Maple 2018.2 Integration Test Results
on the problems in "6 Hyperbolic functions/6.7 Miscellaneous"

Test results for the 276 problems in "6.7.1 Hyperbolic functions.txt"

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

$$\int \frac{\operatorname{sech}(2+3x)^2}{1+2\tanh(2+3x)^2}\, dx$$

Optimal(type 3, 16 leaves, 2 steps):

$$\frac{\arctan\left(\sqrt{2}\tanh(2+3x)\right)\sqrt{2}}{6}$$

Result(type 3, 155 leaves):

$$\frac{\sqrt{6}\arctan\left(\frac{2\tanh\left(1+\frac{3x}{2}\right)}{2\sqrt{3}-2\sqrt{2}}\right)}{3\left(2\sqrt{3}-2\sqrt{2}\right)}-\frac{2\arctan\left(\frac{2\tanh\left(1+\frac{3x}{2}\right)}{2\sqrt{3}-2\sqrt{2}}\right)}{3\left(2\sqrt{3}-2\sqrt{2}\right)}-\frac{\sqrt{6}\arctan\left(\frac{2\tanh\left(1+\frac{3x}{2}\right)}{2\sqrt{3}+2\sqrt{2}}\right)}{3\left(2\sqrt{3}+2\sqrt{2}\right)}-\frac{2\arctan\left(\frac{2\tanh\left(1+\frac{3x}{2}\right)}{2\sqrt{3}+2\sqrt{2}}\right)}{3\left(2\sqrt{3}+2\sqrt{2}\right)}$$

Problem 3: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{csch}(2+3x)^2}{1-2\coth(2+3x)^2}\, dx$$

Optimal(type 3, 17 leaves, 2 steps):

$$-\frac{\operatorname{arctanh}\left(\frac{\sqrt{2}\tanh(2+3x)}{2}\right)\sqrt{2}}{6}$$

Result(type 3, 101 leaves):

$$-\frac{\sqrt{2}\ln\left(\frac{\tanh\left(1+\frac{3x}{2}\right)^2+\tanh\left(1+\frac{3x}{2}\right)\sqrt{2}+1}{\tanh\left(1+\frac{3x}{2}\right)^2-\tanh\left(1+\frac{3x}{2}\right)\sqrt{2}+1}\right)}{24}+\frac{\sqrt{2}\ln\left(\frac{\tanh\left(1+\frac{3x}{2}\right)^2-\tanh\left(1+\frac{3x}{2}\right)\sqrt{2}+1}{\tanh\left(1+\frac{3x}{2}\right)^2+\tanh\left(1+\frac{3x}{2}\right)\sqrt{2}+1}\right)}{24}$$

Problem 4: Unable to integrate problem.

$$\int \cosh(bx+a)^3\sinh(bx+a)^n\, dx$$

Optimal(type 3, 39 leaves, 3 steps):

$$\frac{\sinh(bx+a)^{1+n}}{b\,(1+n)}+\frac{\sinh(bx+a)^{3+n}}{b\,(3+n)}$$

Result(type 8, 19 leaves):

$$\int \cosh(bx+a)^3 \sinh(bx+a)^n \, dx$$

Problem 17: Unable to integrate problem.

$$\int \frac{\sinh(bx+a)^{7/2}}{\cosh(bx+a)^{7/2}} \, dx$$

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

$$-\frac{\arctan\left(\frac{\sqrt{\cosh(bx+a)}}{\sqrt{\sinh(bx+a)}}\right)}{b} + \frac{\operatorname{arctanh}\left(\frac{\sqrt{\cosh(bx+a)}}{\sqrt{\sinh(bx+a)}}\right)}{b} - \frac{2\sinh(bx+a)^{5/2}}{5b\cosh(bx+a)^{5/2}} - \frac{2\sqrt{\sinh(bx+a)}}{b\sqrt{\cosh(bx+a)}}$$

Result(type 8, 19 leaves):

$$\int \frac{\sinh(bx+a)^{7/2}}{\cosh(bx+a)^{7/2}} \, dx$$

Problem 18: Unable to integrate problem.

$$\int \frac{\cosh(bx+a)^{7/2}}{\sinh(bx+a)^{7/2}} \, dx$$

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

$$-\frac{\arctan\left(\frac{\sqrt{\sinh(bx+a)}}{\sqrt{\cosh(bx+a)}}\right)}{b} + \frac{\operatorname{arctanh}\left(\frac{\sqrt{\sinh(bx+a)}}{\sqrt{\cosh(bx+a)}}\right)}{b} - \frac{2\cosh(bx+a)^{5/2}}{5b\sinh(bx+a)^{5/2}} - \frac{2\sqrt{\cosh(bx+a)}}{b\sqrt{\sinh(bx+a)}}$$

Result(type 8, 19 leaves):

$$\int \frac{\cosh(bx+a)^{7/2}}{\sinh(bx+a)^{7/2}} \, dx$$

Problem 19: Unable to integrate problem.

$$\int \frac{\sinh(bx+a)^{4/3}}{\cosh(bx+a)^{4/3}} \, dx$$

Optimal(type 3, 197 leaves, 12 steps):

$$\frac{\operatorname{arctanh}\left(\frac{\cosh(bx+a)^{1/3}}{\sinh(bx+a)^{1/3}}\right)}{b} - \frac{\ln\left(1 + \frac{\cosh(bx+a)^{2/3}}{\sinh(bx+a)^{2/3}} - \frac{\cosh(bx+a)^{1/3}}{\sinh(bx+a)^{1/3}}\right)}{4b} + \frac{\ln\left(1 + \frac{\cosh(bx+a)^{2/3}}{\sinh(bx+a)^{2/3}} + \frac{\cosh(bx+a)^{1/3}}{\sinh(bx+a)^{1/3}}\right)}{4b}$$

$$-\frac{3\sinh(bx+a)^{1/3}}{b\cosh(bx+a)^{1/3}}+\frac{\arctan\left(\frac{\left(1-\frac{2\cosh(bx+a)^{1/3}}{\sinh(bx+a)^{1/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{2b}-\frac{\arctan\left(\frac{\left(1+\frac{2\cosh(bx+a)^{1/3}}{\sinh(bx+a)^{1/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{2b}$$

Result(type 8, 19 leaves):

$$\int\frac{\sinh(bx+a)^{4/3}}{\cosh(bx+a)^{4/3}}\,dx$$

Problem 20: Unable to integrate problem.

