Mathematica 11.3 Integration Test Results

Test results for the 62 problems in "7.3.5 u (a+b arctanh(c+d x))^p.m"

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

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

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

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

Result (type 4, 463 leaves):

$$-\frac{1}{12 b^3}\left(1-(a+b x)^2\right)^{3/2}\left(-\frac{a+b x}{\sqrt{1-(a+b x)^2}}+\frac{6 a (a+b x) \text{ArcTanh}[a+b x]}{\sqrt{1-(a+b x)^2}}+\frac{3 (a+b x) \text{ArcTanh}[a+b x]^2}{\sqrt{1-(a+b x)^2}}-\frac{3 a^2 (a+b x) \text{ArcTanh}[a+b x]^2}{\sqrt{1-(a+b x)^2}}+\text{ArcTanh}[a+b x]^2 \text{Cosh}[3 \text{ArcTanh}[a+b x]]+3 a^2 \text{ArcTanh}[a+b x]^2 \text{Cosh}[3 \text{ArcTanh}[a+b x]]+2 \text{ArcTanh}[a+b x] \text{Cosh}[3 \text{ArcTanh}[a+b x]] \text{Log}\left[1+e^{-2 \text{ArcTanh}[a+b x]}\right]+6 a^2 \text{ArcTanh}[a+b x] \text{Cosh}[3 \text{ArcTanh}[a+b x]] \text{Log}\left[1+e^{-2 \text{ArcTanh}[a+b x]}\right]-6 a \text{Cosh}[3 \text{ArcTanh}[a+b x]] \text{Log}\left[\frac{1}{\sqrt{1-(a+b x)^2}}\right]+\left(3\left(1-4 a+3 a^2\right) \text{ArcTanh}[a+b x]^2+2 \text{ArcTanh}[a+b x]\left(2+\left(3+9 a^2\right) \text{Log}\left[1+e^{-2 \text{ArcTanh}[a+b x]}\right]\right)-18 a \text{Log}\left[\frac{1}{\sqrt{1-(a+b x)^2}}\right]\right)\Big/\left(\sqrt{1-(a+b x)^2}\right)-\frac{4\left(1+3 a^2\right) \text{PolyLog}\left[2,-e^{-2 \text{ArcTanh}[a+b x]}\right]}{\left(1-(a+b x)^2\right)^{3/2}}-\text{Sinh}[3 \text{ArcTanh}[a+b x]]+6 a \text{ArcTanh}[a+b x] \text{Sinh}[3 \text{ArcTanh}[a+b x]]-\text{ArcTanh}[a+b x]^2 \text{Sinh}[3 \text{ArcTanh}[a+b x]]-3 a^2 \text{ArcTanh}[a+b x]^2 \text{Sinh}[3 \text{ArcTanh}[a+b x]]\right)$$

Problem 5: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 634 leaves):

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

$$\frac{2\sqrt{1-a^2}\;e^{\text{ArcTanh}[a]}\;\text{ArcTanh}[a+b x]^3}{3 a}-\text{ArcTanh}[a+b x]^2\,\text{Log}\left[1+e^{-2\,\text{ArcTanh}[a+b x]}\right]-$$

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

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

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

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

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

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

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

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

$$2\,\text{ArcTanh}[a]\,\text{ArcTanh}[a+b x]\,\text{Log}\left[-i\,\text{Sinh}[\text{ArcTanh}[a]-\text{ArcTanh}[a+b x]]\right]+$$

$$\text{ArcTanh}[a+b x]\,\text{PolyLog}\left[2,-e^{-2\,\text{ArcTanh}[a+b x]}\right]-$$

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

$$2\,\text{ArcTanh}[a+b x]\,\text{PolyLog}\left[2,-e^{-\text{ArcTanh}[a]+\text{ArcTanh}[a+b x]}\right]+$$

$$2\,\text{ArcTanh}[a+b x]\,\text{PolyLog}\left[2,e^{-\text{ArcTanh}[a]+\text{ArcTanh}[a+b x]}\right]+$$

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

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

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

Problem 6: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 208 leaves):

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

Problem 7: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 271 leaves):

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

Problem 12: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 54 leaves, 3 steps):

$$\frac{a \,\text{Log}[c+d x]}{d e}-\frac{b \,\text{PolyLog}[2,-c-d x]}{2 d e}+\frac{b \,\text{PolyLog}[2,c+d x]}{2 d e}$$

Result (type 4, 288 leaves):

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

Problem 18: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

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

Optimal (type 4, 168 leaves, 8 steps):

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

Result (type 4, 424 leaves):

$$\frac{1}{d e} \left(a^2 \operatorname{Log}[c + d x] + 2 a b \operatorname{ArcTanh}[c + d x] \left(-\operatorname{Log}\left[\frac{1}{\sqrt{1 - (c + d x)^2}}\right] + \operatorname{Log}\left[\frac{i (c + d x)}{\sqrt{1 - (c + d x)^2}}\right]\right) - \frac{1}{4} a b \left(\pi^2 - 4 i \pi \operatorname{ArcTanh}[c + d x] - 8 \operatorname{ArcTanh}[c + d x]^2 - 8 \operatorname{ArcTanh}[c + d x] \operatorname{Log}\left[1 - e^{-2 \operatorname{ArcTanh}[c+d x]}\right] + 4 i \pi \operatorname{Log}\left[1 + e^{2 \operatorname{ArcTanh}[c+d x]}\right] + 8 \operatorname{ArcTanh}[c + d x] \operatorname{Log}\left[1 + e^{2 \operatorname{ArcTanh}[c+d x]}\right] - 4 i \pi \operatorname{Log}\left[\frac{2}{\sqrt{1 - (c + d x)^2}}\right] - 8 \operatorname{ArcTanh}[c + d x] \operatorname{Log}\left[\frac{2}{\sqrt{1 - (c + d x)^2}}\right] + 8 \operatorname{ArcTanh}[c + d x] \operatorname{Log}\left[\frac{2 i (c + d x)}{\sqrt{1 - (c + d x)^2}}\right] + 4 \operatorname{PolyLog}\left[2, e^{-2 \operatorname{ArcTanh}[c+d x]}\right] + 4 \operatorname{PolyLog}\left[2, -e^{2 \operatorname{ArcTanh}[c+d x]}\right]\right) + b^2 \left(\frac{i \pi^3}{24} - \frac{2}{3} \operatorname{ArcTanh}[c + d x]^3 - \operatorname{ArcTanh}[c + d x]^2 \operatorname{Log}\left[1 + e^{-2 \operatorname{ArcTanh}[c+d x]}\right] + \operatorname{ArcTanh}[c + d x]^2 \operatorname{Log}\left[1 - e^{2 \operatorname{ArcTanh}[c+d x]}\right] + \operatorname{ArcTanh}[c + d x] \operatorname{PolyLog}\left[2, -e^{-2 \operatorname{ArcTanh}[c+d x]}\right] + \operatorname{ArcTanh}[c + d x] \operatorname{PolyLog}\left[2, e^{2 \operatorname{ArcTanh}[c+d x]}\right] + \frac{1}{2} \operatorname{PolyLog}\left[3, -e^{-2 \operatorname{ArcTanh}[c+d x]}\right] - \frac{1}{2} \operatorname{PolyLog}\left[3, e^{2 \operatorname{ArcTanh}[c+d x]}\right]\right)\right)$$

