# Mathematica 11.3 Integration Test Results

## Test results for the 71 problems in "7.6.2 Inverse hyperbolic cosecant functions.m"

### Problem 4: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 162 leaves, 14 steps):

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

Result (type 4, 428 leaves):

$$\frac{1}{8}\left(\pi^2-4\,i\,\pi\,\text{ArcCsch}[a+b\,x]-8\,\text{ArcCsch}[a+b\,x]^2-\right.$$
$$32\,i\,\text{ArcSin}\Big[\frac{\sqrt{\frac{-i+a}{a}}}{\sqrt{2}}\Big]\,\text{ArcTanh}\Big[\frac{(i+a)\,\text{Cot}\big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcCsch}[a+b\,x])\big]}{\sqrt{1+a^2}}\Big]-$$
$$8\,\text{ArcCsch}[a+b\,x]\,\text{Log}\big[1-e^{-2\,\text{ArcCsch}[a+b\,x]}\big]+4\,i\,\pi\,\text{Log}\Big[1-\frac{\left(-1+\sqrt{1+a^2}\right)e^{\text{ArcCsch}[a+b\,x]}}{a}\Big]+$$
$$8\,\text{ArcCsch}[a+b\,x]\,\text{Log}\Big[1-\frac{\left(-1+\sqrt{1+a^2}\right)e^{\text{ArcCsch}[a+b\,x]}}{a}\Big]-$$
$$16\,i\,\text{ArcSin}\Big[\frac{\sqrt{\frac{-i+a}{a}}}{\sqrt{2}}\Big]\,\text{Log}\Big[1-\frac{\left(-1+\sqrt{1+a^2}\right)e^{\text{ArcCsch}[a+b\,x]}}{a}\Big]+4\,i\,\pi$$
$$\text{Log}\Big[1+\frac{\left(1+\sqrt{1+a^2}\right)e^{\text{ArcCsch}[a+b\,x]}}{a}\Big]+8\,\text{ArcCsch}[a+b\,x]\,\text{Log}\Big[1+\frac{\left(1+\sqrt{1+a^2}\right)e^{\text{ArcCsch}[a+b\,x]}}{a}\Big]+$$
$$16\,i\,\text{ArcSin}\Big[\frac{\sqrt{\frac{-i+a}{a}}}{\sqrt{2}}\Big]\,\text{Log}\Big[1+\frac{\left(1+\sqrt{1+a^2}\right)e^{\text{ArcCsch}[a+b\,x]}}{a}\Big]-4\,i\,\pi\,\text{Log}\Big[-\frac{b\,x}{a+b\,x}\Big]+$$
$$4\,\text{PolyLog}\big[2,e^{-2\,\text{ArcCsch}[a+b\,x]}\big]+8\,\text{PolyLog}\Big[2,\frac{\left(-1+\sqrt{1+a^2}\right)e^{\text{ArcCsch}[a+b\,x]}}{a}\Big]+$$
$$\left.8\,\text{PolyLog}\Big[2,-\frac{\left(1+\sqrt{1+a^2}\right)e^{\text{ArcCsch}[a+b\,x]}}{a}\Big]\right)$$

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

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

Optimal (type 3, 63 leaves, 6 steps):

$$-\frac{b\,\text{ArcCsch}[a+b\,x]}{a}-\frac{\text{ArcCsch}[a+b\,x]}{x}+\frac{2\,b\,\text{ArcTanh}\Big[\frac{a+\text{Tanh}\left[\frac{1}{2}\text{ArcCsch}[a+b\,x]\right]}{\sqrt{1+a^2}}\Big]}{a\,\sqrt{1+a^2}}$$

Result (type 3, 141 leaves):

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

## Problem 7: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 501 leaves, 20 steps):

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

Result (type 4, 1429 leaves):

$$a^2 e^3 x+\frac{3}{2} a^2 e^2 f x^2+a^2 e f^2 x^3+\frac{1}{4} a^2 f^3 x^4+$$

$$\frac{1}{6} a b \left(3 x \left(4 e^3 + 6 e^2 f x + 4 e f^2 x^2 + f^3 x^3\right) \text{ArcCsch}[c + d x] + \frac{1}{d^4}\left(f (c + d x) \sqrt{\frac{1 + c^2 + 2 c d x + d^2 x^2}{(c + d x)^2}} \left(\left(-2 + 13 c^2\right) f^2 - 2 c d f (15 e + 2 f x) + d^2 \left(18 e^2 + 6 e f x + f^2 x^2\right)\right) - 3 c \left(-4 d^3 e^3 + 6 c d^2 e^2 f - 4 c^2 d e f^2 + c^3 f^3\right) \text{ArcSinh}\left[\frac{1}{c + d x}\right] + 6 \left(2 d^3 e^3 - 6 c d^2 e^2 f + \left(-1 + 6 c^2\right) d e f^2 + c \left(1 - 2 c^2\right) f^3\right) \text{Log}\left[(c + d x) \left(1 + \sqrt{\frac{1 + c^2 + 2 c d x + d^2 x^2}{(c + d x)^2}}\right)\right]\right)\right) -$$