$$\int\frac{\cosh(bx+a)^{4/3}}{\sinh(bx+a)^{4/3}}\,dx$$

Optimal(type 3, 197 leaves, 12 steps):

$$\frac{\operatorname{arctanh}\left(\frac{\sinh(bx+a)^{1/3}}{\cosh(bx+a)^{1/3}}\right)}{b}-\frac{\ln\left(1-\frac{\sinh(bx+a)^{1/3}}{\cosh(bx+a)^{1/3}}+\frac{\sinh(bx+a)^{2/3}}{\cosh(bx+a)^{2/3}}\right)}{4b}+\frac{\ln\left(1+\frac{\sinh(bx+a)^{1/3}}{\cosh(bx+a)^{1/3}}+\frac{\sinh(bx+a)^{2/3}}{\cosh(bx+a)^{2/3}}\right)}{4b}$$

$$-\frac{3\cosh(bx+a)^{1/3}}{b\sinh(bx+a)^{1/3}}+\frac{\arctan\left(\frac{\left(1-\frac{2\sinh(bx+a)^{1/3}}{\cosh(bx+a)^{1/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{2b}-\frac{\arctan\left(\frac{\left(1+\frac{2\sinh(bx+a)^{1/3}}{\cosh(bx+a)^{1/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{2b}$$

Result(type 8, 19 leaves):

$$\int\frac{\cosh(bx+a)^{4/3}}{\sinh(bx+a)^{4/3}}\,dx$$

Problem 21: Unable to integrate problem.

$$\int\frac{\cosh(bx+a)^{5/3}}{\sinh(bx+a)^{5/3}}\,dx$$

Optimal(type 3, 124 leaves, 9 steps):

$$-\frac{\ln\left(1-\frac{\sinh(bx+a)^{2/3}}{\cosh(bx+a)^{2/3}}\right)}{2b}+\frac{\ln\left(1+\frac{\sinh(bx+a)^{2/3}}{\cosh(bx+a)^{2/3}}+\frac{\sinh(bx+a)^{4/3}}{\cosh(bx+a)^{4/3}}\right)}{4b}-\frac{3\cosh(bx+a)^{2/3}}{2b\sinh(bx+a)^{2/3}}$$

$$-\frac{\arctan\left(\frac{\left(1+\frac{2\sinh(bx+a)^{2/3}}{\cosh(bx+a)^{2/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{2b}$$

Result(type 8, 19 leaves):

$$\int \frac{\cosh(bx+a)^{5/3}}{\sinh(bx+a)^{5/3}}\, dx$$

Problem 22: Unable to integrate problem.

$$\int \frac{\cosh(bx+a)^{7/3}}{\sinh(bx+a)^{7/3}}\, dx$$

Optimal(type 3, 124 leaves, 9 steps):

$$-\frac{\ln\left(1-\frac{\cosh(bx+a)^{2/3}}{\sinh(bx+a)^{2/3}}\right)}{2b}+\frac{\ln\left(1+\frac{\cosh(bx+a)^{4/3}}{\sinh(bx+a)^{4/3}}+\frac{\cosh(bx+a)^{2/3}}{\sinh(bx+a)^{2/3}}\right)}{4b}-\frac{3\cosh(bx+a)^{4/3}}{4b\sinh(bx+a)^{4/3}}$$
$$-\frac{\arctan\left(\frac{\left(1+\frac{2\cosh(bx+a)^{2/3}}{\sinh(bx+a)^{2/3}}\right)\sqrt{3}}{3}\right)\sqrt{3}}{2b}$$

Result(type 8, 19 leaves):

$$\int \frac{\cosh(bx+a)^{7/3}}{\sinh(bx+a)^{7/3}}\, dx$$

Problem 26: Unable to integrate problem.

$$\int \operatorname{sech}(bx+a)^4\sqrt{\tanh(bx+a)}\, dx$$

Optimal(type 3, 27 leaves, 3 steps):

$$\frac{2\tanh(bx+a)^{3/2}}{3b}-\frac{2\tanh(bx+a)^{7/2}}{7b}$$

Result(type 8, 19 leaves):

$$\int \operatorname{sech}(bx+a)^4\sqrt{\tanh(bx+a)}\, dx$$

Problem 27: Result more than twice size of optimal antiderivative.

$$\int \operatorname{sech}(bx+a)^4\tanh(bx+a)^n\, dx$$

Optimal(type 3, 40 leaves, 3 steps):

$$\frac{\tanh(bx+a)^{1+n}}{b(1+n)}-\frac{\tanh(bx+a)^{3+n}}{b(3+n)}$$

Result(type 3, 534 leaves):

$$\frac{1}{b(1+n)(3+n)\left(1+e^{2bx+2a}\right)^3}\Bigg(2\left(e^{6bx+6a}+2n e^{4bx+4a}+3e^{4bx+4a}-2n e^{2bx+2a}-3e^{2bx+2a}\right.$$

$$\left.-1\right)$$

$$e^{-\frac{1}{2}\left(n\left(\mathrm{I}\,\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)^3\pi-\mathrm{I}\,\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)^2\mathrm{csgn}(\mathrm{I}(e^{bx+a}+1))\,\pi-\mathrm{I}\,\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)^2\mathrm{csgn}\left(\frac{\mathrm{I}}{1+e^{2bx+2a}}\right)\pi\right.\right.}$$

$$+\mathrm{I}\,\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)\mathrm{csgn}(\mathrm{I}(e^{bx+a}+1))\,\mathrm{csgn}\left(\frac{\mathrm{I}}{1+e^{2bx+2a}}\right)\pi-\mathrm{I}\,\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}-1)(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)^2\pi$$

$$+\mathrm{I}\,\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}-1)(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)\mathrm{csgn}(\mathrm{I}(e^{bx+a}-1))\,\pi+\mathrm{I}\,\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}-1)(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)^3\pi-\mathrm{I}\,\mathrm{csgn}\left(\frac{\mathrm{I}(e^{bx+a}-1)(e^{bx+a}+1)}{1+e^{2bx+2a}}\right)^2\mathrm{csgn}(\mathrm{I}(e^{bx+a}$$

$$\left.\left.\left.-1))\,\pi+2\ln(1+e^{2bx+2a})-2\ln(e^{bx+a}-1)-2\ln(e^{bx+a}+1)\right)\right)\Bigg)$$

Problem 28: Result more than twice size of optimal antiderivative.

$$\int \mathrm{sech}(x)^8\tanh(x)^6\,dx$$

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

$$\frac{\tanh(x)^7}{7}-\frac{\tanh(x)^9}{3}+\frac{3\tanh(x)^{11}}{11}-\frac{\tanh(x)^{13}}{13}$$

Result(type 3, 71 leaves):

$$-\frac{\sinh(x)^5}{8\cosh(x)^{13}}-\frac{\sinh(x)^3}{16\cosh(x)^{13}}-\frac{\sinh(x)}{64\cosh(x)^{13}}$$
$$+\frac{\left(\frac{1024}{3003}+\frac{\mathrm{sech}(x)^{12}}{13}+\frac{12\,\mathrm{sech}(x)^{10}}{143}+\frac{40\,\mathrm{sech}(x)^8}{429}+\frac{320\,\mathrm{sech}(x)^6}{3003}+\frac{128\,\mathrm{sech}(x)^4}{1001}+\frac{512\,\mathrm{sech}(x)^2}{3003}\right)\tanh(x)}{64}$$