Problem 25: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 257 leaves, 10 steps):

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

Result (type 4, 599 leaves) :

$$\frac{1}{64\,d\,e}\left(64\,a^3\,\text{Log}[c+d\,x]+192\,a^2\,b\,\text{ArcTanh}[c+d\,x]\left(-\text{Log}\left[\frac{1}{\sqrt{1-(c+d\,x)^2}}\right]+\text{Log}\left[\frac{i\,(c+d\,x)}{\sqrt{1-(c+d\,x)^2}}\right]\right)-96\,i\,a^2\,b\left(-\frac{1}{4}\,i\,(\pi-2\,i\,\text{ArcTanh}[c+d\,x])^2+i\,\text{ArcTanh}[c+d\,x]^2+2\,i\,\text{ArcTanh}[c+d\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcTanh}[c+d\,x]}\right]+(\pi-2\,i\,\text{ArcTanh}[c+d\,x])\,\text{Log}\left[1+e^{2\,\text{ArcTanh}[c+d\,x]}\right]-(\pi-2\,i\,\text{ArcTanh}[c+d\,x])\,\text{Log}\left[\frac{2}{\sqrt{1-(c+d\,x)^2}}\right]-2\,i\,\text{ArcTanh}[c+d\,x]\,\text{Log}\left[\frac{2\,i\,(c+d\,x)}{\sqrt{1-(c+d\,x)^2}}\right]-i\,\text{PolyLog}\left[2,\,e^{-2\,\text{ArcTanh}[c+d\,x]}\right]-i\,\text{PolyLog}\left[2,\,-e^{2\,\text{ArcTanh}[c+d\,x]}\right]\right)+8\,a\,b^2\left(i\,\pi^3-16\,\text{ArcTanh}[c+d\,x]^3-24\,\text{ArcTanh}[c+d\,x]^2\,\text{Log}\left[1+e^{-2\,\text{ArcTanh}[c+d\,x]}\right]+24\,\text{ArcTanh}[c+d\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcTanh}[c+d\,x]}\right]+24\,\text{ArcTanh}[c+d\,x]\,\text{PolyLog}\left[2,\,-e^{-2\,\text{ArcTanh}[c+d\,x]}\right]+24\,\text{ArcTanh}[c+d\,x]\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}[c+d\,x]}\right]+12\,\text{PolyLog}\left[3,\,-e^{-2\,\text{ArcTanh}[c+d\,x]}\right]-12\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}[c+d\,x]}\right]\right)+b^3\left(\pi^4-32\,\text{ArcTanh}[c+d\,x]^4-64\,\text{ArcTanh}[c+d\,x]^3\,\text{Log}\left[1+e^{-2\,\text{ArcTanh}[c+d\,x]}\right]+64\,\text{ArcTanh}[c+d\,x]^3\,\text{Log}\left[1-e^{2\,\text{ArcTanh}[c+d\,x]}\right]+96\,\text{ArcTanh}[c+d\,x]^2\,\text{PolyLog}\left[2,\,-e^{-2\,\text{ArcTanh}[c+d\,x]}\right]+96\,\text{ArcTanh}[c+d\,x]^2\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}[c+d\,x]}\right]+96\,\text{ArcTanh}[c+d\,x]\,\text{PolyLog}\left[3,\,-e^{-2\,\text{ArcTanh}[c+d\,x]}\right]-96\,\text{ArcTanh}[c+d\,x]\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}[c+d\,x]}\right]+48\,\text{PolyLog}\left[4,\,-e^{-2\,\text{ArcTanh}[c+d\,x]}\right]+48\,\text{PolyLog}\left[4,\,e^{2\,\text{ArcTanh}[c+d\,x]}\right]\right)\right)$$

Problem 26: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 143 leaves, 7 steps):

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

Result (type 4, 248 leaves):

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

Problem 28: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a+b\,\text{ArcTanh}[c+d\,x])^3}{(c\,e+d\,e\,x)^4}\,dx$$

Optimal (type 4, 269 leaves, 16 steps):

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

Result (type 4, 393 leaves):

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

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

$$6\,b^3\left(\frac{i\,\pi^3}{24}-\frac{\text{ArcTanh}[c+d\,x]}{c+d\,x}-\frac{\left(1-(c+d\,x)^2\right)\text{ArcTanh}[c+d\,x]^2}{2\,(c+d\,x)^2}-\frac{1}{3}\,\text{ArcTanh}[c+d\,x]^3-\frac{\text{ArcTanh}[c+d\,x]^3}{3\,(c+d\,x)}-\frac{\left(1-(c+d\,x)^2\right)\text{ArcTanh}[c+d\,x]^3}{3\,(c+d\,x)^3}+\right.$$

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

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

Problem 29: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 21 leaves, 3 steps):