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

$$\left(3 b^2 d e^2 f x \left(\frac{(c + d x) \sqrt{1 + \frac{1}{(c+d x)^2}} \text{ArcCsch}[c + d x]}{d^2} + \frac{(c + d x)^2 \text{ArcCsch}[c + d x]^2}{2 d^2} - \frac{c \text{ArcCsch}[c + d x]^2 \text{Coth}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]}{2 d^2} - \frac{\text{Log}\left[\frac{1}{c+d x}\right]}{d^2} - \frac{1}{d^2} 2 i c \left(i \text{ArcCsch}[c + d x] \left(\text{Log}\left[1 - e^{-\text{ArcCsch}[c+d x]}\right] - \text{Log}\left[1 + e^{-\text{ArcCsch}[c+d x]}\right]\right) + i \left(\text{PolyLog}\left[2, -e^{-\text{ArcCsch}[c+d x]}\right] - \text{PolyLog}\left[2, e^{-\text{ArcCsch}[c+d x]}\right]\right)\right) + \frac{c \text{ArcCsch}[c + d x]^2 \text{Tanh}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]}{2 d^2}\right)\right) \Big/ \left((c + d x) \left(-1 + \frac{c}{c + d x}\right)\right) -$$

$$\frac{1}{8 d^3} b^2 e f^2 \left(2 \left(-2 + 12 c \text{ArcCsch}[c + d x] + \text{ArcCsch}[c + d x]^2 - 6 c^2 \text{ArcCsch}[c + d x]^2\right) \text{Coth}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right] + 2 \text{ArcCsch}[c + d x] (-1 + 3 c \text{ArcCsch}[c + d x]) \text{Csch}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]^2 - \frac{\text{ArcCsch}[c + d x]^2 \text{Csch}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]^4}{2 (c + d x)} - 48 c \text{Log}\left[\frac{1}{c + d x}\right] + 8 \left(-1 + 6 c^2\right) \left(\text{ArcCsch}[c + d x] \left(\text{Log}\left[1 - e^{-\text{ArcCsch}[c+d x]}\right] - \text{Log}\left[1 + e^{-\text{ArcCsch}[c+d x]}\right]\right) + \text{PolyLog}\left[2, -e^{-\text{ArcCsch}[c+d x]}\right] - \text{PolyLog}\left[2, e^{-\text{ArcCsch}[c+d x]}\right]\right) - 2 \text{ArcCsch}[c + d x] (1 + 3 c \text{ArcCsch}[c + d x]) \text{Sech}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]^2 - 8 (c + d x)^3 \text{ArcCsch}[c + d x]^2 \text{Sinh}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]^4 + 2 \left(2 + 12 c \text{ArcCsch}[c + d x] - \text{ArcCsch}[c + d x]^2 + 6 c^2 \text{ArcCsch}[c + d x]^2\right) \text{Tanh}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]\right) - \frac{1}{192 d (c + d x)^3 \left(-1 + \frac{c}{c+d x}\right)^3}$$

$$b^2 f^3 x^3 \Big(-16 \left(2 \text{ArcCsch}[c+d x]-18 c^2 \text{ArcCsch}[c+d x]+6 c^3 \text{ArcCsch}[c+d x]^2-3 c \left(-2+\text{ArcCsch}[c+d x]^2\right)\right) \text{Coth}\left[\frac{1}{2} \text{ArcCsch}[c+d x]\right]+$$
$$2 \left(2-24 c \text{ArcCsch}[c+d x]-3 \text{ArcCsch}[c+d x]^2+36 c^2 \text{ArcCsch}[c+d x]^2\right) \text{Csch}\left[\frac{1}{2} \text{ArcCsch}[c+d x]\right]^2+3 \text{ArcCsch}[c+d x]^2 \text{Csch}\left[\frac{1}{2} \text{ArcCsch}[c+d x]\right]^4-$$
$$\frac{1}{c+d x} 2 \text{ArcCsch}[c+d x] \left(-1+6 c \text{ArcCsch}[c+d x]\right) \text{Csch}\left[\frac{1}{2} \text{ArcCsch}[c+d x]\right]^4-$$
$$64 \left(-1+9 c^2\right) \text{Log}\left[\frac{1}{c+d x}\right]+$$
$$192 c \left(-1+2 c^2\right) \left(\text{ArcCsch}[c+d x] \left(\text{Log}\left[1-e^{-\text{ArcCsch}[c+d x]}\right]-\text{Log}\left[1+e^{-\text{ArcCsch}[c+d x]}\right]\right)+\text{PolyLog}\left[2,-e^{-\text{ArcCsch}[c+d x]}\right]-\text{PolyLog}\left[2,e^{-\text{ArcCsch}[c+d x]}\right]\right)-$$
$$2 \left(2+24 c \text{ArcCsch}[c+d x]-3 \text{ArcCsch}[c+d x]^2+36 c^2 \text{ArcCsch}[c+d x]^2\right) \text{Sech}\left[\frac{1}{2} \text{ArcCsch}[c+d x]\right]^2+3 \text{ArcCsch}[c+d x]^2 \text{Sech}\left[\frac{1}{2} \text{ArcCsch}[c+d x]\right]^4-$$
$$32 (c+d x)^3 \text{ArcCsch}[c+d x] \left(1+6 c \text{ArcCsch}[c+d x]\right) \text{Sinh}\left[\frac{1}{2} \text{ArcCsch}[c+d x]\right]^4+$$
$$16 \left(-2 \text{ArcCsch}[c+d x]+18 c^2 \text{ArcCsch}[c+d x]+6 c^3 \text{ArcCsch}[c+d x]^2-3 c \left(-2+\text{ArcCsch}[c+d x]^2\right)\right) \text{Tanh}\left[\frac{1}{2} \text{ArcCsch}[c+d x]\right]\Big)$$