Problem 34: Result more than twice size of optimal antiderivative.

$$\int \coth(bx+a)^3\,\mathrm{csch}(bx+a)^3\,dx$$

Optimal(type 3, 27 leaves, 3 steps):

$$-\frac{\mathrm{csch}(bx+a)^3}{3b}-\frac{\mathrm{csch}(bx+a)^5}{5b}$$

Result(type 3, 67 leaves):

$$\frac{-\frac{\cosh(bx+a)^2}{5\sinh(bx+a)^5}-\frac{2\cosh(bx+a)^2}{15\sinh(bx+a)^3}+\frac{2\cosh(bx+a)^2}{15\sinh(bx+a)}-\frac{2\sinh(bx+a)}{15}}{b}$$

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Problem 35: Result more than twice size of optimal antiderivative.
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$$\int \coth(bx+a)^3 \operatorname{csch}(bx+a)^n \, dx$$

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Optimal(type 3, 37 leaves, 3 steps):
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$$-\frac{\operatorname{csch}(bx+a)^n}{bn}-\frac{\operatorname{csch}(bx+a)^{2+n}}{b(2+n)}$$

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Result(type 3, 498 leaves):
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$$-\frac{1}{bn(2+n)\left(e^{2bx+2a}-1\right)^2}\Bigg(\left(n e^{4bx+4a}+2e^{4bx+4a}+2ne^{2bx+2a}-4e^{2bx+2a}+n+2\right)$$

$$e^{-\frac{1}{2}\left(n\left(I\operatorname{csgn}\left(\frac{I}{(e^{bx+a}-1)(e^{bx+a}+1)}\right)^3\pi-I\operatorname{csgn}\left(\frac{I}{(e^{bx+a}-1)(e^{bx+a}+1)}\right)^2\operatorname{csgn}\left(\frac{I}{e^{bx+a}-1}\right)\pi-I\operatorname{csgn}\left(\frac{I}{(e^{bx+a}-1)(e^{bx+a}+1)}\right)^2\operatorname{csgn}\left(\frac{I}{e^{bx+a}+1}\right)\pi\right.\right.}$$

$$+I\operatorname{csgn}\left(\frac{I}{(e^{bx+a}-1)(e^{bx+a}+1)}\right)\operatorname{csgn}\left(\frac{I}{e^{bx+a}-1}\right)\operatorname{csgn}\left(\frac{I}{e^{bx+a}+1}\right)\pi-I\operatorname{csgn}\left(\frac{I}{(e^{bx+a}-1)(e^{bx+a}+1)}\right)\operatorname{csgn}\left(\frac{Ie^{bx+a}}{(e^{bx+a}+1)(e^{bx+a}-1)}\right)^2\pi$$

$$+I\operatorname{csgn}\left(\frac{I}{(e^{bx+a}-1)(e^{bx+a}+1)}\right)\operatorname{csgn}\left(\frac{Ie^{bx+a}}{(e^{bx+a}+1)(e^{bx+a}-1)}\right)\operatorname{csgn}(Ie^{bx+a})\pi+I\operatorname{csgn}\left(\frac{Ie^{bx+a}}{(e^{bx+a}+1)(e^{bx+a}-1)}\right)^3\pi$$

$$\left.\left.-I\operatorname{csgn}\left(\frac{Ie^{bx+a}}{(e^{bx+a}+1)(e^{bx+a}-1)}\right)^2\operatorname{csgn}(Ie^{bx+a})\pi+2\ln(e^{bx+a}-1)-2\ln(e^{bx+a})+2\ln(e^{bx+a}+1)-2\ln(2)\right)\right)\Bigg)$$

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Problem 37: Result more than twice size of optimal antiderivative.
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$$\int \coth(x)^2 \operatorname{csch}(x)^4 \, dx$$

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Optimal(type 3, 13 leaves, 3 steps):
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$$\frac{\coth(x)^3}{3}-\frac{\coth(x)^5}{5}$$

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Result(type 3, 27 leaves):
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$$-\frac{\cosh(x)}{4\sinh(x)^5}-\frac{\left(-\frac{8}{15}-\frac{\operatorname{csch}(x)^4}{5}+\frac{4\operatorname{csch}(x)^2}{15}\right)\coth(x)}{4}$$

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

$$\int \coth(x)^n \operatorname{csch}(x)^4\, dx$$

Optimal(type 3, 26 leaves, 3 steps):

$$\frac{\coth(x)^{1+n}}{1+n}-\frac{\coth(x)^{3+n}}{3+n}$$

Result(type 3, 370 leaves):

$$-\frac{1}{(1+n)\,(3+n)\,(e^{2x}-1)^3}\Bigg(2\,(-e^{6x}+2\,n\,e^{4x}+3\,e^{4x}+2\,n\,e^{2x}+3\,e^{2x}$$

$$-1)\,e^{-\frac{1}{2}\Big(n\Big(I\pi\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{1+e^x}\right)^3-I\pi\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{1+e^x}\right)^2\operatorname{csgn}\left(\frac{I}{1+e^x}\right)-I\pi\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{1+e^x}\right)^2\operatorname{csgn}(I(e^{2x}+1))+I\pi\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{1+e^x}\right)\operatorname{csgn}\left(\frac{I}{1+e^x}\right)\operatorname{csgn}(I(e^{2x}+1))}$$

$$-I\pi\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{1+e^x}\right)\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{(e^x-1)(1+e^x)}\right)^2+I\pi\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{1+e^x}\right)\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{(e^x-1)(1+e^x)}\right)\operatorname{csgn}\left(\frac{I}{e^x-1}\right)+I\pi\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{(e^x-1)(1+e^x)}\right)^3$$

$$-I\pi\operatorname{csgn}\left(\frac{I(e^{2x}+1)}{(e^x-1)(1+e^x)}\right)^2\operatorname{csgn}\left(\frac{I}{e^x-1}\right)+2\ln(e^x-1)-2\ln(e^{2x}+1)+2\ln(1+e^x)\Big)\Big)\Bigg)$$

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

$$\int -\operatorname{csch}(b\,x-c)\operatorname{csch}(b\,x+a)\, dx$$

Optimal(type 3, 36 leaves, 3 steps):

$$-\frac{\operatorname{csch}(a+c)\ln(-\sinh(b\,x-c))}{b}+\frac{\operatorname{csch}(a+c)\ln(\sinh(b\,x+a))}{b}$$