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

Result (type 4, 207 leaves):

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

Problem 30: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 32 leaves, 3 steps):

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

Result (type 4, 263 leaves):

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

Problem 35: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

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

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

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

Result (type 4, 329 leaves):

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

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

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

Optimal (type 4, 562 leaves, 20 steps):

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

Result (type 4, 1215 leaves):

$$a^2 e^3 x + \frac{3}{2} a^2 e^2 f x^2 + a^2 e f^2 x^3 + \frac{1}{4} a^2 f^3 x^4 +$$
$$\frac{1}{12} a b \left(6 x (4 e^3 + 6 e^2 f x + 4 e f^2 x^2 + f^3 x^3) \text{ArcTanh}[c + d x] - \frac{1}{d^4}\right.$$
$$(-2 d f x (3 (1 + 3 c^2) f^2 - 3 c d f (8 e + f x) + d^2 (18 e^2 + 6 e f x + f^2 x^2)) +$$
$$3 (-1 + c) (4 d^3 e^3 - 6 (-1 + c) d^2 e^2 f + 4 (-1 + c)^2 d e f^2 - (-1 + c)^3 f^3) \text{Log}[1 - c - d x] +$$
$$\left.3 (1 + c) (-4 d^3 e^3 + 6 (1 + c) d^2 e^2 f - 4 (1 + c)^2 d e f^2 + (1 + c)^3 f^3) \text{Log}[1 + c + d x])\right) + \frac{1}{d}$$
$$b^2 e^3 \left(\text{ArcTanh}[c + d x] \left(-\text{ArcTanh}[c + d x] + (c + d x) \text{ArcTanh}[c + d x] - 2 \text{Log}\left[1 + e^{-2 \text{ArcTanh}[c+d x]}\right]\right) +\right.$$
$$\left.\text{PolyLog}\left[2, -e^{-2 \text{ArcTanh}[c+d x]}\right]\right) - \frac{1}{2 d^2} 3 b^2 e^2 f \left((1 - (c + d x)^2) \text{ArcTanh}[c + d x]^2 +\right.$$
$$2 \left(-(c + d x) \text{ArcTanh}[c + d x] - c \text{ArcTanh}[c + d x]^2 + c (c + d x) \text{ArcTanh}[c + d x]^2 -\right.$$
$$\left.2 c \text{ArcTanh}[c + d x] \text{Log}\left[1 + e^{-2 \text{ArcTanh}[c+d x]}\right] + \text{Log}\left[\frac{1}{\sqrt{1 - (c + d x)^2}}\right]\right) +$$
$$\left.2 c \text{PolyLog}\left[2, -e^{-2 \text{ArcTanh}[c+d x]}\right]\right) + \frac{1}{12 d^4} b^2 f^3 \left(3 (1 - (c + d x)^2)^2 \text{ArcTanh}[c + d x]^2 -\right.$$
$$(1 - (c + d x)^2) (1 - 12 c \text{ArcTanh}[c + d x] + 6 \text{ArcTanh}[c + d x]^2 +$$

$$18\,c^2\,\text{ArcTanh}[c+d\,x]^2-2\,(c+d\,x)\,\text{ArcTanh}[c+d\,x]\,\big(-1+6\,c\,\text{ArcTanh}[c+d\,x]\big)\Big)-$$

$$4\,\Big(-3\,c\,\text{ArcTanh}[c+d\,x]^2-3\,c^3\,\text{ArcTanh}[c+d\,x]^2+(c+d\,x)\,\Big(-2\,\text{ArcTanh}[c+d\,x]-$$

$$9\,c^2\,\text{ArcTanh}[c+d\,x]+3\,c^3\,\text{ArcTanh}[c+d\,x]^2+3\,c\,\big(1+\text{ArcTanh}[c+d\,x]^2\big)\Big)-$$

$$6\,c\,(1+c^2)\,\text{ArcTanh}[c+d\,x]\,\text{Log}\big[1+e^{-2\,\text{ArcTanh}[c+d\,x]}\big]+2\,\text{Log}\Big[\frac{1}{\sqrt{1-(c+d\,x)^2}}\Big]+$$

$$9\,c^2\,\text{Log}\Big[\frac{1}{\sqrt{1-(c+d\,x)^2}}\Big]\Big)-12\,(c+c^3)\,\text{PolyLog}\big[2,\,-e^{-2\,\text{ArcTanh}[c+d\,x]}\big]\Big)-$$

$$\frac{1}{4\,d^3}\,b^2\,e\,f^2\,\big(1-(c+d\,x)^2\big)^{3/2}\,\Big(-\frac{c+d\,x}{\sqrt{1-(c+d\,x)^2}}+\frac{6\,c\,(c+d\,x)\,\text{ArcTanh}[c+d\,x]}{\sqrt{1-(c+d\,x)^2}}+$$

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

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

$$2\,\text{ArcTanh}[c+d\,x]\,\text{Cosh}[3\,\text{ArcTanh}[c+d\,x]]\,\text{Log}\big[1+e^{-2\,\text{ArcTanh}[c+d\,x]}\big]+$$

$$6\,c^2\,\text{ArcTanh}[c+d\,x]\,\text{Cosh}[3\,\text{ArcTanh}[c+d\,x]]\,\text{Log}\big[1+e^{-2\,\text{ArcTanh}[c+d\,x]}\big]-$$

$$6\,c\,\text{Cosh}[3\,\text{ArcTanh}[c+d\,x]]\,\text{Log}\Big[\frac{1}{\sqrt{1-(c+d\,x)^2}}\Big]+\frac{1}{\sqrt{1-(c+d\,x)^2}}$$

$$\Big(\text{ArcTanh}[c+d\,x]\,\big(4+3\,(1-4\,c+3\,c^2)\,\text{ArcTanh}[c+d\,x]\big)+$$

$$6\,\big(\text{ArcTanh}[c+d\,x]+3\,c^2\,\text{ArcTanh}[c+d\,x]\big)\,\text{Log}\big[1+e^{-2\,\text{ArcTanh}[c+d\,x]}\big]-$$

