i}\,\text{Log}\left[\frac{d\,\left(-\text{i}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)}{1+c-\text{i}\,d+\sqrt{1+2\,c+c^2+d^2}}\right]\,\text{Log}\left[-\frac{1+c+\sqrt{1+2\,c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]-$$

$$\text{i}\,\text{Log}\left[\frac{d\,\left(\text{i}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)}{1+c+\text{i}\,d+\sqrt{1+2\,c+c^2+d^2}}\right]\,\text{Log}\left[-\frac{1+c+\sqrt{1+2\,c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]-$$

$$(a+b\,x)\,\text{Log}\left[\frac{1-c+\sqrt{1-2\,c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{d}\right]-$$

$$\text{i}\,\text{Log}\left[-\frac{d\,\left(-\text{i}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)}{1-c+\text{i}\,d+\sqrt{1-2\,c+c^2+d^2}}\right]\,\text{Log}\left[\frac{1-c+\sqrt{1-2\,c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{d}\right]+$$

$$\text{i}\,\text{Log}\left[-\frac{d\,\left(\text{i}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)}{1-c-\text{i}\,d+\sqrt{1-2\,c+c^2+d^2}}\right]\,\text{Log}\left[\frac{1-c+\sqrt{1-2\,c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{d}\right]+$$

$$(a+b\,x)\,\text{Log}\left[\frac{-1-c+\sqrt{1+2\,c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{d}\right]+$$

$$\text{i}\,\text{Log}\left[-\frac{d\,\left(-\text{i}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)}{-1-c+\text{i}\,d+\sqrt{1+2\,c+c^2+d^2}}\right]\,\text{Log}\left[\frac{-1-c+\sqrt{1+2\,c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{d}\right]-$$

$$\text{i}\,\text{Log}\left[-\frac{d\,\left(\text{i}+\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)}{-1-c-\text{i}\,d+\sqrt{1+2\,c+c^2+d^2}}\right]\,\text{Log}\left[\frac{-1-c+\sqrt{1+2\,c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{d}\right]-$$

$$\text{i}\,\text{PolyLog}\left[2,\,\frac{-1+c+\sqrt{1-2\,c+c^2+d^2}-d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{-1+c-\text{i}\,d+\sqrt{1-2\,c+c^2+d^2}}\right]+$$

$$\text{i}\,\text{PolyLog}\left[2,\,\frac{-1+c+\sqrt{1-2\,c+c^2+d^2}-d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{-1+c+\text{i}\,d+\sqrt{1-2\,c+c^2+d^2}}\right]-$$

$$\text{i}\,\text{PolyLog}\left[2,\,\frac{1+c-\sqrt{1+2\,c+c^2+d^2}-d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{1+c+\text{i}\,d-\sqrt{1+2\,c+c^2+d^2}}\right]+$$

$$\text{i}\,\text{PolyLog}\left[2,\,\frac{1+c+\sqrt{1+2\,c+c^2+d^2}-d\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{1+c-\text{i}\,d+\sqrt{1+2\,c+c^2+d^2}}\right]-$$

$$\mathbb{i}\,\text{PolyLog}\left[2,\frac{1+c+\sqrt{1+2c+c^2+d^2}-d\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]}{1+c+\mathbb{i}\,d+\sqrt{1+2c+c^2+d^2}}\right]+$$

$$\mathbb{i}\,\text{PolyLog}\left[2,\frac{1-c+\sqrt{1-2c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]}{1-c-\mathbb{i}\,d+\sqrt{1-2c+c^2+d^2}}\right]-$$

$$\mathbb{i}\,\text{PolyLog}\left[2,\frac{1-c+\sqrt{1-2c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]}{1-c+\mathbb{i}\,d+\sqrt{1-2c+c^2+d^2}}\right]+$$

$$\left.\mathbb{i}\,\text{PolyLog}\left[2,\frac{-1-c+\sqrt{1+2c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]}{-1-c+\mathbb{i}\,d+\sqrt{1+2c+c^2+d^2}}\right]\right)$$

$$\left.\left((2a)\Big/\left(b\left(1-c^2-d^2-\text{Cos}[2(a+b x)]+c^2\,\text{Cos}[2(a+b x)]-d^2\,\text{Cos}[2(a+b x)]-2\,c\,d\,\text{Sin}[2(a+b x)]\right)\right)-(2(a+b x))\Big/\left(b\left(1-c^2-d^2-\text{Cos}[2(a+b x)]+c^2\,\text{Cos}[2(a+b x)]-d^2\,\text{Cos}[2(a+b x)]-2\,c\,d\,\text{Sin}[2(a+b x)]\right)\right)\right)\right)\Big/$$

$$\left(-\text{Log}\left[-\frac{-1+c+\sqrt{1-2c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]+\right.$$

$$\text{Log}\left[-\frac{1+c+\sqrt{1+2c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]-$$

$$\text{Log}\left[\frac{1-c+\sqrt{1-2c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]}{d}\right]+$$

$$\text{Log}\left[\frac{-1-c+\sqrt{1+2c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]}{d}\right]-$$

$$\frac{\mathbb{i}\,\text{Log}\left[-\frac{-1+c+\sqrt{1-2c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]\text{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{2\left(-\mathbb{i}+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}+$$

$$\frac{\mathbb{i}\,\text{Log}\left[-\frac{1+c+\sqrt{1+2c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]\text{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{2\left(-\mathbb{i}+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}-$$

$$\frac{\mathbb{i}\,\text{Log}\left[\frac{1-c+\sqrt{1-2c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]}{d}\right]\text{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{2\left(-\mathbb{i}+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}+$$

$$\frac{\mathbb{i}\,\text{Log}\left[\frac{-1-c+\sqrt{1+2c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]}{d}\right]\text{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{2\left(-\mathbb{i}+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)}+$$

$$\frac{i \,\text{Log}\left[-\frac{-1+c+\sqrt{1-2 c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right] \text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(i+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}-$$

$$\frac{i \,\text{Log}\left[-\frac{1+c+\sqrt{1+2 c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right] \text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(i+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}+$$

$$\frac{i \,\text{Log}\left[\frac{1-c+\sqrt{1-2 c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]}{d}\right] \text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(i+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}-$$

$$\frac{i \,\text{Log}\left[\frac{-1-c+\sqrt{1+2 c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]}{d}\right] \text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(i+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}-$$

$$\frac{(a+b x)\,\text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(-\frac{-1+c+\sqrt{1-2 c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}-$$

$$\frac{i \,\text{Log}\left[\frac{d\left(-i+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}{-1+c-i\,d+\sqrt{1-2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(-\frac{-1+c+\sqrt{1-2 c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}+$$

$$\frac{i \,\text{Log}\left[\frac{d\left(i+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}{-1+c+i\,d+\sqrt{1-2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(-\frac{-1+c+\sqrt{1-2 c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}+$$

$$\frac{(a+b x)\,\text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(-\frac{1+c+\sqrt{1+2 c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}+\frac{i \,\text{Log}\left[\frac{d\left(-i+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}{1+c-i\,d+\sqrt{1+2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(-\frac{1+c+\sqrt{1+2 c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}-$$

$$\frac{i \,\text{Log}\left[\frac{d\left(i+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}{1+c+i\,d+\sqrt{1+2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(-\frac{1+c+\sqrt{1+2 c+c^2+d^2}}{d}+\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}-$$

$$\frac{i\,d\,\text{Log}\left[1-\frac{-1+c+\sqrt{1-2 c+c^2+d^2}-d\,\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]}{-1+c-i\,d+\sqrt{1-2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2}\,(a+b x)\right]^2}{2\left(-1+c+\sqrt{1-2 c+c^2+d^2}-d\,\text{Tan}\left[\frac{1}{2}\,(a+b x)\right]\right)}+$$

$$\frac{i\, d\, \text{Log}\left[1-\frac{-1+c+\sqrt{1-2 c+c^2+d^2}-d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]}{-1+c+i\, d+\sqrt{1-2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(-1+c+\sqrt{1-2 c+c^2+d^2}-d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}-$$