## Problem 8: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 351 leaves, 17 steps):

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

Result (type 4, 864 leaves):

$$a^2 e^2 x + a^2 e f x^2 + \frac{1}{3} a^2 f^2 x^3 + \frac{1}{3} a b \left(2 x \left(3 e^2 + 3 e f x + f^2 x^2\right) \text{ArcCsch}[c + d x] + \frac{1}{d^3}\left(-f (c + d x) \sqrt{\frac{1 + c^2 + 2 c d x + d^2 x^2}{(c + d x)^2}} (5 c f - d (6 e + f x)) + 2 c \left(3 d^2 e^2 - 3 c d e f + c^2 f^2\right) \text{ArcSinh}\left[\frac{1}{c + d x}\right] + \left(6 d^2 e^2 - 12 c d e f + \left(-1 + 6 c^2\right) f^2\right) \text{Log}\left[(c + d x)\left(1 + \sqrt{\frac{1 + c^2 + 2 c d x + d^2 x^2}{(c + d x)^2}}\right)\right]\right)\right) -$$

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

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

$$\frac{1}{24 d^3} b^2 f^2 \left(2 \left(-2 + 12 c \text{ArcCsch}[c + d x] + \text{ArcCsch}[c + d x]^2 - 6 c^2 \text{ArcCsch}[c + d x]^2\right) \text{Coth}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right] + 2 \text{ArcCsch}[c + d x] (-1 + 3 c \text{ArcCsch}[c + d x]) \text{Csch}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]^2 - \frac{\text{ArcCsch}[c + d x]^2 \text{Csch}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]^4}{2 (c + d x)} - 48 c \text{Log}\left[\frac{1}{c + d x}\right] + 8 \left(-1 + 6 c^2\right) \left(\text{ArcCsch}[c + d x] \left(\text{Log}\left[1 - e^{-\text{ArcCsch}[c+d x]}\right] - \text{Log}\left[1 + e^{-\text{ArcCsch}[c+d x]}\right]\right) + \text{PolyLog}\left[2, -e^{-\text{ArcCsch}[c+d x]}\right] - \text{PolyLog}\left[2, e^{-\text{ArcCsch}[c+d x]}\right]\right) - 2 \text{ArcCsch}[c + d x] (1 + 3 c \text{ArcCsch}[c + d x]) \text{Sech}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]^2 - 8 (c + d x)^3 \text{ArcCsch}[c + d x]^2 \text{Sinh}\left[\frac{1}{2} \text{ArcCsch}[c + d x]\right]^4 + 2 \left(2 + 12 c \text{ArcCsch}[c + d x] - \text{ArcCsch}[c + d x]^2 + 6 c^2 \text{ArcCsch}[c + d x]^2\right)$$

$$\left.\text{Tanh}\left[\frac{1}{2}\text{ArcCsch}[c+d\,x]\right]\right)$$

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

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

Optimal (type 4, 194 leaves, 11 steps):

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

Result (type 4, 427 leaves):

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

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

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

Optimal (type 4, 85 leaves, 8 steps):

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

Result (type 4, 176 leaves):

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

## Problem 11: Unable to integrate problem.

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

Optimal (type 4, 475 leaves, 17 steps):

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

Result (type 8, 22 leaves) :

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

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

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

Optimal (type 4, 448 leaves, 12 steps) :

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

Result (type 4, 2061 leaves):