Result(type 3, 76 leaves):

$$-\frac{2\ln(-e^{2a+2c}+e^{2bx+2a})\,e^{a+c}}{(e^{2a+2c}-1)\,b}+\frac{2\ln(e^{2bx+2a}-1)\,e^{a+c}}{(e^{2a+2c}-1)\,b}$$

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

$$\int \coth(bx+c)^2 \sinh(bx+a)\, dx$$

Optimal(type 3, 46 leaves, 6 steps):

$$-\frac{\operatorname{arctanh}(\cosh(bx+c))\cosh(a-c)}{b}+\frac{\cosh(bx+a)}{b}-\frac{\operatorname{csch}(bx+c)\sinh(a-c)}{b}$$

Result(type 3, 196 leaves):

$$\frac{e^{bx+a}}{2b}+\frac{e^{-bx-a}}{2b}+\frac{e^{bx+a}\left(e^{2c}-e^{2a}\right)}{b\left(e^{2bx+2a+2c}-e^{2a}\right)}+\frac{\ln\left(e^{bx+a}-e^{a-c}\right)e^{-a-c}e^{2c}}{2b}+\frac{\ln\left(e^{bx+a}-e^{a-c}\right)e^{-a-c}e^{2a}}{2b}-\frac{\ln\left(e^{bx+a}+e^{a-c}\right)e^{-a-c}e^{2c}}{2b}$$
$$-\frac{\ln\left(e^{bx+a}+e^{a-c}\right)e^{-a-c}e^{2a}}{2b}$$

Problem 43: Result more than twice size of optimal antiderivative.

$$\int \coth(bx+c)^3 \sinh(bx+a)\, dx$$

Optimal(type 3, 69 leaves, 9 steps):

$$-\frac{\cosh(a-c)\operatorname{csch}(bx+c)}{b}-\frac{3\operatorname{arctanh}(\cosh(bx+c))\sinh(a-c)}{2b}-\frac{\coth(bx+c)\operatorname{csch}(bx+c)\sinh(a-c)}{2b}+\frac{\sinh(bx+a)}{b}$$

Result(type 3, 229 leaves):

$$\frac{e^{bx+a}}{2b}-\frac{e^{-bx-a}}{2b}-\frac{e^{bx+a}\left(e^{2bx+2a+4c}+3e^{2bx+4a+2c}-3e^{2a+2c}-e^{4a}\right)}{2b\left(e^{2bx+2a+2c}-e^{2a}\right)^2}-\frac{3\ln\left(e^{bx+a}-e^{a-c}\right)e^{-a-c}e^{2c}}{4b}+\frac{3\ln\left(e^{bx+a}-e^{a-c}\right)e^{-a-c}e^{2a}}{4b}$$
$$+\frac{3\ln\left(e^{bx+a}+e^{a-c}\right)e^{-a-c}e^{2c}}{4b}-\frac{3\ln\left(e^{bx+a}+e^{a-c}\right)e^{-a-c}e^{2a}}{4b}$$

Problem 44: Result more than twice size of optimal antiderivative.

$$\int \operatorname{csch}(bx+c)\sinh(bx+a)\, dx$$

Optimal(type 3, 26 leaves, 3 steps):

$$x\cosh(a-c)+\frac{\ln(\sinh(bx+c))\sinh(a-c)}{b}$$

Result(type 3, 149 leaves):

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

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

$$\int \cosh(bx+a)\tanh(bx+c)\, dx$$

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

$$\frac{\cosh(bx+a)}{b} - \frac{\arctan(\sinh(bx+c))\sinh(a-c)}{b}$$

Result(type 3, 166 leaves):

$$\frac{e^{bx+a}}{2b} + \frac{e^{-bx-a}}{2b} + \frac{I\ln\left(e^{bx+a}+I e^{a-c}\right) e^{-a-c}\left(e^{c}\right)^2}{2b} - \frac{I\ln\left(e^{bx+a}+I e^{a-c}\right) e^{-a-c}\left(e^{a}\right)^2}{2b} - \frac{I\ln\left(e^{bx+a}-I e^{a-c}\right) e^{-a-c}\left(e^{c}\right)^2}{2b} + \frac{I\ln\left(e^{bx+a}-I e^{a-c}\right) e^{-a-c}\left(e^{a}\right)^2}{2b}$$

Problem 46: Result more than twice size of optimal antiderivative.

$$\int \cosh(bx+a)\tanh(bx+c)^2\,dx$$

Optimal(type 3, 45 leaves, 6 steps):

$$-\frac{\arctan(\sinh(bx+c))\cosh(a-c)}{b} + \frac{\operatorname{sech}(bx+c)\sinh(a-c)}{b} + \frac{\sinh(bx+a)}{b}$$

Result(type 3, 207 leaves):

$$\frac{e^{bx+a}}{2b} - \frac{e^{-bx-a}}{2b} - \frac{e^{bx+a}\left(e^{2c}-e^{2a}\right)}{b\left(e^{2bx+2a+2c}+e^{2a}\right)} + \frac{I\ln\left(e^{bx+a}-I e^{a-c}\right) e^{-a-c} e^{2c}}{2b} + \frac{I\ln\left(e^{bx+a}-I e^{a-c}\right) e^{-a-c} e^{2a}}{2b} - \frac{I\ln\left(e^{bx+a}+I e^{a-c}\right) e^{-a-c} e^{2c}}{2b} - \frac{I\ln\left(e^{bx+a}+I e^{a-c}\right) e^{-a-c} e^{2a}}{2b}$$

Problem 47: Result more than twice size of optimal antiderivative.

$$\int \cosh(bx+a)\operatorname{csch}(bx+c)^2\,dx$$

Optimal(type 3, 36 leaves, 4 steps):

$$-\frac{\cosh(a-c)\operatorname{csch}(bx+c)}{b} - \frac{\operatorname{arctanh}(\cosh(bx+c))\sinh(a-c)}{b}$$

Result(type 3, 170 leaves):

$$-\frac{e^{bx+a}\left(e^{2c}+e^{2a}\right)}{b\left(e^{2bx+2a+2c}-e^{2a}\right)} - \frac{\ln\left(e^{bx+a}-e^{a-c}\right) e^{-a-c} e^{2c}}{2b} + \frac{\ln\left(e^{bx+a}-e^{a-c}\right) e^{-a-c} e^{2a}}{2b} + \frac{\ln\left(e^{bx+a}+e^{a-c}\right) e^{-a-c} e^{2c}}{2b} - \frac{\ln\left(e^{bx+a}+e^{a-c}\right) e^{-a-c} e^{2a}}{2b}$$

Problem 49: Unable to integrate problem.