$$\frac{i\, d\, \text{Log}\left[1-\frac{1+c-\sqrt{1+2 c+c^2+d^2}-d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]}{1+c+i\, d-\sqrt{1+2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(1+c-\sqrt{1+2 c+c^2+d^2}-d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}+$$

$$\frac{i\, d\, \text{Log}\left[1-\frac{1+c+\sqrt{1+2 c+c^2+d^2}-d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]}{1+c-i\, d+\sqrt{1+2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(1+c+\sqrt{1+2 c+c^2+d^2}-d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}-$$

$$\frac{i\, d\, \text{Log}\left[1-\frac{1+c+\sqrt{1+2 c+c^2+d^2}-d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]}{1+c+i\, d+\sqrt{1+2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(1+c+\sqrt{1+2 c+c^2+d^2}-d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}-$$

$$\frac{d\, (a+b x)\, \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(1-c+\sqrt{1-2 c+c^2+d^2}+d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}-$$

$$\frac{i\, d\, \text{Log}\left[-\frac{d \left(-i+\text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}{1-c+i\, d+\sqrt{1-2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(1-c+\sqrt{1-2 c+c^2+d^2}+d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}+$$

$$\frac{i\, d\, \text{Log}\left[-\frac{d \left(i+\text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}{1-c-i\, d+\sqrt{1-2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(1-c+\sqrt{1-2 c+c^2+d^2}+d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}-$$

$$\frac{i\, d\, \text{Log}\left[1-\frac{1-c+\sqrt{1-2 c+c^2+d^2}+d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]}{1-c-i\, d+\sqrt{1-2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(1-c+\sqrt{1-2 c+c^2+d^2}+d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}+$$

$$\frac{i\, d\, \text{Log}\left[1-\frac{1-c+\sqrt{1-2 c+c^2+d^2}+d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]}{1-c+i\, d+\sqrt{1-2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(1-c+\sqrt{1-2 c+c^2+d^2}+d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}+$$

$$\frac{d\, (a+b x)\, \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(-1-c+\sqrt{1+2 c+c^2+d^2}+d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}+$$

$$\frac{i\, d\, \text{Log}\left[-\frac{d \left(-i+\text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}{-1-c+i\, d+\sqrt{1+2 c+c^2+d^2}}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right]^2}{2 \left(-1-c+\sqrt{1+2 c+c^2+d^2}+d\, \text{Tan}\left[\frac{1}{2} (a+b x)\right]\right)}-$$

$$\frac{i\,d\,\text{Log}\left[-\frac{d\left(i+\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}{-1-c-i\,d+\sqrt{1+2\,c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(-1-c+\sqrt{1+2\,c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}-$$

$$\frac{i\,d\,\text{Log}\left[1-\frac{-1-c+\sqrt{1+2\,c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{-1-c+i\,d+\sqrt{1+2\,c+c^2+d^2}}\right]\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}{2\left(-1-c+\sqrt{1+2\,c+c^2+d^2}+d\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)}-$$

$$\left(a\,\text{Cos}\left[\frac{1}{2}(a+b\,x)\right]^2\left(-\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2\left((-1+c)\,\text{Cos}[a+b\,x]-d\,\text{Sin}[a+b\,x]\right)-\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2\left(d\,\text{Cos}[a+b\,x]+(-1+c)\,\text{Sin}[a+b\,x]\right)\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right)\Big/$$
$$\left(d\,\text{Cos}[a+b\,x]+(-1+c)\,\text{Sin}[a+b\,x]\right)+$$
$$\left(a\,\text{Cos}\left[\frac{1}{2}(a+b\,x)\right]^2\left(-\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2\left(\text{Cos}[a+b\,x]+c\,\text{Cos}[a+b\,x]-d\,\text{Sin}[a+b\,x]\right)-\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2\left(d\,\text{Cos}[a+b\,x]+\text{Sin}[a+b\,x]+c\,\text{Sin}[a+b\,x]\right)\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right)\Big/$$
$$\left(d\,\text{Cos}[a+b\,x]+\text{Sin}[a+b\,x]+c\,\text{Sin}[a+b\,x]\right)\Bigg)$$

Problem 265: Result unnecessarily involves higher level functions.

$$\int\frac{\left(a+b\,\text{ArcCoth}[c\,x^n]\right)\left(d+e\,\text{Log}[f\,x^m]\right)}{x}\,dx$$

Optimal (type 4, 160 leaves, 11 steps):

$$a\,d\,\text{Log}[x]+\frac{a\,e\,\text{Log}[f\,x^m]^2}{2\,m}+\frac{b\,d\,\text{PolyLog}\left[2,-\frac{x^{-n}}{c}\right]}{2\,n}+\frac{b\,e\,\text{Log}[f\,x^m]\,\text{PolyLog}\left[2,-\frac{x^{-n}}{c}\right]}{2\,n}-\frac{b\,d\,\text{PolyLog}\left[2,\frac{x^{-n}}{c}\right]}{2\,n}-\frac{b\,e\,\text{Log}[f\,x^m]\,\text{PolyLog}\left[2,\frac{x^{-n}}{c}\right]}{2\,n}+\frac{b\,e\,m\,\text{PolyLog}\left[3,-\frac{x^{-n}}{c}\right]}{2\,n^2}-\frac{b\,e\,m\,\text{PolyLog}\left[3,\frac{x^{-n}}{c}\right]}{2\,n^2}$$

Result (type 5, 131 leaves):

$$-\frac{b\,c\,e\,m\,x^n\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{2},\frac{1}{2},\frac{1}{2},1\right\},\left\{\frac{3}{2},\frac{3}{2},\frac{3}{2}\right\},c^2\,x^{2\,n}\right]}{n^2}+\frac{1}{n}b\,c\,x^n\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{2},\frac{1}{2},1\right\},\left\{\frac{3}{2},\frac{3}{2}\right\},c^2\,x^{2\,n}\right]\left(d+e\,\text{Log}[f\,x^m]\right)-\frac{1}{2}\left(a+b\,\text{ArcCoth}[c\,x^n]-b\,\text{ArcTanh}[c\,x^n]\right)\text{Log}[x]\left(e\,m\,\text{Log}[x]-2\left(d+e\,\text{Log}[f\,x^m]\right)\right)$$

Problem 269: Unable to integrate problem.

$$\int \frac{(a + b\,\text{ArcCoth}[c\,x])\,(d + e\,\text{Log}[1 - c^2\,x^2])}{x}\,dx$$

Optimal (type 4, 381 leaves, 21 steps):

$$-\frac{1}{2}\,b\,e\,\text{Log}\left[1 + \frac{1}{c\,x}\right]^2\,\text{Log}\left[-\frac{1}{c\,x}\right] + \frac{1}{2}\,b\,e\,\text{Log}\left[1 - \frac{1}{c\,x}\right]^2\,\text{Log}\left[\frac{1}{c\,x}\right] + a\,d\,\text{Log}[x] -$$
$$b\,e\,\text{Log}\left[\frac{c + \frac{1}{x}}{c}\right]\,\text{PolyLog}\left[2, \frac{c + \frac{1}{x}}{c}\right] + b\,e\,\text{Log}\left[1 - \frac{1}{c\,x}\right]\,\text{PolyLog}\left[2, 1 - \frac{1}{c\,x}\right] +$$
$$\frac{1}{2}\,b\,d\,\text{PolyLog}\left[2, -\frac{1}{c\,x}\right] + \frac{1}{2}\,b\,e\,\text{Log}\left[-c^2\,x^2\right]\,\text{PolyLog}\left[2, -\frac{1}{c\,x}\right] -$$
$$\frac{1}{2}\,b\,e\,\left(\text{Log}\left[1 - \frac{1}{c\,x}\right] + \text{Log}\left[1 + \frac{1}{c\,x}\right] + \text{Log}\left[-c^2\,x^2\right] - \text{Log}\left[1 - c^2\,x^2\right]\right)\,\text{PolyLog}\left[2, -\frac{1}{c\,x}\right] -$$
$$\frac{1}{2}\,b\,d\,\text{PolyLog}\left[2, \frac{1}{c\,x}\right] - \frac{1}{2}\,b\,e\,\text{Log}\left[-c^2\,x^2\right]\,\text{PolyLog}\left[2, \frac{1}{c\,x}\right] +$$
$$\frac{1}{2}\,b\,e\,\left(\text{Log}\left[1 - \frac{1}{c\,x}\right] + \text{Log}\left[1 + \frac{1}{c\,x}\right] + \text{Log}\left[-c^2\,x^2\right] - \text{Log}\left[1 - c^2\,x^2\right]\right)\,\text{PolyLog}\left[2, \frac{1}{c\,x}\right] -$$
$$\frac{1}{2}\,a\,e\,\text{PolyLog}\left[2, c^2\,x^2\right] + b\,e\,\text{PolyLog}\left[3, \frac{c + \frac{1}{x}}{c}\right] -$$
$$b\,e\,\text{PolyLog}\left[3, 1 - \frac{1}{c\,x}\right] + b\,e\,\text{PolyLog}\left[3, -\frac{1}{c\,x}\right] - b\,e\,\text{PolyLog}\left[3, \frac{1}{c\,x}\right]$$

