Mathematica 11.3 Integration Test Results

on the problems in the test-suite directory "6 Hyperbolic functions\6.3 Hyperbolic tangent"

Test results for the 77 problems in "6.3.1 (c+d x)^m (a+b tanh)^n.m"

Problem 3: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (c+d x) \operatorname{Tanh}[e+f x] \, dx$$

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

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

Result (type 4, 211 leaves):

$$\frac{c \operatorname{Log}[\operatorname{Cosh}[e+f x]]}{f}-\left(d \operatorname{Csch}[e]\left(-e^{-\operatorname{ArcTanh}[\operatorname{Coth}[e]]} f^2 x^2+\frac{1}{\sqrt{1-\operatorname{Coth}[e]^2}} i \operatorname{Coth}[e]\left(-f x\left(-\pi+2 i \operatorname{ArcTanh}[\operatorname{Coth}[e]]\right)-\pi \operatorname{Log}\left[1+e^{2 f x}\right]-2\left(i f x+i \operatorname{ArcTanh}[\operatorname{Coth}[e]]\right) \operatorname{Log}\left[1-e^{2 i (i f x+i \operatorname{ArcTanh}[\operatorname{Coth}[e]])}\right]+\pi \operatorname{Log}[\operatorname{Cosh}[f x]]+2 i \operatorname{ArcTanh}[\operatorname{Coth}[e]] \operatorname{Log}[i \operatorname{Sinh}[f x+\operatorname{ArcTanh}[\operatorname{Coth}[e]]]]+i \operatorname{PolyLog}\left[2, e^{2 i (i f x+i \operatorname{ArcTanh}[\operatorname{Coth}[e]])}\right]\right)\right) \operatorname{Sech}[e]\right) \Big/ \left(2 f^2 \sqrt{\operatorname{Csch}[e]^2\left(-\operatorname{Cosh}[e]^2+\operatorname{Sinh}[e]^2\right)}\right)+\frac{1}{2} d x^2 \operatorname{Tanh}[e]$$

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

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

Optimal (type 4, 88 leaves, 6 steps):

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

Result (type 4, 303 leaves):

$$\frac{1}{3} x \left(3 c^2+3 c d x+d^2 x^2\right)+\frac{2 c d \text{Sech}[e] \left(\text{Cosh}[e] \text{Log}[\text{Cosh}[e] \text{Cosh}[f x]+\text{Sinh}[e] \text{Sinh}[f x]]-f x \text{Sinh}[e]\right)}{f^2 \left(\text{Cosh}[e]^2-\text{Sinh}[e]^2\right)}-$$
$$\left(d^2 \text{Csch}[e] \left(-e^{-\text{ArcTanh}[\text{Coth}[e]]} f^2 x^2+\frac{1}{\sqrt{1-\text{Coth}[e]^2}}\right.\right.$$
$$i \text{Coth}[e] \left(-f x \left(-\pi+2 i \text{ArcTanh}[\text{Coth}[e]]\right)-\pi \text{Log}\left[1+e^{2 f x}\right]-2 \left(i f x+i \text{ArcTanh}[\text{Coth}[e]]\right) \text{Log}\left[1-e^{2 i (i f x+i \text{ArcTanh}[\text{Coth}[e]])}\right]+\right.$$
$$\left.\left.\left.\pi \text{Log}[\text{Cosh}[f x]]+2 i \text{ArcTanh}[\text{Coth}[e]] \text{Log}[i \text{Sinh}[f x+\text{ArcTanh}[\text{Coth}[e]]]]+i \text{PolyLog}\left[2,e^{2 i (i f x+i \text{ArcTanh}[\text{Coth}[e]])}\right]\right)\right) \text{Sech}[e]\right) \Big/$$
$$\left(f^3 \sqrt{\text{Csch}[e]^2 \left(-\text{Cosh}[e]^2+\text{Sinh}[e]^2\right)}\right)+\frac{\text{Sech}[e] \text{Sech}[e+f x] \left(-c^2 \text{Sinh}[f x]-2 c d x \text{Sinh}[f x]-d^2 x^2 \text{Sinh}[f x]\right)}{f}$$

Problem 11: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 237 leaves, 13 steps):

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

Result (type 4, 819 leaves):

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

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

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

$$\frac{c^3 \text{Sech}[e] \left(\text{Cosh}[e] \text{Log}[\text{Cosh}[e] \text{Cosh}[f x] + \text{Sinh}[e] \text{Sinh}[f x]] - f x \,\text{Sinh}[e]\right)}{f \left(\text{Cosh}[e]^2 - \text{Sinh}[e]^2\right)} -$$

$$\left(3 d^3 \text{Csch}[e] \left(-e^{-\text{ArcTanh}[\text{Coth}[e]]} f^2 x^2 + \frac{1}{\sqrt{1 - \text{Coth}[e]^2}} i \,\text{Coth}[e] \left(-f x \left(-\pi + 2 i \,\text{ArcTanh}[\text{Coth}[e]]\right) - \pi \,\text{Log}\left[1 + e^{2 f x}\right] - 2 \left(i f x + i \,\text{ArcTanh}[\text{Coth}[e]]\right) \text{Log}\left[1 - e^{2 i (i f x + i \,\text{ArcTanh}[\text{Coth}[e]])}\right] + \pi \,\text{Log}[\text{Cosh}[f x]] + 2 i \,\text{ArcTanh}[\text{Coth}[e]] \,\text{Log}[i \,\text{Sinh}[f x + \text{ArcTanh}[\text{Coth}[e]]]] + i \,\text{PolyLog}\left[2, e^{2 i (i f x + i \,\text{ArcTanh}[\text{Coth}[e]])}\right]\right)\right) \text{Sech}[e]\right) \Big/$$

$$\left(2 f^4 \sqrt{\text{Csch}[e]^2 \left(-\text{Cosh}[e]^2 + \text{Sinh}[e]^2\right)}\right) - \left(3 c^2 d\, \text{Csch}[e] \left(-e^{-\text{ArcTanh}[\text{Coth}[e]]} f^2 x^2 + \frac{1}{\sqrt{1 - \text{Coth}[e]^2}} i \,\text{Coth}[e] \left(-f x \left(-\pi + 2 i \,\text{ArcTanh}[\text{Coth}[e]]\right) - \pi \,\text{Log}\left[1 + e^{2 f x}\right] - 2 \left(i f x + i \,\text{ArcTanh}[\text{Coth}[e]]\right) \text{Log}\left[1 - e^{2 i (i f x + i \,\text{ArcTanh}[\text{Coth}[e]])}\right] + \pi \,\text{Log}[\text{Cosh}[f x]] + 2 i \,\text{ArcTanh}[\text{Coth}[e]] \,\text{Log}[i \,\text{Sinh}[f x + \text{ArcTanh}[\text{Coth}[e]]]] + i \,\text{PolyLog}\left[2, e^{2 i (i f x + i \,\text{ArcTanh}[\text{Coth}[e]])}\right]\right)\right) \text{Sech}[e]\right) \Big/$$

$$\left(2 f^2 \sqrt{\text{Csch}[e]^2 \left(-\text{Cosh}[e]^2 + \text{Sinh}[e]^2\right)}\right) - \frac{3 \,\text{Sech}[e] \,\text{Sech}[e + f x] \left(c^2 d \,\text{Sinh}[f x] + 2 c\, d^2 x \,\text{Sinh}[f x] + d^3 x^2 \,\text{Sinh}[f x]\right)}{2 f^2} +$$

$$\frac{1}{4} x \left(4 c^3 + 6 c^2 d x + 4 c\, d^2 x^2 + d^3 x^3\right) \text{Tanh}[e]$$

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

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

Optimal (type 4, 157 leaves, 9 steps) :

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

Result (type 4, 465 leaves):

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

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

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

Optimal (type 4, 100 leaves, 7 steps):

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

Result (type 4, 264 leaves):

$$\frac{c\,\text{Log}[\text{Cosh}[e+f\,x]]}{f}+\frac{c\,\text{Sech}[e+f\,x]^2}{2\,f}+\frac{d\,x\,\text{Sech}[e+f\,x]^2}{2\,f}-$$

$$\Bigg(d\,\text{Csch}[e]\,\Bigg(-e^{-\text{ArcTanh}[\text{Coth}[e]]}\,f^2\,x^2+\frac{1}{\sqrt{1-\text{Coth}[e]^2}}\,i\,\text{Coth}[e]\,\big(-f\,x\,(-\pi+2\,i\,\text{ArcTanh}[\text{Coth}[e]])-$$

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

$$2\,i\,\text{ArcTanh}[\text{Coth}[e]]\,\text{Log}[i\,\text{Sinh}[f\,x+\text{ArcTanh}[\text{Coth}[e]]]]+i\,\text{PolyLog}\left[2,\,e^{2\,i\,(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]])}\right]\big)\Bigg)\,\text{Sech}[e]\Bigg)\Bigg/$$

$$\left(2\,f^2\,\sqrt{\text{Csch}[e]^2\,\left(-\text{Cosh}[e]^2+\text{Sinh}[e]^2\right)}\right)-\frac{d\,\text{Sech}[e]\,\text{Sech}[e+f\,x]\,\text{Sinh}[f\,x]}{2\,f^2}+\frac{1}{2}$$

d
x^2
Tanh[e]

Problem 16: Attempted integration timed out after 120 seconds.

$$\int (c+d\,x)\,(b\,\text{Tanh}[e+f\,x])^{5/2}\,dx$$

Optimal (type 4, 1392 leaves, 44 steps) :

$$\frac{2 b^{5/2} d \operatorname{ArcTan}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{b}}\right]}{3 f^2}-\frac{(-b)^{5/2} (c+d x) \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right]}{f}-\frac{(-b)^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right]^2}{2 f^2}+\frac{2 b^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{b}}\right]}{3 f^2}+$$

$$\frac{b^{5/2} (c+d x) \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{b}}\right]}{f}+\frac{b^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{b}}\right]^2}{2 f^2}-\frac{b^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{b}}\right] \operatorname{Log}\left[\frac{2 \sqrt{b}}{\sqrt{b}-\sqrt{b \tanh[e+f x]}}\right]}{f^2}+$$

$$\frac{b^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{b}}\right] \operatorname{Log}\left[\frac{2 \sqrt{b}}{\sqrt{b}+\sqrt{b \tanh[e+f x]}}\right]}{f^2}-\frac{b^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{b}}\right] \operatorname{Log}\left[\frac{2 \sqrt{b} \left(\sqrt{-b}-\sqrt{b \tanh[e+f x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b \tanh[e+f x]}\right)}\right]}{2 f^2}-$$

$$\frac{b^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{b}}\right] \operatorname{Log}\left[\frac{2 \sqrt{b} \left(\sqrt{-b}+\sqrt{b \tanh[e+f x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b \tanh[e+f x]}\right)}\right]}{2 f^2}+\frac{(-b)^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right] \operatorname{Log}\left[\frac{2}{1-\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}}\right]}{f^2}-$$

$$\frac{(-b)^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right] \operatorname{Log}\left[\frac{2 \left(\sqrt{b}-\sqrt{b \tanh[e+f x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(1-\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right)}\right]}{2 f^2}-\frac{(-b)^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right] \operatorname{Log}\left[-\frac{2 \left(\sqrt{b}+\sqrt{b \tanh[e+f x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(1-\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right)}\right]}{2 f^2}-$$

$$\frac{(-b)^{5/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right] \operatorname{Log}\left[\frac{2}{1+\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}}\right]}{f^2}-\frac{b^{5/2} d \operatorname{PolyLog}\left[2, 1-\frac{2 \sqrt{b}}{\sqrt{b}-\sqrt{b \tanh[e+f x]}}\right]}{2 f^2}-\frac{b^{5/2} d \operatorname{PolyLog}\left[2, 1-\frac{2 \sqrt{b}}{\sqrt{b}+\sqrt{b \tanh[e+f x]}}\right]}{2 f^2}+$$

$$\frac{b^{5/2} d \operatorname{PolyLog}\left[2, 1-\frac{2 \sqrt{b} \left(\sqrt{-b}-\sqrt{b \tanh[e+f x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b \tanh[e+f x]}\right)}\right]}{4 f^2}+\frac{b^{5/2} d \operatorname{PolyLog}\left[2, 1-\frac{2 \sqrt{b} \left(\sqrt{-b}+\sqrt{b \tanh[e+f x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b \tanh[e+f x]}\right)}\right]}{4 f^2}+$$

$$\frac{(-b)^{5/2} d \operatorname{PolyLog}\left[2, 1-\frac{2}{1-\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}}\right]}{2 f^2}-\frac{(-b)^{5/2} d \operatorname{PolyLog}\left[2, 1-\frac{2 \left(\sqrt{b}-\sqrt{b \tanh[e+f x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(1-\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right)}\right]}{4 f^2}-\frac{(-b)^{5/2} d \operatorname{PolyLog}\left[2, 1+\frac{2 \left(\sqrt{b}+\sqrt{b \tanh[e+f x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(1-\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}\right)}\right]}{4 f^2}+$$

$$\frac{(-b)^{5/2} d \operatorname{PolyLog}\left[2, 1-\frac{2}{1+\frac{\sqrt{b \tanh[e+f x]}}{\sqrt{-b}}}\right]}{2 f^2}-\frac{4 b^2 d \sqrt{b \tanh[e+f x]}}{3 f^2}-\frac{2 b (c+d x) (b \tanh[e+f x])^{3/2}}{3 f}$$

Result (type 1, 1 leaves):

???

Problem 17: Unable to integrate problem.

$$\int (c + d\,x)\;(b\,\mathrm{Tanh}[e + f\,x])^{3/2}\,dx$$

Optimal (type 4, 1363 leaves, 43 steps) :

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

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

$$\frac{b^{3/2}\, d\, \text{ArcTanh}\left[\frac{\sqrt{b\, \text{Tanh}[e+f x]}}{\sqrt{b}}\right] \text{Log}\left[\frac{2 \sqrt{b}}{\sqrt{b}-\sqrt{b\, \text{Tanh}[e+f x]}}\right]}{f^2}+\frac{b^{3/2}\, d\, \text{ArcTanh}\left[\frac{\sqrt{b\, \text{Tanh}[e+f x]}}{\sqrt{b}}\right] \text{Log}\left[\frac{2 \sqrt{b}}{\sqrt{b}+\sqrt{b\, \text{Tanh}[e+f x]}}\right]}{f^2}-$$

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

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

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

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

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

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

Result (type 8, 20 leaves) :

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

Problem 18: Result unnecessarily involves imaginary or complex numbers.

$$\int (c + d x) \sqrt{b \operatorname{Tanh}[e + f x]} \, dx$$

Optimal (type 4, 1280 leaves, 37 steps) :

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

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

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

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

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

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

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

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

Result (type 4, 556 leaves) :

$$\frac{1}{8 f^2 \sqrt{\text{Tanh}[e+f x]}}\Big(-4 f (c+d x) \left(2 \text{ArcTan}\left[\sqrt{\text{Tanh}[e+f x]}\right]+\text{Log}\left[1-\sqrt{\text{Tanh}[e+f x]}\right]-\text{Log}\left[1+\sqrt{\text{Tanh}[e+f x]}\right]\right)+$$
$$d \Big(4 i \text{ArcTan}\left[\sqrt{\text{Tanh}[e+f x]}\right]^2-4 \text{ArcTan}\left[\sqrt{\text{Tanh}[e+f x]}\right] \text{Log}\left[1+e^{4 i \text{ArcTan}\left[\sqrt{\text{Tanh}[e+f x]}\right]}\right]-\text{Log}\left[1-\sqrt{\text{Tanh}[e+f x]}\right]^2+$$
$$2 \text{Log}\left[1-\sqrt{\text{Tanh}[e+f x]}\right] \text{Log}\left[\left(\frac{1}{2}+\frac{i}{2}\right)\left(-i+\sqrt{\text{Tanh}[e+f x]}\right)\right]+2 \text{Log}\left[1-\sqrt{\text{Tanh}[e+f x]}\right] \text{Log}\left[\left(\frac{1}{2}-\frac{i}{2}\right)\left(i+\sqrt{\text{Tanh}[e+f x]}\right)\right]-$$
$$2 \text{Log}\left[1-\sqrt{\text{Tanh}[e+f x]}\right] \text{Log}\left[\frac{1}{2}\left(1+\sqrt{\text{Tanh}[e+f x]}\right)\right]-2 \text{Log}\left[1-\left(\frac{1}{2}-\frac{i}{2}\right)\left(1+\sqrt{\text{Tanh}[e+f x]}\right)\right] \text{Log}\left[1+\sqrt{\text{Tanh}[e+f x]}\right]+$$
$$2 \text{Log}\left[\frac{1}{2}\left(1-\sqrt{\text{Tanh}[e+f x]}\right)\right] \text{Log}\left[1+\sqrt{\text{Tanh}[e+f x]}\right]-2 \text{Log}\left[\left(-\frac{1}{2}-\frac{i}{2}\right)\left(i+\sqrt{\text{Tanh}[e+f x]}\right)\right] \text{Log}\left[1+\sqrt{\text{Tanh}[e+f x]}\right]+$$
$$\text{Log}\left[1+\sqrt{\text{Tanh}[e+f x]}\right]^2+i \text{PolyLog}\left[2,-e^{4 i \text{ArcTan}\left[\sqrt{\text{Tanh}[e+f x]}\right]}\right]-2 \text{PolyLog}\left[2,\frac{1}{2}\left(1-\sqrt{\text{Tanh}[e+f x]}\right)\right]+$$
$$2 \text{PolyLog}\left[2,\left(-\frac{1}{2}-\frac{i}{2}\right)\left(-1+\sqrt{\text{Tanh}[e+f x]}\right)\right]+2 \text{PolyLog}\left[2,\left(-\frac{1}{2}+\frac{i}{2}\right)\left(-1+\sqrt{\text{Tanh}[e+f x]}\right)\right]+2 \text{PolyLog}\left[2,\frac{1}{2}\left(1+\sqrt{\text{Tanh}[e+f x]}\right)\right]-$$
$$2 \text{PolyLog}\left[2,\left(\frac{1}{2}-\frac{i}{2}\right)\left(1+\sqrt{\text{Tanh}[e+f x]}\right)\right]-2 \text{PolyLog}\left[2,\left(\frac{1}{2}+\frac{i}{2}\right)\left(1+\sqrt{\text{Tanh}[e+f x]}\right)\right]\Big)\Big) \sqrt{b \text{Tanh}[e+f x]}$$

Problem 19: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 1280 leaves, 37 steps) :

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

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

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

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

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

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

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

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

Result (type 4, 556 leaves) :

$$\frac{1}{8 f^2 \sqrt{b \operatorname{Tanh}[e+f x]}}\Big(4 f (c+d x) \Big(2 \operatorname{ArcTan}\Big[\sqrt{\operatorname{Tanh}[e+f x]}\Big]-\operatorname{Log}\Big[1-\sqrt{\operatorname{Tanh}[e+f x]}\Big]+\operatorname{Log}\Big[1+\sqrt{\operatorname{Tanh}[e+f x]}\Big]\Big)+$$
$$d \Big(-4 i \operatorname{ArcTan}\Big[\sqrt{\operatorname{Tanh}[e+f x]}\Big]^2+4 \operatorname{ArcTan}\Big[\sqrt{\operatorname{Tanh}[e+f x]}\Big] \operatorname{Log}\Big[1+e^{4 i \operatorname{ArcTan}\left[\sqrt{\operatorname{Tanh}[e+f x]}\right]}\Big]-\operatorname{Log}\Big[1-\sqrt{\operatorname{Tanh}[e+f x]}\Big]^2+$$
$$2 \operatorname{Log}\Big[1-\sqrt{\operatorname{Tanh}[e+f x]}\Big] \operatorname{Log}\Big[\Big(\frac{1}{2}+\frac{i}{2}\Big)\Big(-i+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big]+2 \operatorname{Log}\Big[1-\sqrt{\operatorname{Tanh}[e+f x]}\Big] \operatorname{Log}\Big[\Big(\frac{1}{2}-\frac{i}{2}\Big)\Big(i+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big]-$$
$$2 \operatorname{Log}\Big[1-\sqrt{\operatorname{Tanh}[e+f x]}\Big] \operatorname{Log}\Big[\frac{1}{2}\Big(1+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big]-2 \operatorname{Log}\Big[1-\Big(\frac{1}{2}-\frac{i}{2}\Big)\Big(1+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big] \operatorname{Log}\Big[1+\sqrt{\operatorname{Tanh}[e+f x]}\Big]+$$
$$2 \operatorname{Log}\Big[\frac{1}{2}\Big(1-\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big] \operatorname{Log}\Big[1+\sqrt{\operatorname{Tanh}[e+f x]}\Big]-2 \operatorname{Log}\Big[\Big(-\frac{1}{2}-\frac{i}{2}\Big)\Big(i+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big] \operatorname{Log}\Big[1+\sqrt{\operatorname{Tanh}[e+f x]}\Big]+$$
$$\operatorname{Log}\Big[1+\sqrt{\operatorname{Tanh}[e+f x]}\Big]^2-i \operatorname{PolyLog}\Big[2,-e^{4 i \operatorname{ArcTan}\left[\sqrt{\operatorname{Tanh}[e+f x]}\right]}\Big]-2 \operatorname{PolyLog}\Big[2,\frac{1}{2}\Big(1-\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big]+$$
$$2 \operatorname{PolyLog}\Big[2,\Big(-\frac{1}{2}-\frac{i}{2}\Big)\Big(-1+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big]+2 \operatorname{PolyLog}\Big[2,\Big(-\frac{1}{2}+\frac{i}{2}\Big)\Big(-1+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big]+2 \operatorname{PolyLog}\Big[2,\frac{1}{2}\Big(1+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big]-$$
$$2 \operatorname{PolyLog}\Big[2,\Big(\frac{1}{2}-\frac{i}{2}\Big)\Big(1+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big]-2 \operatorname{PolyLog}\Big[2,\Big(\frac{1}{2}+\frac{i}{2}\Big)\Big(1+\sqrt{\operatorname{Tanh}[e+f x]}\Big)\Big]\Big)\Big) \sqrt{\operatorname{Tanh}[e+f x]}$$

Problem 20: Unable to integrate problem.

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

Optimal (type 4, 1365 leaves, 43 steps) :

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

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

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

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

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

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

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

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

Result (type 8, 20 leaves):

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

Problem 22: Attempted integration timed out after 120 seconds.

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

Optimal (type 9, 22 leaves, 0 steps):

$$\text{Unintegrable}\left[(c+d x)^2 \sqrt{b \operatorname{Tanh}[e+f x]},\ x\right]$$

Result (type 1, 1 leaves):

???

Problem 23: Attempted integration timed out after 120 seconds.

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

Optimal (type 9, 22 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{(c+d x)^2}{\sqrt{b \operatorname{Tanh}[e+f x]}},\ x\right]$$

Result (type 1, 1 leaves):

???

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

$$\int \frac{(c+d x)^m}{a+a \operatorname{Tanh}[e+f x]}\, dx$$

Optimal (type 4, 89 leaves, 2 steps):

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

Result (type 4, 186 leaves):

$$\left(2^{-2-m}\,(c+d\,x)^m\left(-\frac{f\,(c+d\,x)}{d}\right)^m\left(-\frac{f^2\,(c+d\,x)^2}{d^2}\right)^{-m}\text{Sech}[e+f\,x]\right.$$
$$\left(d\,(1+m)\,\text{Gamma}\left[1+m,\frac{2\,f\,(c+d\,x)}{d}\right]\left(-\text{Cosh}\left[e-\frac{c\,f}{d}\right]+\text{Sinh}\left[e-\frac{c\,f}{d}\right]\right)+2^{1+m}\,f\left(f\left(\frac{c}{d}+x\right)\right)^m\,(c+d\,x)\left(\text{Cosh}\left[e-\frac{c\,f}{d}\right]+\text{Sinh}\left[e-\frac{c\,f}{d}\right]\right)\right.$$
$$\left.\left.\left(\text{Cosh}\left[f\left(\frac{c}{d}+x\right)\right]+\text{Sinh}\left[f\left(\frac{c}{d}+x\right)\right]\right)\right)\right)\Big/\left(a\,d\,f\,(1+m)\,(1+\text{Tanh}[e+f\,x])\right)$$

Problem 51: Attempted integration timed out after 120 seconds.

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

Optimal (type 4, 153 leaves, 4 steps):

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

Result (type 1, 1 leaves):

???

Problem 52: Attempted integration timed out after 120 seconds.

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

Optimal (type 4, 224 leaves, 5 steps):

$$\frac{(c+d\,x)^{1+m}}{8\,a^3\,d\,(1+m)}-\frac{3\times2^{-4-m}\,e^{-2\,e+\frac{2\,c\,f}{d}}\,(c+d\,x)^m\left(\frac{f\,(c+d\,x)}{d}\right)^{-m}\text{Gamma}\left[1+m,\frac{2\,f\,(c+d\,x)}{d}\right]}{a^3\,f}-$$
$$\frac{3\times2^{-5-2\,m}\,e^{-4\,e+\frac{4\,c\,f}{d}}\,(c+d\,x)^m\left(\frac{f\,(c+d\,x)}{d}\right)^{-m}\text{Gamma}\left[1+m,\frac{4\,f\,(c+d\,x)}{d}\right]}{a^3\,f}-\frac{2^{-4-m}\times3^{-1-m}\,e^{-6\,e+\frac{6\,c\,f}{d}}\,(c+d\,x)^m\left(\frac{f\,(c+d\,x)}{d}\right)^{-m}\text{Gamma}\left[1+m,\frac{6\,f\,(c+d\,x)}{d}\right]}{a^3\,f}$$

Result (type 1, 1 leaves):

???

