Mathematica 11.3 Integration Test Results

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):

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

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):

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

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):

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

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):

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

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):

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

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

$$\left.2 \,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}(c+d x)\right]\right]+2 \,\text{Log}\left[\text{Sinh}\left[\frac{1}{2}(c+d x)\right]\right]\right)$$

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):

$$-\frac{1}{2 a^3 \sqrt{a+b}\,d}\,i \sqrt{b}\,(3 a+4 b)$$

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

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

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

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

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

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

Problem 42: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{5\,(3 a-4 b)\,\sqrt{b}\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Sech}[c+d x]}{\sqrt{a+b}}\right]}{8\,(a+b)^{9/2}\,d}-\frac{(a-2 b)\,\text{Cosh}[c+d x]}{(a+b)^4\,d}+\frac{\text{Cosh}[c+d x]^3}{3\,(a+b)^3\,d}+\frac{a\,b\,\text{Sech}[c+d x]}{4\,(a+b)^3\,d\,\left(a+b-b\,\text{Sech}[c+d x]^2\right)^2}+\frac{(7 a-4 b)\,b\,\text{Sech}[c+d x]}{8\,(a+b)^4\,d\,\left(a+b-b\,\text{Sech}[c+d x]^2\right)}$$

Result (type 3, 227 leaves):

$$\frac{1}{24 d}\left(\frac{1}{(a+b)^{9/2}}15\,i\,(3 a-4 b)\,\sqrt{b}\left(\text{ArcTan}\left[\frac{-i\sqrt{a+b}-\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{b}}\right]+\text{ArcTan}\left[\frac{-i\sqrt{a+b}+\sqrt{a}\,\text{Tanh}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{b}}\right]\right)-\left(6\,\text{Cosh}[c+d x]\left(3 a^3-24 a^2 b+30 a b^2-13 b^3+\left(6 a^3-27 a^2 b-11 a b^2+22 b^3\right)\text{Cosh}[2 (c+d x)]+3\,(a-3 b)\,(a+b)^2\,\text{Cosh}[2 (c+d x)]^2\right)\right)\Big/\left((a+b)^4\left(a-b+(a+b)\,\text{Cosh}[2 (c+d x)]\right)^2\right)+\frac{2\,\text{Cosh}[3 (c+d x)]}{(a+b)^3}\right)$$

Problem 44: Result unnecessarily involves imaginary or complex numbers.

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

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):

$$\frac{1}{8 d}\left(-\frac{1}{(a+b)^{7/2}} 15\, i \sqrt{b}\left(\text{ArcTan}\left[\frac{-i \sqrt{a+b}-\sqrt{a}\, \text{Tanh}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{b}}\right]+\text{ArcTan}\left[\frac{-i \sqrt{a+b}+\sqrt{a}\, \text{Tanh}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{b}}\right]\right)+\frac{2 \text{Cosh}[c+d x]\left(4-\frac{4 b^2}{(a-b+(a+b) \text{Cosh}[2 (c+d x)])^2}-\frac{9 b}{a-b+(a+b) \text{Cosh}[2 (c+d x)]}\right)}{(a+b)^3}\right)$$

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):

$$\frac{1}{8 a^3 d}\left(\frac{i \sqrt{b}\left(15 a^2+20 a b+8 b^2\right) \text{ArcTan}\left[\frac{-i \sqrt{a+b}-\sqrt{a}\, \text{Tanh}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{b}}\right]}{(a+b)^{5/2}}+\frac{i \sqrt{b}\left(15 a^2+20 a b+8 b^2\right) \text{ArcTan}\left[\frac{-i \sqrt{a+b}+\sqrt{a}\, \text{Tanh}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{b}}\right]}{(a+b)^{5/2}}+\frac{8 a^2 b^2 \text{Cosh}[c+d x]}{(a+b)^2 (a-b+(a+b) \text{Cosh}[2 (c+d x)])^2}+\frac{2 a b (9 a+4 b) \text{Cosh}[c+d x]}{(a+b)^2 (a-b+(a+b) \text{Cosh}[2 (c+d x)])}-8 \text{Log}\left[\text{Cosh}\left[\frac{1}{2}(c+d x)\right]\right]+8 \text{Log}\left[\text{Sinh}\left[\frac{1}{2}(c+d x)\right]\right]\right)$$

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):

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

Result (type 3, 401 leaves):

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

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

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

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

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

$$\frac{3 a (a-5 b) \text{Log}[1-\text{Tanh}[c+d x]]}{16 (a+b)^3 d}+\frac{3 a (a+5 b) \text{Log}[1+\text{Tanh}[c+d x]]}{16 (a-b)^3 d}-\frac{1}{3 \left(a^2-b^2\right)^3 d}$$