Result (type 8, 29 leaves):

$$\int \frac{(a + b\,\text{ArcCoth}[c\,x])\,(d + e\,\text{Log}[1 - c^2\,x^2])}{x}\,dx$$

Problem 275: Result more than twice size of optimal antiderivative.

$$\int \frac{(a + b\,\text{ArcCoth}[c\,x])\,(d + e\,\text{Log}[1 - c^2\,x^2])}{x^2}\,dx$$

Optimal (type 4, 105 leaves, 6 steps):

$$-\frac{c\,e\,(a + b\,\text{ArcCoth}[c\,x])^2}{b} - \frac{(a + b\,\text{ArcCoth}[c\,x])\,(d + e\,\text{Log}[1 - c^2\,x^2])}{x} +$$
$$\frac{1}{2}\,b\,c\,\left(d + e\,\text{Log}\left[1 - c^2\,x^2\right]\right)\,\text{Log}\left[1 - \frac{1}{1 - c^2\,x^2}\right] - \frac{1}{2}\,b\,c\,e\,\text{PolyLog}\left[2, \frac{1}{1 - c^2\,x^2}\right]$$

Result (type 4, 332 leaves):

$$-\frac{1}{4x}\Big(4ad+4bd\,\text{ArcCoth}[cx]+4bcex\,\text{ArcCoth}[cx]^2+$$
$$8acex\,\text{ArcTanh}[cx]-4bcdx\,\text{Log}[x]-bcex\,\text{Log}\Big[-\frac{1}{c}+x\Big]^2-bcex\,\text{Log}\Big[\frac{1}{c}+x\Big]^2-$$
$$2bcex\,\text{Log}\Big[\frac{1}{c}+x\Big]\,\text{Log}\Big[\frac{1}{2}(1-cx)\Big]+4bcex\,\text{Log}[x]\,\text{Log}[1-cx]-$$
$$2bcex\,\text{Log}\Big[-\frac{1}{c}+x\Big]\,\text{Log}\Big[\frac{1}{2}(1+cx)\Big]+4bcex\,\text{Log}[x]\,\text{Log}[1+cx]+$$
$$4ae\,\text{Log}\big[1-c^2x^2\big]+2bcdx\,\text{Log}\big[1-c^2x^2\big]+4be\,\text{ArcCoth}[cx]\,\text{Log}\big[1-c^2x^2\big]-$$
$$4bcex\,\text{Log}[x]\,\text{Log}\big[1-c^2x^2\big]+2bcex\,\text{Log}\Big[-\frac{1}{c}+x\Big]\,\text{Log}\big[1-c^2x^2\big]+$$
$$2bcex\,\text{Log}\Big[\frac{1}{c}+x\Big]\,\text{Log}\big[1-c^2x^2\big]+4bcex\,\text{PolyLog}[2,-cx]+4bcex\,\text{PolyLog}[2,cx]-$$
$$2bcex\,\text{PolyLog}\Big[2,\frac{1}{2}-\frac{cx}{2}\Big]-2bcex\,\text{PolyLog}\Big[2,\frac{1}{2}(1+cx)\Big]\Big)$$

Problem 276: Result more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,\text{ArcCoth}[cx])\,\big(d+e\,\text{Log}\big[1-c^2x^2\big]\big)}{x^4}\,dx$$

Optimal (type 4, 197 leaves, 15 steps):

$$\frac{2c^2e\,(a+b\,\text{ArcCoth}[cx])}{3x}-\frac{c^3e\,(a+b\,\text{ArcCoth}[cx])^2}{3b}-bc^3e\,\text{Log}[x]+\frac{1}{3}bc^3e\,\text{Log}\big[1-c^2x^2\big]-$$
$$\frac{bc\,(1-c^2x^2)\,\big(d+e\,\text{Log}\big[1-c^2x^2\big]\big)}{6x^2}-\frac{(a+b\,\text{ArcCoth}[cx])\,\big(d+e\,\text{Log}\big[1-c^2x^2\big]\big)}{3x^3}+$$
$$\frac{1}{6}bc^3\,\big(d+e\,\text{Log}\big[1-c^2x^2\big]\big)\,\text{Log}\Big[1-\frac{1}{1-c^2x^2}\Big]-\frac{1}{6}bc^3e\,\text{PolyLog}\Big[2,\frac{1}{1-c^2x^2}\Big]$$

Result (type 4, 457 leaves):

$$\frac{1}{6}\left(-\frac{2 a d}{x^3}-\frac{b c d}{x^2}+\frac{4 a c^2 e}{x}-\frac{2 b d \text{ArcCoth}[c x]}{x^3}+\frac{4 b c^2 e \text{ArcCoth}[c x]}{x}-2 b c^3 e \text{ArcCoth}[c x]^2-\right.$$

$$4 a c^3 e \text{ArcTanh}[c x]-4 b c^3 e \text{Log}\left[\frac{1}{\sqrt{1-\frac{1}{c^2 x^2}}}\right]+2 b c^3 d \text{Log}[x]-2 b c^3 e \text{Log}[x]+$$

$$\frac{1}{2} b c^3 e \text{Log}\left[-\frac{1}{c}+x\right]^2+\frac{1}{2} b c^3 e \text{Log}\left[\frac{1}{c}+x\right]^2+b c^3 e \text{Log}\left[\frac{1}{c}+x\right] \text{Log}\left[\frac{1}{2}(1-c x)\right]-$$

$$2 b c^3 e \text{Log}[x] \text{Log}[1-c x]+b c^3 e \text{Log}\left[-\frac{1}{c}+x\right] \text{Log}\left[\frac{1}{2}(1+c x)\right]-$$

$$2 b c^3 e \text{Log}[x] \text{Log}[1+c x]-b c^3 d \text{Log}\left[1-c^2 x^2\right]+b c^3 e \text{Log}\left[1-c^2 x^2\right]-\frac{2 a e \text{Log}\left[1-c^2 x^2\right]}{x^3}-$$

$$\frac{b c e \text{Log}\left[1-c^2 x^2\right]}{x^2}-\frac{2 b e \text{ArcCoth}[c x] \text{Log}\left[1-c^2 x^2\right]}{x^3}+2 b c^3 e \text{Log}[x] \text{Log}\left[1-c^2 x^2\right]-$$

$$b c^3 e \text{Log}\left[-\frac{1}{c}+x\right] \text{Log}\left[1-c^2 x^2\right]-b c^3 e \text{Log}\left[\frac{1}{c}+x\right] \text{Log}\left[1-c^2 x^2\right]-2 b c^3 e \text{PolyLog}[2,-c x]-$$

$$\left.2 b c^3 e \text{PolyLog}[2, c x]+b c^3 e \text{PolyLog}\left[2, \frac{1}{2}-\frac{c x}{2}\right]+b c^3 e \text{PolyLog}\left[2, \frac{1}{2}(1+c x)\right]\right)$$

Problem 277: Unable to integrate problem.

$$\int \frac{(a+b \text{ArcCoth}[c x])\left(d+e \text{Log}\left[1-c^2 x^2\right]\right)}{x^6} \, dx$$