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

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

Optimal (type 4, 75 leaves, 6 steps):

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

Result (type 4, 227 leaves):

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

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

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

Optimal (type 4, 277 leaves, 15 steps):

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

Result (type 4, 1062 leaves):

$$\frac{1}{2\left(1+e^{2e}\right)f}$$

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

$$\frac{1}{8\,f}\text{Sech}[e]\,\text{Sech}[e+f\,x]\,\left(4\,a^2\,c^3\,f\,x\,\text{Cosh}[f\,x]+4\,b^2\,c^3\,f\,x\,\text{Cosh}[f\,x]+6\,a^2\,c^2\,d\,f\,x^2\,\text{Cosh}[f\,x]+6\,b^2\,c^2\,d\,f\,x^2\,\text{Cosh}[f\,x]+\right.$$
$$4\,a^2\,c\,d^2\,f\,x^3\,\text{Cosh}[f\,x]+4\,b^2\,c\,d^2\,f\,x^3\,\text{Cosh}[f\,x]+a^2\,d^3\,f\,x^4\,\text{Cosh}[f\,x]+b^2\,d^3\,f\,x^4\,\text{Cosh}[f\,x]+4\,a^2\,c^3\,f\,x\,\text{Cosh}[2\,e+f\,x]+$$
$$4\,b^2\,c^3\,f\,x\,\text{Cosh}[2\,e+f\,x]+6\,a^2\,c^2\,d\,f\,x^2\,\text{Cosh}[2\,e+f\,x]+6\,b^2\,c^2\,d\,f\,x^2\,\text{Cosh}[2\,e+f\,x]+4\,a^2\,c\,d^2\,f\,x^3\,\text{Cosh}[2\,e+f\,x]+$$
$$4\,b^2\,c\,d^2\,f\,x^3\,\text{Cosh}[2\,e+f\,x]+a^2\,d^3\,f\,x^4\,\text{Cosh}[2\,e+f\,x]+b^2\,d^3\,f\,x^4\,\text{Cosh}[2\,e+f\,x]-8\,b^2\,c^3\,\text{Sinh}[f\,x]-24\,b^2\,c^2\,d\,x\,\text{Sinh}[f\,x]-$$
$$8\,a\,b\,c^3\,f\,x\,\text{Sinh}[f\,x]-24\,b^2\,c\,d^2\,x^2\,\text{Sinh}[f\,x]-12\,a\,b\,c^2\,d\,f\,x^2\,\text{Sinh}[f\,x]-8\,b^2\,d^3\,x^3\,\text{Sinh}[f\,x]-8\,a\,b\,c\,d^2\,f\,x^3\,\text{Sinh}[f\,x]-$$
$$\left.2\,a\,b\,d^3\,f\,x^4\,\text{Sinh}[f\,x]+8\,a\,b\,c^3\,f\,x\,\text{Sinh}[2\,e+f\,x]+12\,a\,b\,c^2\,d\,f\,x^2\,\text{Sinh}[2\,e+f\,x]+8\,a\,b\,c\,d^2\,f\,x^3\,\text{Sinh}[2\,e+f\,x]+2\,a\,b\,d^3\,f\,x^4\,\text{Sinh}[2\,e+f\,x]\right)$$

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

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

Optimal (type 4, 566 leaves, 28 steps):

$$-\frac{3 b^3 d (c+d x)^2}{2 f^2}-\frac{3 a b^2 (c+d x)^3}{f}+\frac{b^3 (c+d x)^3}{2 f}+\frac{a^3 (c+d x)^4}{4 d}-\frac{3 a^2 b (c+d x)^4}{4 d}+\frac{3 a b^2 (c+d x)^4}{4 d}-$$
$$\frac{b^3 (c+d x)^4}{4 d}+\frac{3 b^3 d^2 (c+d x) \text{Log}[1+e^{2 (e+f x)}]}{f^3}+\frac{9 a b^2 d (c+d x)^2 \text{Log}[1+e^{2 (e+f x)}]}{f^2}+\frac{3 a^2 b (c+d x)^3 \text{Log}[1+e^{2 (e+f x)}]}{f}+$$
$$\frac{b^3 (c+d x)^3 \text{Log}[1+e^{2 (e+f x)}]}{f}+\frac{3 b^3 d^3 \text{PolyLog}[2,-e^{2 (e+f x)}]}{2 f^4}+\frac{9 a b^2 d^2 (c+d x) \text{PolyLog}[2,-e^{2 (e+f x)}]}{f^3}+$$
$$\frac{9 a^2 b d (c+d x)^2 \text{PolyLog}[2,-e^{2 (e+f x)}]}{2 f^2}+\frac{3 b^3 d (c+d x)^2 \text{PolyLog}[2,-e^{2 (e+f x)}]}{2 f^2}-\frac{9 a b^2 d^3 \text{PolyLog}[3,-e^{2 (e+f x)}]}{2 f^4}-$$
$$\frac{9 a^2 b d^2 (c+d x) \text{PolyLog}[3,-e^{2 (e+f x)}]}{2 f^3}-\frac{3 b^3 d^2 (c+d x) \text{PolyLog}[3,-e^{2 (e+f x)}]}{2 f^3}+\frac{9 a^2 b d^3 \text{PolyLog}[4,-e^{2 (e+f x)}]}{4 f^4}+$$
$$\frac{3 b^3 d^3 \text{PolyLog}[4,-e^{2 (e+f x)}]}{4 f^4}-\frac{3 b^3 d (c+d x)^2 \text{Tanh}[e+f x]}{2 f^2}-\frac{3 a b^2 (c+d x)^3 \text{Tanh}[e+f x]}{f}-\frac{b^3 (c+d x)^3 \text{Tanh}[e+f x]^2}{2 f}$$

Result (type 4, 2010 leaves) :

$$\frac{1}{4 (1+e^{2 e}) f^2}$$
$$b e^{2 e} \Big(-24 b^2 c d^2 x-72 a b c^2 d f x-24 a^2 c^3 f^2 x-8 b^2 c^3 f^2 x-12 b^2 d^3 x^2-72 a b c d^2 f x^2-36 a^2 c^2 d f^2 x^2-12 b^2 c^2 d f^2 x^2-24 a b d^3 f x^3-$$
$$24 a^2 c d^2 f^2 x^3-8 b^2 c d^2 f^2 x^3-6 a^2 d^3 f^2 x^4-2 b^2 d^3 f^2 x^4+36 a b c^2 d \text{Log}[1+e^{2 (e+f x)}]+36 a b c^2 d e^{-2 e} \text{Log}[1+e^{2 (e+f x)}]+$$
$$\frac{12 b^2 c d^2 \text{Log}[1+e^{2 (e+f x)}]}{f}+\frac{12 b^2 c d^2 e^{-2 e} \text{Log}[1+e^{2 (e+f x)}]}{f}+12 a^2 c^3 f \text{Log}[1+e^{2 (e+f x)}]+4 b^2 c^3 f \text{Log}[1+e^{2 (e+f x)}]+$$
$$12 a^2 c^3 e^{-2 e} f \text{Log}[1+e^{2 (e+f x)}]+4 b^2 c^3 e^{-2 e} f \text{Log}[1+e^{2 (e+f x)}]+72 a b c d^2 x \text{Log}[1+e^{2 (e+f x)}]+72 a b c d^2 e^{-2 e} x \text{Log}[1+e^{2 (e+f x)}]+$$
$$\frac{12 b^2 d^3 x \text{Log}[1+e^{2 (e+f x)}]}{f}+\frac{12 b^2 d^3 e^{-2 e} x \text{Log}[1+e^{2 (e+f x)}]}{f}+36 a^2 c^2 d f x \text{Log}[1+e^{2 (e+f x)}]+12 b^2 c^2 d f x \text{Log}[1+e^{2 (e+f x)}]+$$
$$36 a^2 c^2 d e^{-2 e} f x \text{Log}[1+e^{2 (e+f x)}]+12 b^2 c^2 d e^{-2 e} f x \text{Log}[1+e^{2 (e+f x)}]+36 a b d^3 x^2 \text{Log}[1+e^{2 (e+f x)}]+36 a b d^3 e^{-2 e} x^2 \text{Log}[1+e^{2 (e+f x)}]+$$
$$36 a^2 c d^2 f x^2 \text{Log}[1+e^{2 (e+f x)}]+12 b^2 c d^2 f x^2 \text{Log}[1+e^{2 (e+f x)}]+36 a^2 c d^2 e^{-2 e} f x^2 \text{Log}[1+e^{2 (e+f x)}]+12 b^2 c d^2 e^{-2 e} f x^2 \text{Log}[1+e^{2 (e+f x)}]+$$
$$12 a^2 d^3 f x^3 \text{Log}[1+e^{2 (e+f x)}]+4 b^2 d^3 f x^3 \text{Log}[1+e^{2 (e+f x)}]+12 a^2 d^3 e^{-2 e} f x^3 \text{Log}[1+e^{2 (e+f x)}]+4 b^2 d^3 e^{-2 e} f x^3 \text{Log}[1+e^{2 (e+f x)}]+$$
$$\frac{1}{f^2} 6 d e^{-2 e} (1+e^{2 e}) \left(6 a b d f (c+d x)+3 a^2 f^2 (c+d x)^2+b^2 (d^2+c^2 f^2+2 c d f^2 x+d^2 f^2 x^2)\right) \text{PolyLog}[2,-e^{2 (e+f x)}]-$$
$$\frac{6 d^2 e^{-2 e} (1+e^{2 e}) (3 a b d+3 a^2 f (c+d x)+b^2 f (c+d x)) \text{PolyLog}[3,-e^{2 (e+f x)}]}{f^2}+\frac{9 a^2 d^3 \text{PolyLog}[4,-e^{2 (e+f x)}]}{f^2}+$$
$$\frac{3 b^2 d^3 \text{PolyLog}[4,-e^{2 (e+f x)}]}{f^2}+\frac{9 a^2 d^3 e^{-2 e} \text{PolyLog}[4,-e^{2 (e+f x)}]}{f^2}+\frac{3 b^2 d^3 e^{-2 e} \text{PolyLog}[4,-e^{2 (e+f x)}]}{f^2}\Big)+$$
$$\frac{(b^3 c^3+3 b^3 c^2 d x+3 b^3 c d^2 x^2+b^3 d^3 x^3) \text{Sech}[e+f x]^2}{2 f}+$$
$$\Big(3 x^2 \Big(a^3 c^2 d-3 a^2 b c^2 d+3 a b^2 c^2 d-b^3 c^2 d+a^3 c^2 d \text{Cosh}[2 e]+3 a^2 b c^2 d \text{Cosh}[2 e]+3 a b^2 c^2 d \text{Cosh}[2 e]+b^3 c^2 d \text{Cosh}[2 e]+$$

$a^3 c^2 d \operatorname{Sinh}[2e] + 3a^2 b c^2 d \operatorname{Sinh}[2e] + 3ab^2 c^2 d \operatorname{Sinh}[2e] + b^3 c^2 d \operatorname{Sinh}[2e])) / (2(1+\operatorname{Cosh}[2e]+\operatorname{Sinh}[2e])) +$

$\frac{1}{1+\operatorname{Cosh}[2e]+\operatorname{Sinh}[2e]} x^3 (a^3 c d^2 - 3a^2 b c d^2 + 3ab^2 c d^2 - b^3 c d^2 + a^3 c d^2 \operatorname{Cosh}[2e] + 3a^2 b c d^2 \operatorname{Cosh}[2e] + 3ab^2 c d^2 \operatorname{Cosh}[2e] +$

$b^3 c d^2 \operatorname{Cosh}[2e] + a^3 c d^2 \operatorname{Sinh}[2e] + 3a^2 b c d^2 \operatorname{Sinh}[2e] + 3ab^2 c d^2 \operatorname{Sinh}[2e] + b^3 c d^2 \operatorname{Sinh}[2e]) +$

$(x^4 (a^3 d^3 - 3a^2 b d^3 + 3ab^2 d^3 - b^3 d^3 + a^3 d^3 \operatorname{Cosh}[2e] + 3a^2 b d^3 \operatorname{Cosh}[2e] + 3ab^2 d^3 \operatorname{Cosh}[2e] + b^3 d^3 \operatorname{Cosh}[2e] +$

$a^3 d^3 \operatorname{Sinh}[2e] + 3a^2 b d^3 \operatorname{Sinh}[2e] + 3ab^2 d^3 \operatorname{Sinh}[2e] + b^3 d^3 \operatorname{Sinh}[2e])) / (4(1+\operatorname{Cosh}[2e]+\operatorname{Sinh}[2e])) +$

$x \Big(a^3 c^3 + 3ab^2 c^3 - \frac{3a^2 b c^3}{1+\operatorname{Cosh}[2e]+\operatorname{Sinh}[2e]} + \frac{3a^2 b c^3 \operatorname{Cosh}[2e] + 3a^2 b c^3 \operatorname{Sinh}[2e]}{1+\operatorname{Cosh}[2e]+\operatorname{Sinh}[2e]} +$

$\frac{2b^3 c^3 \operatorname{Cosh}[2e] + 2b^3 c^3 \operatorname{Sinh}[2e]}{(1+\operatorname{Cosh}[2e]+\operatorname{Sinh}[2e])(1-\operatorname{Cosh}[2e]+\operatorname{Cosh}[4e]-\operatorname{Sinh}[2e]+\operatorname{Sinh}[4e])} +$

$\frac{-2b^3 c^3 \operatorname{Cosh}[4e] - 2b^3 c^3 \operatorname{Sinh}[4e]}{(1+\operatorname{Cosh}[2e]+\operatorname{Sinh}[2e])(1-\operatorname{Cosh}[2e]+\operatorname{Cosh}[4e]-\operatorname{Sinh}[2e]+\operatorname{Sinh}[4e])} -$

$\frac{b^3 c^3}{1+\operatorname{Cosh}[6e]+\operatorname{Sinh}[6e]} + \frac{b^3 c^3 \operatorname{Cosh}[6e] + b^3 c^3 \operatorname{Sinh}[6e]}{1+\operatorname{Cosh}[6e]+\operatorname{Sinh}[6e]}\Big) - \frac{1}{2f^2}$

$3 \operatorname{Sech}[e] \operatorname{Sech}[e+fx] (b^3 c^2 d \operatorname{Sinh}[fx] + 2ab^2 c^3 f \operatorname{Sinh}[fx] + 2b^3 c d^2 x \operatorname{Sinh}[fx] + 6ab^2 c^2 d f x \operatorname{Sinh}[fx] +$

$b^3 d^3 x^2 \operatorname{Sinh}[fx] + 6ab^2 c d^2 f x^2 \operatorname{Sinh}[fx] + 2ab^2 d^3 f x^3 \operatorname{Sinh}[fx])$

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

$$\int (c+dx)^2 (a+b\operatorname{Tanh}[e+fx])^3 \, dx$$

Optimal (type 4, 405 leaves, 22 steps):

$$\frac{b^3 c d x}{f} + \frac{b^3 d^2 x^2}{2f} - \frac{3ab^2 (c+dx)^2}{f} + \frac{a^3 (c+dx)^3}{3d} - \frac{a^2 b (c+dx)^3}{d} + \frac{ab^2 (c+dx)^3}{d} - \frac{b^3 (c+dx)^3}{3d} + \frac{6ab^2 d (c+dx) \operatorname{Log}[1+e^{2(e+fx)}]}{f^2} +$$
$$\frac{3a^2 b (c+dx)^2 \operatorname{Log}[1+e^{2(e+fx)}]}{f} + \frac{b^3 (c+dx)^2 \operatorname{Log}[1+e^{2(e+fx)}]}{f} + \frac{b^3 d^2 \operatorname{Log}[\operatorname{Cosh}[e+fx]]}{f^3} + \frac{3ab^2 d^2 \operatorname{PolyLog}[2, -e^{2(e+fx)}]}{f^3} +$$
$$\frac{3a^2 b d (c+dx) \operatorname{PolyLog}[2, -e^{2(e+fx)}]}{f^2} + \frac{b^3 d (c+dx) \operatorname{PolyLog}[2, -e^{2(e+fx)}]}{f^2} - \frac{3a^2 b d^2 \operatorname{PolyLog}[3, -e^{2(e+fx)}]}{2f^3} -$$
$$\frac{b^3 d^2 \operatorname{PolyLog}[3, -e^{2(e+fx)}]}{2f^3} - \frac{b^3 d (c+dx) \operatorname{Tanh}[e+fx]}{f^2} - \frac{3ab^2 (c+dx)^2 \operatorname{Tanh}[e+fx]}{f} - \frac{b^3 (c+dx)^2 \operatorname{Tanh}[e+fx]^2}{2f}$$

Result (type 4, 1142 leaves):

$$\frac{1}{6 f^3} b \left(-\frac{4 e^{2 e} f x \left(9 a b d f (2 c + d x) + 3 a^2 f^2 \left(3 c^2 + 3 c d x + d^2 x^2\right) + b^2 \left(3 c^2 f^2 + 3 c d f^2 x + d^2 \left(3 + f^2 x^2\right)\right)\right)}{1 + e^{2 e}} + 6 \left(6 a b d f (c + d x) + 3 a^2 f^2 (c + d x)^2 + b^2 \left(c^2 f^2 + 2 c d f^2 x + d^2 \left(1 + f^2 x^2\right)\right)\right) Log\left[1 + e^{2 (e+f x)}\right] + 6 d \left(3 a b d + 3 a^2 f (c + d x) + b^2 f (c + d x)\right) PolyLog\left[2, -e^{2 (e+f x)}\right] - 3 \left(3 a^2 + b^2\right) d^2 PolyLog\left[3, -e^{2 (e+f x)}\right]\right) +$$

$$\frac{1}{12 f^2} Sech[e] Sech[e + f x]^2 \left(6 b^3 c^2 f Cosh[e] + 12 b^3 c d f x Cosh[e] + 6 a^3 c^2 f^2 x Cosh[e] + 18 a b^2 c^2 f^2 x Cosh[e] + 6 b^3 d^2 f x^2 Cosh[e] + 6 a^3 c d f^2 x^2 Cosh[e] + 18 a b^2 c d f^2 x^2 Cosh[e] + 2 a^3 d^2 f^2 x^3 Cosh[e] + 6 a b^2 d^2 f^2 x^3 Cosh[e] + 3 a^3 c^2 f^2 x Cosh[e + 2 f x] + 9 a b^2 c^2 f^2 x Cosh[e + 2 f x] + 3 a^3 c d f^2 x^2 Cosh[e + 2 f x] + 9 a b^2 c d f^2 x^2 Cosh[e + 2 f x] + a^3 d^2 f^2 x^3 Cosh[e + 2 f x] + 3 a b^2 d^2 f^2 x^3 Cosh[e + 2 f x] + 3 a^3 c^2 f^2 x Cosh[3 e + 2 f x] + 9 a b^2 c^2 f^2 x Cosh[3 e + 2 f x] + 3 a^3 c d f^2 x^2 Cosh[3 e + 2 f x] + 9 a b^2 c d f^2 x^2 Cosh[3 e + 2 f x] + a^3 d^2 f^2 x^3 Cosh[3 e + 2 f x] + 3 a b^2 d^2 f^2 x^3 Cosh[3 e + 2 f x] + 6 b^3 c d Sinh[e] + 18 a b^2 c^2 f Sinh[e] + 6 b^3 d^2 x Sinh[e] + 36 a b^2 c d f x Sinh[e] + 18 a^2 b c^2 f^2 x Sinh[e] + 6 b^3 c^2 f^2 x Sinh[e] + 18 a b^2 d^2 f x^2 Sinh[e] + 18 a^2 b c d f^2 x^2 Sinh[e] + 6 b^3 c d f^2 x^2 Sinh[e] + 6 a^2 b d^2 f^2 x^3 Sinh[e] + 2 b^3 d^2 f^2 x^3 Sinh[e] - 6 b^3 c d Sinh[e + 2 f x] - 18 a b^2 c^2 f Sinh[e + 2 f x] - 6 b^3 d^2 x Sinh[e + 2 f x] - 36 a b^2 c d f x Sinh[e + 2 f x] - 9 a^2 b c^2 f^2 x Sinh[e + 2 f x] - 3 b^3 c^2 f^2 x Sinh[e + 2 f x] - 18 a b^2 d^2 f x^2 Sinh[e + 2 f x] - 9 a^2 b c d f^2 x^2 Sinh[e + 2 f x] - 3 b^3 c d f^2 x^2 Sinh[e + 2 f x] - 3 a^2 b d^2 f^2 x^3 Sinh[e + 2 f x] - b^3 d^2 f^2 x^3 Sinh[e + 2 f x] + 9 a^2 b c^2 f^2 x Sinh[3 e + 2 f x] + 3 b^3 c^2 f^2 x Sinh[3 e + 2 f x] + 9 a^2 b c d f^2 x^2 Sinh[3 e + 2 f x] + 3 b^3 c d f^2 x^2 Sinh[3 e + 2 f x] + 3 a^2 b d^2 f^2 x^3 Sinh[3 e + 2 f x] + b^3 d^2 f^2 x^3 Sinh[3 e + 2 f x]\right)$$

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

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

Optimal (type 4, 642 leaves, 28 steps):

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

Result (type 4, 2119 leaves):

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

$$b\Bigg(12\,a\,b\,c^2\,d\,e^{2e}\,f^3\,x+12\,b^2\,c^2\,d\,e^{2e}\,f^3\,x-8\,a^2\,c^3\,e^{2e}\,f^4\,x-8\,a\,b\,c^3\,e^{2e}\,f^4\,x+12\,a\,b\,c\,d^2\,e^{2e}\,f^3\,x^2+12\,b^2\,c\,d^2\,e^{2e}\,f^3\,x^2-$$

$$12\,a^2\,c^2\,d\,e^{2e}\,f^4\,x^2-12\,a\,b\,c^2\,d\,e^{2e}\,f^4\,x^2+4\,a\,b\,d^3\,e^{2e}\,f^3\,x^3+4\,b^2\,d^3\,e^{2e}\,f^3\,x^3-8\,a^2\,c\,d^2\,e^{2e}\,f^4\,x^3-8\,a\,b\,c\,d^2\,e^{2e}\,f^4\,x^3-$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\Big(4\,a^2\,c^3\,f\,x\,\mathrm{Cosh}[f\,x]+4\,b^2\,c^3\,f\,x\,\mathrm{Cosh}[f\,x]+6\,a^2\,c^2\,d\,f\,x^2\,\mathrm{Cosh}[f\,x]+6\,b^2\,c^2\,d\,f\,x^2\,\mathrm{Cosh}[f\,x]+4\,a^2\,c\,d^2\,f\,x^3\,\mathrm{Cosh}[f\,x]+$$

$$4\,b^2\,c\,d^2\,f\,x^3\,\mathrm{Cosh}[f\,x]+a^2\,d^3\,f\,x^4\,\mathrm{Cosh}[f\,x]+b^2\,d^3\,f\,x^4\,\mathrm{Cosh}[f\,x]+4\,a^2\,c^3\,f\,x\,\mathrm{Cosh}[2\,e+f\,x]-$$

$$4\,b^2\,c^3\,f\,x\,\mathrm{Cosh}[2\,e+f\,x]+6\,a^2\,c^2\,d\,f\,x^2\,\mathrm{Cosh}[2\,e+f\,x]-6\,b^2\,c^2\,d\,f\,x^2\,\mathrm{Cosh}[2\,e+f\,x]+$$

$$4\,a^2\,c\,d^2\,f\,x^3\,\mathrm{Cosh}[2\,e+f\,x]-4\,b^2\,c\,d^2\,f\,x^3\,\mathrm{Cosh}[2\,e+f\,x]+a^2\,d^3\,f\,x^4\,\mathrm{Cosh}[2\,e+f\,x]-b^2\,d^3\,f\,x^4\,\mathrm{Cosh}[2\,e+f\,x]-$$

$$8\,b^2\,c^3\,\mathrm{Sinh}[f\,x]-24\,b^2\,c^2\,d\,x\,\mathrm{Sinh}[f\,x]+8\,a\,b\,c^3\,f\,x\,\mathrm{Sinh}[f\,x]-24\,b^2\,c\,d^2\,x^2\,\mathrm{Sinh}[f\,x]+$$

$$12\,a\,b\,c^2\,d\,f\,x^2\,\mathrm{Sinh}[f\,x]-8\,b^2\,d^3\,x^3\,\mathrm{Sinh}[f\,x]+8\,a\,b\,c\,d^2\,f\,x^3\,\mathrm{Sinh}[f\,x]+2\,a\,b\,d^3\,f\,x^4\,\mathrm{Sinh}[f\,x]\Big)\Big/$$

$$\left(8\,(a-b)\,(a+b)\,f\,\left(a\,\mathrm{Cosh}[e]+b\,\mathrm{Sinh}[e]\right)\,\left(a\,\mathrm{Cosh}[e+f\,x]+b\,\mathrm{Sinh}[e+f\,x]\right)\right)$$

Problem 75: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 196 leaves, 5 steps):

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

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

Result (type 4, 751 leaves):

$$\frac{(e+fx)\,(-2de+2cf+d\,(e+fx))\,\text{Sech}[e+fx]^2\,(a\,\text{Cosh}[e+fx]+b\,\text{Sinh}[e+fx])^2}{2\,(a-b)\,(a+b)\,f^2\,(a+b\,\text{Tanh}[e+fx])^2}+$$

$$\left(b^2 d\,(-b\,(e+fx)+a\,\text{Log}[a\,\text{Cosh}[e+fx]+b\,\text{Sinh}[e+fx]])\,\text{Sech}[e+fx]^2\,(a\,\text{Cosh}[e+fx]+b\,\text{Sinh}[e+fx])^2\right)\Big/$$
$$\left(a\,(a-b)\,(a+b)\,(a^2-b^2)\,f^2\,(a+b\,\text{Tanh}[e+fx])^2\right)+$$

$$\left(2bde\,(-b\,(e+fx)+a\,\text{Log}[a\,\text{Cosh}[e+fx]+b\,\text{Sinh}[e+fx]])\,\text{Sech}[e+fx]^2\,(a\,\text{Cosh}[e+fx]+b\,\text{Sinh}[e+fx])^2\right)\Big/$$
$$\left((a-b)\,(a+b)\,(a^2-b^2)\,f^2\,(a+b\,\text{Tanh}[e+fx])^2\right)-$$

$$\left(2bc\,(-b\,(e+fx)+a\,\text{Log}[a\,\text{Cosh}[e+fx]+b\,\text{Sinh}[e+fx]])\,\text{Sech}[e+fx]^2\,(a\,\text{Cosh}[e+fx]+b\,\text{Sinh}[e+fx])^2\right)\Big/$$
$$\left((a-b)\,(a+b)\,(a^2-b^2)\,f\,(a+b\,\text{Tanh}[e+fx])^2\right)+\left(d\left(-e^{-\text{ArcTanh}\left[\frac{a}{b}\right]}\,(e+fx)^2+\frac{1}{\sqrt{1-\frac{a^2}{b^2}}\,b}\right.\right.$$
$$i\,a\left(-(e+fx)\left(-\pi+2\,i\,\text{ArcTanh}\left[\frac{a}{b}\right]\right)-\pi\,\text{Log}\left[1+e^{2\,(e+fx)}\right]-2\left(i\,(e+fx)+i\,\text{ArcTanh}\left[\frac{a}{b}\right]\right)\text{Log}\left[1-e^{2\,i\,\left(i\,(e+fx)+i\,\text{ArcTanh}\left[\frac{a}{b}\right]\right)}\right]+\right.$$
$$\left.\left.\pi\,\text{Log}[\text{Cosh}[e+fx]]+2\,i\,\text{ArcTanh}\left[\frac{a}{b}\right]\text{Log}\left[i\,\text{Sinh}\left[e+fx+\text{ArcTanh}\left[\frac{a}{b}\right]\right]\right]+i\,\text{PolyLog}\left[2,\,e^{2\,i\,\left(i\,(e+fx)+i\,\text{ArcTanh}\left[\frac{a}{b}\right]\right)}\right]\right)\right)$$
$$\left.\text{Sech}[e+fx]^2\,(a\,\text{Cosh}[e+fx]+b\,\text{Sinh}[e+fx])^2\right)\Big/\left((a-b)\,(a+b)\,\sqrt{\frac{-a^2+b^2}{b^2}}\,f^2\,(a+b\,\text{Tanh}[e+fx])^2\right)+$$

$$\left(\text{Sech}[e+fx]^2\,(a\,\text{Cosh}[e+fx]+b\,\text{Sinh}[e+fx])\,(b^2 de\,\text{Sinh}[e+fx]-b^2 cf\,\text{Sinh}[e+fx]-b^2 d\,(e+fx)\,\text{Sinh}[e+fx])\right)\Big/$$
$$\left(a\,(a-b)\,(a+b)\,f^2\,(a+b\,\text{Tanh}[e+fx])^2\right)$$

Problem 76: Attempted integration timed out after 120 seconds.

$$\int\frac{1}{(c+dx)\,(a+b\,\text{Tanh}[e+fx])^2}\,dx$$

Optimal (type 9, 22 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{1}{(c+dx)\,(a+b\,\text{Tanh}[e+fx])^2},\,x\right]$$

Result (type 1, 1 leaves):

???