$$-\frac{a^2}{f\,(e+f\,x)}-$$
$$\left(2\,a\,b\,(c+d\,x)^2\left(f+\frac{d\,e-c\,f}{c+d\,x}\right)^2\left(\frac{\text{ArcCsch}[c+d\,x]}{f+\frac{d\,e}{c+d\,x}-\frac{c\,f}{c+d\,x}}-\frac{2\,\text{ArcTan}\Big[\frac{d\,e-c\,f-f\,\text{Tanh}[\frac{1}{2}\text{ArcCsch}[c+d\,x]]}{\sqrt{-d^2\,e^2+2\,c\,d\,e\,f-(1+c^2)\,f^2}}\Big]}{\sqrt{-d^2\,e^2+2\,c\,d\,e\,f-(1+c^2)\,f^2}}\right)\right)\Big/$$
$$\left(d\,(-d\,e+c\,f)\,(e+f\,x)^2\right)-$$
$$\frac{1}{d\,(e+f\,x)^2}\,b^2\,(c+d\,x)^2\left(f+\frac{d\,e-c\,f}{c+d\,x}\right)^2\left(\frac{\text{ArcCsch}[c+d\,x]^2}{(-d\,e+c\,f)\left(f+\frac{d\,e}{c+d\,x}-\frac{c\,f}{c+d\,x}\right)}+\right.$$
$$\frac{1}{d\,e-c\,f}\,2\left(-\frac{i\,\pi\,\text{ArcTanh}\Big[\frac{-d\,e+c\,f+f\,\text{Tanh}[\frac{1}{2}\text{ArcCsch}[c+d\,x]]}{\sqrt{f^2+(d\,e-c\,f)^2}}\Big]}{\sqrt{f^2+(d\,e-c\,f)^2}}-\frac{1}{\sqrt{-d^2\,e^2+2\,c\,d\,e\,f-f^2-c^2\,f^2}}\left(2\left(\frac{\pi}{2}-\right.\right.\right.$$
$$\left.i\,\text{ArcCsch}[c+d\,x]\right)\text{ArcTanh}\Big[\frac{(f-i\,(d\,e-c\,f))\,\text{Cot}\big[\frac{1}{2}\big(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\big)\big]}{\sqrt{-d^2\,e^2+2\,c\,d\,e\,f-f^2-c^2\,f^2}}\Big]-$$
$$2\,\text{ArcCos}\Big[-\frac{i\,f}{d\,e-c\,f}\Big]\,\text{ArcTanh}\Big[\frac{(-f-i\,(d\,e-c\,f))\,\text{Tan}\big[\frac{1}{2}\big(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\big)\big]}{\sqrt{-d^2\,e^2+2\,c\,d\,e\,f-f^2-c^2\,f^2}}\Big]+$$
$$\left(\text{ArcCos}\Big[-\frac{i\,f}{d\,e-c\,f}\Big]-2\,i\right.$$
$$\left(\text{ArcTanh}\Big[\left((f-i\,(d\,e-c\,f))\,\text{Cot}\Big[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\Big]\right)\Big/\right.$$
$$\left.\left(\sqrt{-d^2\,e^2+2\,c\,d\,e\,f-f^2-c^2\,f^2}\right)\Big]-\text{ArcTanh}\Big[\Big((-f-i\,(d\,e-c\,f))\right.$$

$$\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\Bigg)\Bigg/\left(\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\right)\Bigg]\Bigg)\Bigg)$$

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

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

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

$$\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\Bigg)\Bigg/\left(\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\right)\Bigg]\Bigg)\Bigg)$$

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

$$\Bigg(\text{ArcCos}\left[-\frac{i\,f}{d\,e-c\,f}\right]+2\,i\,\text{ArcTanh}\Bigg[\Bigg(\left(-f-i\,(d\,e-c\,f)\right)$$

$$\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\Bigg)\Bigg/\left(\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\right)\Bigg]\Bigg)$$

$$\text{Log}\Bigg[1-\Bigg(i\left(f-i\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\right)\Bigg(f-i\,(d\,e-c\,f)-$$

$$\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\Bigg)\Bigg)\Bigg/$$

$$\Bigg((d\,e-c\,f)\Bigg(f-i\,(d\,e-c\,f)+\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}$$

$$\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\Bigg)\Bigg)\Bigg]+$$

$$\Bigg(-\text{ArcCos}\left[-\frac{i\,f}{d\,e-c\,f}\right]+2\,i\,\text{ArcTanh}\Bigg[\Bigg(\left(-f-i\,(d\,e-c\,f)\right)\text{Tan}\Bigg[$$

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

$$\text{Log}\Bigg[1-\Bigg(i\left(f+i\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\right)\Bigg(f-i\,(d\,e-c\,f)-$$

$$\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\Bigg)\Bigg)\Bigg/$$

$$\Bigg((d\,e-c\,f)\Bigg(f-i\,(d\,e-c\,f)+\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}$$

$$\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\Bigg)\Bigg)\Bigg]+$$

$$i\,\Bigg(\text{PolyLog}\Bigg[2,\Bigg(i\left(f-i\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\right)\Bigg(f-i\,(d\,e-c\,f)-$$

$$\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\Bigg)\Bigg)\Bigg/$$

$$\Bigg((d\,e-c\,f)\Bigg(f-i\,(d\,e-c\,f)+\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}$$

$$\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\Bigg)\Bigg)\Bigg]-\text{PolyLog}\Bigg[2,\left(i\left(f+i\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\right)\left(f-i\,(d\,e-c\,f)-\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\right)\right)\Bigg/\left((d\,e-c\,f)\left(f-i\,(d\,e-c\,f)+\sqrt{-d^2 e^2+2\,c\,d\,e\,f-f^2-c^2 f^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d\,x]\right)\right]\right)\right)\Bigg]\Bigg)\Bigg)\Bigg)$$

## Problem 13: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 1024 leaves, 23 steps):

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

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

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

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

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

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

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

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

Result (type 4, 8348 leaves) :

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

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

$$\left.\left(2\,\left(2\,d^2 e^2-4\,c\,d\,e\,f+\left(1+2\,c^2\right) f^2\right)\,\text{ArcTan}\left[\frac{d\,e-c\,f-f\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcCsch}[c+d\,x]\right]}{\sqrt{-d^2 e^2+2\,c\,d\,e\,f-\left(1+c^2\right) f^2}}\right]\right)\right/$$