Optimal (type 4, 256 leaves, 24 steps):

$$\frac{7 b c^3 e}{60 x^2}+\frac{2 c^2 e (a+b \text{ArcCoth}[c x])}{15 x^3}+\frac{2 c^4 e (a+b \text{ArcCoth}[c x])}{5 x}-\frac{c^5 e (a+b \text{ArcCoth}[c x])^2}{5 b}-$$

$$\frac{5}{6} b c^5 e \text{Log}[x]+\frac{19}{60} b c^5 e \text{Log}\left[1-c^2 x^2\right]-\frac{b c\left(d+e \text{Log}\left[1-c^2 x^2\right]\right)}{20 x^4}-$$

$$\frac{b c^3\left(1-c^2 x^2\right)\left(d+e \text{Log}\left[1-c^2 x^2\right]\right)}{10 x^2}-\frac{(a+b \text{ArcCoth}[c x])\left(d+e \text{Log}\left[1-c^2 x^2\right]\right)}{5 x^5}+$$

$$\frac{1}{10} b c^5\left(d+e \text{Log}\left[1-c^2 x^2\right]\right) \text{Log}\left[1-\frac{1}{1-c^2 x^2}\right]-\frac{1}{10} b c^5 e \text{PolyLog}\left[2, \frac{1}{1-c^2 x^2}\right]$$

Result (type 8, 29 leaves):

$$\int \frac{(a+b \text{ArcCoth}[c x])\left(d+e \text{Log}\left[1-c^2 x^2\right]\right)}{x^6} \, dx$$

Problem 278: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

$$\int x\,(a+b\,\text{ArcCoth}[c\,x])\,\left(d+e\,\text{Log}\left[f+g\,x^2\right]\right)\,dx$$

Optimal (type 4, 512 leaves, 22 steps):

$$\frac{b\,(d-e)\,x}{2\,c}-\frac{b\,e\,x}{c}+\frac{1}{2}\,d\,x^2\,(a+b\,\text{ArcCoth}[c\,x])-\frac{1}{2}\,e\,x^2\,(a+b\,\text{ArcCoth}[c\,x])+\frac{b\,e\,\sqrt{f}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]}{c\,\sqrt{g}}-\frac{b\,(d-e)\,\text{ArcTanh}[c\,x]}{2\,c^2}-$$
$$\frac{b\,e\,\left(c^2\,f+g\right)\,\text{ArcTanh}[c\,x]\,\text{Log}\left[\frac{2}{1+c\,x}\right]}{c^2\,g}+\frac{b\,e\,\left(c^2\,f+g\right)\,\text{ArcTanh}[c\,x]\,\text{Log}\left[\frac{2\,c\,\left(\sqrt{-f}-\sqrt{g}\,x\right)}{\left(c\,\sqrt{-f}-\sqrt{g}\right)\,(1+c\,x)}\right]}{2\,c^2\,g}+$$
$$\frac{b\,e\,\left(c^2\,f+g\right)\,\text{ArcTanh}[c\,x]\,\text{Log}\left[\frac{2\,c\,\left(\sqrt{-f}+\sqrt{g}\,x\right)}{\left(c\,\sqrt{-f}+\sqrt{g}\right)\,(1+c\,x)}\right]}{2\,c^2\,g}+$$
$$\frac{b\,e\,x\,\text{Log}\left[f+g\,x^2\right]}{2\,c}+\frac{e\,\left(f+g\,x^2\right)\,(a+b\,\text{ArcCoth}[c\,x])\,\text{Log}\left[f+g\,x^2\right]}{2\,g}-$$
$$\frac{b\,e\,\left(c^2\,f+g\right)\,\text{ArcTanh}[c\,x]\,\text{Log}\left[f+g\,x^2\right]}{2\,c^2\,g}+\frac{b\,e\,\left(c^2\,f+g\right)\,\text{PolyLog}\left[2,1-\frac{2}{1+c\,x}\right]}{2\,c^2\,g}-$$
$$\frac{b\,e\,\left(c^2\,f+g\right)\,\text{PolyLog}\left[2,1-\frac{2\,c\,\left(\sqrt{-f}-\sqrt{g}\,x\right)}{\left(c\,\sqrt{-f}-\sqrt{g}\right)\,(1+c\,x)}\right]}{4\,c^2\,g}-\frac{b\,e\,\left(c^2\,f+g\right)\,\text{PolyLog}\left[2,1-\frac{2\,c\,\left(\sqrt{-f}+\sqrt{g}\,x\right)}{\left(c\,\sqrt{-f}+\sqrt{g}\right)\,(1+c\,x)}\right]}{4\,c^2\,g}$$

Result (type 4, 1128 leaves):

$$\frac{1}{4\,c^2\,g}\Bigg(2\,b\,c\,d\,g\,x-6\,b\,c\,e\,g\,x+2\,a\,c^2\,d\,g\,x^2-2\,a\,c^2\,e\,g\,x^2-2\,b\,d\,g\,\text{ArcCoth}[c\,x]+$$
$$2\,b\,e\,g\,\text{ArcCoth}[c\,x]+2\,b\,c^2\,d\,g\,x^2\,\text{ArcCoth}[c\,x]-2\,b\,c^2\,e\,g\,x^2\,\text{ArcCoth}[c\,x]+$$
$$4\,b\,c\,e\,\sqrt{f}\,\sqrt{g}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]-4\,i\,b\,c^2\,e\,f\,\text{ArcSin}\left[\sqrt{\frac{g}{c^2\,f+g}}\right]\,\text{ArcTanh}\left[\frac{c\,f}{\sqrt{-c^2\,f\,g}\,x}\right]-$$
$$4\,i\,b\,e\,g\,\text{ArcSin}\left[\sqrt{\frac{g}{c^2\,f+g}}\right]\,\text{ArcTanh}\left[\frac{c\,f}{\sqrt{-c^2\,f\,g}\,x}\right]-$$
$$4\,b\,c^2\,e\,f\,\text{ArcCoth}[c\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[c\,x]}\right]-$$
$$4\,b\,e\,g\,\text{ArcCoth}[c\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcCoth}[c\,x]}\right]+2\,b\,c^2\,e\,f\,\text{ArcCoth}[c\,x]\,\text{Log}\Bigg[\frac{1}{c^2\,f+g}$$
$$e^{-2\,\text{ArcCoth}[c\,x]}\left(c^2\,\left(-1+e^{2\,\text{ArcCoth}[c\,x]}\right)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g-2\,\sqrt{-c^2\,f\,g}\right)\Bigg]+2\,b\,e\,g\,\text{ArcCoth}[c\,x]$$
$$\text{Log}\left[\frac{1}{c^2\,f+g}e^{-2\,\text{ArcCoth}[c\,x]}\left(c^2\,\left(-1+e^{2\,\text{ArcCoth}[c\,x]}\right)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g-2\,\sqrt{-c^2\,f\,g}\right)\right]-$$

$$2\,i\,b\,c^2\,e\,f\,\text{ArcSin}\left[\sqrt{\frac{g}{c^2 f+g}}\right]\,\text{Log}\left[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\left(c^2\left(-1+e^{2\,\text{ArcCoth}[c\,x]}\right)f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g-2\sqrt{-c^2 f g}\right)\right]-2\,i\,b\,e\,g\,\text{ArcSin}\left[\sqrt{\frac{g}{c^2 f+g}}\right]$$

$$\text{Log}\left[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\left(c^2\left(-1+e^{2\,\text{ArcCoth}[c\,x]}\right)f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g-2\sqrt{-c^2 f g}\right)\right]+$$

$$2\,b\,c^2\,e\,f\,\text{ArcCoth}[c\,x]\,\text{Log}\left[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\left(c^2\left(-1+e^{2\,\text{ArcCoth}[c\,x]}\right)f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g+2\sqrt{-c^2 f g}\right)\right]+2\,b\,e\,g\,\text{ArcCoth}[c\,x]$$

$$\text{Log}\left[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\left(c^2\left(-1+e^{2\,\text{ArcCoth}[c\,x]}\right)f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g+2\sqrt{-c^2 f g}\right)\right]+$$

$$2\,i\,b\,c^2\,e\,f\,\text{ArcSin}\left[\sqrt{\frac{g}{c^2 f+g}}\right]\,\text{Log}\left[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\left(c^2\left(-1+e^{2\,\text{ArcCoth}[c\,x]}\right)f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g+2\sqrt{-c^2 f g}\right)\right]+2\,i\,b\,e\,g\,\text{ArcSin}\left[\sqrt{\frac{g}{c^2 f+g}}\right]$$