Problem 77: Attempted integration timed out after 120 seconds.

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

Optimal (type 9, 22 leaves, 0 steps):

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

Result (type 1, 1 leaves):

???

Test results for the 247 problems in "6.3.2 Hyperbolic tangent functions.m"

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

$$\int (a+a\,\text{Tanh}[c+d\,x])^5\,dx$$

Optimal (type 3, 100 leaves, 5 steps):

$$16\,a^5\,x+\frac{16\,a^5\,\text{Log}[\text{Cosh}[c+d\,x]]}{d}-\frac{8\,a^5\,\text{Tanh}[c+d\,x]}{d}-\frac{2\,a^2\,(a+a\,\text{Tanh}[c+d\,x])^3}{3\,d}-\frac{a\,(a+a\,\text{Tanh}[c+d\,x])^4}{4\,d}-\frac{2\,a\,(a^2+a^2\,\text{Tanh}[c+d\,x])^2}{d}$$

Result (type 3, 202 leaves):

$$\frac{1}{12\,d}a^5\,\text{Sech}[c]\,\text{Sech}[c+d\,x]^4\,\big(18\,\text{Cosh}[3\,c+2\,d\,x]+48\,d\,x\,\text{Cosh}[3\,c+2\,d\,x]+12\,d\,x\,\text{Cosh}[3\,c+4\,d\,x]+12\,d\,x\,\text{Cosh}[5\,c+4\,d\,x]+48\,\text{Cosh}[3\,c+2\,d\,x]\,\text{Log}[\text{Cosh}[c+d\,x]]+12\,\text{Cosh}[3\,c+4\,d\,x]\,\text{Log}[\text{Cosh}[c+d\,x]]+12\,\text{Cosh}[5\,c+4\,d\,x]\,\text{Log}[\text{Cosh}[c+d\,x]]+6\,\text{Cosh}[c+2\,d\,x]\,(3+8\,d\,x+8\,\text{Log}[\text{Cosh}[c+d\,x]])+\text{Cosh}[c]\,(33+72\,d\,x+72\,\text{Log}[\text{Cosh}[c+d\,x]])+75\,\text{Sinh}[c]-70\,\text{Sinh}[c+2\,d\,x]+30\,\text{Sinh}[3\,c+2\,d\,x]-25\,\text{Sinh}[3\,c+4\,d\,x]\big)$$

Problem 42: Result more than twice size of optimal antiderivative.

$$\int (a+a\,\text{Tanh}[c+d\,x])^4\,dx$$

Optimal (type 3, 77 leaves, 4 steps):

$$8 a^4 x+\frac{8 a^4 \operatorname{Log}[\operatorname{Cosh}[c+d x]]}{d}-\frac{4 a^4 \operatorname{Tanh}[c+d x]}{d}-\frac{a (a+a \operatorname{Tanh}[c+d x])^3}{3 d}-\frac{(a^2+a^2 \operatorname{Tanh}[c+d x])^2}{d}$$

Result (type 3, 178 leaves):

$$\frac{1}{6 d (\operatorname{Cosh}[d x]+\operatorname{Sinh}[d x])^4} a^4 \operatorname{Sech}[c] \operatorname{Sech}[c+d x]^3 (\operatorname{Cosh}[4 d x]+\operatorname{Sinh}[4 d x]) \\ (6 d x \operatorname{Cosh}[2 c+3 d x]+6 d x \operatorname{Cosh}[4 c+3 d x]+6 \operatorname{Cosh}[2 c+3 d x] \operatorname{Log}[\operatorname{Cosh}[c+d x]]+6 \operatorname{Cosh}[4 c+3 d x] \operatorname{Log}[\operatorname{Cosh}[c+d x]]+6 \operatorname{Cosh}[d x] \\ (1+3 d x+3 \operatorname{Log}[\operatorname{Cosh}[c+d x]])+6 \operatorname{Cosh}[2 c+d x] (1+3 d x+3 \operatorname{Log}[\operatorname{Cosh}[c+d x]])-21 \operatorname{Sinh}[d x]+12 \operatorname{Sinh}[2 c+d x]-11 \operatorname{Sinh}[2 c+3 d x])$$

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

$$\int (a+b \operatorname{Tanh}[c+d x])^5 \, dx$$

Optimal (type 3, 142 leaves, 5 steps):

$$a (a^4+10 a^2 b^2+5 b^4) x+\frac{b (5 a^4+10 a^2 b^2+b^4) \operatorname{Log}[\operatorname{Cosh}[c+d x]]}{d}-\frac{4 a b^2 (a^2+b^2) \operatorname{Tanh}[c+d x]}{d}- \\ \frac{b (3 a^2+b^2) (a+b \operatorname{Tanh}[c+d x])^2}{2 d}-\frac{2 a b (a+b \operatorname{Tanh}[c+d x])^3}{3 d}-\frac{b (a+b \operatorname{Tanh}[c+d x])^4}{4 d}$$

Result (type 3, 366 leaves):

$$-\frac{b^5 \operatorname{Cosh}[c+d x] (a+b \operatorname{Tanh}[c+d x])^5}{4 d (a \operatorname{Cosh}[c+d x]+b \operatorname{Sinh}[c+d x])^5}+\frac{b^3 (5 a^2+b^2) \operatorname{Cosh}[c+d x]^3 (a+b \operatorname{Tanh}[c+d x])^5}{d (a \operatorname{Cosh}[c+d x]+b \operatorname{Sinh}[c+d x])^5}+ \\ \frac{a (a^4+10 a^2 b^2+5 b^4) (c+d x) \operatorname{Cosh}[c+d x]^5 (a+b \operatorname{Tanh}[c+d x])^5}{d (a \operatorname{Cosh}[c+d x]+b \operatorname{Sinh}[c+d x])^5}+\frac{(5 a^4 b+10 a^2 b^3+b^5) \operatorname{Cosh}[c+d x]^5 \operatorname{Log}[\operatorname{Cosh}[c+d x]] (a+b \operatorname{Tanh}[c+d x])^5}{d (a \operatorname{Cosh}[c+d x]+b \operatorname{Sinh}[c+d x])^5}+ \\ \frac{5 a b^4 \operatorname{Cosh}[c+d x]^2 \operatorname{Sinh}[c+d x] (a+b \operatorname{Tanh}[c+d x])^5}{3 d (a \operatorname{Cosh}[c+d x]+b \operatorname{Sinh}[c+d x])^5}-\frac{10 \operatorname{Cosh}[c+d x]^4 (3 a^3 b^2 \operatorname{Sinh}[c+d x]+2 a b^4 \operatorname{Sinh}[c+d x]) (a+b \operatorname{Tanh}[c+d x])^5}{3 d (a \operatorname{Cosh}[c+d x]+b \operatorname{Sinh}[c+d x])^5}$$

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

$$\int \frac{\operatorname{Csch}[x]}{1+\operatorname{Tanh}[x]} \, dx$$

Optimal (type 3, 12 leaves, 8 steps):

$$-\operatorname{ArcTanh}[\operatorname{Cosh}[x]]+\operatorname{Cosh}[x]-\operatorname{Sinh}[x]$$

Result (type 3, 49 leaves):

$$\frac{\text{Cosh}[x] - \text{Log}\left[\text{Cosh}\left[\frac{x}{2}\right]\right] + \text{Log}\left[\text{Sinh}\left[\frac{x}{2}\right]\right] - \left(\text{Log}\left[\text{Cosh}\left[\frac{x}{2}\right]\right] - \text{Log}\left[\text{Sinh}\left[\frac{x}{2}\right]\right] + \text{Sinh}[x]\right)\text{Tanh}[x]}{1 + \text{Tanh}[x]}$$

Problem 75: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Csch}[x]^3}{1 + \text{Tanh}[x]}\, dx$$

Optimal (type 3, 18 leaves, 8 steps):

$$-\frac{1}{2}\text{ArcTanh}[\text{Cosh}[x]] + \text{Csch}[x] - \frac{1}{2}\text{Coth}[x]\,\text{Csch}[x]$$

Result (type 3, 59 leaves):

$$\frac{1}{8}\left(4\,\text{Coth}\left[\frac{x}{2}\right] - \text{Csch}\left[\frac{x}{2}\right]^2 - 4\,\text{Log}\left[\text{Cosh}\left[\frac{x}{2}\right]\right] + 4\,\text{Log}\left[\text{Sinh}\left[\frac{x}{2}\right]\right] - \text{Sech}\left[\frac{x}{2}\right]^2 - 4\,\text{Tanh}\left[\frac{x}{2}\right]\right)$$

Problem 77: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Csch}[x]^5}{1 + \text{Tanh}[x]}\, dx$$

Optimal (type 3, 34 leaves, 9 steps):

$$\frac{1}{8}\text{ArcTanh}[\text{Cosh}[x]] - \frac{1}{8}\text{Coth}[x]\,\text{Csch}[x] + \frac{\text{Csch}[x]^3}{3} - \frac{1}{4}\text{Coth}[x]\,\text{Csch}[x]^3$$

Result (type 3, 69 leaves):

$$\frac{1}{192}\text{Csch}[x]^4 \left(-42\,\text{Cosh}[x] - 6\,\text{Cosh}[3\,x] + 2\,\text{Sinh}[x]\left(32 - 9\left(\text{Log}\left[\text{Cosh}\left[\frac{x}{2}\right]\right] - \text{Log}\left[\text{Sinh}\left[\frac{x}{2}\right]\right]\right)\text{Sinh}[x] + 3\left(\text{Log}\left[\text{Cosh}\left[\frac{x}{2}\right]\right] - \text{Log}\left[\text{Sinh}\left[\frac{x}{2}\right]\right]\right)\text{Sinh}[3\,x]\right)\right)$$

Problem 79: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Csch}[x]^7}{1 + \text{Tanh}[x]}\, dx$$

Optimal (type 3, 44 leaves, 10 steps):

$$-\frac{1}{16}\text{ArcTanh}[\text{Cosh}[x]]+\frac{1}{16}\text{Coth}[x]\,\text{Csch}[x]-\frac{1}{24}\text{Coth}[x]\,\text{Csch}[x]^3+\frac{\text{Csch}[x]^5}{5}-\frac{1}{6}\text{Coth}[x]\,\text{Csch}[x]^5$$

Result (type 3, 124 leaves):

$$\frac{1}{1920}\left(72\,\text{Coth}\left[\frac{x}{2}\right]+30\,\text{Csch}\left[\frac{x}{2}\right]^2-120\,\text{Log}\left[\text{Cosh}\left[\frac{x}{2}\right]\right]+120\,\text{Log}\left[\text{Sinh}\left[\frac{x}{2}\right]\right]+30\,\text{Sech}\left[\frac{x}{2}\right]^2-5\,\text{Sech}\left[\frac{x}{2}\right]^6-288\,\text{Csch}[x]^3\,\text{Sinh}\left[\frac{x}{2}\right]^4-384\,\text{Csch}[x]^5\,\text{Sinh}\left[\frac{x}{2}\right]^6-18\,\text{Csch}\left[\frac{x}{2}\right]^4\,\text{Sinh}[x]+\text{Csch}\left[\frac{x}{2}\right]^6\left(-5+6\,\text{Sinh}[x]\right)-72\,\text{Tanh}\left[\frac{x}{2}\right]\right)$$

Problem 144: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 231 leaves, 9 steps):

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

Result (type 4, 690 leaves):

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

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

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

$$\left.\left.\text{PolyLog}\left[2,\frac{\text{Cosh}[c+d\,x]+\text{Sinh}[c+d\,x]}{\sqrt{-\frac{\sqrt{a}-i\sqrt{b}}{\sqrt{a}+i\sqrt{b}}}}\right]+\text{PolyLog}\left[2,-\frac{\text{Cosh}[c+d\,x]+\text{Sinh}[c+d\,x]}{\sqrt{-\frac{\sqrt{a}+i\sqrt{b}}{\sqrt{a}-i\sqrt{b}}}}\right]+\text{PolyLog}\left[2,\frac{\text{Cosh}[c+d\,x]+\text{Sinh}[c+d\,x]}{\sqrt{-\frac{\sqrt{a}+i\sqrt{b}}{\sqrt{a}-i\sqrt{b}}}}\right]\right)\right)\Big/$$

$$\left(\left(-\sqrt{\frac{-\sqrt{a}+i\sqrt{b}}{\sqrt{a}+i\sqrt{b}}}+\sqrt{-\frac{\sqrt{a}+i\sqrt{b}}{\sqrt{a}-i\sqrt{b}}}\right)\left(\sqrt{\frac{-\sqrt{a}+i\sqrt{b}}{\sqrt{a}+i\sqrt{b}}}+\sqrt{-\frac{\sqrt{a}+i\sqrt{b}}{\sqrt{a}-i\sqrt{b}}}\right)(a+b)\,d^2\right)$$

Problem 145: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 351 leaves, 11 steps):

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

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

Result (type 4, 316 leaves):

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

Problem 146: Result more than twice size of optimal antiderivative.

$$\int x^3 \text{Tanh}[a+2 \text{Log}[x]]\, dx$$

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

$$\frac{x^4}{4}-\frac{1}{2}e^{-2a}\text{Log}\left[1+e^{2a}x^4\right]$$

Result (type 3, 64 leaves):

$$\frac{x^4}{4}-\frac{1}{2}\text{Cosh}[2a]\,\text{Log}\left[\text{Cosh}[a]+x^4\text{Cosh}[a]-\text{Sinh}[a]+x^4\text{Sinh}[a]\right]+\frac{1}{2}\text{Log}\left[\text{Cosh}[a]+x^4\text{Cosh}[a]-\text{Sinh}[a]+x^4\text{Sinh}[a]\right]\text{Sinh}[2a]$$

Problem 147: Result is not expressed in closed-form.

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

Optimal (type 3, 151 leaves, 11 steps):

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

Result (type 7, 64 leaves):

$$\frac{1}{6}\left(2x^3+3\,\text{RootSum}\left[\text{Cosh}[a]-\text{Sinh}[a]+\text{Cosh}[a]\,\#1^4+\text{Sinh}[a]\,\#1^4\,\&,\frac{\text{Log}[x]-\text{Log}[x-\#1]}{\#1}\,\&\right]\left(\text{Cosh}[2a]-\text{Sinh}[2a]\right)\right)$$

Problem 149: Result is not expressed in closed-form.

$$\int \text{Tanh}[a+2 \text{Log}[x]]\, dx$$

Optimal (type 3, 145 leaves, 11 steps):

$$x+\frac{e^{-a/2}\,\mathrm{ArcTan}\left[1-\sqrt{2}\,e^{a/2}\,x\right]}{\sqrt{2}}-\frac{e^{-a/2}\,\mathrm{ArcTan}\left[1+\sqrt{2}\,e^{a/2}\,x\right]}{\sqrt{2}}+\frac{e^{-a/2}\,\mathrm{Log}\left[1-\sqrt{2}\,e^{a/2}\,x+e^{a}\,x^{2}\right]}{2\sqrt{2}}-\frac{e^{-a/2}\,\mathrm{Log}\left[1+\sqrt{2}\,e^{a/2}\,x+e^{a}\,x^{2}\right]}{2\sqrt{2}}$$

Result (type 7, 58 leaves):

$$x+\frac{1}{2}\,\mathrm{RootSum}\left[\mathrm{Cosh}[a]-\mathrm{Sinh}[a]+\mathrm{Cosh}[a]\,\sharp1^{4}+\mathrm{Sinh}[a]\,\sharp1^{4}\,\&,\ \frac{\mathrm{Log}[x]-\mathrm{Log}[x-\sharp1]}{\sharp1^{3}}\,\&\right]\,(\mathrm{Cosh}[2\,a]-\mathrm{Sinh}[2\,a])$$

Problem 151: Result is not expressed in closed-form.

$$\int\frac{\mathrm{Tanh}[a+2\,\mathrm{Log}[x]]}{x^{2}}\,dx$$

Optimal (type 3, 147 leaves, 11 steps):

$$\frac{1}{x}-\frac{e^{a/2}\,\mathrm{ArcTan}\left[1-\sqrt{2}\,e^{a/2}\,x\right]}{\sqrt{2}}+\frac{e^{a/2}\,\mathrm{ArcTan}\left[1+\sqrt{2}\,e^{a/2}\,x\right]}{\sqrt{2}}+\frac{e^{a/2}\,\mathrm{Log}\left[1-\sqrt{2}\,e^{a/2}\,x+e^{a}\,x^{2}\right]}{2\sqrt{2}}-\frac{e^{a/2}\,\mathrm{Log}\left[1+\sqrt{2}\,e^{a/2}\,x+e^{a}\,x^{2}\right]}{2\sqrt{2}}$$

Result (type 7, 59 leaves):

$$\frac{2-x\,\mathrm{RootSum}\left[\mathrm{Cosh}[a]+\mathrm{Sinh}[a]+\mathrm{Cosh}[a]\,\sharp1^{4}-\mathrm{Sinh}[a]\,\sharp1^{4}\,\&,\ \frac{\mathrm{Log}[x]+\mathrm{Log}\left[\frac{1}{x}-\sharp1\right]}{\sharp1^{3}}\,\&\right]\,(\mathrm{Cosh}[a]+\mathrm{Sinh}[a])^{2}}{2\,x}$$

Problem 154: Result unnecessarily involves imaginary or complex numbers.

$$\int x^{2}\,\mathrm{Tanh}[a+2\,\mathrm{Log}[x]]^{2}\,dx$$

Optimal (type 3, 173 leaves, 12 steps):

$$\frac{x^{3}}{3}+\frac{x^{3}}{1+e^{2a}\,x^{4}}+\frac{3\,e^{-3a/2}\,\mathrm{ArcTan}\left[1-\sqrt{2}\,e^{a/2}\,x\right]}{2\sqrt{2}}-\frac{3\,e^{-3a/2}\,\mathrm{ArcTan}\left[1+\sqrt{2}\,e^{a/2}\,x\right]}{2\sqrt{2}}-\frac{3\,e^{-3a/2}\,\mathrm{Log}\left[1-\sqrt{2}\,e^{a/2}\,x+e^{a}\,x^{2}\right]}{4\sqrt{2}}+\frac{3\,e^{-3a/2}\,\mathrm{Log}\left[1+\sqrt{2}\,e^{a/2}\,x+e^{a}\,x^{2}\right]}{4\sqrt{2}}$$

Result (type 3, 174 leaves):

$$\frac{1}{12}\left(4\,x^{3}+\frac{12\,x^{3}}{1+e^{2a}\,x^{4}}+9\,(-1)^{3/4}\,e^{-3a/2}\,\mathrm{Log}\left[(-1)^{1/4}\,e^{-3a/2}-e^{-a}\,x\right]+9\,(-1)^{1/4}\,e^{-3a/2}\,\mathrm{Log}\left[(-1)^{3/4}\,e^{-3a/2}-e^{-a}\,x\right]-9\,(-1)^{3/4}\,e^{-3a/2}\,\mathrm{Log}\left[(-1)^{1/4}\,e^{-3a/2}+e^{-a}\,x\right]-9\,(-1)^{1/4}\,e^{-3a/2}\,\mathrm{Log}\left[(-1)^{3/4}\,e^{-3a/2}+e^{-a}\,x\right]\right)$$

Problem 156: Result unnecessarily involves imaginary or complex numbers.

$$\int \tanh[a+2\log[x]]^2\,dx$$

Optimal (type 3, 165 leaves, 13 steps):

$$x+\frac{x}{1+e^{2a}x^4}+\frac{e^{-a/2}\,\text{ArcTan}\left[1-\sqrt{2}\,e^{a/2}x\right]}{2\sqrt{2}}-\frac{e^{-a/2}\,\text{ArcTan}\left[1+\sqrt{2}\,e^{a/2}x\right]}{2\sqrt{2}}+\frac{e^{-a/2}\,\text{Log}\left[1-\sqrt{2}\,e^{a/2}x+e^{a}x^2\right]}{4\sqrt{2}}-\frac{e^{-a/2}\,\text{Log}\left[1+\sqrt{2}\,e^{a/2}x+e^{a}x^2\right]}{4\sqrt{2}}$$

Result (type 3, 146 leaves):

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

Problem 158: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\tanh[a+2\log[x]]^2}{x^2}\,dx$$

Optimal (type 3, 190 leaves, 12 steps):

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

Result (type 3, 181 leaves):

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

Problem 161: Result more than twice size of optimal antiderivative.

$$\int (e\,x)^m \tanh[a+2\log[x]]^2\,dx$$

Optimal (type 5, 79 leaves, 4 steps):

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

Result (type 5, 168 leaves):

$$\frac{1}{(\text{Cosh}[a]-\text{Sinh}[a])^2}$$

$$x\,(e\,x)^m\left(\frac{1}{(5+m)\,(9+m)}x^4\,(\text{Cosh}[a]+\text{Sinh}[a])\,\left(-2\,(9+m)\,\text{Hypergeometric2F1}\left[2,\frac{5+m}{4},\frac{9+m}{4},-x^4\,(\text{Cosh}[2a]+\text{Sinh}[2a])\right]\,(\text{Cosh}[a]-\text{Sinh}[a])+\right.\right.$$
$$\left.(5+m)\,x^4\,\text{Hypergeometric2F1}\left[2,\frac{9+m}{4},\frac{13+m}{4},-x^4\,(\text{Cosh}[2a]+\text{Sinh}[2a])\right]\,(\text{Cosh}[a]+\text{Sinh}[a])\right)+$$
$$\left.\frac{\text{Hypergeometric2F1}\left[2,\frac{1+m}{4},\frac{5+m}{4},-x^4\,(\text{Cosh}[2a]+\text{Sinh}[2a])\right]\,(\text{Cosh}[2a]-\text{Sinh}[2a])}{1+m}\right)$$

Problem 163: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 79 leaves, 3 steps):

$$x\,\left(1-e^{2a}x^{2b}\right)^{-p}\,\left(-1+e^{2a}x^{2b}\right)^p\,\text{AppellF1}\left[\frac{1}{2b},-p,p,\frac{1}{2}\left(2+\frac{1}{b}\right),e^{2a}x^{2b},-e^{2a}x^{2b}\right]$$

Result (type 6, 259 leaves):

$$\left((1+2b)\,x\,\left(\frac{-1+e^{2a}x^{2b}}{1+e^{2a}x^{2b}}\right)^p\,\text{AppellF1}\left[\frac{1}{2b},-p,p,1+\frac{1}{2b},e^{2a}x^{2b},-e^{2a}x^{2b}\right]\right)\Big/$$
$$\left(-2\,b\,e^{2a}\,p\,x^{2b}\,\text{AppellF1}\left[1+\frac{1}{2b},1-p,p,2+\frac{1}{2b},e^{2a}x^{2b},-e^{2a}x^{2b}\right]-\right.$$
$$\left.2\,b\,e^{2a}\,p\,x^{2b}\,\text{AppellF1}\left[1+\frac{1}{2b},-p,1+p,2+\frac{1}{2b},e^{2a}x^{2b},-e^{2a}x^{2b}\right]+(1+2b)\,\text{AppellF1}\left[\frac{1}{2b},-p,p,1+\frac{1}{2b},e^{2a}x^{2b},-e^{2a}x^{2b}\right]\right)$$

Problem 164: Result more than twice size of optimal antiderivative.

$$\int (e\,x)^m\,\text{Tanh}[a+b\,\text{Log}[x]]^p\,dx$$

Optimal (type 6, 99 leaves, 3 steps):

$$\frac{(e\,x)^{1+m}\left(1-e^{2a}x^{2b}\right)^{-p}\left(-1+e^{2a}x^{2b}\right)^{p}\text{AppellF1}\left[\frac{1+m}{2b},-p,p,1+\frac{1+m}{2b},e^{2a}x^{2b},-e^{2a}x^{2b}\right]}{e\,(1+m)}$$

Result (type 6, 287 leaves):

$$\left((1+2b+m)\,x\,(e\,x)^{m}\left(\frac{-1+e^{2a}x^{2b}}{1+e^{2a}x^{2b}}\right)^{p}\text{AppellF1}\left[\frac{1+m}{2b},-p,p,1+\frac{1+m}{2b},e^{2a}x^{2b},-e^{2a}x^{2b}\right]\right)\Big/$$
$$\left((1+m)\left((1+2b+m)\,\text{AppellF1}\left[\frac{1+m}{2b},-p,p,\frac{1+2b+m}{2b},e^{2a}x^{2b},-e^{2a}x^{2b}\right]-\right.\right.$$
$$\left.\left.2b\,e^{2a}p\,x^{2b}\left(\text{AppellF1}\left[\frac{1+2b+m}{2b},1-p,p,\frac{1+4b+m}{2b},e^{2a}x^{2b},-e^{2a}x^{2b}\right]+\text{AppellF1}\left[\frac{1+2b+m}{2b},-p,1+p,\frac{1+4b+m}{2b},e^{2a}x^{2b},-e^{2a}x^{2b}\right]\right)\right)\right)$$

Problem 166: Result unnecessarily involves higher level functions.

$$\int \text{Tanh}\left[a+\frac{\text{Log}[x]}{4}\right]^{p}dx$$

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

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

Result (type 6, 176 leaves):

$$-\left(\left(3\left(\frac{-1+e^{2a}\sqrt{x}}{1+e^{2a}\sqrt{x}}\right)^{p}x\,\text{AppellF1}\left[2,-p,p,3,e^{2a}\sqrt{x},-e^{2a}\sqrt{x}\right]\right)\Big/\left(-3\,\text{AppellF1}\left[2,-p,p,3,e^{2a}\sqrt{x},-e^{2a}\sqrt{x}\right]+\right.\right.$$
$$\left.\left.e^{2a}p\sqrt{x}\left(\text{AppellF1}\left[3,1-p,p,4,e^{2a}\sqrt{x},-e^{2a}\sqrt{x}\right]+\text{AppellF1}\left[3,-p,1+p,4,e^{2a}\sqrt{x},-e^{2a}\sqrt{x}\right]\right)\right)\right)$$