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

$$\text{Sinh}[3\,\text{ArcTanh}[c+d\,x]]+6\,c\,\text{ArcTanh}[c+d\,x]\,\text{Sinh}[3\,\text{ArcTanh}[c+d\,x]]-$$

$$\text{ArcTanh}[c+d\,x]^2\,\text{Sinh}[3\,\text{ArcTanh}[c+d\,x]]-3\,c^2\,\text{ArcTanh}[c+d\,x]^2\,\text{Sinh}[3\,\text{ArcTanh}[c+d\,x]]\Big)$$

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

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

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

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

Result (type 4, 795 leaves) :

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

$$\frac{1}{12 d^3} b^2 f^2 \left(1 - (c + d x)^2\right)^{3/2} \left(-\frac{c + d x}{\sqrt{1 - (c + d x)^2}} + \frac{6 c (c + d x) \text{ArcTanh}[c + d x]}{\sqrt{1 - (c + d x)^2}} + \frac{3 (c + d x) \text{ArcTanh}[c + d x]^2}{\sqrt{1 - (c + d x)^2}} - \frac{3 c^2 (c + d x) \text{ArcTanh}[c + d x]^2}{\sqrt{1 - (c + d x)^2}} + \text{ArcTanh}[c + d x]^2 \text{Cosh}[3 \text{ArcTanh}[c + d x]] + 3 c^2 \text{ArcTanh}[c + d x]^2 \text{Cosh}[3 \text{ArcTanh}[c + d x]] + 2 \text{ArcTanh}[c + d x] \text{Cosh}[3 \text{ArcTanh}[c + d x]] \text{Log}\left[1 + e^{-2 \text{ArcTanh}[c+d x]}\right] + 6 c^2 \text{ArcTanh}[c + d x] \text{Cosh}[3 \text{ArcTanh}[c + d x]] \text{Log}\left[1 + e^{-2 \text{ArcTanh}[c+d x]}\right] - 6 c \text{Cosh}[3 \text{ArcTanh}[c + d x]] \text{Log}\left[\frac{1}{\sqrt{1 - (c + d x)^2}}\right] + \frac{1}{\sqrt{1 - (c + d x)^2}} \left(3 \left(1 - 4 c + 3 c^2\right) \text{ArcTanh}[c + d x]^2 + 2 \text{ArcTanh}[c + d x] \left(2 + \left(3 + 9 c^2\right) \text{Log}\left[1 + e^{-2 \text{ArcTanh}[c+d x]}\right]\right) - 18 c \text{Log}\left[\frac{1}{\sqrt{1 - (c + d x)^2}}\right]\right) - \frac{4 \left(1 + 3 c^2\right) \text{PolyLog}\left[2, -e^{-2 \text{ArcTanh}[c+d x]}\right]}{\left(1 - (c + d x)^2\right)^{3/2}} - \text{Sinh}[3 \text{ArcTanh}[c + d x]] + 6 c \text{ArcTanh}[c + d x] \text{Sinh}[3 \text{ArcTanh}[c + d x]] - \text{ArcTanh}[c + d x]^2 \text{Sinh}[3 \text{ArcTanh}[c + d x]] - 3 c^2 \text{ArcTanh}[c + d x]^2 \text{Sinh}[3 \text{ArcTanh}[c + d x]]\right)$$

Problem 42: Unable to integrate problem.

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

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

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

Result (type 8, 22 leaves):

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

Problem 43: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 1198 leaves):

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

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

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

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

$$b^2$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 44: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 750 leaves, 26 steps):

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

Result (type 4, 1970 leaves):

$$-\frac{a^2}{2 f (e+f x)^2}+\frac{1}{d (e+f x)^3}$$

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

$$\left((c+d\,x)\,(f-2\,d\,e\,\text{ArcTanh}[c+d\,x]+2\,c\,f\,\text{ArcTanh}[c+d\,x])\right)\Big/\left((d\,e-c\,f)\right.$$

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

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

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

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

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

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

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

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

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

$$\left(f\left(1-(c+dx)^2\right)^{3/2}\left(\frac{de}{\sqrt{1-(c+dx)^2}}-\frac{cf}{\sqrt{1-(c+dx)^2}}+\frac{f(c+dx)}{\sqrt{1-(c+dx)^2}}\right)^3\left(-f\,\mathrm{ArcTanh}[c+dx]+(de-cf)\,\mathrm{Log}\left[\frac{de-cf}{\sqrt{1-(c+dx)^2}}+\frac{f(c+dx)}{\sqrt{1-(c+dx)^2}}\right]\right)\right)\Big/$$

$$\left((de-cf)(de-f-cf)(de+f-cf)\left(-f^2+(de-cf)^2\right)\left(de-cf+f(c+dx)\right)^3\right)-$$

$$\left(c\left(1-(c+dx)^2\right)^{3/2}\left(\frac{de}{\sqrt{1-(c+dx)^2}}-\frac{cf}{\sqrt{1-(c+dx)^2}}+\frac{f(c+dx)}{\sqrt{1-(c+dx)^2}}\right)^3\right.$$

$$\left(-e^{-\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]}\mathrm{ArcTanh}[c+dx]^2+\frac{1}{f\sqrt{1-\frac{(de-cf)^2}{f^2}}}\,i\,(de-cf)\left(-\left(-\pi+2\,i\,\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]\right)\mathrm{ArcTanh}[c+dx]-2\left(i\,\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]+i\,\mathrm{ArcTanh}[c+dx]\right)\right.\right.$$

$$\mathrm{Log}\left[1-e^{2i\left(i\,\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]+i\,\mathrm{ArcTanh}[c+dx]\right)}\right]-\pi\,\mathrm{Log}\left[1+e^{2\,\mathrm{ArcTanh}[c+dx]}\right]+$$

$$\pi\,\mathrm{Log}\left[\frac{1}{\sqrt{1-(c+dx)^2}}\right]+2\,i\,\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]\mathrm{Log}\left[i\,\mathrm{Sinh}\left[\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]+\right.\right.$$