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

$$b^{1/3} \left(a^4+7 a^2 b^2+b^4+3 a^{2/3} b^{4/3} \left(2 a^2+b^2\right)\right) \text{Log}\left[a^{2/3}-a^{1/3} b^{1/3} \text{Tanh}[c+d x]+b^{2/3} \text{Tanh}[c+d x]^2\right]-$$

$$\frac{a^2 b \left(a^2+2 b^2\right) \text{Log}\left[a+b \text{Tanh}[c+d x]^3\right]}{\left(a^2-b^2\right)^3 d}+\frac{1}{16 (a+b) d (1-\text{Tanh}[c+d x])^2}-$$

$$\frac{5 a-b}{16 (a+b)^2 d (1-\text{Tanh}[c+d x])}-\frac{1}{16 (a-b) d (1+\text{Tanh}[c+d x])^2}+\frac{5 a+b}{16 (a-b)^2 d (1+\text{Tanh}[c+d x])}$$

Result (type 7, 645 leaves):

$$\frac{1}{96 (a-b)^2 (a+b)^3 d} \Big(-32 a b \text{RootSum}\Big[$$

$$a-b+3 a \#1+3 b \#1+3 a \#1^2-3 b \#1^2+a \#1^3+b \#1^3 \&, \frac{1}{a-b+2 a \#1+2 b \#1+a \#1^2-b \#1^2}$$

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

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):

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

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):

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

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):

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

Result (type 3, 132 leaves):

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

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

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

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

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

Result (type 3, 132 leaves):

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

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

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

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

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

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):

$$\frac{1}{15\sqrt{2}}\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2x]\right)\text{Sech}[x]^2}\left(\left(-23+\frac{2a^2}{b^2}-\frac{6a}{b}-\left(15\sqrt{2}\sqrt{a+b}\,\text{Cosh}[x]\left(\text{Log}\left[-\text{Sech}\left[\frac{x}{2}\right]^2\right]-\text{Log}\left[a+b+\frac{\sqrt{a+b}\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2x]\right)\text{Sech}\left[\frac{x}{2}\right]^4}}{\sqrt{2}}+(a+b)\,\text{Tanh}\left[\frac{x}{2}\right]^2\right]\right)\text{Sech}\left[\frac{x}{2}\right]^2\right)\Big/\left(\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2x]\right)\text{Sech}\left[\frac{x}{2}\right]^4}\right)\right)+\left(11+\frac{a}{b}\right)\text{Sech}[x]^2-3\,\text{Sech}[x]^4\right)$$

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

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

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

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

Result (type 4, 580 leaves):

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

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

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

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

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

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

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

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

Result (type 3, 310 leaves):

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

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

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

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

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

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

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

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

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

Result (type 4, 531 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 3, 214 leaves):

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

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

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

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

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

Result (type 3, 137 leaves):

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

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

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

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

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

Result (type 3, 124 leaves):

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

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

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

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

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

Result (type 4, 192 leaves):

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

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

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

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

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

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):

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

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

Result (type 3, 864 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 4, 558 leaves):

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

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

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

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

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

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

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):

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

Result (type 3, 911 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 3, 184 leaves):

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

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

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

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

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):

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

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

Result (type 4, 584 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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):

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

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):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 4, 197 leaves):

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

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

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

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

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

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):

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

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

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

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

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

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

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

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

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

Result (type 4, 542 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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):

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

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):

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

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):

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

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):

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

Result (type 3, 874 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 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):

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

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

$$\left.\left.\left.(a+b)\,\text{Tanh}\left[\frac{x}{2}\right]^2\right]\right)\,\text{Sech}\left[\frac{x}{2}\right]^2\right)\Bigg/$$

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

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

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

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

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

Result (type 4, 188 leaves):

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

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

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

Optimal (type 3, 52 leaves, 5 steps):

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

Result (type 3, 178 leaves):

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

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

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

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

Problem 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):

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

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

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

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

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

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):

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

Problem 244: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 78 leaves, 8 steps):

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

Result (type 3, 903 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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):

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

Result (type 4, 230 leaves):

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

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

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

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

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

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):

$$\frac{1}{3\,\sqrt{2}\,b^2\,(a+b)^3}\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\,\text{Sech}[x]^2}\;\left(-\left(\left(3\,\sqrt{2}\,a\,\text{Coth}[x]\,\left(\left(a^2+3\,a\,b+2\,b^2\right)\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]+b^2\,\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\right)\right)\Big/\left(b\,\sqrt{\frac{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\,\text{Csch}[x]^2}{b}}\right)\right)+\left(a\,(a+b)\,\left(3\,a^2+2\,a\,b-7\,b^2+\left(3\,a^2+10\,a\,b+7\,b^2\right)\,\text{Cosh}[2\,x]\right)\,\text{Sinh}[2\,x]\right)\Big/\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)^2\right)$$

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):

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

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):

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

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

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

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

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

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

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

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

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

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

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

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

Problem 249: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 74 leaves, 6 steps):

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

Result (type 3, 372 leaves):

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

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

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

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

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

Problem 250: Result unnecessarily involves higher level functions and more

than twice size of optimal antiderivative.