Problem 167: Result unnecessarily involves higher level functions.

$$\int \text{Tanh}\left[a+\frac{\text{Log}[x]}{6}\right]^{p}dx$$

Optimal (type 5, 158 leaves, 5 steps):

$$-e^{-6a}p\left(-1+e^{2a}x^{1/3}\right)^{1+p}\left(1+e^{2a}x^{1/3}\right)^{1-p}+e^{-4a}\left(-1+e^{2a}x^{1/3}\right)^{1+p}\left(1+e^{2a}x^{1/3}\right)^{1-p}x^{1/3}+$$
$$\frac{2^{-p}e^{-6a}\left(1+2p^{2}\right)\left(-1+e^{2a}x^{1/3}\right)^{1+p}\text{Hypergeometric2F1}\left[p,1+p,2+p,\frac{1}{2}\left(1-e^{2a}x^{1/3}\right)\right]}{1+p}$$

Result (type 6, 177 leaves):

$$\left(4\left(\frac{-1+e^{2a}x^{1/3}}{1+e^{2a}x^{1/3}}\right)^p x\,\text{AppellF1}\left[3,-p,p,4,e^{2a}x^{1/3},-e^{2a}x^{1/3}\right]\right)\Big/\left(4\,\text{AppellF1}\left[3,-p,p,4,e^{2a}x^{1/3},-e^{2a}x^{1/3}\right]-e^{2a}p\,x^{1/3}\left(\text{AppellF1}\left[4,1-p,p,5,e^{2a}x^{1/3},-e^{2a}x^{1/3}\right]+\text{AppellF1}\left[4,-p,1+p,5,e^{2a}x^{1/3},-e^{2a}x^{1/3}\right]\right)\right)$$

Problem 168: Result unnecessarily involves higher level functions.

$$\int \text{Tanh}\left[a+\frac{\text{Log}[x]}{8}\right]^p dx$$

Optimal (type 5, 190 leaves, 5 steps):

$$\frac{1}{3}e^{-12a}\left(-1+e^{2a}x^{1/4}\right)^{1+p}\left(1+e^{2a}x^{1/4}\right)^{1-p}\left(e^{4a}\left(3+2p^2\right)-2e^{6a}p\,x^{1/4}\right)+e^{-4a}\left(-1+e^{2a}x^{1/4}\right)^{1+p}\left(1+e^{2a}x^{1/4}\right)^{1-p}\sqrt{x}-\frac{2^{2-p}e^{-8a}p\left(2+p^2\right)\left(-1+e^{2a}x^{1/4}\right)^{1+p}\text{Hypergeometric2F1}\left[p,1+p,2+p,\frac{1}{2}\left(1-e^{2a}x^{1/4}\right)\right]}{3(1+p)}$$

Result (type 6, 177 leaves):

$$\left(5\left(\frac{-1+e^{2a}x^{1/4}}{1+e^{2a}x^{1/4}}\right)^p x\,\text{AppellF1}\left[4,-p,p,5,e^{2a}x^{1/4},-e^{2a}x^{1/4}\right]\right)\Big/\left(5\,\text{AppellF1}\left[4,-p,p,5,e^{2a}x^{1/4},-e^{2a}x^{1/4}\right]-e^{2a}p\,x^{1/4}\left(\text{AppellF1}\left[5,1-p,p,6,e^{2a}x^{1/4},-e^{2a}x^{1/4}\right]+\text{AppellF1}\left[5,-p,1+p,6,e^{2a}x^{1/4},-e^{2a}x^{1/4}\right]\right)\right)$$

Problem 169: Result more than twice size of optimal antiderivative.

$$\int \text{Tanh}[a+\text{Log}[x]]^p dx$$

Optimal (type 6, 61 leaves, 3 steps):

$$x\left(1-e^{2a}x^2\right)^{-p}\left(-1+e^{2a}x^2\right)^p\text{AppellF1}\left[\frac{1}{2},-p,p,\frac{3}{2},e^{2a}x^2,-e^{2a}x^2\right]$$

Result (type 6, 171 leaves):

$$\left(3x\left(\frac{-1+e^{2a}x^2}{1+e^{2a}x^2}\right)^p\text{AppellF1}\left[\frac{1}{2},-p,p,\frac{3}{2},e^{2a}x^2,-e^{2a}x^2\right]\right)\Big/\left(3\,\text{AppellF1}\left[\frac{1}{2},-p,p,\frac{3}{2},e^{2a}x^2,-e^{2a}x^2\right]-2e^{2a}p\,x^2\left(\text{AppellF1}\left[\frac{3}{2},1-p,p,\frac{5}{2},e^{2a}x^2,-e^{2a}x^2\right]+\text{AppellF1}\left[\frac{3}{2},-p,1+p,\frac{5}{2},e^{2a}x^2,-e^{2a}x^2\right]\right)\right)$$

Problem 170: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 61 leaves, 3 steps):

$$x\left(1-e^{2a}x^4\right)^{-p}\left(-1+e^{2a}x^4\right)^p \text{AppellF1}\left[\frac{1}{4},-p,p,\frac{5}{4},e^{2a}x^4,-e^{2a}x^4\right]$$

Result (type 6, 171 leaves):

$$\left(5x\left(\frac{-1+e^{2a}x^4}{1+e^{2a}x^4}\right)^p \text{AppellF1}\left[\frac{1}{4},-p,p,\frac{5}{4},e^{2a}x^4,-e^{2a}x^4\right]\right)\Big/\left(5\,\text{AppellF1}\left[\frac{1}{4},-p,p,\frac{5}{4},e^{2a}x^4,-e^{2a}x^4\right]-4e^{2a}p\,x^4\left(\text{AppellF1}\left[\frac{5}{4},1-p,p,\frac{9}{4},e^{2a}x^4,-e^{2a}x^4\right]+\text{AppellF1}\left[\frac{5}{4},-p,1+p,\frac{9}{4},e^{2a}x^4,-e^{2a}x^4\right]\right)\right)$$

Problem 171: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 61 leaves, 3 steps):

$$x\left(1-e^{2a}x^6\right)^{-p}\left(-1+e^{2a}x^6\right)^p \text{AppellF1}\left[\frac{1}{6},-p,p,\frac{7}{6},e^{2a}x^6,-e^{2a}x^6\right]$$

Result (type 6, 171 leaves):

$$\left(7x\left(\frac{-1+e^{2a}x^6}{1+e^{2a}x^6}\right)^p \text{AppellF1}\left[\frac{1}{6},-p,p,\frac{7}{6},e^{2a}x^6,-e^{2a}x^6\right]\right)\Big/\left(7\,\text{AppellF1}\left[\frac{1}{6},-p,p,\frac{7}{6},e^{2a}x^6,-e^{2a}x^6\right]-6e^{2a}p\,x^6\left(\text{AppellF1}\left[\frac{7}{6},1-p,p,\frac{13}{6},e^{2a}x^6,-e^{2a}x^6\right]+\text{AppellF1}\left[\frac{7}{6},-p,1+p,\frac{13}{6},e^{2a}x^6,-e^{2a}x^6\right]\right)\right)$$

Problem 172: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 59 leaves, 4 steps):

$$\frac{x^4}{4}-\frac{1}{2}x^4\,\text{Hypergeometric2F1}\left[1,\frac{2}{b\,d\,n},1+\frac{2}{b\,d\,n},-e^{2ad}\left(c\,x^n\right)^{2bd}\right]$$

Result (type 5, 127 leaves):

$$\frac{1}{8+4\,b\,d\,n}x^4\left(2e^{2d\,(a+b\,\text{Log}[c\,x^n])}\,\text{Hypergeometric2F1}\left[1,1+\frac{2}{b\,d\,n},2+\frac{2}{b\,d\,n},-e^{2d\,(a+b\,\text{Log}[c\,x^n])}\right]-\left(2+b\,d\,n\right)\text{Hypergeometric2F1}\left[1,\frac{2}{b\,d\,n},1+\frac{2}{b\,d\,n},-e^{2d\,(a+b\,\text{Log}[c\,x^n])}\right]\right)$$

Problem 173: Result more than twice size of optimal antiderivative.

$$\int x^2 \operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right] dx$$

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

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

Result (type 5, 136 leaves):

$$\frac{1}{9+6 b d n} x^3\left(3 e^{2 d\left(a+b \operatorname{Log}\left[c x^n\right]\right)} \operatorname{Hypergeometric2F1}\left[1, 1+\frac{3}{2 b d n}, 2+\frac{3}{2 b d n}, -e^{2 d\left(a+b \operatorname{Log}\left[c x^n\right]\right)}\right]-\left(3+2 b d n\right) \operatorname{Hypergeometric2F1}\left[1, \frac{3}{2 b d n}, 1+\frac{3}{2 b d n}, -e^{2 d\left(a+b \operatorname{Log}\left[c x^n\right]\right)}\right]\right)$$

Problem 174: Result more than twice size of optimal antiderivative.

$$\int x \operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right] dx$$

Optimal (type 5, 55 leaves, 4 steps):

$$\frac{x^2}{2}-x^2 \operatorname{Hypergeometric2F1}\left[1, \frac{1}{b d n}, 1+\frac{1}{b d n}, -e^{2 a d}\left(c x^n\right)^{2 b d}\right]$$

Result (type 5, 124 leaves):

$$\frac{1}{2+2 b d n} x^2\left(e^{2 a d}\left(c x^n\right)^{2 b d} \operatorname{Hypergeometric2F1}\left[1, 1+\frac{1}{b d n}, 2+\frac{1}{b d n}, -e^{2 a d}\left(c x^n\right)^{2 b d}\right]-\left(1+b d n\right) \operatorname{Hypergeometric2F1}\left[1, \frac{1}{b d n}, 1+\frac{1}{b d n}, -e^{2 d\left(a+b \operatorname{Log}\left[c x^n\right]\right)}\right]\right)$$

Problem 175: Result more than twice size of optimal antiderivative.

$$\int \operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right] dx$$

Optimal (type 5, 53 leaves, 4 steps):

$$x-2 x \operatorname{Hypergeometric2F1}\left[1, \frac{1}{2 b d n}, 1+\frac{1}{2 b d n}, -e^{2 a d}\left(c x^n\right)^{2 b d}\right]$$

Result (type 5, 129 leaves):

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

Problem 177: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Tanh}\left[d\,\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right]}{x^2}\,dx$$

Optimal (type 5, 59 leaves, 4 steps):

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

Result (type 5, 126 leaves):

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

Problem 178: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Tanh}\left[d\,\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right]}{x^3}\,dx$$

Optimal (type 5, 56 leaves, 4 steps):

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

Result (type 5, 120 leaves):

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

Problem 192: Result more than twice size of optimal antiderivative.

$$\int \text{Tanh}\left[d\,\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right]^p\,dx$$

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

$$x\,\left(1-e^{2\,a\,d}\,\left(c\,x^n\right)^{2\,b\,d}\right)^{-p}\,\left(-1+e^{2\,a\,d}\,\left(c\,x^n\right)^{2\,b\,d}\right)^p\,\text{AppellF1}\left[\frac{1}{2\,b\,d\,n},\,-p,\,p,\,1+\frac{1}{2\,b\,d\,n},\,e^{2\,a\,d}\,\left(c\,x^n\right)^{2\,b\,d},\,-e^{2\,a\,d}\,\left(c\,x^n\right)^{2\,b\,d}\right]$$

Result (type 6, 387 leaves):

$$\left((1+2 b d n)\, x \left(\frac{-1+e^{2 a d} (c x^n)^{2 b d}}{1+e^{2 a d} (c x^n)^{2 b d}}\right)^p \text{AppellF1}\left[\frac{1}{2 b d n}, -p, p, 1+\frac{1}{2 b d n}, e^{2 a d} (c x^n)^{2 b d}, -e^{2 a d} (c x^n)^{2 b d}\right]\right) \Big/ \left(-2 b d\, e^{2 a d} n p\, (c x^n)^{2 b d} \text{AppellF1}\left[1+\frac{1}{2 b d n}, 1-p, p, 2+\frac{1}{2 b d n}, e^{2 a d} (c x^n)^{2 b d}, -e^{2 a d} (c x^n)^{2 b d}\right] - 2 b d\, e^{2 a d} n p\, (c x^n)^{2 b d} \text{AppellF1}\left[1+\frac{1}{2 b d n}, -p, 1+p, 2+\frac{1}{2 b d n}, e^{2 a d} (c x^n)^{2 b d}, -e^{2 a d} (c x^n)^{2 b d}\right] + (1+2 b d n) \text{AppellF1}\left[\frac{1}{2 b d n}, -p, p, 1+\frac{1}{2 b d n}, e^{2 a d} (c x^n)^{2 b d}, -e^{2 a d} (c x^n)^{2 b d}\right]\right)$$

Problem 193: Result more than twice size of optimal antiderivative.

$$\int (e x)^m \text{Tanh}[d (a+b \text{Log}[c x^n])]^p \, dx$$

Optimal (type 6, 135 leaves, 4 steps):

$$\frac{1}{e (1+m)} (e x)^{1+m} \left(1-e^{2 a d} (c x^n)^{2 b d}\right)^{-p} \left(-1+e^{2 a d} (c x^n)^{2 b d}\right)^p \text{AppellF1}\left[\frac{1+m}{2 b d n}, -p, p, 1+\frac{1+m}{2 b d n}, e^{2 a d} (c x^n)^{2 b d}, -e^{2 a d} (c x^n)^{2 b d}\right]$$

Result (type 6, 417 leaves):

$$\left((1+m+2 b d n)\, x\, (e x)^m \left(\frac{-1+e^{2 a d} (c x^n)^{2 b d}}{1+e^{2 a d} (c x^n)^{2 b d}}\right)^p \text{AppellF1}\left[\frac{1+m}{2 b d n}, -p, p, 1+\frac{1+m}{2 b d n}, e^{2 a d} (c x^n)^{2 b d}, -e^{2 a d} (c x^n)^{2 b d}\right]\right) \Big/ \left((1+m) \left((1+m+2 b d n) \text{AppellF1}\left[\frac{1+m}{2 b d n}, -p, p, \frac{1+m+2 b d n}{2 b d n}, e^{2 a d} (c x^n)^{2 b d}, -e^{2 a d} (c x^n)^{2 b d}\right] - 2 b d\, e^{2 a d} n p\, (c x^n)^{2 b d} \left(\text{AppellF1}\left[\frac{1+m+2 b d n}{2 b d n}, 1-p, p, \frac{1+m+4 b d n}{2 b d n}, e^{2 a d} (c x^n)^{2 b d}, -e^{2 a d} (c x^n)^{2 b d}\right] + \text{AppellF1}\left[\frac{1+m+2 b d n}{2 b d n}, -p, 1+p, \frac{1+m+4 b d n}{2 b d n}, e^{2 a d} (c x^n)^{2 b d}, -e^{2 a d} (c x^n)^{2 b d}\right]\right)\right)\right)$$

Problem 200: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Tanh}[x]^5}{\sqrt{a+b \text{Tanh}[x]^2+c \text{Tanh}[x]^4}} \, dx$$

Optimal (type 3, 135 leaves, 8 steps):

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

Result (type 3, 42 734 leaves) : Display of huge result suppressed!

Problem 201: Attempted integration timed out after 120 seconds.

$$\int \frac{\text{Tanh}[x]^3}{\sqrt{a+b\,\text{Tanh}[x]^2+c\,\text{Tanh}[x]^4}}\,dx$$

Optimal (type 3, 105 leaves, 7 steps) :

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

Result (type 1, 1 leaves) :

???

Problem 202: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2+c\,\text{Tanh}[x]^4}}\,dx$$

Optimal (type 3, 58 leaves, 4 steps) :

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

Result (type 3, 59 564 leaves) : Display of huge result suppressed!

Problem 203: Unable to integrate problem.

$$\int \frac{\text{Coth}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2+c\,\text{Tanh}[x]^4}}\,dx$$

Optimal (type 3, 106 leaves, 8 steps) :

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

Result (type 8, 23 leaves):

$$\int \frac{\text{Coth}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2+c\,\text{Tanh}[x]^4}}\,dx$$

Problem 204: Unable to integrate problem.

$$\int \frac{\text{Coth}[x]^3}{\sqrt{a+b\,\text{Tanh}[x]^2+c\,\text{Tanh}[x]^4}}\,dx$$

Optimal (type 3, 183 leaves, 11 steps):

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

Result (type 8, 25 leaves):

$$\int \frac{\text{Coth}[x]^3}{\sqrt{a+b\,\text{Tanh}[x]^2+c\,\text{Tanh}[x]^4}}\,dx$$

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

$$\int \text{Tanh}[x]\sqrt{a+b\,\text{Tanh}[x]^2+c\,\text{Tanh}[x]^4}\,dx$$

Optimal (type 3, 132 leaves, 8 steps):

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

Result (type 3, 178 715 leaves): Display of huge result suppressed!

Problem 214: Result is not expressed in closed-form.

$$\int e^x \tanh[2x]^2 \, dx$$

Optimal (type 3, 113 leaves, 13 steps):

$$e^x + \frac{e^x}{1+e^{4x}} + \frac{\text{ArcTan}\left[1-\sqrt{2}\, e^x\right]}{2\sqrt{2}} - \frac{\text{ArcTan}\left[1+\sqrt{2}\, e^x\right]}{2\sqrt{2}} + \frac{\text{Log}\left[1-\sqrt{2}\, e^x+e^{2x}\right]}{4\sqrt{2}} - \frac{\text{Log}\left[1+\sqrt{2}\, e^x+e^{2x}\right]}{4\sqrt{2}}$$

Result (type 7, 48 leaves):

$$e^x + \frac{e^x}{1+e^{4x}} + \frac{1}{4}\,\text{RootSum}\left[1+\#1^4\,\&,\ \frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^3}\,\&\right]$$

Problem 215: Result is not expressed in closed-form.

$$\int e^x \tanh[2x] \, dx$$

Optimal (type 3, 95 leaves, 11 steps):

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

Result (type 7, 35 leaves):

$$e^x + \frac{1}{2}\,\text{RootSum}\left[1+\#1^4\,\&,\ \frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^3}\,\&\right]$$

Problem 218: Result is not expressed in closed-form.

$$\int e^x \tanh[3x]^2 \, dx$$

Optimal (type 3, 113 leaves, 14 steps):

$$e^x + \frac{2e^x}{3\left(1+e^{6x}\right)} - \frac{2\,\text{ArcTan}\left[e^x\right]}{9} + \frac{1}{9}\,\text{ArcTan}\left[\sqrt{3}-2e^x\right] - \frac{1}{9}\,\text{ArcTan}\left[\sqrt{3}+2e^x\right] + \frac{\text{Log}\left[1-\sqrt{3}\, e^x+e^{2x}\right]}{6\sqrt{3}} - \frac{\text{Log}\left[1+\sqrt{3}\, e^x+e^{2x}\right]}{6\sqrt{3}}$$

Result (type 7, 97 leaves):

$$e^x + \frac{2e^x}{3\left(1+e^{6x}\right)} - \frac{2\,\text{ArcTan}\left[e^x\right]}{9} - \frac{1}{9}\,\text{RootSum}\left[1-\#1^2+\#1^4\,\&,\ \frac{-2x+2\,\text{Log}\left[e^x-\#1\right]+x\,\#1^2-\text{Log}\left[e^x-\#1\right]\,\#1^2}{-\#1+2\,\#1^3}\,\&\right]$$

Problem 219: Result is not expressed in closed-form.

$$\int e^x \,\text{Tanh}[3\,x]\,dx$$

Optimal (type 3, 97 leaves, 12 steps):

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

Result (type 7, 81 leaves):

$$e^x - \frac{2\,\text{ArcTan}[e^x]}{3} - \frac{1}{3}\,\text{RootSum}\left[1 - \#1^2 + \#1^4\,\&,\ \frac{-2\,x + 2\,\text{Log}[e^x - \#1] + x\,\#1^2 - \text{Log}[e^x - \#1]\,\#1^2}{-\#1 + 2\,\#1^3}\,\&\right]$$

Problem 222: Result is not expressed in closed-form.

$$\int e^x \,\text{Tanh}[4\,x]^2\,dx$$

Optimal (type 3, 382 leaves, 23 steps):

$$e^x + \frac{e^x}{2\left(1 + e^{8x}\right)} + \frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{2}} - 2\,e^x}{\sqrt{2+\sqrt{2}}}\right]}{8\sqrt{2\left(2-\sqrt{2}\right)}} + \frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{2}} - 2\,e^x}{\sqrt{2-\sqrt{2}}}\right]}{8\sqrt{2\left(2+\sqrt{2}\right)}} - \frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{2}} + 2\,e^x}{\sqrt{2+\sqrt{2}}}\right]}{8\sqrt{2\left(2-\sqrt{2}\right)}} -$$

$$\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{2}} + 2\,e^x}{\sqrt{2-\sqrt{2}}}\right]}{8\sqrt{2\left(2+\sqrt{2}\right)}} + \frac{1}{32}\sqrt{2-\sqrt{2}}\,\text{Log}\left[1 - \sqrt{2-\sqrt{2}}\,e^x + e^{2x}\right] - \frac{1}{32}\sqrt{2-\sqrt{2}}\,\text{Log}\left[1 + \sqrt{2-\sqrt{2}}\,e^x + e^{2x}\right] +$$

$$\frac{1}{32}\sqrt{2+\sqrt{2}}\,\text{Log}\left[1 - \sqrt{2+\sqrt{2}}\,e^x + e^{2x}\right] - \frac{1}{32}\sqrt{2+\sqrt{2}}\,\text{Log}\left[1 + \sqrt{2+\sqrt{2}}\,e^x + e^{2x}\right]$$

Result (type 7, 51 leaves):

$$e^x + \frac{e^x}{2\left(1 + e^{8x}\right)} + \frac{1}{16}\,\text{RootSum}\left[1 + \#1^8\,\&,\ \frac{x - \text{Log}[e^x - \#1]}{\#1^7}\,\&\right]$$

Problem 223: Result is not expressed in closed-form.

$$\int e^x \,\text{Tanh}[4\,x]\,dx$$

Optimal (type 3, 366 leaves, 21 steps):

$$e^x + \frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{2}}-2\,e^x}{\sqrt{2+\sqrt{2}}}\right]}{2\sqrt{2\left(2-\sqrt{2}\right)}} + \frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{2}}-2\,e^x}{\sqrt{2-\sqrt{2}}}\right]}{2\sqrt{2\left(2+\sqrt{2}\right)}} - \frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{2}}+2\,e^x}{\sqrt{2+\sqrt{2}}}\right]}{2\sqrt{2\left(2-\sqrt{2}\right)}} - \frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{2}}+2\,e^x}{\sqrt{2-\sqrt{2}}}\right]}{2\sqrt{2\left(2+\sqrt{2}\right)}} + \frac{1}{8}\sqrt{2-\sqrt{2}}\,\text{Log}\left[1-\sqrt{2-\sqrt{2}}\,e^x+e^{2\,x}\right] -$$
$$\frac{1}{8}\sqrt{2-\sqrt{2}}\,\text{Log}\left[1+\sqrt{2-\sqrt{2}}\,e^x+e^{2\,x}\right] + \frac{1}{8}\sqrt{2+\sqrt{2}}\,\text{Log}\left[1-\sqrt{2+\sqrt{2}}\,e^x+e^{2\,x}\right] - \frac{1}{8}\sqrt{2+\sqrt{2}}\,\text{Log}\left[1+\sqrt{2+\sqrt{2}}\,e^x+e^{2\,x}\right]$$

Result (type 7, 35 leaves):

$$e^x + \frac{1}{4}\,\text{RootSum}\left[1+\#1^8\,\&,\ \frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^7}\,\&\right]$$

Problem 224: Result is not expressed in closed-form.

$$\int e^x \,\text{Coth}[4\,x]\,dx$$

Optimal (type 3, 116 leaves, 15 steps):

$$e^x - \frac{\text{ArcTan}\left[e^x\right]}{2} + \frac{\text{ArcTan}\left[1-\sqrt{2}\,e^x\right]}{2\sqrt{2}} - \frac{\text{ArcTan}\left[1+\sqrt{2}\,e^x\right]}{2\sqrt{2}} - \frac{\text{ArcTanh}\left[e^x\right]}{2} + \frac{\text{Log}\left[1-\sqrt{2}\,e^x+e^{2\,x}\right]}{4\sqrt{2}} - \frac{\text{Log}\left[1+\sqrt{2}\,e^x+e^{2\,x}\right]}{4\sqrt{2}}$$

Result (type 7, 59 leaves):

$$\frac{1}{4}\left(4\,e^x - 2\,\text{ArcTan}\left[e^x\right] + \text{Log}\left[1-e^x\right] - \text{Log}\left[1+e^x\right] + \text{RootSum}\left[1+\#1^4\,\&,\ \frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^3}\,\&\right]\right)$$

Problem 225: Result is not expressed in closed-form.

$$\int e^x \,\text{Coth}[4\,x]^2\,dx$$

Optimal (type 3, 134 leaves, 17 steps):

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

Result (type 7, 73 leaves):

$$\frac{1}{16}\left(16\,e^x-\frac{8\,e^x}{-1+e^{8x}}-2\,\text{ArcTan}\left[e^x\right]+\text{Log}\left[1-e^x\right]-\text{Log}\left[1+e^x\right]+\text{RootSum}\left[1+\#1^4\,\&,\,\frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^3}\,\&\right]\right)$$

Problem 226: Result is not expressed in closed-form.

$$\int\frac{e^x}{a-\text{Tanh}[2\,x]}\,dx$$

Optimal (type 3, 107 leaves, 5 steps):

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

Result (type 7, 54 leaves):

$$\frac{2\,(-1+a)\,e^x+\text{RootSum}\left[1+a-\#1^4+a\,\#1^4\,\&,\,\frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^3}\,\&\right]}{2\,(-1+a)^2}$$

Problem 227: Result is not expressed in closed-form.

$$\int\frac{e^x}{(a-\text{Tanh}[2\,x])^2}\,dx$$

Optimal (type 3, 152 leaves, 7 steps):

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

Result (type 7, 107 leaves):

$$\frac{\frac{4\,(-1+a)\,e^x\,\left(2+2\,a-e^{4x}+a^2\,\left(1+e^{4x}\right)\right)}{1+a-e^{4x}+a\,e^{4x}}+(1+4\,a)\,\text{RootSum}\left[1+a-\#1^4+a\,\#1^4\,\&,\,\frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^3}\,\&\right]}{4\,(-1+a)^3\,(1+a)}$$

Problem 230: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 67 leaves, 4 steps):

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

Result (type 5, 141 leaves):

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

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

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

Optimal (type 5, 65 leaves, 4 steps):

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

Result (type 5, 134 leaves):