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

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

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

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

$$\left.\left.2 c d e f \text{ArcCsch}[c+d x]^2+f^2 \text{ArcCsch}[c+d x]^2+c^2 f^2 \text{ArcCsch}[c+d x]^2\right)\right) \Big/$$

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

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

$$\left(\left(d e-c f\right)^2 \left(-d e+c f\right) \left(d^2 e^2-2 c d e f+f^2+c^2 f^2\right) \left(d e-c f+f \left(c+d x\right)\right)^3\right)-$$

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

$$\left(\left(d e-c f\right)^2 \left(-d e+c f\right) \left(d^2 e^2-2 c d e f+f^2+c^2 f^2\right) \left(d e-c f+f \left(c+d x\right)\right)^3\right)+$$

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

$$2 d^2 e^2 \left(c+d x\right)^3 \left(f+\frac{d e}{c+d x}-\frac{c f}{c+d x}\right)^3 \left(-\frac{i \pi \text{ArcTanh}\left[\frac{-d e+c f+f \text{Tanh}\left[\frac{1}{2} \text{ArcCsch}[c+d x]\right]}{\sqrt{f^2+(d e-c f)^2}}\right]}{\sqrt{f^2+\left(d e-c f\right)^2}}-\right.$$

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

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

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

$$\Bigg(\text{ArcCos}\left[-\frac{i f}{d e-c f}\right]-2 i\,\Bigg(\text{ArcTanh}\Big[\Big(\left(f-i\,(d e-c f)\right)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\Big)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\Big]-\text{ArcTanh}\Big[\Big(\left(-f-i\,(d e-c f)\right)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\Big)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\Big]\Bigg)\Bigg)$$

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

$$2 i\,\Bigg(\text{ArcTanh}\Big[\Big(\left(f-i\,(d e-c f)\right)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\Big)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\Big]-\text{ArcTanh}\Big[\Big(\left(-f-i\,(d e-c f)\right)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\Big)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\Big]\Bigg)\Bigg)$$

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

$$\Bigg(\text{ArcCos}\left[-\frac{i f}{d e-c f}\right]+2 i\,\text{ArcTanh}\Big[\Big(\left(-f-i\,(d e-c f)\right)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\Big)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\Big]\Bigg)$$

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

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

$$\Bigg(-\text{ArcCos}\left[-\frac{i f}{d e-c f}\right]+2 i\,\text{ArcTanh}\Big[\Big(\left(-f-i\,(d e-c f)\right)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\Big)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\Big]\Bigg)$$

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

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

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

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

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

$$\left.\left(\left(d e-c f\right)\left(f-i\left(d e-c f\right)+\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\right)\right)\Big]\right)\Bigg)\Bigg)-$$

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

$$4\ c\ d\ e\ f\ \left(c+d x\right)^3\left(f+\frac{d e}{c+d x}-\frac{c f}{c+d x}\right)^3$$

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

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

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

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

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

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

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

$$\left(\left(d e-c f\right)\left(f-i\left(d e-c f\right)+\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\ \mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcCsch}[c+d x]\right)\right]\right)\right)\Big]+$$

$$i\left(\mathrm{PolyLog}\Big[2,\left(i\left(f-i\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\left(f-i\left(d e-c f\right)-\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\ \mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcCsch}[c+d x]\right)\right]\right)\right)\Big/\left(\left(d e-c f\right)\left(f-i\left(d e-c f\right)+\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\ \mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcCsch}[c+d x]\right)\right]\right)\right)\Big]-\mathrm{PolyLog}\Big[2,\left(i\left(f+i\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\left(f-i\left(d e-c f\right)-\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\ \mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcCsch}[c+d x]\right)\right]\right)\right)\Big/\left(\left(d e-c f\right)\left(f-i\left(d e-c f\right)+\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\ \mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcCsch}[c+d x]\right)\right]\right)\right)\Big]\right)\Bigg)\Bigg)+$$

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

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

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

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

$$2\,\mathrm{ArcCos}\left[-\frac{i f}{d e-c f}\right]\mathrm{ArcTanh}\left[\frac{\left(-f-i\left(d e-c f\right)\right)\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcCsch}[c+d x]\right)\right]}{\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{i f}{d e-c f}\right]-2 i\left(\text{ArcTanh}\left[\left(\left(f-i\left(d e-c f\right)\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\right)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\right]-\text{ArcTanh}\left[\left(\left(-f-i\left(d e-c f\right)\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\right)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\right]\right)\right)$$