$$\left.\left.\left.\left.\left.\mathrm{ArcTanh}[c+dx]\right]\right]+i\,\mathrm{PolyLog}\left[2,e^{2i\left(i\,\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]+i\,\mathrm{ArcTanh}[c+dx]\right)}\right]\right)\right)\right)\Big/$$

$$\left((de-cf)(de-f-cf)(de+f-cf)\sqrt{\frac{f^2-(de-cf)^2}{f^2}}\left(de-cf+f(c+dx)\right)^3\right)+$$

$$\left(de\left(1-(c+dx)^2\right)^{3/2}\left(\frac{de}{\sqrt{1-(c+dx)^2}}-\frac{cf}{\sqrt{1-(c+dx)^2}}+\frac{f(c+dx)}{\sqrt{1-(c+dx)^2}}\right)^3\right.$$

$$\left(-e^{-\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]}\mathrm{ArcTanh}[c+dx]^2+\frac{1}{f\sqrt{1-\frac{(de-cf)^2}{f^2}}}\,i\,(de-cf)\left(-\left(-\pi+2\,i\,\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]\right)\mathrm{ArcTanh}[c+dx]-2\left(i\,\mathrm{ArcTanh}\left[\frac{de-cf}{f}\right]+i\,\mathrm{ArcTanh}[c+dx]\right)\right.\right.$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 4, 1868 leaves):

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

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

$$\frac{1}{2\,d^3}\,(3\,a^2\,b\,d^2\,e^2-3\,a^2\,b\,c\,d^2\,e^2+3\,a^2\,b\,d\,e\,f-6\,a^2\,b\,c\,d\,e\,f+$$

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

$$\frac{1}{2\,d^3}\,(3\,a^2\,b\,d^2\,e^2+3\,a^2\,b\,c\,d^2\,e^2-3\,a^2\,b\,d\,e\,f-6\,a^2\,b\,c\,d\,e\,f-3\,a^2\,b\,c^2\,d\,e\,f+$$

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

$$(\text{ArcTanh}[c+d\,x]\,(-\text{ArcTanh}[c+d\,x]+(c+d\,x)\,\text{ArcTanh}[c+d\,x]-2\,\text{Log}[1+e^{-2\,\text{ArcTanh}[c+d\,x]}])+$$

$$\text{PolyLog}[2,-e^{-2\,\text{ArcTanh}[c+d\,x]}])-\frac{1}{d^2}$$

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

$$c\,(c+d\,x)\,\text{ArcTanh}[c+d\,x]^2-2\,c\,\text{ArcTanh}[c+d\,x]\,\text{Log}[1+e^{-2\,\text{ArcTanh}[c+d\,x]}]+$$

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

$$(\text{ArcTanh}[c+d\,x]^2\,(-\text{ArcTanh}[c+d\,x]+(c+d\,x)\,\text{ArcTanh}[c+d\,x]-3\,\text{Log}[1+e^{-2\,\text{ArcTanh}[c+d\,x]}])+$$

$$3\,\text{ArcTanh}[c+d\,x]\,\text{PolyLog}[2,-e^{-2\,\text{ArcTanh}[c+d\,x]}]+\frac{3}{2}\,\text{PolyLog}[3,-e^{-2\,\text{ArcTanh}[c+d\,x]}])+$$

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

$$(1-(c+d\,x)^2)\,\text{ArcTanh}[c+d\,x]^2+(c+d\,x)\,\text{ArcTanh}[c+d\,x]\,(-3+2\,c\,\text{ArcTanh}[c+d\,x])+$$

$$6\,\text{Log}[1+e^{-2\,\text{ArcTanh}[c+d\,x]}]-6\,c\,\text{ArcTanh}[c+d\,x]\,\text{Log}[1+e^{-2\,\text{ArcTanh}[c+d\,x]}])+$$

$$(3-6\,c\,\text{ArcTanh}[c+d\,x])\,\text{PolyLog}[2,-e^{-2\,\text{ArcTanh}[c+d\,x]}]-3\,c\,\text{PolyLog}[3,-e^{-2\,\text{ArcTanh}[c+d\,x]}])-$$

$$\frac{1}{4\,d^3}\,a\,b^2\,f^2\,(1-(c+d\,x)^2)^{3/2}\,\Big(-\frac{c+d\,x}{\sqrt{1-(c+d\,x)^2}}+\frac{6\,c\,(c+d\,x)\,\text{ArcTanh}[c+d\,x]}{\sqrt{1-(c+d\,x)^2}}+$$

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

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

$$2\,\text{ArcTanh}[c+d\,x]\,\text{Cosh}[3\,\text{ArcTanh}[c+d\,x]]\,\text{Log}[1+e^{-2\,\text{ArcTanh}[c+d\,x]}]+$$

$$6\,c^2\,\text{ArcTanh}[c+d\,x]\,\text{Cosh}[3\,\text{ArcTanh}[c+d\,x]]\,\text{Log}[1+e^{-2\,\text{ArcTanh}[c+d\,x]}]-$$

$$6\,c\,\text{Cosh}[3\,\text{ArcTanh}[c+d\,x]]\,\text{Log}\Big[\frac{1}{\sqrt{1-(c+d\,x)^2}}\Big]+\frac{1}{\sqrt{1-(c+d\,x)^2}}$$

$$(\text{ArcTanh}[c+d\,x]\,(4+3\,(1-4\,c+3\,c^2)\,\text{ArcTanh}[c+d\,x])+$$

$$6\left(\text{ArcTanh}[c+d x]+3 c^2 \text{ArcTanh}[c+d x]\right) \text{Log}\left[1+e^{-2 \text{ArcTanh}[c+d x]}\right]-18 c \,\text{Log}\left[\frac{1}{\sqrt{1-(c+d x)^2}}\right]\Bigg)-\frac{4\left(1+3 c^2\right) \text{PolyLog}\left[2,-e^{-2 \text{ArcTanh}[c+d x]}\right]}{\left(1-(c+d x)^2\right)^{3/2}}-$$

$$\text{Sinh}[3 \text{ArcTanh}[c+d x]]+6 c \,\text{ArcTanh}[c+d x] \,\text{Sinh}[3 \text{ArcTanh}[c+d x]]-\text{ArcTanh}[c+d x]^2 \,\text{Sinh}[3 \text{ArcTanh}[c+d x]]-3 c^2 \text{ArcTanh}[c+d x]^2 \,\text{Sinh}[3 \text{ArcTanh}[c+d x]]\Bigg)+$$