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

Test results for the 263 problems in "6.3.7 (d hyper)^m (a+b (c tanh)^n)^p.m"

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

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

Optimal (type 3, 51 leaves, 4 steps):

$$\frac{(a-2\,b)\,\text{ArcTanh}[\text{Cosh}[c+d\,x]]}{2\,d}-\frac{a\,\text{Coth}[c+d\,x]\,\text{Csch}[c+d\,x]}{2\,d}+\frac{b\,\text{Sech}[c+d\,x]}{d}$$

Result (type 3, 123 leaves):

$$-\frac{a\,\text{Csch}\left[\frac{1}{2}(c+d\,x)\right]^2}{8\,d}+\frac{a\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]\right]}{2\,d}-\frac{b\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]\right]}{d}-\frac{a\,\text{Log}\left[\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right]}{2\,d}+\frac{b\,\text{Log}\left[\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right]}{d}-\frac{a\,\text{Sech}\left[\frac{1}{2}(c+d\,x)\right]^2}{8\,d}+\frac{b\,\text{Sech}[c+d\,x]}{d}$$

Problem 26: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Sinh}[c+d\,x]^3}{a+b\,\text{Tanh}[c+d\,x]^2}\,dx$$

Optimal (type 3, 75 leaves, 4 steps):

$$\frac{a\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Sech}[c+d\,x]}{\sqrt{a+b}}\right]}{(a+b)^{5/2}\,d}-\frac{a\,\text{Cosh}[c+d\,x]}{(a+b)^2\,d}+\frac{\text{Cosh}[c+d\,x]^3}{3\,(a+b)\,d}$$

Result (type 3, 135 leaves):

$$\frac{1}{12\,(a+b)^{5/2}\,d}\left(12\,i\,a\sqrt{b}\left(\text{ArcTan}\left[\frac{-i\sqrt{a+b}-\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{b}}\right]+\text{ArcTan}\left[\frac{-i\sqrt{a+b}+\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{b}}\right]\right)-3\,(3\,a-b)\sqrt{a+b}\,\text{Cosh}[c+d\,x]+(a+b)^{3/2}\,\text{Cosh}[3\,(c+d\,x)]\right)$$

Problem 28: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 53 leaves, 3 steps):

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

Result (type 3, 107 leaves):

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

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

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

Optimal (type 3, 55 leaves, 4 steps):

$$-\frac{\text{ArcTanh}[\text{Cosh}[c+d x]]}{a d}+\frac{\sqrt{b} \text{ArcTanh}\left[\frac{\sqrt{b} \text{Sech}[c+d x]}{\sqrt{a+b}}\right]}{a \sqrt{a+b} d}$$

Result (type 3, 135 leaves):

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

Problem 31: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Csch}[c+d x]^3}{a+b \text{Tanh}[c+d x]^2} \, dx$$

Optimal (type 3, 85 leaves, 5 steps):

$$\frac{(a+2 b) \text{ArcTanh}[\text{Cosh}[c+d x]]}{2 a^2 d}-\frac{\sqrt{b} \sqrt{a+b} \text{ArcTanh}\left[\frac{\sqrt{b} \text{Sech}[c+d x]}{\sqrt{a+b}}\right]}{a^2 d}-\frac{\text{Coth}[c+d x] \text{Csch}[c+d x]}{2 a d}$$

Result (type 3, 198 leaves):

$$-\frac{1}{8 a^2 d}\left(8 i \sqrt{b} \sqrt{a+b} \text{ArcTan}\left[\frac{-i \sqrt{a+b}-\sqrt{a} \text{Tanh}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{b}}\right]+8 i \sqrt{b} \sqrt{a+b} \text{ArcTan}\left[\frac{-i \sqrt{a+b}+\sqrt{a} \text{Tanh}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{b}}\right]+a \text{Csch}\left[\frac{1}{2}(c+d x)\right]^2-\right.$$
$$\left.4 a \text{Log}\left[\text{Cosh}\left[\frac{1}{2}(c+d x)\right]\right]-8 b \text{Log}\left[\text{Cosh}\left[\frac{1}{2}(c+d x)\right]\right]+4 a \text{Log}\left[\text{Sinh}\left[\frac{1}{2}(c+d x)\right]\right]+8 b \text{Log}\left[\text{Sinh}\left[\frac{1}{2}(c+d x)\right]\right]+a \text{Sech}\left[\frac{1}{2}(c+d x)\right]^2\right)$$

Problem 34: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 124 leaves, 5 steps):

$$\frac{(3 a-2 b) \sqrt{b} \,\text{ArcTanh}\left[\frac{\sqrt{b} \,\text{Sech}[c+d x]}{\sqrt{a+b}}\right]}{2 (a+b)^{7/2} d}-\frac{(a-b) \,\text{Cosh}[c+d x]}{(a+b)^3 d}+\frac{\text{Cosh}[c+d x]^3}{3 (a+b)^2 d}+\frac{a b \,\text{Sech}[c+d x]}{2 (a+b)^3 d \left(a+b-b \,\text{Sech}[c+d x]^2\right)}$$

Result (type 3, 160 leaves):

$$\frac{1}{12 d}\left(\frac{6 i (3 a-2 b) \sqrt{b} \left(\text{ArcTan}\left[\frac{-i \sqrt{a+b}-\sqrt{a} \,\text{Tanh}\left[\frac{1}{2} (c+d x)\right]}{\sqrt{b}}\right]+\text{ArcTan}\left[\frac{-i \sqrt{a+b}+\sqrt{a} \,\text{Tanh}\left[\frac{1}{2} (c+d x)\right]}{\sqrt{b}}\right]\right)}{(a+b)^{7/2}}+\frac{3 \,\text{Cosh}[c+d x] \left(5 b+a \left(-3+\frac{4 b}{a-b+(a+b) \,\text{Cosh}[2 (c+d x)]}\right)\right)}{(a+b)^3}+\frac{\text{Cosh}[3 (c+d x)]}{(a+b)^2}\right)$$

Problem 36: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 92 leaves, 4 steps):

$$-\frac{3 \sqrt{b} \,\text{ArcTanh}\left[\frac{\sqrt{b} \,\text{Sech}[c+d x]}{\sqrt{a+b}}\right]}{2 (a+b)^{5/2} d}+\frac{3 \,\text{Cosh}[c+d x]}{2 (a+b)^2 d}-\frac{\text{Cosh}[c+d x]}{2 (a+b) d \left(a+b-b \,\text{Sech}[c+d x]^2\right)}$$

Result (type 3, 133 leaves):

$$\frac{-\frac{3 i \sqrt{b} \left(\text{ArcTan}\left[\frac{-i \sqrt{a+b}-\sqrt{a} \,\text{Tanh}\left[\frac{1}{2} (c+d x)\right]}{\sqrt{b}}\right]+\text{ArcTan}\left[\frac{-i \sqrt{a+b}+\sqrt{a} \,\text{Tanh}\left[\frac{1}{2} (c+d x)\right]}{\sqrt{b}}\right]\right)}{(a+b)^{5/2}}+\frac{2 \,\text{Cosh}[c+d x] \left(1-\frac{b}{a-b+(a+b) \,\text{Cosh}[2 (c+d x)]}\right)}{(a+b)^2}}{2 d}$$

Problem 37: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 103 leaves, 5 steps):

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

Result (type 3, 188 leaves):

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

Problem 39: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 141 leaves, 6 steps):

$$\frac{(a+4 b) \, \text{ArcTanh}[\text{Cosh}[c+d x]]}{2 a^3 d}-\frac{\sqrt{b} \, (3 a+4 b) \, \text{ArcTanh}\left[\frac{\sqrt{b} \, \text{Sech}[c+d x]}{\sqrt{a+b}}\right]}{2 a^3 \sqrt{a+b} \, d}-\frac{\text{Coth}[c+d x] \, \text{Csch}[c+d x]}{2 a d \left(a+b-b \, \text{Sech}[c+d x]^2\right)}-\frac{b \, \text{Sech}[c+d x]}{a^2 d \left(a+b-b \, \text{Sech}[c+d x]^2\right)}$$

Result (type 3, 314 leaves):

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

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

$$\frac{\text{Csch}\left[\frac{1}{2}(c+dx)\right]^2}{8a^2d}+\frac{(a+4b)\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}(c+dx)\right]\right]}{2a^3d}+\frac{(-a-4b)\,\text{Log}\left[\text{Sinh}\left[\frac{1}{2}(c+dx)\right]\right]}{2a^3d}-\frac{\text{Sech}\left[\frac{1}{2}(c+dx)\right]^2}{8a^2d}$$

Problem 42: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Sinh}[c+dx]^3}{\left(a+b\,\text{Tanh}[c+dx]^2\right)^3}\,dx$$

Optimal (type 3, 166 leaves, 6 steps):

$$\frac{5\,(3a-4b)\,\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Sech}[c+dx]}{\sqrt{a+b}}\right]}{8\,(a+b)^{9/2}\,d}-\frac{(a-2b)\,\text{Cosh}[c+dx]}{(a+b)^4\,d}+$$

$$\frac{\text{Cosh}[c+dx]^3}{3\,(a+b)^3\,d}+\frac{a\,b\,\text{Sech}[c+dx]}{4\,(a+b)^3\,d\,\left(a+b-b\,\text{Sech}[c+dx]^2\right)^2}+\frac{(7a-4b)\,b\,\text{Sech}[c+dx]}{8\,(a+b)^4\,d\,\left(a+b-b\,\text{Sech}[c+dx]^2\right)}$$

Result (type 3, 227 leaves):

$$\frac{1}{24d}\left(\frac{15\,i\,(3a-4b)\,\sqrt{b}\left(\text{ArcTan}\left[\frac{-i\sqrt{a+b}-\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+dx)\right]}{\sqrt{b}}\right]+\text{ArcTan}\left[\frac{-i\sqrt{a+b}+\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+dx)\right]}{\sqrt{b}}\right]\right)}{(a+b)^{9/2}}-\right.$$

$$\left(6\,\text{Cosh}[c+dx]\left(3a^3-24a^2b+30ab^2-13b^3+\left(6a^3-27a^2b-11ab^2+22b^3\right)\text{Cosh}[2(c+dx)]+3\,(a-3b)\,(a+b)^2\,\text{Cosh}[2(c+dx)]^2\right)\right)\Big/$$

$$\left.\left((a+b)^4\,(a-b+(a+b)\,\text{Cosh}[2(c+dx)])^2\right)+\frac{2\,\text{Cosh}[3(c+dx)]}{(a+b)^3}\right)$$

Problem 44: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Sinh}[c+dx]}{\left(a+b\,\text{Tanh}[c+dx]^2\right)^3}\,dx$$

Optimal (type 3, 126 leaves, 5 steps):

$$-\frac{15\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Sech}[c+d\,x]}{\sqrt{a+b}}\right]}{8\,(a+b)^{7/2}\,d}+\frac{15\,\text{Cosh}[c+d\,x]}{8\,(a+b)^3\,d}-\frac{\text{Cosh}[c+d\,x]}{4\,(a+b)\,d\,\left(a+b-b\,\text{Sech}[c+d\,x]^2\right)^2}-\frac{5\,\text{Cosh}[c+d\,x]}{8\,(a+b)^2\,d\,\left(a+b-b\,\text{Sech}[c+d\,x]^2\right)}$$

Result (type 3, 157 leaves):

$$\frac{1}{8\,d}\left(-\frac{15\,i\,\sqrt{b}\left(\text{ArcTan}\left[\frac{-i\sqrt{a+b}-\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{b}}\right]+\text{ArcTan}\left[\frac{-i\sqrt{a+b}+\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{b}}\right]\right)}{(a+b)^{7/2}}+\right.$$

$$\left.\frac{2\,\text{Cosh}[c+d\,x]\left(4-\frac{4\,b^2}{(a-b+(a+b)\,\text{Cosh}[2\,(c+d\,x)])^2}-\frac{9\,b}{a-b+(a+b)\,\text{Cosh}[2\,(c+d\,x)]}\right)}{(a+b)^3}\right)$$

Problem 45: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 156 leaves, 6 steps):

$$-\frac{\text{ArcTanh}[\text{Cosh}[c+d\,x]]}{a^3\,d}+\frac{\sqrt{b}\left(15\,a^2+20\,a\,b+8\,b^2\right)\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Sech}[c+d\,x]}{\sqrt{a+b}}\right]}{8\,a^3\,(a+b)^{5/2}\,d}+$$

$$\frac{b\,\text{Sech}[c+d\,x]}{4\,a\,(a+b)\,d\,\left(a+b-b\,\text{Sech}[c+d\,x]^2\right)^2}+\frac{b\,(7\,a+4\,b)\,\text{Sech}[c+d\,x]}{8\,a^2\,(a+b)^2\,d\,\left(a+b-b\,\text{Sech}[c+d\,x]^2\right)}$$

Result (type 3, 249 leaves):

$$\frac{1}{8\,a^3\,d}\left(\frac{i\sqrt{b}\left(15\,a^2+20\,a\,b+8\,b^2\right)\text{ArcTan}\left[\frac{-i\sqrt{a+b}-\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{b}}\right]}{(a+b)^{5/2}}+\frac{i\sqrt{b}\left(15\,a^2+20\,a\,b+8\,b^2\right)\text{ArcTan}\left[\frac{-i\sqrt{a+b}+\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{b}}\right]}{(a+b)^{5/2}}+\right.$$

$$\left.\frac{8\,a^2\,b^2\,\text{Cosh}[c+d\,x]}{(a+b)^2\,(a-b+(a+b)\,\text{Cosh}[2\,(c+d\,x)])^2}+\frac{2\,a\,b\,(9\,a+4\,b)\,\text{Cosh}[c+d\,x]}{(a+b)^2\,(a-b+(a+b)\,\text{Cosh}[2\,(c+d\,x)])}-8\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]\right]+8\,\text{Log}\left[\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right]\right)$$

Problem 47: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 196 leaves, 7 steps):

$$\frac{(a+6 b)\,\text{ArcTanh}[\text{Cosh}[c+d x]]}{2 a^4 d}-\frac{\sqrt{b}\,\left(15 a^2+40 a b+24 b^2\right)\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Sech}[c+d x]}{\sqrt{a+b}}\right]}{8 a^4 (a+b)^{3/2} d}-\frac{\text{Coth}[c+d x]\,\text{Csch}[c+d x]}{2 a d\left(a+b-b\,\text{Sech}[c+d x]^2\right)^2}-\frac{3 b\,\text{Sech}[c+d x]}{4 a^2 d\left(a+b-b\,\text{Sech}[c+d x]^2\right)^2}-\frac{b\,(11 a+12 b)\,\text{Sech}[c+d x]}{8 a^3 (a+b) d\left(a+b-b\,\text{Sech}[c+d x]^2\right)}$$

Result (type 3, 401 leaves):

$$-\frac{i\sqrt{b}\,\left(15 a^2+40 a b+24 b^2\right)\text{ArcTan}\left[\frac{\text{Sech}\left[\frac{1}{2}(c+d x)\right]\left(-i\sqrt{a+b}\,\text{Cosh}\left[\frac{1}{2}(c+d x)\right]-\sqrt{a}\,\text{Sinh}\left[\frac{1}{2}(c+d x)\right]\right)}{\sqrt{b}}\right]}{8 a^4 (a+b)^{3/2} d}-\frac{i\sqrt{b}\,\left(15 a^2+40 a b+24 b^2\right)\text{ArcTan}\left[\frac{\text{Sech}\left[\frac{1}{2}(c+d x)\right]\left(-i\sqrt{a+b}\,\text{Cosh}\left[\frac{1}{2}(c+d x)\right]+\sqrt{a}\,\text{Sinh}\left[\frac{1}{2}(c+d x)\right]\right)}{\sqrt{b}}\right]}{8 a^4 (a+b)^{3/2} d}-\frac{b^2\,\text{Cosh}[c+d x]}{a^2 (a+b) d\left(a-b+a\,\text{Cosh}[2(c+d x)]+b\,\text{Cosh}[2(c+d x)]\right)^2}+\frac{-9 a b\,\text{Cosh}[c+d x]-8 b^2\,\text{Cosh}[c+d x]}{4 a^3 (a+b) d\left(a-b+a\,\text{Cosh}[2(c+d x)]+b\,\text{Cosh}[2(c+d x)]\right)}-\frac{\text{Csch}\left[\frac{1}{2}(c+d x)\right]^2}{8 a^3 d}+\frac{(a+6 b)\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}(c+d x)\right]\right]}{2 a^4 d}+\frac{(-a-6 b)\,\text{Log}\left[\text{Sinh}\left[\frac{1}{2}(c+d x)\right]\right]}{2 a^4 d}-\frac{\text{Sech}\left[\frac{1}{2}(c+d x)\right]^2}{8 a^3 d}$$

Problem 73: Result is not expressed in closed-form.

$$\int \frac{\text{Sinh}[c+d x]^4}{a+b\,\text{Tanh}[c+d x]^3}\,dx$$

Optimal (type 3, 491 leaves, 11 steps):

$$-\frac{a^{2/3} b^{1/3} \left(a^2+3 a^{4/3} b^{2/3}-b^2\right) \text{ArcTan}\left[\frac{a^{1/3}-2 b^{1/3} \text{Tanh}[c+d x]}{\sqrt{3}\, a^{1/3}}\right]}{\sqrt{3} \left(a^{4/3}+a^{2/3} b^{2/3}+b^{4/3}\right)^3 d}-\frac{3 a (a-5 b) \text{Log}[1-\text{Tanh}[c+d x]]}{16 (a+b)^3 d}+$$
$$\frac{3 a (a+5 b) \text{Log}[1+\text{Tanh}[c+d x]]}{16 (a-b)^3 d}-\frac{a^{2/3} b^{1/3} \left(a^4+7 a^2 b^2+b^4+3 a^{2/3} b^{4/3} \left(2 a^2+b^2\right)\right) \text{Log}\left[a^{1/3}+b^{1/3} \text{Tanh}[c+d x]\right]}{3 \left(a^2-b^2\right)^3 d}+$$
$$\frac{a^{2/3} b^{1/3} \left(a^4+7 a^2 b^2+b^4+3 a^{2/3} b^{4/3} \left(2 a^2+b^2\right)\right) \text{Log}\left[a^{2/3}-a^{1/3} b^{1/3} \text{Tanh}[c+d x]+b^{2/3} \text{Tanh}[c+d x]^2\right]}{6 \left(a^2-b^2\right)^3 d}-\frac{a^2 b \left(a^2+2 b^2\right) \text{Log}\left[a+b \text{Tanh}[c+d x]^3\right]}{\left(a^2-b^2\right)^3 d}+$$
$$\frac{1}{16 (a+b) d (1-\text{Tanh}[c+d x])^2}-\frac{5 a-b}{16 (a+b)^2 d (1-\text{Tanh}[c+d x])}-\frac{1}{16 (a-b) d (1+\text{Tanh}[c+d x])^2}+\frac{5 a+b}{16 (a-b)^2 d (1+\text{Tanh}[c+d x])}$$

Result (type 7, 645 leaves) :

$$\frac{1}{96 (a-b)^2 (a+b)^3 d}\Bigg(-32 a b \,\text{RootSum}\Big[a-b+3 a \#1+3 b \#1+3 a \#1^2-3 b \#1^2+a \#1^3+b \#1^3 \&, \frac{1}{a-b+2 a \#1+2 b \#1+a \#1^2-b \#1^2}\Big(-6 a^3 c-12 a b^2 c-6 a^3 d x-$$
$$12 a b^2 d x+3 a^3 \text{Log}\left[e^{2 (c+d x)}-\#1\right]+6 a b^2 \text{Log}\left[e^{2 (c+d x)}-\#1\right]-8 a^3 c \#1+4 a^2 b c \#1+8 a b^2 c \#1-4 b^3 c \#1-8 a^3 d x \#1+$$
$$4 a^2 b d x \#1+8 a b^2 d x \#1-4 b^3 d x \#1+4 a^3 \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1-2 a^2 b \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1-4 a b^2 \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1+$$
$$2 b^3 \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1-10 a^3 c \#1^2+20 a^2 b c \#1^2-20 a b^2 c \#1^2+4 b^3 c \#1^2-10 a^3 d x \#1^2+20 a^2 b d x \#1^2-20 a b^2 d x \#1^2+$$
$$4 b^3 d x \#1^2+5 a^3 \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1^2-10 a^2 b \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1^2+10 a b^2 \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1^2-2 b^3 \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1^2\Big) \&\Big]+$$
$$3 \Big(4 b \left(5 a^3+5 a^2 b+a b^2+b^3\right) \text{Cosh}[2 (c+d x)]-(a-b) b (a+b)^2 \text{Cosh}[4 (c+d x)]-8 a \left(a^3+a^2 b+2 a b^2+2 b^3\right) \text{Sinh}[2 (c+d x)]+$$
$$a (a-b) \left(12 \left(a^2-6 a b+5 b^2\right) (c+d x)+(a+b)^2 \text{Sinh}[4 (c+d x)]\right)\Big)\Bigg)$$

Problem 75: Result is not expressed in closed-form.

$$\int \frac{\text{Sinh}[c+d x]^2}{a+b \,\text{Tanh}[c+d x]^3} \, dx$$

Optimal (type 3, 384 leaves, 11 steps) :

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

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

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

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

Result (type 7, 423 leaves) :

$$-\frac{1}{12\, (a - b)\, (a + b)^2\, d}\Bigg(6\, \left(a^2 - 3\, a\, b + 2\, b^2\right)\, (c + d\, x) + 3\, b\, (a + b)\, \text{Cosh}[2\, (c + d\, x)] +$$

$$4\, b\, \text{RootSum}\Big[a - b + 3\, a\, \#1 + 3\, b\, \#1 + 3\, a\, \#1^2 - 3\, b\, \#1^2 + a\, \#1^3 + b\, \#1^3\, \&,\ \frac{1}{a - b + 2\, a\, \#1 + 2\, b\, \#1 + a\, \#1^2 - b\, \#1^2}$$

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

$$2\, a^2\, \text{Log}\left[e^{2\, (c+d\, x)} - \#1\right]\, \#1 + 2\, b^2\, \text{Log}\left[e^{2\, (c+d\, x)} - \#1\right]\, \#1 + 8\, a^2\, c\, \#1^2 - 8\, a\, b\, c\, \#1^2 + 2\, b^2\, c\, \#1^2 + 8\, a^2\, d\, x\, \#1^2 - 8\, a\, b\, d\, x\, \#1^2 + 2\, b^2\, d\, x\, \#1^2 -$$

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

Problem 78: Result is not expressed in closed-form.

$$\int \frac{\text{Csch}[c + d\, x]^2}{a + b\, \text{Tanh}[c + d\, x]^3}\, dx$$

Optimal (type 3, 157 leaves, 8 steps) :

$$\frac{b^{1/3}\, \text{ArcTan}\left[\frac{a^{1/3} - 2\, b^{1/3}\, \text{Tanh}[c + d\, x]}{\sqrt{3}\, a^{1/3}}\right]}{\sqrt{3}\, a^{4/3}\, d} - \frac{\text{Coth}[c + d\, x]}{a\, d} + \frac{b^{1/3}\, \text{Log}\left[a^{1/3} + b^{1/3}\, \text{Tanh}[c + d\, x]\right]}{3\, a^{4/3}\, d} - \frac{b^{1/3}\, \text{Log}\left[a^{2/3} - a^{1/3}\, b^{1/3}\, \text{Tanh}[c + d\, x] + b^{2/3}\, \text{Tanh}[c + d\, x]^2\right]}{6\, a^{4/3}\, d}$$

Result (type 7, 190 leaves) :

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

$$\big(-c - d\, x - \text{Log}[-\text{Cosh}[c + d\, x] - \text{Sinh}[c + d\, x] + \text{Cosh}[c + d\, x]\, \#1 - \text{Sinh}[c + d\, x]\, \#1] + c\, \#1 + d\, x\, \#1 +$$

$$\text{Log}[-\text{Cosh}[c + d\, x] - \text{Sinh}[c + d\, x] + \text{Cosh}[c + d\, x]\, \#1 - \text{Sinh}[c + d\, x]\, \#1]\, \#1\big) \Big/ \left(a + b + 2\, a\, \#1 - 2\, b\, \#1 + a\, \#1^2 + b\, \#1^2\right)\, \&\Big]\Big)$$

Problem 80: Result is not expressed in closed-form.

$$\int \frac{\text{Csch}[c+d x]^4}{a+b \text{Tanh}[c+d x]^3} \, dx$$

Optimal (type 3, 215 leaves, 12 steps):

$$-\frac{b^{1/3} \text{ArcTan}\left[\frac{a^{1/3}-2 b^{1/3} \text{Tanh}[c+d x]}{\sqrt{3}\, a^{1/3}}\right]}{\sqrt{3}\, a^{4/3} d}+\frac{\text{Coth}[c+d x]}{a d}-\frac{\text{Coth}[c+d x]^3}{3 a d}-\frac{b \text{Log}[\text{Tanh}[c+d x]]}{a^2 d}-\frac{b^{1/3} \text{Log}\left[a^{1/3}+b^{1/3} \text{Tanh}[c+d x]\right]}{3 a^{4/3} d}+\frac{b^{1/3} \text{Log}\left[a^{2/3}-a^{1/3} b^{1/3} \text{Tanh}[c+d x]+b^{2/3} \text{Tanh}[c+d x]^2\right]}{6 a^{4/3} d}+\frac{b \text{Log}\left[a+b \text{Tanh}[c+d x]^3\right]}{3 a^2 d}$$

Result (type 7, 322 leaves):

$$\frac{1}{3 a^2 d}\Big(-a \text{Coth}[c+d x] \left(-2+\text{Csch}[c+d x]^2\right)+3 b \left(c+d x-\text{Log}[\text{Sinh}[c+d x]]\right)+ b \text{RootSum}\Big[a-b+3 a \#1+3 b \#1+3 a \#1^2-3 b \#1^2+a \#1^3+b \#1^3 \&, \Big(-2 a c+2 b c-2 a d x+2 b d x+a \text{Log}\left[e^{2 (c+d x)}-\#1\right]-b \text{Log}\left[e^{2 (c+d x)}-\#1\right]- 8 a c \#1-4 b c \#1-8 a d x \#1-4 b d x \#1+4 a \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1+2 b \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1+2 a c \#1^2+2 b c \#1^2+ 2 a d x \#1^2+2 b d x \#1^2-a \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1^2-b \text{Log}\left[e^{2 (c+d x)}-\#1\right] \#1^2\Big) \Big/ \left(a-b+2 a \#1+2 b \#1+a \#1^2-b \#1^2\right) \&\Big]\Big)$$

Problem 104: Result more than twice size of optimal antiderivative.