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

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

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

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

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

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

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

$$\mathrm{i}\left(\text{PolyLog}\left[2,\left(\mathrm{i}\left(f-\mathrm{i}\sqrt{-d^2e^2+2cdef-f^2-c^2f^2}\right)\left(f-\mathrm{i}\left(de-cf\right)-\sqrt{-d^2e^2+2cdef-f^2-c^2f^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcCsch}[c+dx]\right)\right]\right)\right)\Big/\left(\left(de-cf\right)\left(f-\mathrm{i}\left(de-cf\right)+\sqrt{-d^2e^2+2cdef-f^2-c^2f^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcCsch}[c+dx]\right)\right]\right)\right)\right]-\text{PolyLog}\left[2,\left(\mathrm{i}\left(f+\mathrm{i}\sqrt{-d^2e^2+2cdef-f^2-c^2f^2}\right)\left(f-\mathrm{i}\left(de-cf\right)-\sqrt{-d^2e^2+2cdef-f^2-c^2f^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcCsch}[c+dx]\right)\right]\right)\right)\Big/\left(\left(de-cf\right)\left(f-\mathrm{i}\left(de-cf\right)+\sqrt{-d^2e^2+2cdef-f^2-c^2f^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcCsch}[c+dx]\right)\right]\right)\right)\right]\right)\Bigg)\Bigg)+$$

$$\frac{1}{\left(de-cf\right)^2\left(d^2e^2-2cdef+f^2+c^2f^2\right)\left(de-cf+f\left(c+dx\right)\right)^3}$$

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

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

$$\frac{1}{\sqrt{-d^2e^2+2cdef-f^2-c^2f^2}}\left(2\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcCsch}[c+dx]\right)\right.$$

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

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

$$\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,f}{de-cf}\right]-2\,\mathrm{i}\right.$$

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

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

$$2 i\left(\text{ArcTanh}\left[\left(\left(f-i\left(d e-c f\right)\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\right)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\right]-\text{ArcTanh}\left[\left(\left(-f-i\left(d e-c f\right)\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcCsch}[c+d x]\right)\right]\right)\Big/\left(\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\right]\right)\Bigg)$$

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

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

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

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

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

$$i\left(\text{PolyLog}\left[2,\left(i\left(f-i\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\left(f-i\left(d e-c f\right)-\right.\right.\right.\right.$$

$$\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\ \mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\ \mathrm{ArcCsch}[c+d x]\right)\right]\Big)\Big)\Big/$$
$$\Big(\left(d e-c f\right)\Big(f-i\left(d e-c f\right)+\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}$$
$$\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\ \mathrm{ArcCsch}[c+d x]\right)\right]\Big)\Big)\Big]-\mathrm{PolyLog}\Big[$$
$$2,\ \Big(i\left(f+i\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\right)\Big(f-i\left(d e-c f\right)-$$
$$\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}\ \mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\ \mathrm{ArcCsch}[c+d x]\right)\right]\Big)\Big)\Big/$$
$$\Big(\left(d e-c f\right)\Big(f-i\left(d e-c f\right)+\sqrt{-d^2 e^2+2 c d e f-f^2-c^2 f^2}$$
$$\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\ \mathrm{ArcCsch}[c+d x]\right)\right]\Big)\Big)\Big]\Big)\Big)\Big)$$

## Problem 23: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 61 leaves, 7 steps):

$$\frac{\mathrm{ArcCsch}[a x^n]^2}{2 n}-\frac{\mathrm{ArcCsch}[a x^n]\ \mathrm{Log}\left[1-e^{2\,\mathrm{ArcCsch}[a x^n]}\right]}{n}-\frac{\mathrm{PolyLog}\left[2,\ e^{2\,\mathrm{ArcCsch}[a x^n]}\right]}{2 n}$$

Result (type 5, 64 leaves):

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

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

$$\int \mathrm{ArcCsch}\left[c\, e^{a+b x}\right] dx$$

Optimal (type 4, 77 leaves, 7 steps):

$$\frac{\mathrm{ArcCsch}\left[c\, e^{a+b x}\right]^2}{2 b}-\frac{\mathrm{ArcCsch}\left[c\, e^{a+b x}\right]\mathrm{Log}\left[1-e^{2\,\mathrm{ArcCsch}\left[c\, e^{a+b x}\right]}\right]}{b}-\frac{\mathrm{PolyLog}\left[2,\ e^{2\,\mathrm{ArcCsch}\left[c\, e^{a+b x}\right]}\right]}{2 b}$$

Result (type 4, 236 leaves):

$$x\,\text{ArcCsch}\left[c\,e^{a+b\,x}\right]+\left(e^{-a-b\,x}\sqrt{1+c^2\,e^{2\,(a+b\,x)}}\left(\text{Log}\left[-c^2\,e^{2\,(a+b\,x)}\right]^2+\text{ArcTanh}\left[\sqrt{1+c^2\,e^{2\,(a+b\,x)}}\right]\left(-8\,b\,x+4\,\text{Log}\left[-c^2\,e^{2\,(a+b\,x)}\right]\right)-4\,\text{Log}\left[-c^2\,e^{2\,(a+b\,x)}\right]\text{Log}\left[\frac{1}{2}\left(1+\sqrt{1+c^2\,e^{2\,(a+b\,x)}}\right)\right]+2\,\text{Log}\left[\frac{1}{2}\left(1+\sqrt{1+c^2\,e^{2\,(a+b\,x)}}\right)\right]^2-4\,\text{PolyLog}\left[2,\frac{1}{2}\left(1-\sqrt{1+c^2\,e^{2\,(a+b\,x)}}\right)\right]\right)\right)\Big/\left(8\,b\,c\,\sqrt{1+\frac{e^{-2\,(a+b\,x)}}{c^2}}\right)$$