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

$$\frac{1}{12}\left(1-(c+d x)^2\right)^{3/2}\Bigg(-\frac{3(c+d x) \text{ArcTanh}[c+d x]}{\sqrt{1-(c+d x)^2}}+\frac{9 c(c+d x) \text{ArcTanh}[c+d x]^2}{\sqrt{1-(c+d x)^2}}+\frac{3(c+d x) \text{ArcTanh}[c+d x]^3}{\sqrt{1-(c+d x)^2}}-\frac{3 c^2(c+d x) \text{ArcTanh}[c+d x]^3}{\sqrt{1-(c+d x)^2}}-$$

$$9 c \,\text{ArcTanh}[c+d x]^2 \,\text{Cosh}[3 \text{ArcTanh}[c+d x]]+\text{ArcTanh}[c+d x]^3 \,\text{Cosh}[3 \text{ArcTanh}[c+d x]]+3 c^2 \text{ArcTanh}[c+d x]^3 \,\text{Cosh}[3 \text{ArcTanh}[c+d x]]-$$

$$18 c \,\text{ArcTanh}[c+d x] \,\text{Cosh}[3 \text{ArcTanh}[c+d x]] \,\text{Log}\left[1+e^{-2 \text{ArcTanh}[c+d x]}\right]+$$

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

$$9 c^2 \text{ArcTanh}[c+d x]^2 \,\text{Cosh}[3 \text{ArcTanh}[c+d x]] \,\text{Log}\left[1+e^{-2 \text{ArcTanh}[c+d x]}\right]+$$

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

$$\Bigg(3\Bigg(\text{ArcTanh}[c+d x]^2\left(2-9 c+\text{ArcTanh}[c+d x]-4 c \,\text{ArcTanh}[c+d x]+3 c^2 \text{ArcTanh}[c+d x]\right)+3 \text{ArcTanh}[c+d x]\left(-6 c+\text{ArcTanh}[c+d x]+3 c^2 \text{ArcTanh}[c+d x]\right)$$

$$\text{Log}\left[1+e^{-2 \text{ArcTanh}[c+d x]}\right]+3 \,\text{Log}\left[\frac{1}{\sqrt{1-(c+d x)^2}}\right]\Bigg)\Bigg)\Big/\left(\sqrt{1-(c+d x)^2}\right)-$$

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

$$9 c \,\text{ArcTanh}[c+d x]^2 \,\text{Sinh}[3 \text{ArcTanh}[c+d x]]-\text{ArcTanh}[c+d x]^3 \,\text{Sinh}[3 \text{ArcTanh}[c+d x]]-3 c^2 \text{ArcTanh}[c+d x]^3 \,\text{Sinh}[3 \text{ArcTanh}[c+d x]]\Bigg)\Bigg)$$

Problem 48: Unable to integrate problem.

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

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

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

Result (type 8, 22 leaves):

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

Problem 49: Attempted integration timed out after 120 seconds.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 1, 1 leaves):

???

Problem 52: Unable to integrate problem.

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

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

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

Result (type 8, 20 leaves):

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

Problem 53: Result is not expressed in closed-form.

$$\int \frac{\text{ArcTanh}[a+b x]}{c+d x^3}\,dx$$

Optimal (type 4, 780 leaves, 23 steps):

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

Result (type 7, 881 leaves):

$$\frac{1}{6} b^2 \text{RootSum}\Big[b^3 c - d - 3 a d - 3 a^2 d - a^3 d + 3 b^3 c \#1 + 3 d \#1 + 3 a d \#1 - 3 a^2 d \#1 - 3 a^3 d \#1 + 3 b^3 c \#1^2 - 3 d \#1^2 + 3 a d \#1^2 + 3 a^2 d \#1^2 - 3 a^3 d \#1^2 + b^3 c \#1^3 + d \#1^3 - 3 a d \#1^3 + 3 a^2 d \#1^3 - a^3 d \#1^3 \&,$$

$$\Bigg(i \pi \text{ArcTanh}[a + b x] + 2 \text{ArcTanh}[a + b x]^2 + 2 \text{ArcTanh}[a + b x] \text{ArcTanh}\Big[\frac{1 - \#1}{1 + \#1}\Big] - i \pi \text{Log}\Big[1 + e^{2 \text{ArcTanh}[a+b x]}\Big] + 2 \text{ArcTanh}[a + b x] \text{Log}\Big[1 - e^{-2 \left(\text{ArcTanh}[a+b x] + \text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\Big] +$$

$$2 \text{ArcTanh}\Big[\frac{1 - \#1}{1 + \#1}\Big] \text{Log}\Big[1 - e^{-2 \left(\text{ArcTanh}[a+b x] + \text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\Big] + i \pi \text{Log}\Big[\frac{1}{\sqrt{1 - (a + b x)^2}}\Big] -$$

$$2 \text{ArcTanh}\Big[\frac{1 - \#1}{1 + \#1}\Big] \text{Log}\Big[i \text{Sinh}\Big[\text{ArcTanh}[a + b x] + \text{ArcTanh}\Big[\frac{1 - \#1}{1 + \#1}\Big]\Big]\Big] -$$

$$\text{PolyLog}\Big[2, e^{-2 \left(\text{ArcTanh}[a+b x] + \text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\Big] + 2 \text{ArcTanh}[a + b x]^2 \#1 -$$

$$i \pi \text{ArcTanh}[a + b x] \#1^2 - 2 \text{ArcTanh}[a + b x] \text{ArcTanh}\Big[\frac{1 - \#1}{1 + \#1}\Big] \#1^2 +$$

$$i \pi \text{Log}\Big[1 + e^{2 \text{ArcTanh}[a+b x]}\Big] \#1^2 - 2 \text{ArcTanh}[a + b x] \text{Log}\Big[1 - e^{-2 \left(\text{ArcTanh}[a+b x] + \text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\Big] \#1^2 -$$

$$2 \text{ArcTanh}\Big[\frac{1 - \#1}{1 + \#1}\Big] \text{Log}\Big[1 - e^{-2 \left(\text{ArcTanh}[a+b x] + \text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\Big] \#1^2 - i \pi \text{Log}\Big[\frac{1}{\sqrt{1 - (a + b x)^2}}\Big] \#1^2 +$$

$$2 \text{ArcTanh}\Big[\frac{1 - \#1}{1 + \#1}\Big] \text{Log}\Big[i \text{Sinh}\Big[\text{ArcTanh}[a + b x] + \text{ArcTanh}\Big[\frac{1 - \#1}{1 + \#1}\Big]\Big]\Big] \#1^2 +$$