$$\int \sinh(bx+a)\tanh(dx+c)\,dx$$

Optimal(type 5, 109 leaves, 6 steps):

$$\frac{e^{-bx-a}}{2b} + \frac{e^{bx+a}}{2b} - \frac{e^{-bx-a}\,\mathrm{hypergeom}\left(\left[1, -\frac{b}{2d}\right], \left[1-\frac{b}{2d}\right], -e^{2dx+2c}\right)}{b} - \frac{e^{bx+a}\,\mathrm{hypergeom}\left(\left[1, \frac{b}{2d}\right], \left[1+\frac{b}{2d}\right], -e^{2dx+2c}\right)}{b}$$

Result(type 8, 59 leaves):

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

Problem 50: Unable to integrate problem.

$$\int \cosh (b x+a) \coth (d x+c) d x$$

Optimal(type 5, 104 leaves, 6 steps):

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

Result(type 8, 58 leaves):

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

Problem 52: Result more than twice size of optimal antiderivative.

$$\int \sinh (x) \tanh (2 x) d x$$

Optimal(type 3, 15 leaves, 4 steps):

$$\sinh (x)-\frac{\arctan \left(\sinh (x) \sqrt{2}\right) \sqrt{2}}{2}$$

Result(type 3, 53 leaves):

$$\frac{e^{x}}{2}-\frac{e^{-x}}{2}+\frac{I \sqrt{2} \ln \left(e^{2 x}-I \sqrt{2} e^{x}-1\right)}{4}-\frac{I \sqrt{2} \ln \left(e^{2 x}+I \sqrt{2} e^{x}-1\right)}{4}$$

Problem 53: Unable to integrate problem.

$$\int \sinh (x) \tanh (n x) d x$$

Optimal(type 5, 67 leaves, 6 steps):

$$\frac{1}{2 e^{x}}+\frac{e^{x}}{2}-\frac{\operatorname{hypergeom}\left(\left[1,-\frac{1}{2 n}\right],\left[1-\frac{1}{2 n}\right],-e^{2 n x}\right)}{e^{x}}-e^{x} \operatorname{hypergeom}\left(\left[1, \frac{1}{2 n}\right],\left[1+\frac{1}{2 n}\right],-e^{2 n x}\right)$$

Result(type 8, 35 leaves):

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

Problem 54: Result more than twice size of optimal antiderivative.

$$\int \coth(3x)\sinh(x)\,dx$$

Optimal(type 3, 16 leaves, 3 steps):

$$\sinh(x) - \frac{\arctan\left(\frac{2\sinh(x)\sqrt{3}}{3}\right)\sqrt{3}}{3}$$

Result(type 3, 50 leaves):

$$-\frac{1}{1+\tanh\left(\frac{x}{2}\right)} - \frac{\sqrt{3}\arctan\left(\frac{\tanh\left(\frac{x}{2}\right)\sqrt{3}}{3}\right)}{3} - \frac{1}{\tanh\left(\frac{x}{2}\right)-1} - \frac{\sqrt{3}\arctan\left(\tanh\left(\frac{x}{2}\right)\sqrt{3}\right)}{3}$$

Problem 55: Result more than twice size of optimal antiderivative.

$$\int \coth(4x)\sinh(x)\,dx$$

Optimal(type 3, 20 leaves, 6 steps):

$$-\frac{\arctan(\sinh(x))}{4} + \sinh(x) - \frac{\arctan\left(\sinh(x)\sqrt{2}\right)\sqrt{2}}{4}$$

Result(type 3, 142 leaves):

$$-\frac{1}{1+\tanh\left(\frac{x}{2}\right)} - \frac{1}{\tanh\left(\frac{x}{2}\right)-1} - \frac{\arctan\left(\tanh\left(\frac{x}{2}\right)\right)}{2} + \frac{\sqrt{2}\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{-2+2\sqrt{2}}\right)}{2\left(-2+2\sqrt{2}\right)} - \frac{\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{-2+2\sqrt{2}}\right)}{-2+2\sqrt{2}} - \frac{\sqrt{2}\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{2+2\sqrt{2}}\right)}{2\left(2+2\sqrt{2}\right)}$$
$$- \frac{\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{2+2\sqrt{2}}\right)}{2+2\sqrt{2}}$$

Problem 56: Result more than twice size of optimal antiderivative.

$$\int \operatorname{csch}(3x)\sinh(x)\,dx$$

Optimal(type 3, 13 leaves, 2 steps):

$$\frac{\arctan\left(\frac{\tanh(x)\sqrt{3}}{3}\right)\sqrt{3}}{3}$$

Result(type 3, 39 leaves):

$$\frac{I\sqrt{3}\,\ln\left(e^{2x}+\frac{1}{2}+\frac{I\sqrt{3}}{2}\right)}{6}-\frac{I\sqrt{3}\,\ln\left(e^{2x}+\frac{1}{2}-\frac{I\sqrt{3}}{2}\right)}{6}$$

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

$$\int \operatorname{csch}(6x)\sinh(x)\,dx$$

Optimal(type 3, 26 leaves, 7 steps):

$$\frac{\arctan(\sinh(x))}{6}+\frac{\arctan(2\sinh(x))}{6}-\frac{\arctan\left(\frac{2\sinh(x)\sqrt{3}}{3}\right)\sqrt{3}}{6}$$

Result(type 3, 91 leaves):

$$\frac{I\ln(e^{x}+I)}{6}-\frac{I\ln(e^{x}-I)}{6}+\frac{I\sqrt{3}\,\ln\left(e^{2x}-I\sqrt{3}\,e^{x}-1\right)}{12}-\frac{I\sqrt{3}\,\ln\left(e^{2x}+I\sqrt{3}\,e^{x}-1\right)}{12}+\frac{I\ln(e^{2x}+I\,e^{x}-1)}{12}-\frac{I\ln(e^{2x}-I\,e^{x}-1)}{12}$$

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

$$\int \cosh(x)\coth(6x)\,dx$$

Optimal(type 3, 28 leaves, 7 steps):

$$-\frac{\operatorname{arctanh}(\cosh(x))}{6}-\frac{\operatorname{arctanh}(2\cosh(x))}{6}+\cosh(x)-\frac{\operatorname{arctanh}\left(\frac{2\cosh(x)\sqrt{3}}{3}\right)\sqrt{3}}{6}$$

Result(type 3, 86 leaves):

$$\frac{e^{x}}{2}+\frac{e^{-x}}{2}-\frac{\ln(1+e^{x})}{6}+\frac{\ln(e^{x}-1)}{6}+\frac{\sqrt{3}\,\ln\left(e^{2x}-\sqrt{3}\,e^{x}+1\right)}{12}-\frac{\sqrt{3}\,\ln\left(e^{2x}+\sqrt{3}\,e^{x}+1\right)}{12}+\frac{\ln(e^{2x}-e^{x}+1)}{12}-\frac{\ln(e^{2x}+e^{x}+1)}{12}$$