$$\int \text{Sech}[c+d x]^4 \left(a+b \text{Tanh}[c+d x]^2\right)^3 dx$$

Optimal (type 3, 102 leaves, 3 steps):

$$\frac{a^3 \text{Tanh}[c+d x]}{d}+\frac{a^2 (a-3 b) \text{Tanh}[c+d x]^3}{3 d}-\frac{3 a (a-b) b \text{Tanh}[c+d x]^5}{5 d}-\frac{(3 a-b) b^2 \text{Tanh}[c+d x]^7}{7 d}-\frac{b^3 \text{Tanh}[c+d x]^9}{9 d}$$

Result (type 3, 218 leaves):

$$\frac{1}{20160 d}\Big(5775 a^3-1071 a^2 b+621 a b^2-725 b^3+ 10 \left(903 a^3-63 a^2 b-27 a b^2+107 b^3\right) \text{Cosh}[2 (c+d x)]+8 \left(525 a^3+126 a^2 b-81 a b^2-50 b^3\right) \text{Cosh}[4 (c+d x)]+ 1050 a^3 \text{Cosh}[6 (c+d x)]+630 a^2 b \text{Cosh}[6 (c+d x)]+270 a b^2 \text{Cosh}[6 (c+d x)]+50 b^3 \text{Cosh}[6 (c+d x)]+105 a^3 \text{Cosh}[8 (c+d x)]+ 63 a^2 b \text{Cosh}[8 (c+d x)]+27 a b^2 \text{Cosh}[8 (c+d x)]+5 b^3 \text{Cosh}[8 (c+d x)]\Big) \text{Sech}[c+d x]^8 \text{Tanh}[c+d x]$$

Problem 133: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Sech}[c+d x]^7}{\left(a+b \text{Tanh}[c+d x]^2\right)^3} \, dx$$

Optimal (type 3, 156 leaves, 6 steps):

$$-\frac{\text{ArcTan}[\text{Sinh}[c+d x]]}{b^3 d}+\frac{\sqrt{a+b}\left(8 a^2-4 a b+3 b^2\right) \text{ArcTan}\left[\frac{\sqrt{a+b}\, \text{Sinh}[c+d x]}{\sqrt{a}}\right]}{8 a^{5/2} b^3 d}+\frac{(a+b) \text{Sinh}[c+d x]}{4 a b d \left(a+(a+b) \text{Sinh}[c+d x]^2\right)^2}-\frac{(4 a-3 b) (a+b) \text{Sinh}[c+d x]}{8 a^2 b^2 d \left(a+(a+b) \text{Sinh}[c+d x]^2\right)}$$

Result (type 3, 317 leaves):

$$-\frac{1}{32 b^3 d}\left(\frac{2 \sqrt{a+b}\left(8 a^2-4 a b+3 b^2\right) \text{ArcTan}\left[\frac{\sqrt{a}\, \text{Csch}[c+d x]}{\sqrt{a+b}}\right]}{a^{5/2}}+\frac{2\left(8 a^3+4 a^2 b-a b^2+3 b^3\right) \text{ArcTan}\left[\frac{\sqrt{a}\, \text{Csch}[c+d x]}{\sqrt{a+b}}\right]}{a^{5/2} \sqrt{a+b}}+\right.$$
$$64 \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}(c+d x)\right]\right]+\frac{i \sqrt{a+b}\left(8 a^2-4 a b+3 b^2\right) \text{Log}[a-b+(a+b) \text{Cosh}[2(c+d x)]]}{a^{5/2}}-$$
$$\left.\frac{i\left(8 a^3+4 a^2 b-a b^2+3 b^3\right) \text{Log}[a-b+(a+b) \text{Cosh}[2(c+d x)]]}{a^{5/2} \sqrt{a+b}}-\frac{32 b^2 (a+b) \text{Sinh}[c+d x]}{a(a-b+(a+b) \text{Cosh}[2(c+d x)])^2}+\frac{8 b\left(4 a^2+a b-3 b^2\right) \text{Sinh}[c+d x]}{a^2(a-b+(a+b) \text{Cosh}[2(c+d x)])}\right)$$

Problem 144: Result more than twice size of optimal antiderivative.

$$\int \text{Tanh}[c+d x]^4\left(a+b\, \text{Tanh}[c+d x]^2\right)^2 dx$$

Optimal (type 3, 83 leaves, 4 steps):

$$(a+b)^2 x-\frac{(a+b)^2 \text{Tanh}[c+d x]}{d}-\frac{(a+b)^2 \text{Tanh}[c+d x]^3}{3 d}-\frac{b(2 a+b) \text{Tanh}[c+d x]^5}{5 d}-\frac{b^2 \text{Tanh}[c+d x]^7}{7 d}$$

Result (type 3, 205 leaves):

$$a^2 x+2 a b x+b^2 x-\frac{4 a^2 \text{Tanh}[c+d x]}{3 d}-\frac{46 a b \text{Tanh}[c+d x]}{15 d}-\frac{176 b^2 \text{Tanh}[c+d x]}{105 d}+$$
$$\frac{a^2 \text{Sech}[c+d x]^2 \text{Tanh}[c+d x]}{3 d}+\frac{22 a b \text{Sech}[c+d x]^2 \text{Tanh}[c+d x]}{15 d}+\frac{122 b^2 \text{Sech}[c+d x]^2 \text{Tanh}[c+d x]}{105 d}-$$
$$\frac{2 a b \text{Sech}[c+d x]^4 \text{Tanh}[c+d x]}{5 d}-\frac{22 b^2 \text{Sech}[c+d x]^4 \text{Tanh}[c+d x]}{35 d}+\frac{b^2 \text{Sech}[c+d x]^6 \text{Tanh}[c+d x]}{7 d}$$

Problem 146: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 63 leaves, 4 steps):

$$(a+b)^2 x-\frac{(a+b)^2 \operatorname{Tanh}[c+d x]}{d}-\frac{b(2 a+b) \operatorname{Tanh}[c+d x]^3}{3 d}-\frac{b^2 \operatorname{Tanh}[c+d x]^5}{5 d}$$

Result (type 3, 132 leaves):

$$a^2 x+2 a b x+b^2 x-\frac{a^2 \operatorname{Tanh}[c+d x]}{d}-\frac{8 a b \operatorname{Tanh}[c+d x]}{3 d}-\frac{23 b^2 \operatorname{Tanh}[c+d x]}{15 d}+\frac{2 a b \operatorname{Sech}[c+d x]^2 \operatorname{Tanh}[c+d x]}{3 d}+\frac{11 b^2 \operatorname{Sech}[c+d x]^2 \operatorname{Tanh}[c+d x]}{15 d}-\frac{b^2 \operatorname{Sech}[c+d x]^4 \operatorname{Tanh}[c+d x]}{5 d}$$

Problem 154: Result more than twice size of optimal antiderivative.

$$\int \operatorname{Coth}[c+d x]^6 \left(a+b \operatorname{Tanh}[c+d x]^2\right)^2 dx$$

Optimal (type 3, 63 leaves, 4 steps):

$$(a+b)^2 x-\frac{(a+b)^2 \operatorname{Coth}[c+d x]}{d}-\frac{a(a+2 b) \operatorname{Coth}[c+d x]^3}{3 d}-\frac{a^2 \operatorname{Coth}[c+d x]^5}{5 d}$$

Result (type 3, 132 leaves):

$$a^2 x+2 a b x+b^2 x-\frac{23 a^2 \operatorname{Coth}[c+d x]}{15 d}-\frac{8 a b \operatorname{Coth}[c+d x]}{3 d}-\frac{b^2 \operatorname{Coth}[c+d x]}{d}-\frac{11 a^2 \operatorname{Coth}[c+d x] \operatorname{Csch}[c+d x]^2}{15 d}-\frac{2 a b \operatorname{Coth}[c+d x] \operatorname{Csch}[c+d x]^2}{3 d}-\frac{a^2 \operatorname{Coth}[c+d x] \operatorname{Csch}[c+d x]^4}{5 d}$$

Problem 156: Result more than twice size of optimal antiderivative.

$$\int \operatorname{Tanh}[c+d x]^4 \left(a+b \operatorname{Tanh}[c+d x]^2\right)^3 dx$$

Optimal (type 3, 114 leaves, 4 steps):

$$(a+b)^3 x-\frac{(a+b)^3 \operatorname{Tanh}[c+d x]}{d}-\frac{(a+b)^3 \operatorname{Tanh}[c+d x]^3}{3 d}-\frac{b\left(3 a^2+3 a b+b^2\right) \operatorname{Tanh}[c+d x]^5}{5 d}-\frac{b^2(3 a+b) \operatorname{Tanh}[c+d x]^7}{7 d}-\frac{b^3 \operatorname{Tanh}[c+d x]^9}{9 d}$$

Result (type 3, 640 leaves):

$$\frac{1}{80640\,d}\,\text{Sech}[c+d\,x]^9\,\big(39690\,a^3\,(c+d\,x)\,\text{Cosh}[c+d\,x]+119070\,a^2\,b\,(c+d\,x)\,\text{Cosh}[c+d\,x]+119070\,a\,b^2\,(c+d\,x)\,\text{Cosh}[c+d\,x]+39690\,b^3\,(c+d\,x)\,\text{Cosh}[c+d\,x]+26460\,a^3\,(c+d\,x)\,\text{Cosh}[3\,(c+d\,x)]+79380\,a^2\,b\,(c+d\,x)\,\text{Cosh}[3\,(c+d\,x)]+79380\,a\,b^2\,(c+d\,x)\,\text{Cosh}[3\,(c+d\,x)]+26460\,b^3\,(c+d\,x)\,\text{Cosh}[3\,(c+d\,x)]+11340\,a^3\,(c+d\,x)\,\text{Cosh}[5\,(c+d\,x)]+34020\,a^2\,b\,(c+d\,x)\,\text{Cosh}[5\,(c+d\,x)]+34020\,a\,b^2\,(c+d\,x)\,\text{Cosh}[5\,(c+d\,x)]+11340\,b^3\,(c+d\,x)\,\text{Cosh}[5\,(c+d\,x)]+2835\,a^3\,(c+d\,x)\,\text{Cosh}[7\,(c+d\,x)]+8505\,a^2\,b\,(c+d\,x)\,\text{Cosh}[7\,(c+d\,x)]+8505\,a\,b^2\,(c+d\,x)\,\text{Cosh}[7\,(c+d\,x)]+2835\,b^3\,(c+d\,x)\,\text{Cosh}[7\,(c+d\,x)]+315\,a^3\,(c+d\,x)\,\text{Cosh}[9\,(c+d\,x)]+945\,a^2\,b\,(c+d\,x)\,\text{Cosh}[9\,(c+d\,x)]+945\,a\,b^2\,(c+d\,x)\,\text{Cosh}[9\,(c+d\,x)]+315\,b^3\,(c+d\,x)\,\text{Cosh}[9\,(c+d\,x)]-3780\,a^3\,\text{Sinh}[c+d\,x]-12474\,a^2\,b\,\text{Sinh}[c+d\,x]-10584\,a\,b^2\,\text{Sinh}[c+d\,x]-7938\,b^3\,\text{Sinh}[c+d\,x]-7980\,a^3\,\text{Sinh}[3\,(c+d\,x)]-24696\,a^2\,b\,\text{Sinh}[3\,(c+d\,x)]-24696\,a\,b^2\,\text{Sinh}[3\,(c+d\,x)]-5292\,b^3\,\text{Sinh}[3\,(c+d\,x)]-6300\,a^3\,\text{Sinh}[5\,(c+d\,x)]-18144\,a^2\,b\,\text{Sinh}[5\,(c+d\,x)]-19224\,a\,b^2\,\text{Sinh}[5\,(c+d\,x)]-7668\,b^3\,\text{Sinh}[5\,(c+d\,x)]-2520\,a^3\,\text{Sinh}[7\,(c+d\,x)]-7371\,a^2\,b\,\text{Sinh}[7\,(c+d\,x)]-6696\,a\,b^2\,\text{Sinh}[7\,(c+d\,x)]-1917\,b^3\,\text{Sinh}[7\,(c+d\,x)]-420\,a^3\,\text{Sinh}[9\,(c+d\,x)]-1449\,a^2\,b\,\text{Sinh}[9\,(c+d\,x)]-1584\,a\,b^2\,\text{Sinh}[9\,(c+d\,x)]-563\,b^3\,\text{Sinh}[9\,(c+d\,x)]\big)$$

Problem 202: Result more than twice size of optimal antiderivative.

$$\int \sqrt{1-\text{Tanh}[x]^2}\,dx$$

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

$$\text{ArcSin}[\text{Tanh}[x]]$$

Result (type 3, 19 leaves):

$$2\,\text{ArcTan}\left[\text{Tanh}\left[\frac{x}{2}\right]\right]\,\text{Cosh}[x]\,\sqrt{\text{Sech}[x]^2}$$

Problem 208: Result more than twice size of optimal antiderivative.

$$\int \text{Tanh}[x]^5\,\sqrt{a+b\,\text{Tanh}[x]^2}\,dx$$

Optimal (type 3, 87 leaves, 7 steps):

$$\sqrt{a+b}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a+b}}\right]-\sqrt{a+b\,\text{Tanh}[x]^2}+\frac{(a-b)\,\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}{3\,b^2}-\frac{\left(a+b\,\text{Tanh}[x]^2\right)^{5/2}}{5\,b^2}$$

Result (type 3, 184 leaves):

$$\frac{1}{15\sqrt{2}}\sqrt{\left(a-b+(a+b)\operatorname{Cosh}[2x]\right)\operatorname{Sech}[x]^2}\left(-23+\frac{2a^2}{b^2}-\frac{6a}{b}-\right.$$

$$\left(15\sqrt{2}\sqrt{a+b}\operatorname{Cosh}[x]\left(\operatorname{Log}\left[-\operatorname{Sech}\left[\frac{x}{2}\right]^2\right]-\operatorname{Log}\left[a+b+\frac{\sqrt{a+b}\sqrt{\left(a-b+(a+b)\operatorname{Cosh}[2x]\right)\operatorname{Sech}\left[\frac{x}{2}\right]^4}}{\sqrt{2}}+(a+b)\operatorname{Tanh}\left[\frac{x}{2}\right]^2\right]\right)\operatorname{Sech}\left[\frac{x}{2}\right]^2\right)\Big/$$

$$\left.\left(\sqrt{\left(a-b+(a+b)\operatorname{Cosh}[2x]\right)\operatorname{Sech}\left[\frac{x}{2}\right]^4}\right)+\left(11+\frac{a}{b}\right)\operatorname{Sech}[x]^2-3\operatorname{Sech}[x]^4\right)$$

Problem 209: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \operatorname{Tanh}[x]^4\sqrt{a+b\operatorname{Tanh}[x]^2}\,dx$$

Optimal (type 3, 121 leaves, 8 steps):

$$\frac{\left(a^2-4ab-8b^2\right)\operatorname{ArcTanh}\left[\frac{\sqrt{b}\operatorname{Tanh}[x]}{\sqrt{a+b\operatorname{Tanh}[x]^2}}\right]}{8b^{3/2}}+\sqrt{a+b}\operatorname{ArcTanh}\left[\frac{\sqrt{a+b}\operatorname{Tanh}[x]}{\sqrt{a+b\operatorname{Tanh}[x]^2}}\right]-\frac{(a+4b)\operatorname{Tanh}[x]\sqrt{a+b\operatorname{Tanh}[x]^2}}{8b}-\frac{1}{4}\operatorname{Tanh}[x]^3\sqrt{a+b\operatorname{Tanh}[x]^2}$$

Result (type 4, 580 leaves):

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

$$\left.\left.\text{Csch}[2\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\text{Sinh}[x]^4\right)\Big/\left(a\,(a-b+(a+b)\,\text{Cosh}[2\,x])\right)\right)-$$

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

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

$$\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\text{Sinh}[x]^4\right)\Big/\left(4\,a\,\sqrt{1+\text{Cosh}[2\,x]}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}\right)\right)+$$

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

$$\left.\left.\left.\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\text{Sinh}[x]^4\right)\Big/\left(2\,(a+b)\,\sqrt{1+\text{Cosh}[2\,x]}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}\right)\right)\right)+$$

$$\sqrt{\frac{a-b+a\,\text{Cosh}[2\,x]+b\,\text{Cosh}[2\,x]}{1+\text{Cosh}[2\,x]}}\,\left(\frac{\text{Sech}[x]\,(-a\,\text{Sinh}[x]-6\,b\,\text{Sinh}[x])}{8\,b}+\frac{1}{4}\,\text{Sech}[x]^2\,\text{Tanh}[x]\right)$$

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

$$\int \tanh[x]^3 \sqrt{a+b\tanh[x]^2}\, dx$$

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

$$\sqrt{a+b}\ \text{ArcTanh}\left[\frac{\sqrt{a+b\tanh[x]^2}}{\sqrt{a+b}}\right]-\sqrt{a+b\tanh[x]^2}-\frac{\left(a+b\tanh[x]^2\right)^{3/2}}{3 b}$$

Result (type 3, 310 leaves):

$$\sqrt{\frac{a-b+a\cosh[2x]+b\cosh[2x]}{1+\cosh[2x]}}\left(-\frac{a+4b}{3b}+\frac{\text{Sech}[x]^2}{3}\right)+\left(\sqrt{a+b}\ (1+\cosh[x])\sqrt{\frac{1+\cosh[2x]}{(1+\cosh[x])^2}}\sqrt{\frac{a-b+(a+b)\cosh[2x]}{1+\cosh[2x]}}\right.$$
$$\left(\text{Log}\left[-1+\tanh\left[\frac{x}{2}\right]^2\right]-\text{Log}\left[a+b+a\tanh\left[\frac{x}{2}\right]^2+b\tanh\left[\frac{x}{2}\right]^2+\sqrt{a+b}\sqrt{4b\tanh\left[\frac{x}{2}\right]^2+a\left(1+\tanh\left[\frac{x}{2}\right]^2\right)^2}\right]\right)\left(-1+\tanh\left[\frac{x}{2}\right]^2\right)$$
$$\left.\left(1+\tanh\left[\frac{x}{2}\right]^2\right)\sqrt{\frac{4b\tanh\left[\frac{x}{2}\right]^2+a\left(1+\tanh\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\tanh\left[\frac{x}{2}\right]^2\right)^2}}\right)\Bigg/\left(\sqrt{a-b+(a+b)\cosh[2x]}\sqrt{\left(1+\tanh\left[\frac{x}{2}\right]^2\right)^2}\sqrt{4b\tanh\left[\frac{x}{2}\right]^2+a\left(1+\tanh\left[\frac{x}{2}\right]^2\right)^2}\right)$$

Problem 211: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \tanh[x]^2 \sqrt{a+b\tanh[x]^2}\, dx$$

Optimal (type 3, 85 leaves, 7 steps):

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

Result (type 4, 531 leaves):

$$\left(b^2\sqrt{\frac{a-b+(a+b)\cosh[2x]}{1+\cosh[2x]}}\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\cosh[2x])\,\text{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\cosh[2x])\,\text{Csch}[x]^2}{b}}\right.$$

$$\left.\text{Csch}[2x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\text{Sinh}[x]^4\right)\Big/\left(a\,\left(a-b+(a+b)\,\text{Cosh}[2x]\right)\right)-$$

$$\frac{1}{\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}}4\,i\,b\,(a+b)\,\sqrt{1+\text{Cosh}[2x]}\,\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}$$

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

$$\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\text{Sinh}[x]^4\right)\Big/\left(4\,a\,\sqrt{1+\text{Cosh}[2x]}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\right)\right)+$$

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

$$\left.\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\text{Sinh}[x]^4\right)\Big/$$

$$\left.\left(2\,(a+b)\,\sqrt{1+\text{Cosh}[2x]}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\right)\right)-\frac{1}{2}\sqrt{\frac{a-b+a\,\text{Cosh}[2x]+b\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\,\text{Tanh}[x]$$

Problem 212: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 44 leaves, 5 steps):

$$\sqrt{a+b}\;\mathrm{ArcTanh}\Big[\frac{\sqrt{a+b\,\mathrm{Tanh}[x]^2}}{\sqrt{a+b}}\Big]-\sqrt{a+b\,\mathrm{Tanh}[x]^2}$$

Result (type 3, 214 leaves):

$$-\left(\left(\left(\left(\sqrt{\frac{a-b+a\,\mathrm{Cosh}[2x]+b\,\mathrm{Cosh}[2x]}{3+4\,\mathrm{Cosh}[x]+\mathrm{Cosh}[2x]}}+\mathrm{Cosh}[x]\left(\sqrt{\frac{a-b+a\,\mathrm{Cosh}[2x]+b\,\mathrm{Cosh}[2x]}{3+4\,\mathrm{Cosh}[x]+\mathrm{Cosh}[2x]}}+\right.\right.\right.\right.\right.$$
$$\left.\left.\sqrt{a+b}\;\mathrm{Log}\Big[-\mathrm{Sech}\Big[\frac{x}{2}\Big]^2\Big]-\sqrt{a+b}\;\mathrm{Log}\Big[a+b+\frac{\sqrt{a+b}\,\sqrt{\big(a-b+(a+b)\,\mathrm{Cosh}[2x]\big)\,\mathrm{Sech}\big[\frac{x}{2}\big]^4}}{\sqrt{2}}+(a+b)\,\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big]\right)\right)$$
$$\left.\mathrm{Sech}\Big[\frac{x}{2}\Big]^2\sqrt{\big(a-b+(a+b)\,\mathrm{Cosh}[2x]\big)\,\mathrm{Sech}[x]^2}\right)\Big/\left(\sqrt{\big(a-b+(a+b)\,\mathrm{Cosh}[2x]\big)\,\mathrm{Sech}\Big[\frac{x}{2}\Big]^4}\right)\right)$$

Problem 213: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 60 leaves, 6 steps):

$$-\sqrt{b}\;\mathrm{ArcTanh}\Big[\frac{\sqrt{b}\;\mathrm{Tanh}[x]}{\sqrt{a+b\,\mathrm{Tanh}[x]^2}}\Big]+\sqrt{a+b}\;\mathrm{ArcTanh}\Big[\frac{\sqrt{a+b}\;\mathrm{Tanh}[x]}{\sqrt{a+b\,\mathrm{Tanh}[x]^2}}\Big]$$

Result (type 3, 137 leaves):

$$\frac{1}{2}\left(-\sqrt{a+b}\;\mathrm{Log}[1-\mathrm{Tanh}[x]]+\sqrt{a+b}\;\mathrm{Log}[1+\mathrm{Tanh}[x]]-2\sqrt{b}\;\mathrm{Log}\Big[b\,\mathrm{Tanh}[x]+\sqrt{b}\;\sqrt{a+b\,\mathrm{Tanh}[x]^2}\Big]-\right.$$
$$\left.\sqrt{a+b}\;\mathrm{Log}\Big[a-b\,\mathrm{Tanh}[x]+\sqrt{a+b}\;\sqrt{a+b\,\mathrm{Tanh}[x]^2}\Big]+\sqrt{a+b}\;\mathrm{Log}\Big[a+b\,\mathrm{Tanh}[x]+\sqrt{a+b}\;\sqrt{a+b\,\mathrm{Tanh}[x]^2}\Big]\right)$$

Problem 214: Result more than twice size of optimal antiderivative.

$$\int \mathrm{Coth}[x] \sqrt{a + b\,\mathrm{Tanh}[x]^2}\, dx$$

Optimal (type 3, 56 leaves, 7 steps):

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

Result (type 3, 124 leaves):

$$-\left(\left(\mathrm{Cosh}[x]\left(\sqrt{a}\ \mathrm{ArcTanh}\left[\frac{\sqrt{2}\sqrt{a}\ \mathrm{Cosh}[x]}{\sqrt{a - b + (a+b)\,\mathrm{Cosh}[2x]}}\right] - \sqrt{a+b}\ \mathrm{Log}\left[\sqrt{2}\sqrt{a+b}\ \mathrm{Cosh}[x] + \sqrt{a - b + (a+b)\,\mathrm{Cosh}[2x]}\right]\right)\right.\right.$$
$$\left.\left.\sqrt{(a - b + (a+b)\,\mathrm{Cosh}[2x])\,\mathrm{Sech}[x]^2}\right) \Big/ \left(\sqrt{a - b + (a+b)\,\mathrm{Cosh}[2x]}\right)\right)$$

Problem 215: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \mathrm{Coth}[x]^2 \sqrt{a + b\,\mathrm{Tanh}[x]^2}\, dx$$

Optimal (type 3, 48 leaves, 5 steps):

$$\sqrt{a+b}\ \mathrm{ArcTanh}\left[\frac{\sqrt{a+b}\ \mathrm{Tanh}[x]}{\sqrt{a + b\,\mathrm{Tanh}[x]^2}}\right] - \mathrm{Coth}[x]\sqrt{a + b\,\mathrm{Tanh}[x]^2}$$

Result (type 4, 192 leaves):

$$-\left(\left(\left(\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\text{Csch}[x]^2-\sqrt{2}\,(a+b)\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]+\right.\right.\right.$$

$$\left.\sqrt{2}\,a\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\,\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\right)$$

$$\left.\left.\text{Tanh}[x]\right)\Big/\left(\sqrt{2}\,\sqrt{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Sech}[x]^2}\right)\right)$$

Problem 216: Result more than twice size of optimal antiderivative.

$$\int \text{Coth}[x]^3\sqrt{a+b\,\text{Tanh}[x]^2}\,dx$$

Optimal (type 3, 83 leaves, 8 steps):

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

Result (type 3, 864 leaves):