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

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

$$2 e^{-\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]} \text{ArcTanh}[a + b x]^2 \#1^2 \sqrt{\frac{\#1}{(1 + \#1)^2}}\Bigg) \Bigg/$$

$$\left(b^3 c - a d - 2 a^2 d - a^3 d + 2 b^3 c \#1 + 2 a d \#1 - 2 a^3 d \#1 + b^3 c \#1^2 - a d \#1^2 + 2 a^2 d \#1^2 - a^3 d \#1^2\right) \&\Big]$$

Problem 54: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 481 leaves, 17 steps):

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

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

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

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

Result (type 4, 1419 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 55: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 304 leaves):

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

Problem 56: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 186 leaves, 15 steps):

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

Result (type 4, 759 leaves):

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

Problem 57: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 545 leaves, 25 steps):

$$\frac{(1-a-b x) \operatorname{Log}[1-a-b x]}{2 b c}+\frac{(1+a+b x) \operatorname{Log}[1+a+b x]}{2 b c}+$$

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

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

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

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

Result (type 4, 1458 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 58: Result is not expressed in closed-form.

$$\int\frac{\text{ArcTanh}[a+b\,x]}{c+\frac{d}{x^3}}\,dx$$

Optimal (type 4, 832 leaves, 31 steps):

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

$$\frac{d^{1/3}\,\mathrm{Log}[1+a+b x]\,\mathrm{Log}\left[-\frac{b\left(d^{1/3}+c^{1/3} x\right)}{(1+a)\,c^{1/3}-b\,d^{1/3}}\right]}{6 c^{4/3}}+\frac{d^{1/3}\,\mathrm{Log}[1-a-b x]\,\mathrm{Log}\left[\frac{b\left(d^{1/3}+c^{1/3} x\right)}{(1-a)\,c^{1/3}+b\,d^{1/3}}\right]}{6 c^{4/3}}+$$

$$\frac{(-1)^{2/3} d^{1/3}\,\mathrm{Log}[1-a-b x]\,\mathrm{Log}\left[-\frac{b\left(d^{1/3}-(-1)^{1/3} c^{1/3} x\right)}{(-1)^{1/3}(1-a)\,c^{1/3}-b\,d^{1/3}}\right]}{6 c^{4/3}}-$$

$$\frac{(-1)^{2/3} d^{1/3}\,\mathrm{Log}[1+a+b x]\,\mathrm{Log}\left[\frac{b\left(d^{1/3}-(-1)^{1/3} c^{1/3} x\right)}{(-1)^{1/3}(1+a)\,c^{1/3}+b\,d^{1/3}}\right]}{6 c^{4/3}}+$$

$$\frac{(-1)^{1/3} d^{1/3}\,\mathrm{Log}[1+a+b x]\,\mathrm{Log}\left[-\frac{b\left(d^{1/3}+(-1)^{2/3} c^{1/3} x\right)}{(-1)^{2/3}(1+a)\,c^{1/3}-b\,d^{1/3}}\right]}{6 c^{4/3}}-$$

$$\frac{(-1)^{1/3} d^{1/3}\,\mathrm{Log}[1-a-b x]\,\mathrm{Log}\left[\frac{b\left(d^{1/3}+(-1)^{2/3} c^{1/3} x\right)}{(-1)^{2/3}(1-a)\,c^{1/3}+b\,d^{1/3}}\right]}{6 c^{4/3}}+$$

$$\frac{(-1)^{2/3} d^{1/3}\,\mathrm{PolyLog}\left[2,\frac{(-1)^{1/3} c^{1/3}(1-a-b x)}{(-1)^{1/3}(1-a)\,c^{1/3}-b\,d^{1/3}}\right]}{6 c^{4/3}}+\frac{d^{1/3}\,\mathrm{PolyLog}\left[2,\frac{c^{1/3}(1-a-b x)}{(1-a)\,c^{1/3}+b\,d^{1/3}}\right]}{6 c^{4/3}}-$$

$$\frac{(-1)^{1/3} d^{1/3}\,\mathrm{PolyLog}\left[2,\frac{(-1)^{2/3} c^{1/3}(1-a-b x)}{(-1)^{2/3}(1-a)\,c^{1/3}+b\,d^{1/3}}\right]}{6 c^{4/3}}-\frac{d^{1/3}\,\mathrm{PolyLog}\left[2,\frac{c^{1/3}(1+a+b x)}{(1+a)\,c^{1/3}-b\,d^{1/3}}\right]}{6 c^{4/3}}+$$

$$\frac{(-1)^{1/3} d^{1/3}\,\mathrm{PolyLog}\left[2,\frac{(-1)^{2/3} c^{1/3}(1+a+b x)}{(-1)^{2/3}(1+a)\,c^{1/3}-b\,d^{1/3}}\right]}{6 c^{4/3}}-\frac{(-1)^{2/3} d^{1/3}\,\mathrm{PolyLog}\left[2,\frac{(-1)^{1/3} c^{1/3}(1+a+b x)}{(-1)^{1/3}(1+a)\,c^{1/3}+b\,d^{1/3}}\right]}{6 c^{4/3}}$$