## Problem 38: Result unnecessarily involves higher level functions.

$$\int e^{\text{ArcCsch}\left[a\,x^2\right]}\,x^4\,dx$$

Optimal (type 4, 202 leaves, 8 steps):

$$-\frac{2\sqrt{1+\frac{1}{a^2x^4}}}{5\,a^2\left(a+\frac{1}{x^2}\right)x}+\frac{2\sqrt{1+\frac{1}{a^2x^4}}\,x}{5\,a^2}+\frac{x^3}{3\,a}+\frac{1}{5}\sqrt{1+\frac{1}{a^2x^4}}\,x^5+\frac{2\sqrt{\frac{a^2+\frac{1}{x^4}}{\left(a+\frac{1}{x^2}\right)^2}}\left(a+\frac{1}{x^2}\right)\text{EllipticE}\left[2\,\text{ArcCot}\left[\sqrt{a}\,x\right],\frac{1}{2}\right]}{5\,a^{7/2}\sqrt{1+\frac{1}{a^2x^4}}}-\frac{\sqrt{\frac{a^2+\frac{1}{x^4}}{\left(a+\frac{1}{x^2}\right)^2}}\left(a+\frac{1}{x^2}\right)\text{EllipticF}\left[2\,\text{ArcCot}\left[\sqrt{a}\,x\right],\frac{1}{2}\right]}{5\,a^{7/2}\sqrt{1+\frac{1}{a^2x^4}}}$$

Result (type 5, 126 leaves):

$$-\frac{1}{15\,a\left(a\,x^2\right)^{3/2}}2\sqrt{2}\,e^{-\text{ArcCsch}\left[a\,x^2\right]}\left(\frac{e^{\text{ArcCsch}\left[a\,x^2\right]}}{-1+e^{2\,\text{ArcCsch}\left[a\,x^2\right]}}\right)^{5/2}x^3\left(-1-2\,e^{2\,\text{ArcCsch}\left[a\,x^2\right]}-3\,e^{4\,\text{ArcCsch}\left[a\,x^2\right]}+\left(1-e^{2\,\text{ArcCsch}\left[a\,x^2\right]}\right)^{5/2}\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},e^{2\,\text{ArcCsch}\left[a\,x^2\right]}\right]\right)$$

## Problem 40: Result unnecessarily involves higher level functions.

$$\int e^{\text{ArcCsch}\left[a\,x^2\right]}\,x^2\,dx$$

Optimal (type 4, 86 leaves, 5 steps):

$$\frac{x}{a}+\frac{1}{3}\sqrt{1+\frac{1}{a^2 x^4}}\,x^3-\frac{\sqrt{\frac{a^2+\frac{1}{x^4}}{\left(a+\frac{1}{x^2}\right)^2}}\left(a+\frac{1}{x^2}\right)\text{EllipticF}\left[2\,\text{ArcCot}\left[\sqrt{a}\,x\right],\frac{1}{2}\right]}{3\,a^{5/2}\sqrt{1+\frac{1}{a^2 x^4}}}$$

Result (type 5, 113 leaves) :

$$-\frac{1}{3\,a\,\sqrt{a\,x^2}}2\,\sqrt{2}\,e^{-\text{ArcCsch}\left[a\,x^2\right]}\left(\frac{e^{\text{ArcCsch}\left[a\,x^2\right]}}{-1+e^{2\,\text{ArcCsch}\left[a\,x^2\right]}}\right)^{3/2}x\left(1-2\,e^{2\,\text{ArcCsch}\left[a\,x^2\right]}-\left(1-e^{2\,\text{ArcCsch}\left[a\,x^2\right]}\right)^{3/2}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},e^{2\,\text{ArcCsch}\left[a\,x^2\right]}\right]\right)$$

## Problem 42: Result unnecessarily involves higher level functions.

$$\int e^{\text{ArcCsch}\left[a\,x^2\right]}\,dx$$

Optimal (type 4, 165 leaves, 7 steps) :

$$-\frac{1}{a\,x}-\frac{2\sqrt{1+\frac{1}{a^2 x^4}}}{\left(a+\frac{1}{x^2}\right)x}+\sqrt{1+\frac{1}{a^2 x^4}}\,x+\frac{2\sqrt{\frac{a^2+\frac{1}{x^4}}{\left(a+\frac{1}{x^2}\right)^2}}\left(a+\frac{1}{x^2}\right)\text{EllipticE}\left[2\,\text{ArcCot}\left[\sqrt{a}\,x\right],\frac{1}{2}\right]}{a^{3/2}\sqrt{1+\frac{1}{a^2 x^4}}}-\frac{\sqrt{\frac{a^2+\frac{1}{x^4}}{\left(a+\frac{1}{x^2}\right)^2}}\left(a+\frac{1}{x^2}\right)\text{EllipticF}\left[2\,\text{ArcCot}\left[\sqrt{a}\,x\right],\frac{1}{2}\right]}{a^{3/2}\sqrt{1+\frac{1}{a^2 x^4}}}$$