$$\text{Log}\left[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\left(c^2\left(-1+e^{2\,\text{ArcCoth}[c\,x]}\right)f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g+2\sqrt{-c^2 f g}\right)\right]+$$

$$2\,a\,c^2\,e\,f\,\text{Log}\left[f+g\,x^2\right]+2\,b\,c\,e\,g\,x\,\text{Log}\left[f+g\,x^2\right]+2\,a\,c^2\,e\,g\,x^2\,\text{Log}\left[f+g\,x^2\right]-$$

$$2\,b\,e\,g\,\text{ArcCoth}[c\,x]\,\text{Log}\left[f+g\,x^2\right]+2\,b\,c^2\,e\,g\,x^2\,\text{ArcCoth}[c\,x]\,\text{Log}\left[f+g\,x^2\right]+$$

$$2\,b\,e\left(c^2 f+g\right)\text{PolyLog}\left[2,\,e^{-2\,\text{ArcCoth}[c\,x]}\right]-$$

$$b\,e\left(c^2 f+g\right)\text{PolyLog}\left[2,\,\frac{e^{-2\,\text{ArcCoth}[c\,x]}\left(c^2 f-g+2\sqrt{-c^2 f g}\right)}{c^2 f+g}\right]-$$

$$b\,c^2\,e\,f\,\text{PolyLog}\left[2,\,-\frac{e^{-2\,\text{ArcCoth}[c\,x]}\left(-c^2 f+g+2\sqrt{-c^2 f g}\right)}{c^2 f+g}\right]-$$

$$b\,e\,g\,\text{PolyLog}\left[2,\,-\frac{e^{-2\,\text{ArcCoth}[c\,x]}\left(-c^2 f+g+2\sqrt{-c^2 f g}\right)}{c^2 f+g}\right]\Bigg)$$

Problem 279: Result more than twice size of optimal antiderivative.

$$\int\left(a+b\,\text{ArcCoth}[c\,x]\right)\left(d+e\,\text{Log}\left[f+g\,x^2\right]\right)\,dx$$

Optimal (type 4, 546 leaves, 38 steps):

$$-2\,a\,e\,x-2\,b\,e\,x\,\text{ArcCoth}[c\,x]+\frac{2\,a\,e\,\sqrt{f}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]}{\sqrt{g}}-\frac{b\,e\,\sqrt{f}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[1-\frac{1}{c\,x}\right]}{\sqrt{g}}+$$

$$\frac{b\,e\,\sqrt{f}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[1+\frac{1}{c\,x}\right]}{\sqrt{g}}+\frac{b\,e\,\sqrt{f}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[-\frac{2\sqrt{f}\,\sqrt{g}\,(1-c\,x)}{\left(i\,c\,\sqrt{f}-\sqrt{g}\right)\left(\sqrt{f}-i\,\sqrt{g}\,x\right)}\right]}{\sqrt{g}}-$$

$$\frac{b\,e\,\sqrt{f}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[\frac{2\sqrt{f}\,\sqrt{g}\,(1+c\,x)}{\left(i\,c\,\sqrt{f}+\sqrt{g}\right)\left(\sqrt{f}-i\,\sqrt{g}\,x\right)}\right]}{\sqrt{g}}-\frac{b\,e\,\text{Log}\left[1-c^2\,x^2\right]}{c}+$$

$$x\,(a+b\,\text{ArcCoth}[c\,x])\,\left(d+e\,\text{Log}\left[f+g\,x^2\right]\right)+\frac{b\,\text{Log}\left[\frac{g\,(1-c^2\,x^2)}{c^2\,f+g}\right]\left(d+e\,\text{Log}\left[f+g\,x^2\right]\right)}{2\,c}+$$

$$\frac{b\,e\,\text{PolyLog}\left[2,\frac{c^2\,(f+g\,x^2)}{c^2\,f+g}\right]}{2\,c}-\frac{i\,b\,e\,\sqrt{f}\,\text{PolyLog}\left[2,1+\frac{2\sqrt{f}\,\sqrt{g}\,(1-c\,x)}{\left(i\,c\,\sqrt{f}-\sqrt{g}\right)\left(\sqrt{f}-i\,\sqrt{g}\,x\right)}\right]}{2\,\sqrt{g}}+$$

$$\frac{i\,b\,e\,\sqrt{f}\,\text{PolyLog}\left[2,1-\frac{2\sqrt{f}\,\sqrt{g}\,(1+c\,x)}{\left(i\,c\,\sqrt{f}+\sqrt{g}\right)\left(\sqrt{f}-i\,\sqrt{g}\,x\right)}\right]}{2\,\sqrt{g}}$$

Result (type 4, 1287 leaves):

$$a\,d\,x-2\,a\,e\,x+b\,d\,x\,\text{ArcCoth}[c\,x]+\frac{2\,a\,e\,\sqrt{f}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]}{\sqrt{g}}+\frac{b\,d\,\text{Log}\left[1-c^2\,x^2\right]}{2\,c}+$$

$$a\,e\,x\,\text{Log}\left[f+g\,x^2\right]+b\,e\left(x\,\text{ArcCoth}[c\,x]+\frac{\text{Log}\left[1-c^2\,x^2\right]}{2\,c}\right)\text{Log}\left[f+g\,x^2\right]+$$

$$\frac{1}{2\,c}\,b\,e\left(-4\,c\,x\,\text{ArcCoth}[c\,x]+4\,\text{Log}\left[\frac{1}{c\,\sqrt{1-\frac{1}{c^2\,x^2}}\,x}\right]+\right.$$

$$\frac{1}{g}\sqrt{c^2\,f\,g}\left(-2\,i\,\text{ArcCos}\left[\frac{c^2\,f-g}{c^2\,f+g}\right]\text{ArcTan}\left[\frac{\sqrt{c^2\,f\,g}}{c\,g\,x}\right]+4\,\text{ArcCoth}[c\,x]\,\text{ArcTan}\left[\frac{c\,g\,x}{\sqrt{c^2\,f\,g}}\right]-\right.$$

$$\left(\text{ArcCos}\left[\frac{c^2\,f-g}{c^2\,f+g}\right]+2\,\text{ArcTan}\left[\frac{\sqrt{c^2\,f\,g}}{c\,g\,x}\right]\right)\text{Log}\left[\frac{2\,i\,g\left(i\,c^2\,f+\sqrt{c^2\,f\,g}\right)\left(-1+\frac{1}{c\,x}\right)}{\left(c^2\,f+g\right)\left(g+\frac{i\sqrt{c^2\,f\,g}}{c\,x}\right)}\right]-$$

$$\left(\text{ArcCos}\left[\frac{c^2\,f-g}{c^2\,f+g}\right]-2\,\text{ArcTan}\left[\frac{\sqrt{c^2\,f\,g}}{c\,g\,x}\right]\right)\text{Log}\left[\frac{2\,g\left(c^2\,f+i\sqrt{c^2\,f\,g}\right)\left(1+\frac{1}{c\,x}\right)}{\left(c^2\,f+g\right)\left(g+\frac{i\sqrt{c^2\,f\,g}}{c\,x}\right)}\right]+$$

$$\left(\text{ArcCos}\left[\frac{c^2 f-g}{c^2 f+g}\right]+2\left(\text{ArcTan}\left[\frac{\sqrt{c^2 f g}}{c g x}\right]+\text{ArcTan}\left[\frac{c g x}{\sqrt{c^2 f g}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\sqrt{2}\ e^{-\text{ArcCoth}[c x]}\sqrt{c^2 f g}}{\sqrt{c^2 f+g}\ \sqrt{-c^2 f+g+\left(c^2 f+g\right)\text{Cosh}[2\,\text{ArcCoth}[c x]]}}\right]+$$