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

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

$$\text{Log}\left[a+2\,b+a\,\text{Tanh}\left[\frac{x}{2}\right]^2+\sqrt{a}\sqrt{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right]+\text{Log}\left[a+a\,\text{Tanh}\left[\frac{x}{2}\right]^2+2\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+\right.$$

$$\sqrt{a}\ \sqrt{4\,b\,\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2+a\,\Big(1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\ \Big]\Big)\ \Big(-1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)\ \Big(1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)\ \sqrt{\frac{4\,b\,\mathrm{Tanh}\big[\frac{x}{2}\big]^2+a\,\big(1+\mathrm{Tanh}\big[\frac{x}{2}\big]^2\big)^2}{\big(-1+\mathrm{Tanh}\big[\frac{x}{2}\big]^2\big)^2}}\ \Big/$$

$$\Big(4\,\sqrt{a}\ \sqrt{a-b+(a+b)\,\mathrm{Cosh}[2\,x]}\ \sqrt{\Big(1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\ \sqrt{4\,b\,\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2+a\,\Big(1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\ \Big)+\frac{1}{\sqrt{a-b+(a+b)\,\mathrm{Cosh}[2\,x]}}$$

$$3\,(a+b)\,\sqrt{1+\mathrm{Cosh}[2\,x]}\ \sqrt{\frac{a-b+(a+b)\,\mathrm{Cosh}[2\,x]}{1+\mathrm{Cosh}[2\,x]}}\ \Bigg(\Bigg(4\,\mathrm{Cosh}[x]^2\,\sqrt{-2\,b+a\,(1+\mathrm{Cosh}[2\,x])+b\,(1+\mathrm{Cosh}[2\,x])}$$

$$\mathrm{Coth}[x]\,\Bigg(-\frac{\mathrm{ArcTanh}\Big[\frac{\sqrt{a}\ \sqrt{1+\mathrm{Cosh}[2\,x]}}{\sqrt{b\,(-1+\mathrm{Cosh}[2\,x])+a\,(1+\mathrm{Cosh}[2\,x])}}\Big]}{\sqrt{a}}+\frac{1}{\sqrt{a+b}}\mathrm{Log}\Big[a\,\sqrt{1+\mathrm{Cosh}[2\,x]}\ +b\,\sqrt{1+\mathrm{Cosh}[2\,x]}\ +\sqrt{a+b}$$

$$\sqrt{b\,(-1+\mathrm{Cosh}[2\,x])+a\,(1+\mathrm{Cosh}[2\,x])}\ \Big]\Bigg)\ \mathrm{Sinh}[2\,x]\Bigg)\Big/\ \Big(3\,(1+\mathrm{Cosh}[2\,x])^2\,\sqrt{a-b+(a+b)\,\mathrm{Cosh}[2\,x]}\Big)-$$

$$\Bigg((1+\mathrm{Cosh}[x])\,\sqrt{\frac{1+\mathrm{Cosh}[2\,x]}{(1+\mathrm{Cosh}[x])^2}}\ \Bigg(-\mathrm{Log}\Big[\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big]+\mathrm{Log}\Big[a+2\,b+a\,\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2+\sqrt{a}\ \sqrt{4\,b\,\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2+a\,\Big(1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\ \Big]+$$

$$\mathrm{Log}\Big[a+a\,\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2+2\,b\,\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2+\sqrt{a}\ \sqrt{4\,b\,\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2+a\,\Big(1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\ \Big]\Bigg)\ \Big(-1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)\ \Big(1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)$$

$$\sqrt{\frac{4\,b\,\mathrm{Tanh}\big[\frac{x}{2}\big]^2+a\,\big(1+\mathrm{Tanh}\big[\frac{x}{2}\big]^2\big)^2}{\big(-1+\mathrm{Tanh}\big[\frac{x}{2}\big]^2\big)^2}}\ \Big/\ \Big(4\,\sqrt{a}\ \sqrt{1+\mathrm{Cosh}[2\,x]}\ \sqrt{\Big(1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\ \sqrt{4\,b\,\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2+a\,\Big(1+\mathrm{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\ \Big)\Bigg)\Bigg)$$

Problem 217: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \mathrm{Coth}[x]^4 \sqrt{a+b\,\mathrm{Tanh}[x]^2}\, dx$$

Optimal (type 3, 78 leaves, 6 steps):

$$\sqrt{a+b}\,\mathrm{ArcTanh}\left[\frac{\sqrt{a+b}\,\mathrm{Tanh}[x]}{\sqrt{a+b\,\mathrm{Tanh}[x]^2}}\right]-\frac{(3a+b)\,\mathrm{Coth}[x]\,\sqrt{a+b\,\mathrm{Tanh}[x]^2}}{3a}-\frac{1}{3}\,\mathrm{Coth}[x]^3\,\sqrt{a+b\,\mathrm{Tanh}[x]^2}$$

Result (type 4, 558 leaves):

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

$$(a+b)\left(-\left(\left(b\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\right.\right.\right.$$

$$\left.\left.\text{Csch}[2x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\text{Sinh}[x]^4\right)\Big/\left(a\,(a-b+(a+b)\,\text{Cosh}[2x])\right)\right)-$$

$$\frac{1}{\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}}4\,i\,b\sqrt{1+\text{Cosh}[2x]}\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}$$

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

$$\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\text{Sinh}[x]^4\right)\Big/\left(4a\sqrt{1+\text{Cosh}[2x]}\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\right)\right)+$$

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

$$\left.\left.\left.\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\text{Sinh}[x]^4\right)\Big/\left(2\,(a+b)\sqrt{1+\text{Cosh}[2x]}\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\right)\right)\right)$$

Problem 218: Result more than twice size of optimal antiderivative.

$$\int \text{Coth}[x]^5\sqrt{a+b\,\text{Tanh}[x]^2}\,dx$$

Optimal (type 3, 121 leaves, 9 steps):

$$-\frac{\left(8a^2+4ab-b^2\right)\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a}}\right]}{8a^{3/2}}+\sqrt{a+b}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a+b}}\right]-\frac{(4a+b)\,\text{Coth}[x]^2\sqrt{a+b\,\text{Tanh}[x]^2}}{8a}-\frac{1}{4}\text{Coth}[x]^4\sqrt{a+b\,\text{Tanh}[x]^2}$$

Result (type 3, 911 leaves):

$$\sqrt{\frac{a-b+a\,\text{Cosh}[2x]+b\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\left(-\frac{6a+b}{8a}+\frac{(-8a-b)\,\text{Csch}[x]^2}{8a}-\frac{\text{Csch}[x]^4}{4}\right)+$$

$$\frac{1}{4a}\Bigg(\Bigg(\left(6a^2+2ab-b^2\right)(1+\text{Cosh}[x])\sqrt{\frac{1+\text{Cosh}[2x]}{(1+\text{Cosh}[x])^2}}\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}$$

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

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

$$\left(4\sqrt{a}\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\sqrt{\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\sqrt{4b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right)+\frac{1}{\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}}$$

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

$$\text{Coth}[x]\Bigg(-\frac{\text{ArcTanh}\left[\frac{\sqrt{a}\sqrt{1+\text{Cosh}[2x]}}{\sqrt{b\,(-1+\text{Cosh}[2x])+a\,(1+\text{Cosh}[2x])}}\right]}{\sqrt{a}}+\frac{1}{\sqrt{a+b}}\text{Log}\left[a\sqrt{1+\text{Cosh}[2x]}+b\sqrt{1+\text{Cosh}[2x]}+\sqrt{a+b}\right.$$

$$\left.\left.\sqrt{b\,(-1+\operatorname{Cosh}[2\,x])+a\,(1+\operatorname{Cosh}[2\,x])}\,\right]\right)\operatorname{Sinh}[2\,x]\Bigg)\Big/\left(3\,(1+\operatorname{Cosh}[2\,x])^2\sqrt{a-b+(a+b)\operatorname{Cosh}[2\,x]}\right)-$$

$$\left((1+\operatorname{Cosh}[x])\sqrt{\frac{1+\operatorname{Cosh}[2\,x]}{(1+\operatorname{Cosh}[x])^2}}\left(-\operatorname{Log}\left[\operatorname{Tanh}\left[\frac{x}{2}\right]^2\right]+\operatorname{Log}\left[a+2\,b+a\operatorname{Tanh}\left[\frac{x}{2}\right]^2+\sqrt{a}\sqrt{4\,b\operatorname{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\operatorname{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\right]+\right.\right.$$

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

$$\left.\left.\sqrt{\frac{4\,b\operatorname{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\operatorname{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\operatorname{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\right)\middle/\left(4\sqrt{a}\sqrt{1+\operatorname{Cosh}[2\,x]}\sqrt{\left(1+\operatorname{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\sqrt{4\,b\operatorname{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\operatorname{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right)\right)\right)$$

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

$$\int \operatorname{Tanh}[x]^3\left(a+b\operatorname{Tanh}[x]^2\right)^{3/2}dx$$

Optimal (type 3, 82 leaves, 7 steps):

$$(a+b)^{3/2}\operatorname{ArcTanh}\left[\frac{\sqrt{a+b\operatorname{Tanh}[x]^2}}{\sqrt{a+b}}\right]-(a+b)\sqrt{a+b\operatorname{Tanh}[x]^2}-\frac{1}{3}\left(a+b\operatorname{Tanh}[x]^2\right)^{3/2}-\frac{\left(a+b\operatorname{Tanh}[x]^2\right)^{5/2}}{5\,b}$$

Result (type 3, 184 leaves):

$$\frac{1}{15\sqrt{2}}\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2x]\right)\text{Sech}[x]^2}\left(-26\,a-\frac{3\,a^2}{b}-23\,b-\right.$$

$$\left(15\sqrt{2}\,(a+b)^{3/2}\,\text{Cosh}[x]\left(\text{Log}\left[-\text{Sech}\left[\frac{x}{2}\right]^2\right]-\text{Log}\left[a+b+\frac{\sqrt{a+b}\,\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2x]\right)\text{Sech}\left[\frac{x}{2}\right]^4}}{\sqrt{2}}+(a+b)\,\text{Tanh}\left[\frac{x}{2}\right]^2\right]\right)\text{Sech}\left[\frac{x}{2}\right]^2\right)\Big/$$

$$\left.\left(\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2x]\right)\text{Sech}\left[\frac{x}{2}\right]^4}\right)+(6\,a+11\,b)\,\text{Sech}[x]^2-3\,b\,\text{Sech}[x]^4\right)$$

Problem 220: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \text{Tanh}[x]^2\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}dx$$

Optimal (type 3, 123 leaves, 8 steps):

$$-\frac{\left(3\,a^2+12\,a\,b+8\,b^2\right)\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\right]}{8\sqrt{b}}+(a+b)^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{a+b}\,\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\right]-$$

$$\frac{1}{8}(5\,a+4\,b)\,\text{Tanh}[x]\,\sqrt{a+b\,\text{Tanh}[x]^2}-\frac{1}{4}\,b\,\text{Tanh}[x]^3\,\sqrt{a+b\,\text{Tanh}[x]^2}$$

Result (type 4, 584 leaves):

$$\frac{1}{4}\left(-\left(\left(\left(b\left(a^2-4ab-4b^2\right)\sqrt{\frac{a-b+(a+b)\,\mathrm{Cosh}[2x]}{1+\mathrm{Cosh}[2x]}}\sqrt{-\frac{a\,\mathrm{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\mathrm{Cosh}[2x])\,\mathrm{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\mathrm{Cosh}[2x])\,\mathrm{Csch}[x]^2}{b}}\right.\right.\right.\right.$$

$$\left.\left.\mathrm{Csch}[2x]\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\mathrm{Cosh}[2x])\,\mathrm{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\mathrm{Sinh}[x]^4\right)\Big/\left(a\left(a-b+(a+b)\,\mathrm{Cosh}[2x]\right)\right)\right)-$$

$$\frac{1}{\sqrt{a-b+(a+b)\,\mathrm{Cosh}[2x]}}4\,\mathbb{i}\,b\left(4a^2+8ab+4b^2\right)\sqrt{1+\mathrm{Cosh}[2x]}\sqrt{\frac{a-b+(a+b)\,\mathrm{Cosh}[2x]}{1+\mathrm{Cosh}[2x]}}$$

$$\left(-\left(\left(\mathbb{i}\sqrt{-\frac{a\,\mathrm{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\mathrm{Cosh}[2x])\,\mathrm{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\mathrm{Cosh}[2x])\,\mathrm{Csch}[x]^2}{b}}\,\mathrm{Csch}[2x]\right.\right.\right.$$

$$\left.\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\mathrm{Cosh}[2x])\,\mathrm{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\mathrm{Sinh}[x]^4\right)\Big/\left(4a\sqrt{1+\mathrm{Cosh}[2x]}\sqrt{a-b+(a+b)\,\mathrm{Cosh}[2x]}\right)\right)+$$

$$\left(\mathbb{i}\sqrt{-\frac{a\,\mathrm{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\mathrm{Cosh}[2x])\,\mathrm{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\mathrm{Cosh}[2x])\,\mathrm{Csch}[x]^2}{b}}\,\mathrm{Csch}[2x]\right.$$

$$\left.\left.\left.\mathrm{EllipticPi}\left[\frac{b}{a+b},\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\mathrm{Cosh}[2x])\,\mathrm{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\mathrm{Sinh}[x]^4\right)\Big/\left(2(a+b)\sqrt{1+\mathrm{Cosh}[2x]}\sqrt{a-b+(a+b)\,\mathrm{Cosh}[2x]}\right)\right)\right)+$$

$$\sqrt{\frac{a-b+a\,\mathrm{Cosh}[2x]+b\,\mathrm{Cosh}[2x]}{1+\mathrm{Cosh}[2x]}}\left(\frac{1}{8}\mathrm{Sech}[x]\left(-5a\,\mathrm{Sinh}[x]-6b\,\mathrm{Sinh}[x]\right)+\frac{1}{4}b\,\mathrm{Sech}[x]^2\,\mathrm{Tanh}[x]\right)$$

Problem 221: Result more than twice size of optimal antiderivative.

$$\int \text{Tanh}[x] \left(a + b\,\text{Tanh}[x]^2\right)^{3/2} dx$$

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

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

Result (type 3, 164 leaves):

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

Problem 223: Result more than twice size of optimal antiderivative.

$$\int \text{Coth}[x] \left(a + b\,\text{Tanh}[x]^2\right)^{3/2} dx$$

Optimal (type 3, 71 leaves, 8 steps):

$$-a^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a}}\right] + (a+b)^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a+b}}\right] - b\sqrt{a+b\,\text{Tanh}[x]^2}$$

Result (type 3, 872 leaves):

$$-b\sqrt{\frac{a-b+a\,\text{Cosh}[2x]+b\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}+$$

$$\frac{1}{2}\Bigg(\Bigg((3a^2-2ab-b^2)\,(1+\text{Cosh}[x])\sqrt{\frac{1+\text{Cosh}[2x]}{(1+\text{Cosh}[x])^2}}\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\Bigg(-\text{Log}\Big[\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big]+\text{Log}\Big[a+2b+a\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+$$

$$\sqrt{a}\sqrt{4b\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+a\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\Big]+\text{Log}\Big[a+a\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+2b\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+\sqrt{a}\sqrt{4b\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+a\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\Big]\Bigg)$$

$$\Big(-1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)\sqrt{\frac{4b\,\text{Tanh}[\frac{x}{2}]^2+a\,(1+\text{Tanh}[\frac{x}{2}]^2)^2}{(-1+\text{Tanh}[\frac{x}{2}]^2)^2}}\Bigg)\Bigg/$$

$$\Bigg(4\sqrt{a}\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\sqrt{\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\sqrt{4b\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+a\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\Bigg)+$$

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

$$\Bigg(\Bigg(4\,\text{Cosh}[x]^2\sqrt{-2b+a\,(1+\text{Cosh}[2x])+b\,(1+\text{Cosh}[2x])}\;\text{Coth}[x]\Bigg(-\frac{\text{ArcTanh}\Big[\frac{\sqrt{a}\sqrt{1+\text{Cosh}[2x]}}{\sqrt{b\,(-1+\text{Cosh}[2x])+a\,(1+\text{Cosh}[2x])}}\Big]}{\sqrt{a}}+$$

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

$$\text{Sinh}[2x]\Bigg)\Bigg/\Big(3\,(1+\text{Cosh}[2x])^2\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\Big)-$$

$$\Bigg((1+\text{Cosh}[x])\sqrt{\frac{1+\text{Cosh}[2\,x]}{(1+\text{Cosh}[x])^2}}\,\Bigg(-\text{Log}\Big[\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big]+\text{Log}\Big[a+2\,b+a\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+\sqrt{a}\,\sqrt{4\,b\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+a\,\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\,\Big]+$$

$$\text{Log}\Big[a+a\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+2\,b\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+\sqrt{a}\,\sqrt{4\,b\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+a\,\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\,\Big]\Bigg)\Big(-1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)$$

$$\sqrt{\frac{4\,b\,\text{Tanh}[\frac{x}{2}]^2+a\,(1+\text{Tanh}[\frac{x}{2}]^2)^2}{(-1+\text{Tanh}[\frac{x}{2}]^2)^2}}\Bigg/\Bigg(4\,\sqrt{a}\,\sqrt{1+\text{Cosh}[2\,x]}\,\sqrt{\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\,\sqrt{4\,b\,\text{Tanh}\Big[\frac{x}{2}\Big]^2+a\,\Big(1+\text{Tanh}\Big[\frac{x}{2}\Big]^2\Big)^2}\,\Bigg)\Bigg)$$

Problem 224: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \text{Coth}[x]^2\,\big(a+b\,\text{Tanh}[x]^2\big)^{3/2}\,dx$$

Optimal (type 3, 77 leaves, 7 steps):

$$-b^{3/2}\,\text{ArcTanh}\Big[\frac{\sqrt{b}\,\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\Big]+(a+b)^{3/2}\,\text{ArcTanh}\Big[\frac{\sqrt{a+b}\,\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\Big]-a\,\text{Coth}[x]\,\sqrt{a+b\,\text{Tanh}[x]^2}$$

Result (type 4, 197 leaves):

$$-\Bigg(\Bigg(a\,(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2-\sqrt{2}\,(a+2\,b)\,\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Big],1\Big]+\sqrt{2}\,(a+b)\,\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}$$

$$\text{EllipticPi}\Big[\frac{b}{a+b},\text{ArcSin}\Big[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Big],1\Big]\Bigg)\,\text{Tanh}[x]\Bigg)\Bigg/\Big(\sqrt{2}\,\sqrt{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Sech}[x]^2}\Big)$$

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

$$\int \frac{\text{Tanh}[x]^5}{\sqrt{a+b\,\text{Tanh}[x]^2}}\,dx$$

Optimal (type 3, 70 leaves, 6 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a+b}}\right]}{\sqrt{a+b}}+\frac{(a-b)\sqrt{a+b\,\text{Tanh}[x]^2}}{b^2}-\frac{\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}{3\,b^2}$$

Result (type 3, 313 leaves):

$$\sqrt{\frac{a-b+a\,\text{Cosh}[2\,x]+b\,\text{Cosh}[2\,x]}{1+\text{Cosh}[2\,x]}}\left(\frac{2\,(a-2\,b)}{3\,b^2}+\frac{\text{Sech}[x]^2}{3\,b}\right)+\left((1+\text{Cosh}[x])\sqrt{\frac{1+\text{Cosh}[2\,x]}{(1+\text{Cosh}[x])^2}}\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2\,x]}{1+\text{Cosh}[2\,x]}}\right.$$
$$\left(\text{Log}\left[-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right]-\text{Log}\left[a+b+a\,\text{Tanh}\left[\frac{x}{2}\right]^2+b\,\text{Tanh}\left[\frac{x}{2}\right]^2+\sqrt{a+b}\sqrt{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right]\right)$$
$$\left.\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\sqrt{\frac{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\right)\Big/$$
$$\left(\sqrt{a+b}\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}\sqrt{\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\sqrt{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right)$$

Problem 230: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Tanh}[x]^4}{\sqrt{a+b\,\text{Tanh}[x]^2}}\,dx$$

Optimal (type 3, 88 leaves, 7 steps):

$$\frac{(a-2\,b)\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\right]}{2\,b^{3/2}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b}\,\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\right]}{\sqrt{a+b}}-\frac{\text{Tanh}[x]\sqrt{a+b\,\text{Tanh}[x]^2}}{2\,b}$$

Result (type 4, 542 leaves):

$$\frac{1}{b}\Bigg(-\Bigg(\Bigg(\Bigg((a-b)\,b\,\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2\,x]}{1+\text{Cosh}[2\,x]}}\,\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\,\sqrt{-\frac{a\,(1+\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\,\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}$$

$$\text{Csch}[2\,x]\,\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Bigg],1\Bigg]\,\text{Sinh}[x]^4\Bigg)\Bigg/\big(a\,(a-b+(a+b)\,\text{Cosh}[2\,x])\big)\Bigg)-$$

$$\frac{1}{\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}}\,4\,i\,b^2\,\sqrt{1+\text{Cosh}[2\,x]}\,\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2\,x]}{1+\text{Cosh}[2\,x]}}$$

$$\Bigg(-\Bigg(\Bigg(i\,\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\,\sqrt{-\frac{a\,(1+\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\,\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\,\text{Csch}[2\,x]$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Bigg],1\Bigg]\,\text{Sinh}[x]^4\Bigg)\Bigg/\Big(4\,a\,\sqrt{1+\text{Cosh}[2\,x]}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}\Big)\Bigg)+$$

$$\Bigg(i\,\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\,\sqrt{-\frac{a\,(1+\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\,\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\,\text{Csch}[2\,x]$$

$$\text{EllipticPi}\Bigg[\frac{b}{a+b},\text{ArcSin}\Bigg[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Bigg],1\Bigg]\,\text{Sinh}[x]^4\Bigg)\Bigg/$$

$$\left.\left.\left(2\,(a+b)\,\sqrt{1+\text{Cosh}[2\,x]}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}\right)\right)\right)-\frac{\sqrt{\frac{a-b+a\,\text{Cosh}[2\,x]+b\,\text{Cosh}[2\,x]}{1+\text{Cosh}[2\,x]}}\,\text{Tanh}[x]}{2\,b}$$

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

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

Optimal (type 3, 47 leaves, 5 steps):

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

Result (type 3, 227 leaves):

$$-\left(\left(\text{Sech}\left[\frac{x}{2}\right]^2\left(4\,b\,\text{Cosh}[x]\,\text{Log}\left[-\text{Sech}\left[\frac{x}{2}\right]^2\right]-4\,b\,\text{Cosh}[x]\,\text{Log}\left[a+b+\frac{\sqrt{a+b}\,\sqrt{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Sech}\left[\frac{x}{2}\right]^4}}{\sqrt{2}}+(a+b)\,\text{Tanh}\left[\frac{x}{2}\right]^2\right]+\right.\right.\right.$$

$$\left.\sqrt{2}\,\sqrt{a+b}\,\sqrt{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Sech}\left[\frac{x}{2}\right]^4}+\sqrt{2}\,\sqrt{a+b}\,\text{Cosh}[x]\,\sqrt{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Sech}\left[\frac{x}{2}\right]^4}\right)$$

$$\left.\left.\sqrt{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Sech}[x]^2}\right)\Big/\left(4\,b\,\sqrt{a+b}\,\sqrt{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Sech}\left[\frac{x}{2}\right]^4}\right)\right)$$

Problem 232: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 60 leaves, 6 steps):

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

Result (type 4, 101 leaves):

$$-\left(\left(a\,\text{Coth}[x]\,\text{EllipticPi}\left[\frac{b}{a+b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],\,1\right]\sqrt{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Sech}[x]^2}\right)\Big/\left(b\,(a+b)\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\right)\right)$$

Problem 233: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 3, 136 leaves):

$$-\left(\left(\text{Cosh}[x]\left(\text{Log}\left[-\text{Sech}\left[\frac{x}{2}\right]^2\right]-\text{Log}\left[a+b+\frac{\sqrt{a+b}\sqrt{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Sech}\left[\frac{x}{2}\right]^4}}{\sqrt{2}}+(a+b)\,\text{Tanh}\left[\frac{x}{2}\right]^2\right]\right)\text{Sech}\left[\frac{x}{2}\right]^2\sqrt{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Sech}[x]^2}\right)\Big/\left(\sqrt{a+b}\sqrt{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Sech}\left[\frac{x}{2}\right]^4}\right)\right)$$

Problem 234: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{a+b\,\text{Tanh}[x]^2}}\,dx$$

Optimal (type 3, 31 leaves, 3 steps):

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

Result (type 3, 83 leaves):

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

Problem 235: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 56 leaves, 7 steps):

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

Result (type 3, 161 leaves):

$$\left(\sqrt{\text{Cosh}[x]^2}\left(-\sqrt{a+b}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\sqrt{1+\text{Cosh}[2x]}}{\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}}\right]+\sqrt{a}\,\text{Log}\left[a\sqrt{1+\text{Cosh}[2x]}+b\sqrt{1+\text{Cosh}[2x]}+\sqrt{a+b}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\right]\right)\right.$$
$$\left.\sqrt{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Sech}[x]^2}\right)\Big/\left(\sqrt{a}\,\sqrt{a+b}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\right)$$

Problem 236: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 51 leaves, 5 steps):

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

Result (type 4, 206 leaves):

$$-\left(\left(\left((a+b)\,\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\,\text{Csch}[x]^2-\sqrt{2}\,a\,(a+b)\,\sqrt{\frac{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\,\text{Csch}[x]^2}{b}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]+\sqrt{2}\,a^2\,\sqrt{\frac{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\,\text{Csch}[x]^2}{b}}\,\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\right)\text{Tanh}[x]\right)\Big/\left(\sqrt{2}\,a\,(a+b)\,\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\,\text{Sech}[x]^2}\right)\right)$$

Problem 237: Result more than twice size of optimal antiderivative.