Problem 65: Unable to integrate problem.

$$\int \cosh(x)\coth(nx)\,dx$$

Optimal(type 5, 62 leaves, 6 steps):

$$-\frac{1}{2\,e^{x}}+\frac{e^{x}}{2}+\frac{\operatorname{hypergeom}\left(\left[1,-\frac{1}{2n}\right],\left[1-\frac{1}{2n}\right],e^{2nx}\right)}{e^{x}}-e^{x}\operatorname{hypergeom}\left(\left[1,\frac{1}{2n}\right],\left[1+\frac{1}{2n}\right],e^{2nx}\right)$$

Result(type 8, 34 leaves):

$$\frac{e^{x}}{2}-\frac{1}{2\,e^{x}}+\int\frac{(e^{x})^{2}+1}{\left((e^{nx})^{2}-1\right)e^{x}}\,dx$$

Problem 66: Result is not expressed in closed-form.

$$\int \cosh(x)\,\mathrm{sech}(4x)\,dx$$

Optimal(type 3, 49 leaves, 4 steps):

$$\frac{\arctan\left(\frac{2\sinh(x)}{\sqrt{2-\sqrt{2}}}\right)}{2\sqrt{4-2\sqrt{2}}}-\frac{\arctan\left(\frac{2\sinh(x)}{\sqrt{2+\sqrt{2}}}\right)}{2\sqrt{4+2\sqrt{2}}}$$

Result(type 7, 39 leaves):

$$2\left(\sum_{\_R=RootOf(32768\_Z^4+512\_Z^2+1)}\_R\ln\left(e^{2x}+\left(-4096\_R^3-48\_R\right)e^x-1\right)\right)$$

Problem 67: Result is not expressed in closed-form.

$$\int \cosh(x)\,\mathrm{sech}(5x)\,dx$$

Optimal(type 3, 49 leaves, 4 steps):

$$-\frac{\arctan\left(\sqrt{5-2\sqrt{5}}\,\tanh(x)\right)\sqrt{10-2\sqrt{5}}}{10}+\frac{\arctan\left(\sqrt{5+2\sqrt{5}}\,\tanh(x)\right)\sqrt{10+2\sqrt{5}}}{10}$$

Result(type 7, 40 leaves):

$$2\left(\sum_{\_R=RootOf(32000\_Z^4+400\_Z^2+1)}\_R\ln\left(-4000\_R^3+200\_R^2+e^{2x}-30\_R+1\right)\right)$$

Problem 68: Result more than twice size of optimal antiderivative.

$$\int \cosh(x)\,\mathrm{csch}(4x)\,dx$$

Optimal(type 3, 18 leaves, 4 steps):

$$-\frac{\mathrm{arctanh}(\cosh(x))}{4}+\frac{\mathrm{arctanh}\left(\cosh(x)\sqrt{2}\right)\sqrt{2}}{4}$$

Result(type 3, 52 leaves):

$$-\frac{\ln(1+e^x)}{4}+\frac{\ln(e^x-1)}{4}+\frac{\ln\left(1+e^{2x}+e^x\sqrt{2}\right)\sqrt{2}}{8}-\frac{\ln\left(1+e^{2x}-e^x\sqrt{2}\right)\sqrt{2}}{8}$$

Problem 69: Unable to integrate problem.

$$\int x^m\cosh(bx+a)\sinh(bx+a)\,dx$$

Optimal(type 4, 70 leaves, 5 steps):

$$\frac{2^{-3-m} e^{2 a} x^m \Gamma(1+m, -2 b x)}{b(-b x)^m}+\frac{2^{-3-m} x^m \Gamma(1+m, 2 b x)}{b e^{2 a}(b x)^m}$$

Result(type 8, 18 leaves):

$$\int x^m \cosh(b x+a) \sinh(b x+a)\, dx$$

Problem 71: Unable to integrate problem.

$$\int x^m \cosh(b x+a)^2 \sinh(b x+a)\, dx$$

Optimal(type 4, 124 leaves, 8 steps):

$$\frac{3^{-1-m} e^{3 a} x^m \Gamma(1+m, -3 b x)}{8 b(-b x)^m}+\frac{e^a x^m \Gamma(1+m, -b x)}{8 b(-b x)^m}+\frac{x^m \Gamma(1+m, b x)}{8 b e^a(b x)^m}+\frac{3^{-1-m} x^m \Gamma(1+m, 3 b x)}{8 b e^{3 a}(b x)^m}$$

Result(type 8, 20 leaves):

$$\int x^m \cosh(b x+a)^2 \sinh(b x+a)\, dx$$

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

$$\int x^3 \cosh(b x+a) \sinh(b x+a)^2\, dx$$

Optimal(type 3, 103 leaves, 7 steps):

$$\frac{14 \cosh(b x+a)}{9 b^4}+\frac{2 x^2 \cosh(b x+a)}{3 b^2}-\frac{2 \cosh(b x+a)^3}{27 b^4}-\frac{4 x \sinh(b x+a)}{3 b^3}-\frac{x^2 \cosh(b x+a) \sinh(b x+a)^2}{3 b^2}+\frac{2 x \sinh(b x+a)^3}{9 b^3}$$
$$+\frac{x^3 \sinh(b x+a)^3}{3 b}$$

Result(type 3, 333 leaves):

$$\frac{1}{b^4}\Bigg(\frac{(b x+a)^3 \sinh(b x+a) \cosh(b x+a)^2}{3}-\frac{(b x+a)^3 \sinh(b x+a)}{3}-\frac{(b x+a)^2 \sinh(b x+a)^2 \cosh(b x+a)}{3}+\frac{2(b x+a)^2 \cosh(b x+a)}{3}$$
$$+\frac{2(b x+a) \sinh(b x+a) \cosh(b x+a)^2}{9}-\frac{14(b x+a) \sinh(b x+a)}{9}-\frac{2 \cosh(b x+a) \sinh(b x+a)^2}{27}+\frac{40 \cosh(b x+a)}{27}$$
$$-3 a\left(\frac{(b x+a)^2 \sinh(b x+a) \cosh(b x+a)^2}{3}-\frac{(b x+a)^2 \sinh(b x+a)}{3}-\frac{2(b x+a) \sinh(b x+a)^2 \cosh(b x+a)}{9}+\frac{4(b x+a) \cosh(b x+a)}{9}\right.$$
$$\left.+\frac{2 \cosh(b x+a)^2 \sinh(b x+a)}{27}-\frac{14 \sinh(b x+a)}{27}\right)+3 a^2\left(\frac{(b x+a) \sinh(b x+a) \cosh(b x+a)^2}{3}-\frac{(b x+a) \sinh(b x+a)}{3}\right.$$
$$\left.-\frac{\cosh(b x+a) \sinh(b x+a)^2}{9}+\frac{2 \cosh(b x+a)}{9}\right)-a^3\left(\frac{\cosh(b x+a)^2 \sinh(b x+a)}{3}-\frac{\sinh(b x+a)}{3}\right)\Bigg)$$