$$\left(\text{ArcCos}\left[\frac{c^2 f-g}{c^2 f+g}\right]-2\left(\text{ArcTan}\left[\frac{\sqrt{c^2 f g}}{c g x}\right]+\text{ArcTan}\left[\frac{c g x}{\sqrt{c^2 f g}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\sqrt{2}\ e^{\text{ArcCoth}[c x]}\sqrt{c^2 f g}}{\sqrt{c^2 f+g}\ \sqrt{-c^2 f+g+\left(c^2 f+g\right)\text{Cosh}[2\,\text{ArcCoth}[c x]]}}\right]+$$

$$i\left(-\text{PolyLog}\left[2,\frac{\left(-c^2 f+g+2 i\sqrt{c^2 f g}\right)\left(g-\frac{i\sqrt{c^2 f g}}{c x}\right)}{\left(c^2 f+g\right)\left(g+\frac{i\sqrt{c^2 f g}}{c x}\right)}\right]+\right.$$

$$\left.\left.\left.\text{PolyLog}\left[2,\frac{\left(c^2 f-g+2 i\sqrt{c^2 f g}\right)\left(i g+\frac{\sqrt{c^2 f g}}{c x}\right)}{\left(c^2 f+g\right)\left(-i g+\frac{\sqrt{c^2 f g}}{c x}\right)}\right]\right)\right)\right)-$$

$$\frac{1}{c}b e g\left(\frac{\left(-\text{Log}\left[-\frac{1}{c}+x\right]-\text{Log}\left[\frac{1}{c}+x\right]+\text{Log}\left[1-c^2 x^2\right]\right)\text{Log}\left[f+g x^2\right]}{2 g}+\right.$$

$$\frac{\text{Log}\left[-\frac{1}{c}+x\right]\text{Log}\left[1-\frac{\sqrt{g}\left(-\frac{1}{c}+x\right)}{-i\sqrt{f}-\frac{\sqrt{g}}{c}}\right]+\text{PolyLog}\left[2,\frac{\sqrt{g}\left(-\frac{1}{c}+x\right)}{-i\sqrt{f}-\frac{\sqrt{g}}{c}}\right]}{2 g}+$$

$$\frac{\text{Log}\left[-\frac{1}{c}+x\right]\text{Log}\left[1-\frac{\sqrt{g}\left(-\frac{1}{c}+x\right)}{i\sqrt{f}-\frac{\sqrt{g}}{c}}\right]+\text{PolyLog}\left[2,\frac{\sqrt{g}\left(-\frac{1}{c}+x\right)}{i\sqrt{f}-\frac{\sqrt{g}}{c}}\right]}{2 g}+$$

$$\frac{\text{Log}\left[\frac{1}{c}+x\right]\text{Log}\left[1-\frac{\sqrt{g}\left(\frac{1}{c}+x\right)}{-i\sqrt{f}+\frac{\sqrt{g}}{c}}\right]+\text{PolyLog}\left[2,\frac{\sqrt{g}\left(\frac{1}{c}+x\right)}{-i\sqrt{f}+\frac{\sqrt{g}}{c}}\right]}{2 g}+$$

$$\left.\frac{\text{Log}\left[\frac{1}{c}+x\right]\text{Log}\left[1-\frac{\sqrt{g}\left(\frac{1}{c}+x\right)}{i\sqrt{f}+\frac{\sqrt{g}}{c}}\right]+\text{PolyLog}\left[2,\frac{\sqrt{g}\left(\frac{1}{c}+x\right)}{i\sqrt{f}+\frac{\sqrt{g}}{c}}\right]}{2g}\right)$$

Problem 281: Result more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,\text{ArcCoth}[c\,x])\left(d+e\,\text{Log}\left[f+g\,x^2\right]\right)}{x^2}\,dx$$

Optimal (type 4, 560 leaves, 38 steps):

$$\frac{2\,a\,e\sqrt{g}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]}{\sqrt{f}}-\frac{b\,e\sqrt{g}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[1-\frac{1}{c\,x}\right]}{\sqrt{f}}+$$
$$\frac{b\,e\sqrt{g}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[1+\frac{1}{c\,x}\right]}{\sqrt{f}}+\frac{b\,e\sqrt{g}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[-\frac{2\sqrt{f}\sqrt{g}\,(1-c\,x)}{\left(i\,c\sqrt{f}-\sqrt{g}\right)\left(\sqrt{f}-i\sqrt{g}\,x\right)}\right]}{\sqrt{f}}-$$
$$\frac{b\,e\sqrt{g}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[\frac{2\sqrt{f}\sqrt{g}\,(1+c\,x)}{\left(i\,c\sqrt{f}+\sqrt{g}\right)\left(\sqrt{f}-i\sqrt{g}\,x\right)}\right]}{\sqrt{f}}-\frac{(a+b\,\text{ArcCoth}[c\,x])\left(d+e\,\text{Log}\left[f+g\,x^2\right]\right)}{x}+$$
$$\frac{1}{2}b\,c\,\text{Log}\left[-\frac{g\,x^2}{f}\right]\left(d+e\,\text{Log}\left[f+g\,x^2\right]\right)-\frac{1}{2}b\,c\,\text{Log}\left[\frac{g\left(1-c^2x^2\right)}{c^2f+g}\right]\left(d+e\,\text{Log}\left[f+g\,x^2\right]\right)-$$
$$\frac{1}{2}b\,c\,e\,\text{PolyLog}\left[2,\frac{c^2\left(f+g\,x^2\right)}{c^2f+g}\right]+\frac{1}{2}b\,c\,e\,\text{PolyLog}\left[2,1+\frac{g\,x^2}{f}\right]-$$
$$\frac{i\,b\,e\sqrt{g}\,\text{PolyLog}\left[2,1+\frac{2\sqrt{f}\sqrt{g}\,(1-c\,x)}{\left(i\,c\sqrt{f}-\sqrt{g}\right)\left(\sqrt{f}-i\sqrt{g}\,x\right)}\right]}{2\sqrt{f}}+\frac{i\,b\,e\sqrt{g}\,\text{PolyLog}\left[2,1-\frac{2\sqrt{f}\sqrt{g}\,(1+c\,x)}{\left(i\,c\sqrt{f}+\sqrt{g}\right)\left(\sqrt{f}-i\sqrt{g}\,x\right)}\right]}{2\sqrt{f}}$$

Result (type 4, 1236 leaves):

$$-\frac{a\,d}{x}-\frac{b\,d\,\text{ArcCoth}[c\,x]}{x}+b\,c\,d\,\text{Log}[x]-$$
$$\frac{1}{2}b\,c\,d\,\text{Log}\left[1-c^2x^2\right]+a\,e\left(\frac{2\sqrt{g}\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]}{\sqrt{f}}-\frac{\text{Log}\left[f+g\,x^2\right]}{x}\right)+$$
$$\frac{1}{2}b\,e\left(-\frac{\left(2\,\text{ArcCoth}[c\,x]+c\,x\left(-2\,\text{Log}[x]+\text{Log}\left[1-c^2x^2\right]\right)\right)\text{Log}\left[f+g\,x^2\right]}{x}-2\,c\left(\text{Log}[x]\right.\right.$$
$$\left(\text{Log}\left[1-\frac{i\sqrt{g}\,x}{\sqrt{f}}\right]+\text{Log}\left[1+\frac{i\sqrt{g}\,x}{\sqrt{f}}\right]\right)+\text{PolyLog}\left[2,-\frac{i\sqrt{g}\,x}{\sqrt{f}}\right]+\text{PolyLog}\left[2,\frac{i\sqrt{g}\,x}{\sqrt{f}}\right]\right)+$$

$$c\left(\text{Log}\left[-\frac{1}{c}+x\right]\text{Log}\left[\frac{c\left(\sqrt{f}-\mathrm{i}\sqrt{g}\,x\right)}{c\sqrt{f}-\mathrm{i}\sqrt{g}}\right]+\text{Log}\left[\frac{1}{c}+x\right]\text{Log}\left[\frac{c\left(\sqrt{f}-\mathrm{i}\sqrt{g}\,x\right)}{c\sqrt{f}+\mathrm{i}\sqrt{g}}\right]+\right.$$