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

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

$$-\frac{(2a-b)\,\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a}}\right]}{2a^{3/2}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a+b}}\right]}{\sqrt{a+b}}-\frac{\text{Coth}[x]^2\sqrt{a+b\,\text{Tanh}[x]^2}}{2a}$$

Result (type 3, 874 leaves):

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

$$\frac{1}{2a}\Bigg(\Bigg((3a-2b)\,(1+\text{Cosh}[x])\sqrt{\frac{1+\text{Cosh}[2x]}{(1+\text{Cosh}[x])^2}}\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\Bigg(-\text{Log}\left[\text{Tanh}\left[\frac{x}{2}\right]^2\right]+\text{Log}\Big[a+2b+a\,\text{Tanh}\left[\frac{x}{2}\right]^2+$$

$$\sqrt{a}\sqrt{4b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\Big]+\text{Log}\Big[a+a\,\text{Tanh}\left[\frac{x}{2}\right]^2+2b\,\text{Tanh}\left[\frac{x}{2}\right]^2+\sqrt{a}\sqrt{4b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\Big]\Bigg)$$

$$\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\sqrt{\frac{4b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\Bigg)\Bigg/\Bigg(4\sqrt{a}\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}$$

$$\sqrt{\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\sqrt{4b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\Bigg)+$$

$$\frac{1}{\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}}3a\sqrt{1+\text{Cosh}[2x]}\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\Bigg(\Bigg(4\,\text{Cosh}[x]^2\sqrt{-2b+a\,(1+\text{Cosh}[2x])+b\,(1+\text{Cosh}[2x])}$$

$$\text{Coth}[x]\left(-\frac{\text{ArcTanh}\left[\frac{\sqrt{a}\sqrt{1+\text{Cosh}[2x]}}{\sqrt{b\,(-1+\text{Cosh}[2x])+a\,(1+\text{Cosh}[2x])}}\right]}{\sqrt{a}}+\frac{1}{\sqrt{a+b}}\text{Log}\Big[a\sqrt{1+\text{Cosh}[2x]}+b\sqrt{1+\text{Cosh}[2x]}+\sqrt{a+b}\right.$$

$$\left.\sqrt{b\,(-1+\text{Cosh}[2x])+a\,(1+\text{Cosh}[2x])}\Big]\right)\Bigg)\text{Sinh}[2x]\Bigg)\Bigg/\left(3\,(1+\text{Cosh}[2x])^2\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\right)-$$

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

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

$$\left.\left.\sqrt{\frac{4b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\right)\middle/\left(4\sqrt{a}\sqrt{1+\text{Cosh}[2x]}\sqrt{\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\sqrt{4b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right)\right)$$

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

$$\int\frac{\text{Tanh}[x]^5}{\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 72 leaves, 6 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a+b}}\right]}{(a+b)^{3/2}}-\frac{a^2}{b^2(a+b)\sqrt{a+b\,\text{Tanh}[x]^2}}-\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{b^2}$$

Result (type 3, 200 leaves):

$$\frac{1}{\sqrt{2}}\left(\frac{-2a^2+b^2-\left(2a^2+2ab+b^2\right)\text{Cosh}[2x]}{b^2(a+b)\left(a-b+(a+b)\text{Cosh}[2x]\right)}-\right.$$

$$\left(\sqrt{2}\,\text{Cosh}[x]\left(\text{Log}\left[-\text{Sech}\left[\frac{x}{2}\right]^2\right]-\text{Log}\left[a+b+\frac{\sqrt{a+b}\sqrt{\left(a-b+(a+b)\text{Cosh}[2x]\right)\text{Sech}\left[\frac{x}{2}\right]^4}}{\sqrt{2}}+(a+b)\,\text{Tanh}\left[\frac{x}{2}\right]^2\right]\right)\text{Sech}\left[\frac{x}{2}\right]^2\right)\Big/$$

$$\left.\left((a+b)^{3/2}\sqrt{\left(a-b+(a+b)\text{Cosh}[2x]\right)\text{Sech}\left[\frac{x}{2}\right]^4}\right)\right)\sqrt{\left(a-b+(a+b)\text{Cosh}[2x]\right)\text{Sech}[x]^2}$$

Problem 239: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\tanh[x]^4}{\left(a+b\tanh[x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 84 leaves, 7 steps):

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,\tanh[x]}{\sqrt{a+b\tanh[x]^2}}\right]}{b^{3/2}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b}\,\tanh[x]}{\sqrt{a+b\tanh[x]^2}}\right]}{(a+b)^{3/2}}+\frac{a\tanh[x]}{b\,(a+b)\,\sqrt{a+b\tanh[x]^2}}$$

Result (type 4, 188 leaves):

$$-\left(\left(a\left(-2a-2b+\sqrt{2}\,(a+b)\sqrt{\frac{(a-b+(a+b)\cosh[2x])\,\text{Csch}[x]^2}{b}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\cosh[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]+\right.\right.\right.$$

$$\left.\sqrt{2}\,b\sqrt{\frac{(a-b+(a+b)\cosh[2x])\,\text{Csch}[x]^2}{b}}\;\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\cosh[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\right)$$

$$\left.\left.\tanh[x]\right)\Big/\left(\sqrt{2}\,b\,(a+b)^2\sqrt{(a-b+(a+b)\cosh[2x])\,\text{Sech}[x]^2}\right)\right)$$

Problem 240: Result more than twice size of optimal antiderivative.

$$\int \frac{\tanh[x]^3}{\left(a+b\tanh[x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 52 leaves, 5 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\tanh[x]^2}}{\sqrt{a+b}}\right]}{(a+b)^{3/2}}+\frac{a}{b\,(a+b)\,\sqrt{a+b\tanh[x]^2}}$$

Result (type 3, 178 leaves):

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

Problem 241: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\text{Tanh}[x]^2}{\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 53 leaves, 4 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b}\,\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\right]}{(a+b)^{3/2}}-\frac{\text{Tanh}[x]}{(a+b)\,\sqrt{a+b\,\text{Tanh}[x]^2}}$$

Result (type 4, 182 leaves):

$$\left(\left(\sqrt{2}\,(a+b)\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]-\right.\right.$$

$$\left.\left.2\left(a+b+\frac{a\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\;\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]}{\sqrt{2}}\right)\right)\right.$$

$$\left.\text{Tanh}[x]\right)\Big/\left(\sqrt{2}\,(a+b)^2\sqrt{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Sech}[x]^2}\right)$$

Problem 242: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Tanh}[x]}{\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 49 leaves, 5 steps):

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

Result (type 3, 174 leaves):

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

$$\left(\sqrt{2}\,\text{Cosh}[x]\,\left(\text{Log}\left[-\text{Sech}\left[\frac{x}{2}\right]^2\right]-\text{Log}\left[a+b+\frac{\sqrt{a+b}\,\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\,\text{Sech}\left[\frac{x}{2}\right]^4}}{\sqrt{2}}+(a+b)\,\text{Tanh}\left[\frac{x}{2}\right]^2\right]\right)\,\text{Sech}\left[\frac{x}{2}\right]^2\right)\Big/$$

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

Problem 244: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Coth}[x]}{\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 78 leaves, 8 steps):

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a}}\right]}{a^{3/2}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a+b}}\right]}{(a+b)^{3/2}}+\frac{b}{a\,(a+b)\,\sqrt{a+b\,\text{Tanh}[x]^2}}$$

Result (type 3, 903 leaves):

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

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

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

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

$$\left.\sqrt{\frac{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\,\right)\Bigg/\left(4\,\sqrt{a}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}\,\sqrt{\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\sqrt{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\right)+$$

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

$$\text{Coth}[x]\left(-\frac{\text{ArcTanh}\left[\frac{\sqrt{a}\,\sqrt{1+\text{Cosh}[2\,x]}}{\sqrt{b\,(-1+\text{Cosh}[2\,x])+a\,(1+\text{Cosh}[2\,x])}}\right]}{\sqrt{a}}+\frac{1}{\sqrt{a+b}}\text{Log}\left[a\,\sqrt{1+\text{Cosh}[2\,x]}+b\,\sqrt{1+\text{Cosh}[2\,x]}+\sqrt{a+b}\right.\right.$$

$$\left.\left.\left.\sqrt{b\,(-1+\text{Cosh}[2\,x])+a\,(1+\text{Cosh}[2\,x])}\,\right]\right)\text{Sinh}[2\,x]\right)\Bigg/\left(3\,(1+\text{Cosh}[2\,x])^2\,\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}\right)-$$

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

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

$$\left.\left.\sqrt{\frac{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\,\right)\Bigg/\left(4\,\sqrt{a}\,\sqrt{1+\text{Cosh}[2\,x]}\,\sqrt{\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\sqrt{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\,\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\right)\right)\right)$$

Problem 245: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Coth}[x]^2}{\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 85 leaves, 6 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b}\,\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\right]}{(a+b)^{3/2}}+\frac{b\,\text{Coth}[x]}{a\,(a+b)\,\sqrt{a+b\,\text{Tanh}[x]^2}}-\frac{(a+2\,b)\,\text{Coth}[x]\,\sqrt{a+b\,\text{Tanh}[x]^2}}{a^2\,(a+b)}$$

Result (type 4, 230 leaves):

$$-\left(\left(\left((a+b)\,\left(a^2-2\,b^2+\left(a^2+2\,a\,b+2\,b^2\right)\,\text{Cosh}[2\,x]\right)\,\text{Csch}[x]^2-\right.\right.\right.$$

$$\sqrt{2}\,a^2\,(a+b)\,\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]+$$

$$\left.\sqrt{2}\,a^3\,\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\,\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\right)$$

$$\left.\left.\text{Sech}[x]^2\,\text{Sinh}[2\,x]\right)\Big/\left(2\,\sqrt{2}\,a^2\,(a+b)^2\,\sqrt{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Sech}[x]^2}\right)\right)$$

Problem 246: Result unnecessarily involves higher level functions.

$$\int \frac{\text{Tanh}[x]^6}{\left(a+b\,\text{Tanh}[x]^2\right)^{5/2}}\,dx$$

Optimal (type 3, 118 leaves, 8 steps):

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\ \text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\right]}{b^{5/2}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b}\ \text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\right]}{(a+b)^{5/2}}+\frac{a\,\text{Tanh}[x]^3}{3\,b\,(a+b)\,\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}+\frac{a\,(a+2\,b)\,\text{Tanh}[x]}{b^2\,(a+b)^2\,\sqrt{a+b\,\text{Tanh}[x]^2}}$$

Result (type 4, 231 leaves):

$$\frac{1}{3\sqrt{2}\,b^2\,(a+b)^3}\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\text{Sech}[x]^2}\left(-\left(\left(3\sqrt{2}\,a\,\text{Coth}[x]\left(\left(a^2+3\,a\,b+2\,b^2\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]+b^2\,\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\right)\right)\Big/\left(b\sqrt{\frac{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\text{Csch}[x]^2}{b}}\right)\right)+\frac{a\,(a+b)\left(3\,a^2+2\,a\,b-7\,b^2+\left(3\,a^2+10\,a\,b+7\,b^2\right)\text{Cosh}[2\,x]\right)\text{Sinh}[2\,x]}{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)^2}\right)$$

Problem 247: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Tanh}[x]^5}{\left(a+b\,\text{Tanh}[x]^2\right)^{5/2}}\,dx$$

Optimal (type 3, 84 leaves, 6 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a+b}}\right]}{(a+b)^{5/2}}-\frac{a^2}{3\,b^2\,(a+b)\,\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}+\frac{a\,(a+2\,b)}{b^2\,(a+b)^2\,\sqrt{a+b\,\text{Tanh}[x]^2}}$$

Result (type 3, 376 leaves):

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

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

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

$$\left.\sqrt{\frac{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\right)\Bigg/\left((a+b)^{5/2}\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}\,\sqrt{\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\sqrt{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right)$$

Problem 248: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\text{Tanh}[x]^4}{\left(a+b\,\text{Tanh}[x]^2\right)^{5/2}}\,dx$$

Optimal (type 3, 90 leaves, 6 steps):

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

Result (type 4, 595 leaves):

$$\frac{1}{(a+b)^2}$$

$$\Bigg(-\Bigg(\Bigg(b\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\,\text{Csch}[2x]\,\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Big],1\Big]\,\text{Sinh}[x]^4\Bigg)\Big/\big(a\,(a-b+(a+b)\,\text{Cosh}[2x])\big)\Bigg)-\frac{1}{\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}}\,4\,i\,b\sqrt{1+\text{Cosh}[2x]}$$

$$\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\Bigg(-\Bigg(\Bigg(i\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}$$

$$\text{Csch}[2x]\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Big],1\Big]\,\text{Sinh}[x]^4\Bigg)\Big/\Big(4\,a\sqrt{1+\text{Cosh}[2x]}\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\Big)\Bigg)+$$

$$\Bigg(i\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\,\text{Csch}[2x]$$

$$\text{EllipticPi}\Big[\frac{b}{a+b},\text{ArcSin}\Big[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Big],1\Big]\,\text{Sinh}[x]^4\Bigg)\Big/\Big(2\,(a+b)\sqrt{1+\text{Cosh}[2x]}\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\Big)\Bigg)\Bigg)+$$

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

Problem 249: Result more than twice size of optimal antiderivative.

$$\int \frac{\tanh[x]^3}{\left(a+b\tanh[x]^2\right)^{5/2}}\,dx$$

Optimal (type 3, 74 leaves, 6 steps):

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

Result (type 3, 372 leaves):

$$\sqrt{\frac{a-b+a\cosh[2x]+b\cosh[2x]}{1+\cosh[2x]}}\left(\frac{a-3b}{3b\,(a+b)^3}+\frac{4ab}{3\,(a+b)^3\,(a-b+a\cosh[2x]+b\cosh[2x])^2}+\frac{2\,(2a-3b)}{3\,(a+b)^3\,(a-b+a\cosh[2x]+b\cosh[2x])}\right)+$$
$$\left((1+\cosh[x])\sqrt{\frac{1+\cosh[2x]}{(1+\cosh[x])^2}}\sqrt{\frac{a-b+(a+b)\cosh[2x]}{1+\cosh[2x]}}\right.$$
$$\left(\text{Log}\left[-1+\tanh\left[\frac{x}{2}\right]^2\right]-\text{Log}\left[a+b+a\tanh\left[\frac{x}{2}\right]^2+b\tanh\left[\frac{x}{2}\right]^2+\sqrt{a+b}\sqrt{4b\tanh\left[\frac{x}{2}\right]^2+a\left(1+\tanh\left[\frac{x}{2}\right]^2\right)^2}\right]\right)\left(-1+\tanh\left[\frac{x}{2}\right]^2\right)\left(1+\tanh\left[\frac{x}{2}\right]^2\right)$$
$$\left.\sqrt{\frac{4b\tanh\left[\frac{x}{2}\right]^2+a\left(1+\tanh\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\tanh\left[\frac{x}{2}\right]^2\right)^2}}\right)\Bigg/\left((a+b)^{5/2}\sqrt{a-b+(a+b)\cosh[2x]}\sqrt{\left(1+\tanh\left[\frac{x}{2}\right]^2\right)^2}\sqrt{4b\tanh\left[\frac{x}{2}\right]^2+a\left(1+\tanh\left[\frac{x}{2}\right]^2\right)^2}\right)$$

Problem 250: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\tanh[x]^2}{\left(a+b\tanh[x]^2\right)^{5/2}}\,dx$$

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

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b}\,\tanh[x]}{\sqrt{a+b\tanh[x]^2}}\right]}{(a+b)^{5/2}}-\frac{\tanh[x]}{3\,(a+b)\,\left(a+b\tanh[x]^2\right)^{3/2}}-\frac{(2a-b)\tanh[x]}{3a\,(a+b)^2\sqrt{a+b\tanh[x]^2}}$$

Result (type 4, 608 leaves):

$$\frac{1}{(a+b)^2}\Bigg(-\Bigg(\Bigg(b\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\,\text{Csch}[2x]\,\text{EllipticF}\Bigg[$$

$$\text{ArcSin}\Bigg[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Bigg],1\Bigg]\,\text{Sinh}[x]^4\Bigg)\Bigg/\Big(a\,\big(a-b+(a+b)\,\text{Cosh}[2x]\big)\Big)\Bigg)-\frac{1}{\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}}\,4\,\mathbb{i}\,b\,\sqrt{1+\text{Cosh}[2x]}$$

$$\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\Bigg(-\Bigg(\Bigg(\mathbb{i}\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}$$

$$\text{Csch}[2x]\,\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Bigg],1\Bigg]\,\text{Sinh}[x]^4\Bigg)\Bigg/\Big(4\,a\,\sqrt{1+\text{Cosh}[2x]}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\Big)\Bigg)+$$

$$\Bigg(\mathbb{i}\sqrt{-\frac{a\,\text{Coth}[x]^2}{b}}\sqrt{-\frac{a\,(1+\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}\,\text{Csch}[2x]$$

$$\text{EllipticPi}\Bigg[\frac{b}{a+b},\text{ArcSin}\Bigg[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\Bigg],1\Bigg]\,\text{Sinh}[x]^4\Bigg)\Bigg/\Big(2\,(a+b)\,\sqrt{1+\text{Cosh}[2x]}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2x]}\Big)\Bigg)\Bigg)+$$

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

Problem 251: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Tanh}[x]}{\left(a+b\,\text{Tanh}[x]^2\right)^{5/2}}\,dx$$

Optimal (type 3, 70 leaves, 6 steps):

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

Result (type 3, 359 leaves):

$$\sqrt{\frac{a-b+a\,\text{Cosh}[2\,x]+b\,\text{Cosh}[2\,x]}{1+\text{Cosh}[2\,x]}}\left(-\frac{4}{3\,(a+b)^3}-\frac{4\,b^2}{3\,(a+b)^3\,(a-b+a\,\text{Cosh}[2\,x]+b\,\text{Cosh}[2\,x])^2}-\frac{10\,b}{3\,(a+b)^3\,(a-b+a\,\text{Cosh}[2\,x]+b\,\text{Cosh}[2\,x])}\right)+$$
$$\left((1+\text{Cosh}[x])\,\sqrt{\frac{1+\text{Cosh}[2\,x]}{(1+\text{Cosh}[x])^2}}\,\sqrt{\frac{a-b+(a+b)\,\text{Cosh}[2\,x]}{1+\text{Cosh}[2\,x]}}\right.$$
$$\left(\text{Log}\left[-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right]-\text{Log}\left[a+b+a\,\text{Tanh}\left[\frac{x}{2}\right]^2+b\,\text{Tanh}\left[\frac{x}{2}\right]^2+\sqrt{a+b}\,\sqrt{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\right]\right)\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)$$
$$\left.\sqrt{\frac{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\right)\Bigg/\left((a+b)^{5/2}\,\sqrt{a-b+(a+b)\,\text{Cosh}[2\,x]}\,\sqrt{\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\sqrt{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right)$$

Problem 253: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Coth}[x]}{\left(a+b\,\text{Tanh}[x]^2\right)^{5/2}}\,dx$$

Optimal (type 3, 108 leaves, 9 steps):

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a}}\right]}{a^{5/2}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Tanh}[x]^2}}{\sqrt{a+b}}\right]}{(a+b)^{5/2}}+\frac{b}{3\,a\,(a+b)\,\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}+\frac{b\,(2\,a+b)}{a^2\,(a+b)^2\,\sqrt{a+b\,\text{Tanh}[x]^2}}$$

Result (type 3, 966 leaves):

$$\sqrt{\frac{a-b+a\,\mathrm{Cosh}[2x]+b\,\mathrm{Cosh}[2x]}{1+\mathrm{Cosh}[2x]}}$$

$$\left(\frac{b\,(7a+3b)}{3a^2\,(a+b)^3}+\frac{4b^3}{3a\,(a+b)^3\,(a-b+a\,\mathrm{Cosh}[2x]+b\,\mathrm{Cosh}[2x])^2}+\frac{2b^2\,(8a+3b)}{3a^2\,(a+b)^3\,(a-b+a\,\mathrm{Cosh}[2x]+b\,\mathrm{Cosh}[2x])}\right)+$$

$$\frac{1}{2a^2\,(a+b)^2}\Bigg(\Bigg((3a^2+8ab+4b^2)\,(1+\mathrm{Cosh}[x])\,\sqrt{\frac{1+\mathrm{Cosh}[2x]}{(1+\mathrm{Cosh}[x])^2}}\,\sqrt{\frac{a-b+(a+b)\,\mathrm{Cosh}[2x]}{1+\mathrm{Cosh}[2x]}}$$

$$\left(-\mathrm{Log}\left[\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right]+\mathrm{Log}\left[a+2b+a\,\mathrm{Tanh}\left[\frac{x}{2}\right]^2+\sqrt{a}\,\sqrt{4b\,\mathrm{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right]+\right.$$

$$\left.\mathrm{Log}\left[a+a\,\mathrm{Tanh}\left[\frac{x}{2}\right]^2+2b\,\mathrm{Tanh}\left[\frac{x}{2}\right]^2+\sqrt{a}\,\sqrt{4b\,\mathrm{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right]\right)\left(-1+\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right)\left(1+\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right)$$

$$\sqrt{\frac{4b\,\mathrm{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\Bigg)\Bigg/\left(4\sqrt{a}\,\sqrt{a-b+(a+b)\,\mathrm{Cosh}[2x]}\,\sqrt{\left(1+\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\sqrt{4b\,\mathrm{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right)+$$

$$\frac{1}{\sqrt{a-b+(a+b)\,\mathrm{Cosh}[2x]}}\,3a^2\,\sqrt{1+\mathrm{Cosh}[2x]}\,\sqrt{\frac{a-b+(a+b)\,\mathrm{Cosh}[2x]}{1+\mathrm{Cosh}[2x]}}\,\Bigg(\Bigg(4\,\mathrm{Cosh}[x]^2\,\sqrt{-2b+a\,(1+\mathrm{Cosh}[2x])+b\,(1+\mathrm{Cosh}[2x])}$$

$$\mathrm{Coth}[x]\left(-\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{a}\,\sqrt{1+\mathrm{Cosh}[2x]}}{\sqrt{b\,(-1+\mathrm{Cosh}[2x])+a\,(1+\mathrm{Cosh}[2x])}}\right]}{\sqrt{a}}+\frac{1}{\sqrt{a+b}}\mathrm{Log}\left[a\,\sqrt{1+\mathrm{Cosh}[2x]}+b\,\sqrt{1+\mathrm{Cosh}[2x]}+\sqrt{a+b}\right.\right.$$

$$\left.\left.\sqrt{b\,(-1+\mathrm{Cosh}[2x])+a\,(1+\mathrm{Cosh}[2x])}\right]\right)\mathrm{Sinh}[2x]\Bigg)\Bigg/\left(3\,(1+\mathrm{Cosh}[2x])^2\,\sqrt{a-b+(a+b)\,\mathrm{Cosh}[2x]}\right)-$$

$$\Bigg((1+\mathrm{Cosh}[x])\,\sqrt{\frac{1+\mathrm{Cosh}[2x]}{(1+\mathrm{Cosh}[x])^2}}\,\left(-\mathrm{Log}\left[\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right]+\mathrm{Log}\left[a+2b+a\,\mathrm{Tanh}\left[\frac{x}{2}\right]^2+\sqrt{a}\,\sqrt{4b\,\mathrm{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\mathrm{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right]+\right.$$

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

$$\left.\left.\sqrt{\frac{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}{\left(-1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}}\right)\middle/\left(4\sqrt{a}\,\sqrt{1+\text{Cosh}[2\,x]}\,\sqrt{\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\,\sqrt{4\,b\,\text{Tanh}\left[\frac{x}{2}\right]^2+a\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)^2}\right)\right)\right)$$

Problem 254: Result unnecessarily involves higher level functions.

$$\int \frac{\text{Coth}[x]^2}{\left(a+b\,\text{Tanh}[x]^2\right)^{5/2}}\,dx$$

Optimal (type 3, 131 leaves, 7 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b}\,\text{Tanh}[x]}{\sqrt{a+b\,\text{Tanh}[x]^2}}\right]}{(a+b)^{5/2}}+\frac{b\,\text{Coth}[x]}{3\,a\,(a+b)\left(a+b\,\text{Tanh}[x]^2\right)^{3/2}}+\frac{b\,(7\,a+4\,b)\,\text{Coth}[x]}{3\,a^2\,(a+b)^2\sqrt{a+b\,\text{Tanh}[x]^2}}-\frac{(3\,a+2\,b)\,(a+4\,b)\,\text{Coth}[x]\,\sqrt{a+b\,\text{Tanh}[x]^2}}{3\,a^3\,(a+b)^2}$$

Result (type 4, 246 leaves):

$$\frac{1}{3\sqrt{2}\,a^3\,(a+b)^3}$$

$$\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\text{Sech}[x]^2}\,\left(\left(3\sqrt{2}\,a^3\,\text{Coth}[x]\left((a+b)\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]-a\,\text{EllipticPi}\left[\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\right)\right)\middle/\left(b\sqrt{\frac{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\text{Csch}[x]^2}{b}}\right)-\right.$$

$$\left((a+b)\left(3\,(a+b)^2\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)^2\text{Coth}[x]+2\,a\,b^3\,\text{Sinh}[2\,x]+b^2\,(9\,a+5\,b)\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\text{Sinh}[2\,x]\right)\right)\Big/$$

$$\left.\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)^2\right)$$

Problem 259: Result more than twice size of optimal antiderivative.

$$\int \text{Tanh}[x] \left(a + b\,\text{Tanh}[x]^4\right)^{3/2} dx$$

Optimal (type 3, 124 leaves, 9 steps):

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

Result (type 3, 62 021 leaves): Display of huge result suppressed!

Problem 260: Result more than twice size of optimal antiderivative.

$$\int \text{Tanh}[x]\,\sqrt{a + b\,\text{Tanh}[x]^4}\,dx$$

Optimal (type 3, 89 leaves, 8 steps):

$$-\frac{1}{2}\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Tanh}[x]^2}{\sqrt{a+b\,\text{Tanh}[x]^4}}\right] + \frac{1}{2}\sqrt{a+b}\,\text{ArcTanh}\left[\frac{a+b\,\text{Tanh}[x]^2}{\sqrt{a+b}\,\sqrt{a+b\,\text{Tanh}[x]^4}}\right] - \frac{1}{2}\sqrt{a+b\,\text{Tanh}[x]^4}$$

Result (type 3, 31 650 leaves): Display of huge result suppressed!

Problem 261: Unable to integrate problem.

$$\int \frac{\text{Tanh}[x]}{\sqrt{a + b\,\text{Tanh}[x]^4}}\,dx$$

Optimal (type 3, 40 leaves, 4 steps):

$$\frac{\text{ArcTanh}\left[\frac{a+b\,\text{Tanh}[x]^2}{\sqrt{a+b}\,\sqrt{a+b\,\text{Tanh}[x]^4}}\right]}{2\sqrt{a+b}}$$

Result (type 8, 17 leaves):

$$\int \frac{\text{Tanh}[x]}{\sqrt{a + b\,\text{Tanh}[x]^4}}\,dx$$

Problem 262: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Tanh}[x]}{\left(a+b\,\text{Tanh}[x]^4\right)^{3/2}}\,dx$$

Optimal (type 3, 74 leaves, 6 steps):

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

Result (type 3, 33 271 leaves): Display of huge result suppressed!

Problem 263: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Tanh}[x]}{\left(a+b\,\text{Tanh}[x]^4\right)^{5/2}}\,dx$$

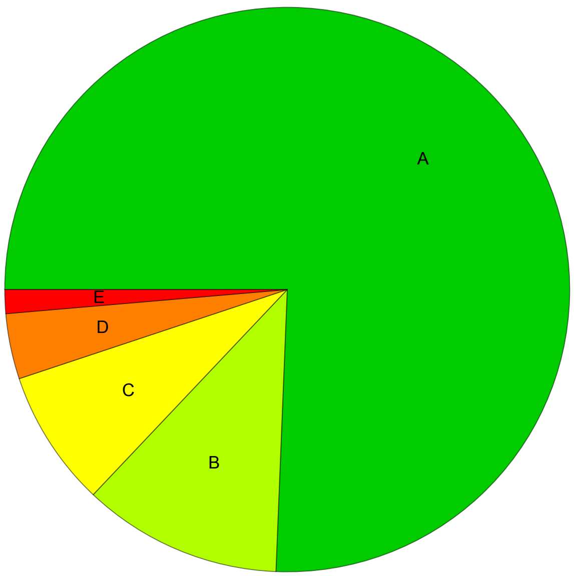
Optimal (type 3, 118 leaves, 7 steps):

$$\frac{\text{ArcTanh}\left[\frac{a+b\,\text{Tanh}[x]^2}{\sqrt{a+b}\,\sqrt{a+b\,\text{Tanh}[x]^4}}\right]}{2\,(a+b)^{5/2}}-\frac{a-b\,\text{Tanh}[x]^2}{6\,a\,(a+b)\,\left(a+b\,\text{Tanh}[x]^4\right)^{3/2}}-\frac{3\,a^2-b\,(5\,a+2\,b)\,\text{Tanh}[x]^2}{6\,a^2\,(a+b)^2\,\sqrt{a+b\,\text{Tanh}[x]^4}}$$

Result (type 3, 41 215 leaves): Display of huge result suppressed!

Summary of Integration Test Results

587 integration problems



A - 444 optimal antiderivatives

B - 67 more than twice size of optimal antiderivatives

C - 46 unnecessarily complex antiderivatives

D - 22 unable to integrate problems

E - 8 integration timeouts