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

Optimal (type 3, 88 leaves, 6 steps):

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

Result (type 4, 608 leaves):

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

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

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

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

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

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

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

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):

$$\sqrt{\frac{a-b+a\,\text{Cosh}[2x]+b\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\left(-\frac{4}{3(a+b)^3}-\frac{4b^2}{3(a+b)^3(a-b+a\,\text{Cosh}[2x]+b\,\text{Cosh}[2x])^2}-\frac{10b}{3(a+b)^3(a-b+a\,\text{Cosh}[2x]+b\,\text{Cosh}[2x])}\right)+$$

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

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

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):

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

Result (type 3, 966 leaves):

$$\sqrt{\frac{a-b+a\,\text{Cosh}[2x]+b\,\text{Cosh}[2x]}{1+\text{Cosh}[2x]}}\left(\frac{b(7a+3b)}{3a^2(a+b)^3}+\frac{4b^3}{3a(a+b)^3(a-b+a\,\text{Cosh}[2x]+b\,\text{Cosh}[2x])^2}+\frac{2b^2(8a+3b)}{3a^2(a+b)^3(a-b+a\,\text{Cosh}[2x]+b\,\text{Cosh}[2x])}\right)+$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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):

$$\frac{1}{3\sqrt{2}\,a^3\,(a+b)^3}\sqrt{\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\,\text{Sech}[x]^2}\left(\left(3\sqrt{2}\,a^3\,\text{Coth}[x]\left((a+b)\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]-a\,\text{EllipticPi}\left[\frac{b}{a+b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}}{\sqrt{2}}\right],1\right]\right)\right)\Bigg/\left(b\sqrt{\frac{(a-b+(a+b)\,\text{Cosh}[2\,x])\,\text{Csch}[x]^2}{b}}\right)-\left((a+b)\left(3\,(a+b)^2\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)^2\text{Coth}[x]+2\,a\,b^3\,\text{Sinh}[2\,x]+b^2\,(9\,a+5\,b)\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)\text{Sinh}[2\,x]\right)\right)\Big/\left(a-b+(a+b)\,\text{Cosh}[2\,x]\right)^2\right)$$

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):

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

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.

$$\int \frac{\text{Tanh}[x]}{\left(a+b\,\text{Tanh}[x]^4\right)^{5/2}}\,dx$$

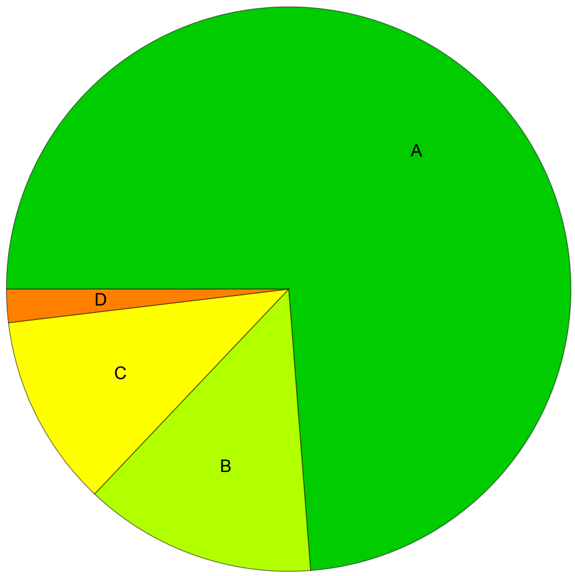
Optimal (type 3, 118 leaves, 7 steps):

$$\frac{\text{ArcTanh}\left[\frac{a+b\,\text{Tanh}[x]^2}{\sqrt{a+b}\,\sqrt{a+b\,\text{Tanh}[x]^4}}\right]}{2\,(a+b)^{5/2}}-\frac{a-b\,\text{Tanh}[x]^2}{6\,a\,(a+b)\,\left(a+b\,\text{Tanh}[x]^4\right)^{3/2}}-\frac{3\,a^2-b\,(5\,a+2\,b)\,\text{Tanh}[x]^2}{6\,a^2\,(a+b)^2\,\sqrt{a+b\,\text{Tanh}[x]^4}}$$

Result (type 3, 41 215 leaves): Display of huge result suppressed!

Summary of Integration Test Results

263 integration problems



A - 194 optimal antiderivatives

B - 35 more than twice size of optimal antiderivatives

C - 29 unnecessarily complex antiderivatives

D - 5 unable to integrate problems

E - 0 integration timeouts