$$\text{Log}\left[-\frac{1}{c}+x\right]\text{Log}\left[\frac{c\left(\sqrt{f}+\mathrm{i}\sqrt{g}\,x\right)}{c\sqrt{f}+\mathrm{i}\sqrt{g}}\right]-\left(\text{Log}\left[-\frac{1}{c}+x\right]+\text{Log}\left[\frac{1}{c}+x\right]-\text{Log}\left[1-c^2x^2\right]\right)$$

$$\text{Log}\left[f+g\,x^2\right]+\text{Log}\left[\frac{1}{c}+x\right]\text{Log}\left[1-\frac{\sqrt{g}\,(1+c\,x)}{\mathrm{i}\,c\sqrt{f}+\sqrt{g}}\right]+\text{PolyLog}\left[2,\frac{c\sqrt{g}\left(\frac{1}{c}+x\right)}{\mathrm{i}\,c\sqrt{f}+\sqrt{g}}\right]+\text{PolyLog}\Big[$$

$$\left.2,\frac{\mathrm{i}\sqrt{g}\,(-1+c\,x)}{c\sqrt{f}-\mathrm{i}\sqrt{g}}\Big]+\text{PolyLog}\left[2,-\frac{\mathrm{i}\sqrt{g}\,(-1+c\,x)}{c\sqrt{f}+\mathrm{i}\sqrt{g}}\right]+\text{PolyLog}\left[2,\frac{\mathrm{i}\sqrt{g}\,(1+c\,x)}{c\sqrt{f}+\mathrm{i}\sqrt{g}}\right]\right)-$$

$$\frac{1}{\sqrt{c^2 f g}}c\,g\left(2\,\mathrm{i}\,\text{ArcCos}\left[\frac{c^2f-g}{c^2f+g}\right]\text{ArcTan}\left[\frac{c\,f}{\sqrt{c^2fg}\,x}\right]-4\,\text{ArcCoth}[c\,x]\,\text{ArcTan}\left[\frac{c\,g\,x}{\sqrt{c^2fg}}\right]+\right.$$

$$\left(\text{ArcCos}\left[\frac{c^2f-g}{c^2f+g}\right]+2\,\text{ArcTan}\left[\frac{c\,f}{\sqrt{c^2fg}\,x}\right]\right)\text{Log}\left[\frac{2\,g\left(c^2f-\mathrm{i}\sqrt{c^2fg}\right)(-1+c\,x)}{\left(c^2f+g\right)\left(\mathrm{i}\sqrt{c^2fg}+c\,g\,x\right)}\right]+$$

$$\left(\text{ArcCos}\left[\frac{c^2f-g}{c^2f+g}\right]-2\,\text{ArcTan}\left[\frac{c\,f}{\sqrt{c^2fg}\,x}\right]\right)\text{Log}\left[\frac{2\,g\left(c^2f+\mathrm{i}\sqrt{c^2fg}\right)(1+c\,x)}{\left(c^2f+g\right)\left(\mathrm{i}\sqrt{c^2fg}+c\,g\,x\right)}\right]-$$

$$\left(\text{ArcCos}\left[\frac{c^2f-g}{c^2f+g}\right]+2\left(\text{ArcTan}\left[\frac{c\,f}{\sqrt{c^2fg}\,x}\right]+\text{ArcTan}\left[\frac{c\,g\,x}{\sqrt{c^2fg}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\sqrt{2}\,e^{-\text{ArcCoth}[c\,x]}\sqrt{c^2fg}}{\sqrt{c^2f+g}\,\sqrt{-c^2f+g+\left(c^2f+g\right)\text{Cosh}[2\,\text{ArcCoth}[c\,x]]}}\right]-$$

$$\left(\text{ArcCos}\left[\frac{c^2f-g}{c^2f+g}\right]-2\left(\text{ArcTan}\left[\frac{c\,f}{\sqrt{c^2fg}\,x}\right]+\text{ArcTan}\left[\frac{c\,g\,x}{\sqrt{c^2fg}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\sqrt{2}\,e^{\text{ArcCoth}[c\,x]}\sqrt{c^2fg}}{\sqrt{c^2f+g}\,\sqrt{-c^2f+g+\left(c^2f+g\right)\text{Cosh}[2\,\text{ArcCoth}[c\,x]]}}\right]+$$

$$\mathrm{i}\left(\text{PolyLog}\left[2,\frac{\left(c^2f-g-2\,\mathrm{i}\sqrt{c^2fg}\right)\left(\sqrt{c^2fg}+\mathrm{i}\,c\,g\,x\right)}{\left(c^2f+g\right)\left(\sqrt{c^2fg}-\mathrm{i}\,c\,g\,x\right)}\right]-\right.$$

$$\text{PolyLog}\left[2,\frac{\left(c^2 f-g+2 i \sqrt{c^2 f g}\right)\left(\sqrt{c^2 f g}+i c g x\right)}{\left(c^2 f+g\right)\left(\sqrt{c^2 f g}-i c g x\right)}\right]\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 282: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a+b \text{ArcCoth}[c x])\left(d+e \text{Log}\left[f+g x^2\right]\right)}{x^3}\,dx$$

Optimal (type 4, 712 leaves, 32 steps):

$$\frac{b c e \sqrt{g} \text{ArcTan}\left[\frac{\sqrt{g} x}{\sqrt{f}}\right]}{\sqrt{f}}+\frac{a e g \text{Log}[x]}{f}+\frac{b e g \text{ArcCoth}[c x] \text{Log}\left[\frac{2}{1+c x}\right]}{f}+$$

$$b c^2 e \text{ArcTanh}[c x] \text{Log}\left[\frac{2}{1+c x}\right]-\frac{b e g \text{ArcCoth}[c x] \text{Log}\left[\frac{2 c\left(\sqrt{-f}-\sqrt{g} x\right)}{\left(c \sqrt{-f}-\sqrt{g}\right)(1+c x)}\right]}{2 f}-$$

$$\frac{1}{2} b c^2 e \text{ArcTanh}[c x] \text{Log}\left[\frac{2 c\left(\sqrt{-f}-\sqrt{g} x\right)}{\left(c \sqrt{-f}-\sqrt{g}\right)(1+c x)}\right]-\frac{b e g \text{ArcCoth}[c x] \text{Log}\left[\frac{2 c\left(\sqrt{-f}+\sqrt{g} x\right)}{\left(c \sqrt{-f}+\sqrt{g}\right)(1+c x)}\right]}{2 f}-$$

$$\frac{1}{2} b c^2 e \text{ArcTanh}[c x] \text{Log}\left[\frac{2 c\left(\sqrt{-f}+\sqrt{g} x\right)}{\left(c \sqrt{-f}+\sqrt{g}\right)(1+c x)}\right]-\frac{a e g \text{Log}\left[f+g x^2\right]}{2 f}-$$

$$\frac{b c\left(d+e \text{Log}\left[f+g x^2\right]\right)}{2 x}-\frac{(a+b \text{ArcCoth}[c x])\left(d+e \text{Log}\left[f+g x^2\right]\right)}{2 x^2}+$$

$$\frac{1}{2} b c^2 \text{ArcTanh}[c x]\left(d+e \text{Log}\left[f+g x^2\right]\right)+\frac{b e g \text{PolyLog}\left[2,-\frac{1}{c x}\right]}{2 f}-$$

$$\frac{b e g \text{PolyLog}\left[2,\frac{1}{c x}\right]}{2 f}-\frac{1}{2} b c^2 e \text{PolyLog}\left[2,1-\frac{2}{1+c x}\right]-\frac{b e g \text{PolyLog}\left[2,1-\frac{2}{1+c x}\right]}{2 f}+$$

$$\frac{1}{4} b c^2 e \text{PolyLog}\left[2,1-\frac{2 c\left(\sqrt{-f}-\sqrt{g} x\right)}{\left(c \sqrt{-f}-\sqrt{g}\right)(1+c x)}\right]+\frac{b e g \text{PolyLog}\left[2,1-\frac{2 c\left(\sqrt{-f}-\sqrt{g} x\right)}{\left(c \sqrt{-f}-\sqrt{g}\right)(1+c x)}\right]}{4 f}+$$

$$\frac{1}{4} b c^2 e \text{PolyLog}\left[2,1-\frac{2 c\left(\sqrt{-f}+\sqrt{g} x\right)}{\left(c \sqrt{-f}+\sqrt{g}\right)(1+c x)}\right]+\frac{b e g \text{PolyLog}\left[2,1-\frac{2 c\left(\sqrt{-f}+\sqrt{g} x\right)}{\left(c \sqrt{-f}+\sqrt{g}\right)(1+c x)}\right]}{4 f}$$