Result (type 7, 917 leaves) :

$$-\frac{1}{6\,b\,c}\left(-6\,(a+b\,x)\,\text{ArcTanh}[a+b\,x]+6\,\text{Log}\left[\frac{1}{\sqrt{1-(a+b\,x)^2}}\right]+b^3\,d\,\text{RootSum}\Big[c+3\,a\,c+3\,a^2\,c+a^3\,c-b^3\,d-3\,c\,\#1-3\,a\,c\,\#1+3\,a^2\,c\,\#1+3\,a^3\,c\,\#1-3\,b^3\,d\,\#1+3\,c\,\#1^2-3\,a\,c\,\#1^2-3\,a^2\,c\,\#1^2+3\,a^3\,c\,\#1^2-3\,b^3\,d\,\#1^2-c\,\#1^3+3\,a\,c\,\#1^3-3\,a^2\,c\,\#1^3+a^3\,c\,\#1^3-b^3\,d\,\#1^3\,\&,\right.$$

$$\Big(-i\,\pi\,\text{ArcTanh}[a+b\,x]-2\,\text{ArcTanh}[a+b\,x]^2-2\,\text{ArcTanh}[a+b\,x]\,\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]+i\,\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}[a+b\,x]}\right]-2\,\text{ArcTanh}[a+b\,x]\,\text{Log}\left[1-e^{-2\left(\text{ArcTanh}[a+b\,x]+\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\right]-2\,\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\text{Log}\left[1-e^{-2\left(\text{ArcTanh}[a+b\,x]+\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\right]-i\,\pi\,\text{Log}\left[\frac{1}{\sqrt{1-(a+b\,x)^2}}\right]+2\,\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\text{Log}\left[i\,\text{Sinh}\left[\text{ArcTanh}[a+b\,x]+\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right]\right]+\text{PolyLog}\left[2,e^{-2\left(\text{ArcTanh}[a+b\,x]+\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\right]-2\,\text{ArcTanh}[a+b\,x]^2\,\#1+i\,\pi\,\text{ArcTanh}[a+b\,x]\,\#1^2+2\,\text{ArcTanh}[a+b\,x]\,\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\#1^2-i\,\pi\,\text{Log}\left[1+e^{2\,\text{ArcTanh}[a+b\,x]}\right]\#1^2+2\,\text{ArcTanh}[a+b\,x]\,\text{Log}\left[1-e^{-2\left(\text{ArcTanh}[a+b\,x]+\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\right]\#1^2+2\,\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\text{Log}\left[1-e^{-2\left(\text{ArcTanh}[a+b\,x]+\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\right]\#1^2+i\,\pi\,\text{Log}\left[\frac{1}{\sqrt{1-(a+b\,x)^2}}\right]\#1^2-2\,\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\text{Log}\left[i\,\text{Sinh}\left[\text{ArcTanh}[a+b\,x]+\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right]\right]\#1^2-\text{PolyLog}\left[2,e^{-2\left(\text{ArcTanh}[a+b\,x]+\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]\right)}\right]\#1^2+2\,e^{-\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]}\,\text{ArcTanh}[a+b\,x]^2\sqrt{\frac{\#1}{(1+\#1)^2}}+4\,e^{-\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]}\,\text{ArcTanh}[a+b\,x]^2\,\#1\sqrt{\frac{\#1}{(1+\#1)^2}}+2\,e^{-\text{ArcTanh}\left[\frac{1-\#1}{1+\#1}\right]}\,\text{ArcTanh}[a+b\,x]^2\,\#1^2\sqrt{\frac{\#1}{(1+\#1)^2}}\Big)\Big/\left(a\,c+2\,a^2\,c+a^3\,c-b^3\,d-2\,a\,c\,\#1+2\,a^3\,c\,\#1-2\,b^3\,d\,\#1+a\,c\,\#1^2-2\,a^2\,c\,\#1^2+a^3\,c\,\#1^2-b^3\,d\,\#1^2\right)\,\&\Big]\Bigg)$$

Problem 59: Unable to integrate problem.

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

Optimal (type 4, 585 leaves, 31 steps) :

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

Result (type 8, 20 leaves):

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

Problem 60: Attempted integration timed out after 120 seconds.

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

Optimal (type 4, 661 leaves, 37 steps):

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

Result (type 1, 1 leaves):

???

Problem 61: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 8801 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

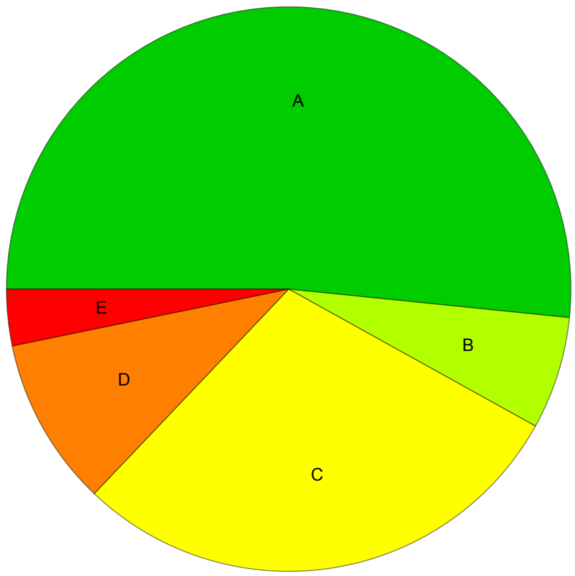
$$\pi\,\text{Log}\left[\frac{1}{\sqrt{1-\left(\frac{b}{\sqrt{b^2-4\,a\,c}}-\frac{2\,c\,d}{\sqrt{b^2-4\,a\,c}\;e}+\frac{2\,c\,(d+e\,x)}{\sqrt{b^2-4\,a\,c}\;e}\right)^2}}\right]+2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{2\,c\,(1+d)-b\,e}{\sqrt{b^2-4\,a\,c}\;e}\right]$$

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

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

Summary of Integration Test Results

62 integration problems



A - 32 optimal antiderivatives

B - 4 more than twice size of optimal antiderivatives

C - 18 unnecessarily complex antiderivatives

D - 6 unable to integrate problems

E - 2 integration timeouts