Problem 76: Result more than twice size of optimal antiderivative.

$$\int x^2 \cosh(bx+a)\sinh(bx+a)^2\,dx$$

Optimal(type 3, 73 leaves, 4 steps):

$$\frac{4x\cosh(bx+a)}{9b^2}-\frac{4\sinh(bx+a)}{9b^3}-\frac{2x\cosh(bx+a)\sinh(bx+a)^2}{9b^2}+\frac{2\sinh(bx+a)^3}{27b^3}+\frac{x^2\sinh(bx+a)^3}{3b}$$

Result(type 3, 192 leaves):

$$\frac{1}{b^3}\left(\frac{(bx+a)^2\sinh(bx+a)\cosh(bx+a)^2}{3}-\frac{(bx+a)^2\sinh(bx+a)}{3}-\frac{2(bx+a)\sinh(bx+a)^2\cosh(bx+a)}{9}+\frac{4(bx+a)\cosh(bx+a)}{9}\right.$$
$$+\frac{2\cosh(bx+a)^2\sinh(bx+a)}{27}-\frac{14\sinh(bx+a)}{27}-2a\left(\frac{(bx+a)\sinh(bx+a)\cosh(bx+a)^2}{3}-\frac{(bx+a)\sinh(bx+a)}{3}\right.$$
$$\left.\left.-\frac{\cosh(bx+a)\sinh(bx+a)^2}{9}+\frac{2\cosh(bx+a)}{9}\right)+a^2\left(\frac{\cosh(bx+a)^2\sinh(bx+a)}{3}-\frac{\sinh(bx+a)}{3}\right)\right)$$

Problem 78: Unable to integrate problem.

$$\int x^m \cosh(bx+a)^2\sinh(bx+a)^2\,dx$$

Optimal(type 4, 87 leaves, 5 steps):

$$-\frac{x^{1+m}}{8(1+m)}+\frac{e^{4a}x^m\Gamma(1+m,-4bx)}{2^{6+2m}b(-bx)^m}-\frac{x^m\Gamma(1+m,4bx)}{2^{6+2m}b\,e^{4a}(bx)^m}$$

Result(type 8, 22 leaves):

$$\int x^m \cosh(bx+a)^2\sinh(bx+a)^2\,dx$$

Problem 80: Result more than twice size of optimal antiderivative.

$$\int x^3 \cosh(bx+a)^3\sinh(bx+a)^2\,dx$$

Optimal(type 3, 178 leaves, 14 steps):

$$\frac{3\cosh(bx+a)}{4b^4}+\frac{3x^2\cosh(bx+a)}{8b^2}-\frac{\cosh(3bx+3a)}{216b^4}-\frac{x^2\cosh(3bx+3a)}{48b^2}-\frac{3\cosh(5bx+5a)}{5000b^4}-\frac{3x^2\cosh(5bx+5a)}{400b^2}-\frac{3x\sinh(bx+a)}{4b^3}$$
$$-\frac{x^3\sinh(bx+a)}{8b}+\frac{x\sinh(3bx+3a)}{72b^3}+\frac{x^3\sinh(3bx+3a)}{48b}+\frac{3x\sinh(5bx+5a)}{1000b^3}+\frac{x^3\sinh(5bx+5a)}{80b}$$

Result(type 3, 533 leaves):

$$\frac{1}{b^4}\left(\frac{(bx+a)^3\sinh(bx+a)\cosh(bx+a)^4}{5}-\frac{2(bx+a)^3\sinh(bx+a)}{15}-\frac{(bx+a)^3\sinh(bx+a)\cosh(bx+a)^2}{15}\right.$$
$$-\frac{3(bx+a)^2\sinh(bx+a)^2\cosh(bx+a)^3}{25}-\frac{4(bx+a)^2\sinh(bx+a)^2\cosh(bx+a)}{75}+\frac{26(bx+a)^2\cosh(bx+a)}{75}$$

$$+\frac{6\,(b x+a)\sinh(b x+a)\cosh(b x+a)^4}{125}-\frac{856\,(b x+a)\sinh(b x+a)}{1125}+\frac{22\,(b x+a)\sinh(b x+a)\cosh(b x+a)^2}{1125}$$

$$-\frac{6\cosh(b x+a)^3\sinh(b x+a)^2}{625}-\frac{272\cosh(b x+a)\sinh(b x+a)^2}{16875}+\frac{12568\cosh(b x+a)}{16875}-3\,a\left(\frac{(b x+a)^2\sinh(b x+a)\cosh(b x+a)^4}{5}\right.$$

$$-\frac{2\,(b x+a)^2\sinh(b x+a)}{15}-\frac{(b x+a)^2\sinh(b x+a)\cosh(b x+a)^2}{15}-\frac{2\,(b x+a)\sinh(b x+a)^2\cosh(b x+a)^3}{25}$$

$$-\frac{8\,(b x+a)\sinh(b x+a)^2\cosh(b x+a)}{225}+\frac{52\,(b x+a)\cosh(b x+a)}{225}+\frac{2\cosh(b x+a)^4\sinh(b x+a)}{125}-\frac{856\sinh(b x+a)}{3375}$$

$$\left.+\frac{22\cosh(b x+a)^2\sinh(b x+a)}{3375}\right)+3\,a^2\left(\frac{(b x+a)\sinh(b x+a)\cosh(b x+a)^4}{5}-\frac{2\,(b x+a)\sinh(b x+a)}{15}\right.$$

$$\left.-\frac{(b x+a)\sinh(b x+a)\cosh(b x+a)^2}{15}-\frac{\cosh(b x+a)^3\sinh(b x+a)^2}{25}-\frac{4\cosh(b x+a)\sinh(b x+a)^2}{225}+\frac{26\cosh(b x+a)}{225}\right)$$

$$\left.-a^3\left(\frac{\cosh(b x+a)^4\sinh(b x+a)}{5}-\frac{\left(\frac{2}{3}+\frac{\cosh(b x+a)^2}{3}\right)\sinh(b x+a)}{5}\right)\right)$$

Problem 82: Result more than twice size of optimal antiderivative.

$$\int x^2\cosh(b x+a)\sinh(b x+a)^3\,dx$$

Optimal(type 3, 89 leaves, 4 steps):

$$-\frac{3x^2}{32\,b}+\frac{3\,x\cosh(b x+a)\sinh(b x+a)}{16\,b^2}-\frac{3\sinh(b x+a)^2}{32\,b^3}-\frac{x\cosh(b x+a)\sinh(b x+a)^3}{8\,b^2}+\frac{\sinh(b x+a)^4}{32\,b^3}+\frac{x^2\sinh(b x+a)^4}{4\,b}$$