Result (type 4, 1193 leaves):

$$\frac{1}{4 f x^2}\Bigg(-2 a d f-2 b c d f x-2 b d f \text{ArcCoth}[c x]+2 b c^2 d f x^2 \text{ArcCoth}[c x]+$$

$$4\,b\,c\,e\,\sqrt{f}\,\sqrt{g}\,x^2\,\text{ArcTan}\Big[\frac{\sqrt{g}\,x}{\sqrt{f}}\Big]+4\,\mathrm{i}\,b\,c^2\,e\,f\,x^2\,\text{ArcSin}\Big[\sqrt{\frac{g}{c^2 f+g}}\Big]\,\text{ArcTanh}\Big[\frac{c\,f}{\sqrt{-c^2 f g}\,x}\Big]+$$

$$4\,\mathrm{i}\,b\,e\,g\,x^2\,\text{ArcSin}\Big[\sqrt{\frac{g}{c^2 f+g}}\Big]\,\text{ArcTanh}\Big[\frac{c\,f}{\sqrt{-c^2 f g}\,x}\Big]+$$

$$4\,b\,c^2\,e\,f\,x^2\,\text{ArcCoth}[c\,x]\,\text{Log}\big[1-e^{-2\,\text{ArcCoth}[c\,x]}\big]+4\,b\,e\,g\,x^2\,\text{ArcCoth}[c\,x]\,\text{Log}\big[1+e^{-2\,\text{ArcCoth}[c\,x]}\big]-$$

$$2\,b\,c^2\,e\,f\,x^2\,\text{ArcCoth}[c\,x]\,\text{Log}\Big[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\Big(c^2\,\big(-1+e^{2\,\text{ArcCoth}[c\,x]}\big)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g-2\,\sqrt{-c^2 f g}\Big)\Big]-2\,b\,e\,g\,x^2\,\text{ArcCoth}[c\,x]$$

$$\text{Log}\Big[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\Big(c^2\,\big(-1+e^{2\,\text{ArcCoth}[c\,x]}\big)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g-2\,\sqrt{-c^2 f g}\Big)\Big]+$$

$$2\,\mathrm{i}\,b\,c^2\,e\,f\,x^2\,\text{ArcSin}\Big[\sqrt{\frac{g}{c^2 f+g}}\Big]\,\text{Log}\Big[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\Big(c^2\,\big(-1+e^{2\,\text{ArcCoth}[c\,x]}\big)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g-2\,\sqrt{-c^2 f g}\Big)\Big]+2\,\mathrm{i}\,b\,e\,g\,x^2\,\text{ArcSin}\Big[\sqrt{\frac{g}{c^2 f+g}}\Big]$$

$$\text{Log}\Big[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\Big(c^2\,\big(-1+e^{2\,\text{ArcCoth}[c\,x]}\big)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g-2\,\sqrt{-c^2 f g}\Big)\Big]-$$

$$2\,b\,c^2\,e\,f\,x^2\,\text{ArcCoth}[c\,x]\,\text{Log}\Big[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\Big(c^2\,\big(-1+e^{2\,\text{ArcCoth}[c\,x]}\big)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g+2\,\sqrt{-c^2 f g}\Big)\Big]-2\,b\,e\,g\,x^2\,\text{ArcCoth}[c\,x]$$

$$\text{Log}\Big[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\Big(c^2\,\big(-1+e^{2\,\text{ArcCoth}[c\,x]}\big)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g+2\,\sqrt{-c^2 f g}\Big)\Big]-$$

$$2\,\mathrm{i}\,b\,c^2\,e\,f\,x^2\,\text{ArcSin}\Big[\sqrt{\frac{g}{c^2 f+g}}\Big]\,\text{Log}\Big[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\Big(c^2\,\big(-1+e^{2\,\text{ArcCoth}[c\,x]}\big)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g+2\,\sqrt{-c^2 f g}\Big)\Big]-2\,\mathrm{i}\,b\,e\,g\,x^2\,\text{ArcSin}\Big[\sqrt{\frac{g}{c^2 f+g}}\Big]$$

$$\text{Log}\Big[\frac{1}{c^2 f+g}e^{-2\,\text{ArcCoth}[c\,x]}\Big(c^2\,\big(-1+e^{2\,\text{ArcCoth}[c\,x]}\big)\,f+g+e^{2\,\text{ArcCoth}[c\,x]}\,g+2\,\sqrt{-c^2 f g}\Big)\Big]+$$

$$4\,a\,e\,g\,x^2\,\text{Log}[x]-2\,a\,e\,f\,\text{Log}\big[f+g\,x^2\big]-2\,b\,c\,e\,f\,x\,\text{Log}\big[f+g\,x^2\big]-2\,a\,e\,g\,x^2\,\text{Log}\big[f+g\,x^2\big]-$$

$$2\,b\,e\,f\,\text{ArcCoth}[c\,x]\,\text{Log}\big[f+g\,x^2\big]+2\,b\,c^2\,e\,f\,x^2\,\text{ArcCoth}[c\,x]\,\text{Log}\big[f+g\,x^2\big]-$$

$$2\,b\,e\,g\,x^2\,\text{PolyLog}\big[2,\,-e^{-2\,\text{ArcCoth}[c\,x]}\big]-2\,b\,c^2\,e\,f\,x^2\,\text{PolyLog}\big[2,\,e^{-2\,\text{ArcCoth}[c\,x]}\big]+$$

$$b\,c^2\,e\,f\,x^2\,\text{PolyLog}\Big[2,\,\frac{e^{-2\,\text{ArcCoth}[c\,x]}\,\big(c^2 f-g+2\,\sqrt{-c^2 f g}\big)}{c^2 f+g}\Big]+$$

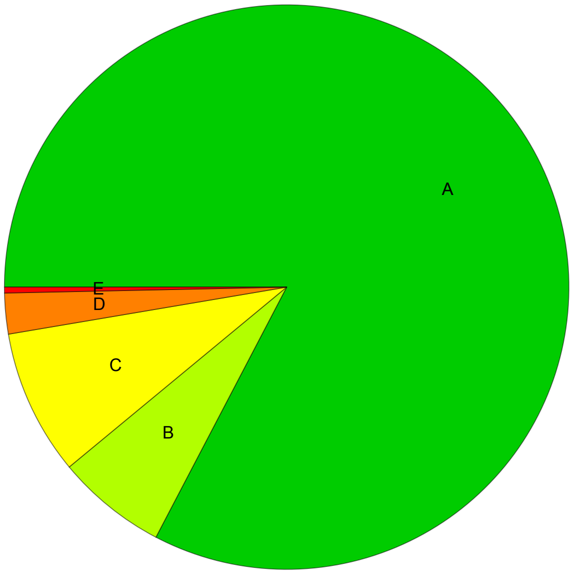
$$b\,e\,g\,x^2\,\text{PolyLog}\Big[2,\,\frac{e^{-2\,\text{ArcCoth}[c\,x]}\,\big(c^2 f-g+2\,\sqrt{-c^2 f g}\big)}{c^2 f+g}\Big]+$$

$$b\,c^2\,e\,f\,x^2\,\text{PolyLog}\Big[2,\,-\frac{e^{-2\,\text{ArcCoth}[c\,x]}\,\big(-c^2 f+g+2\,\sqrt{-c^2 f g}\big)}{c^2 f+g}\Big]+$$

$$\left. b\, e\, g\, x^2\, \text{PolyLog}\left[2, -\frac{e^{-2\,\text{ArcCoth}[c\,x]}\left(-c^2 f + g + 2\sqrt{-c^2 f g}\right)}{c^2 f + g}\right]\right)$$

Summary of Integration Test Results

300 integration problems



A - 248 optimal antiderivatives

B - 19 more than twice size of optimal antiderivatives

C - 25 unnecessarily complex antiderivatives

D - 7 unable to integrate problems

E - 1 integration timeouts