Result (type 5, 96 leaves) :

$$\frac{1}{3\sqrt{a\,x^2}}\sqrt{2}\,e^{\text{ArcCsch}\left[a\,x^2\right]}\sqrt{\frac{e^{\text{ArcCsch}\left[a\,x^2\right]}}{-1+e^{2\,\text{ArcCsch}\left[a\,x^2\right]}}}\,x\left(3-2\sqrt{1-e^{2\,\text{ArcCsch}\left[a\,x^2\right]}}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},e^{2\,\text{ArcCsch}\left[a\,x^2\right]}\right]\right)$$

## Problem 44: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e^{\text{ArcCsch}\left[a\,x^2\right]}}{x^2}\,dx$$

Optimal (type 4, 91 leaves, 5 steps) :

$$-\frac{1}{3\,a\,x^3}-\frac{\sqrt{1+\frac{1}{a^2 x^4}}}{3\,x}-\frac{\sqrt{\frac{a^2+\frac{1}{x^4}}{\left(a+\frac{1}{x^2}\right)^2}}\,\left(a+\frac{1}{x^2}\right)\,\text{EllipticF}\left[2\,\text{ArcCot}\left[\sqrt{a}\,x\right],\frac{1}{2}\right]}{3\,\sqrt{a}\,\sqrt{1+\frac{1}{a^2 x^4}}}$$

Result (type 4, 95 leaves):

$$-\frac{1}{3\,x^3}\left(\frac{1}{a}+\sqrt{1+\frac{1}{a^2 x^4}}\,x^2+\frac{1}{\sqrt{1+a^2 x^4}}\,2\,(-1)^{1/4}\,\sqrt{1+\frac{1}{a^2 x^4}}\,x^2\,\left(a\,x^2\right)^{3/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\,\sqrt{a\,x^2}\right],-1\right]\right)$$

# Problem 46: Result unnecessarily involves higher level functions.

$$\int \frac{e^{\text{ArcCsch}\left[a\,x^2\right]}}{x^4}\,dx$$

Optimal (type 4, 181 leaves, 7 steps):

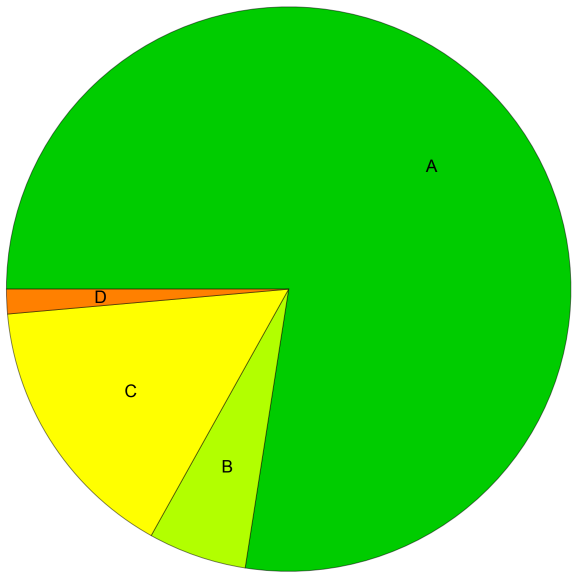
$$-\frac{1}{5\,a\,x^5}-\frac{\sqrt{1+\frac{1}{a^2 x^4}}}{5\,x^3}-\frac{2\,a^2\,\sqrt{1+\frac{1}{a^2 x^4}}}{5\,\left(a+\frac{1}{x^2}\right)\,x}+\frac{2\,\sqrt{a}\,\sqrt{\frac{a^2+\frac{1}{x^4}}{\left(a+\frac{1}{x^2}\right)^2}}\,\left(a+\frac{1}{x^2}\right)\,\text{EllipticE}\left[2\,\text{ArcCot}\left[\sqrt{a}\,x\right],\frac{1}{2}\right]}{5\,\sqrt{1+\frac{1}{a^2 x^4}}}-\frac{\sqrt{a}\,\sqrt{\frac{a^2+\frac{1}{x^4}}{\left(a+\frac{1}{x^2}\right)^2}}\,\left(a+\frac{1}{x^2}\right)\,\text{EllipticF}\left[2\,\text{ArcCot}\left[\sqrt{a}\,x\right],\frac{1}{2}\right]}{5\,\sqrt{1+\frac{1}{a^2 x^4}}}$$

Result (type 5, 119 leaves):

$$-\frac{1}{10\,x^3}e^{-\text{ArcCsch}\left[a\,x^2\right]}\,\sqrt{\frac{e^{\text{ArcCsch}\left[a\,x^2\right]}}{-2+2\,e^{2\,\text{ArcCsch}\left[a\,x^2\right]}}}\,\left(a\,x^2\right)^{3/2}\,\left(-3+2\,e^{2\,\text{ArcCsch}\left[a\,x^2\right]}+e^{4\,\text{ArcCsch}\left[a\,x^2\right]}+8\,\sqrt{1-e^{2\,\text{ArcCsch}\left[a\,x^2\right]}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},e^{2\,\text{ArcCsch}\left[a\,x^2\right]}\right]\right)$$

# Summary of Integration Test Results

71 integration problems




A - 55 optimal antiderivatives

B - 4 more than twice size of optimal antiderivatives

C - 11 unnecessarily complex antiderivatives

D - 1 unable to integrate problems

E - 0 integration timeouts