Result(type 3, 236 leaves):

$$\frac{1}{b^3}\left(\frac{(b x+a)^2\sinh(b x+a)^2\cosh(b x+a)^2}{4}-\frac{(b x+a)^2\cosh(b x+a)^2}{4}-\frac{(b x+a)\sinh(b x+a)\cosh(b x+a)^3}{8}\right.$$

$$+\frac{5\,(b x+a)\cosh(b x+a)\sinh(b x+a)}{16}+\frac{5\,(b x+a)^2}{32}+\frac{\cosh(b x+a)^2\sinh(b x+a)^2}{32}-\frac{\cosh(b x+a)^2}{8}$$

$$-2\,a\left(\frac{(b x+a)\sinh(b x+a)^2\cosh(b x+a)^2}{4}-\frac{\cosh(b x+a)^2\,(b x+a)}{4}-\frac{\sinh(b x+a)\cosh(b x+a)^3}{16}+\frac{5\cosh(b x+a)\sinh(b x+a)}{32}+\frac{5\,b x}{32}\right.$$

$$\left.\left.+\frac{5\,a}{32}\right)+a^2\left(\frac{\cosh(b x+a)^2\sinh(b x+a)^2}{4}-\frac{\cosh(b x+a)^2}{4}\right)\right)$$

Problem 84: Unable to integrate problem.

$$\int x^m \cosh(bx+a)^2 \sinh(bx+a)^3 \, dx$$

Optimal(type 4, 195 leaves, 11 steps):

$$\frac{5^{-1-m} e^{5a} x^m \Gamma(1+m, -5bx)}{32 b (-bx)^m} - \frac{3^{-1-m} e^{3a} x^m \Gamma(1+m, -3bx)}{32 b (-bx)^m} - \frac{e^a x^m \Gamma(1+m, -bx)}{16 b (-bx)^m} - \frac{x^m \Gamma(1+m, bx)}{16 b e^a (bx)^m} - \frac{3^{-1-m} x^m \Gamma(1+m, 3bx)}{32 b e^{3a} (bx)^m} + \frac{5^{-1-m} x^m \Gamma(1+m, 5bx)}{32 b e^{5a} (bx)^m}$$

Result(type 8, 22 leaves):

$$\int x^m \cosh(bx+a)^2 \sinh(bx+a)^3 \, dx$$

Problem 85: Result more than twice size of optimal antiderivative.

$$\int x^2 \cosh(bx+a)^3 \sinh(bx+a)^3 \, dx$$

Optimal(type 3, 93 leaves, 8 steps):

$$-\frac{3\cosh(2bx+2a)}{128 b^3} - \frac{3x^2\cosh(2bx+2a)}{64 b} + \frac{\cosh(6bx+6a)}{3456 b^3} + \frac{x^2\cosh(6bx+6a)}{192 b} + \frac{3x\sinh(2bx+2a)}{64 b^2} - \frac{x\sinh(6bx+6a)}{576 b^2}$$

Result(type 3, 357 leaves):

$$\frac{1}{b^3}\left(\frac{(bx+a)^2\sinh(bx+a)^2\cosh(bx+a)^4}{6} - \frac{(bx+a)^2\sinh(bx+a)^2\cosh(bx+a)^2}{12} - \frac{(bx+a)^2\cosh(bx+a)^2}{12} - \frac{(bx+a)\sinh(bx+a)\cosh(bx+a)^5}{18} + \frac{(bx+a)\sinh(bx+a)\cosh(bx+a)^3}{18} + \frac{\cosh(bx+a)^4\sinh(bx+a)^2}{108} - \frac{\cosh(bx+a)^2\sinh(bx+a)^2}{216} - \frac{5\cosh(bx+a)^2}{108} + \frac{(bx+a)\cosh(bx+a)\sinh(bx+a)}{12} + \frac{(bx+a)^2}{24} - 2a\left(\frac{(bx+a)\sinh(bx+a)^2\cosh(bx+a)^4}{6} - \frac{(bx+a)\sinh(bx+a)^2\cosh(bx+a)^2}{12} - \frac{\cosh(bx+a)^2(bx+a)}{12} - \frac{\sinh(bx+a)\cosh(bx+a)^5}{36} + \frac{\sinh(bx+a)\cosh(bx+a)^3}{36} + \frac{\cosh(bx+a)\sinh(bx+a)}{24} + \frac{bx}{24} + \frac{a}{24}\right) + a^2\left(\frac{\cosh(bx+a)^4\sinh(bx+a)^2}{6} - \frac{\cosh(bx+a)^2\sinh(bx+a)^2}{12} - \frac{\cosh(bx+a)^2}{12}\right)\right)$$

Problem 92: Result more than twice size of optimal antiderivative.

$$\int x^2 \operatorname{sech}(bx+a)^2 \sinh(bx+a) \, dx$$

Optimal(type 4, 62 leaves, 6 steps):

$$\frac{4x\arctan(e^{bx+a})}{b^2} - \frac{2\,\mathrm{I}\,\mathrm{polylog}(2, -\mathrm{I}\,e^{bx+a})}{b^3} + \frac{2\,\mathrm{I}\,\mathrm{polylog}(2, \mathrm{I}\,e^{bx+a})}{b^3} - \frac{x^2\operatorname{sech}(bx+a)}{b}$$

Result(type 4, 153 leaves):

$$-\frac{2 x^2 e^{b x+a}}{b \left(1+e^{2 b x+2 a}\right)}-\frac{2 I \ln\left(1+I e^{b x+a}\right) x}{b^2}-\frac{2 I \ln\left(1+I e^{b x+a}\right) a}{b^3}+\frac{2 I \ln\left(1-I e^{b x+a}\right) x}{b^2}+\frac{2 I \ln\left(1-I e^{b x+a}\right) a}{b^3}-\frac{2 I \operatorname{dilog}\left(1+I e^{b x+a}\right)}{b^3}$$
$$+\frac{2 I \operatorname{dilog}\left(1-I e^{b x+a}\right)}{b^3}-\frac{4 a \arctan\left(e^{b x+a}\right)}{b^3}$$

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Problem 109: Result more than twice size of optimal antiderivative.
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$$\int x \cosh(b x+a)^2 \operatorname{csch}(b x+a)\, dx$$

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Optimal(type 4, 63 leaves, 8 steps):
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$$-\frac{2 x \operatorname{arctanh}\left(e^{b x+a}\right)}{b}+\frac{x \cosh(b x+a)}{b}-\frac{\operatorname{polylog}\left(2, -e^{b x+a}\right)}{b^2}+\frac{\operatorname{polylog}\left(2, e^{b x+a}\right)}{b^2}-\frac{\sinh(b x+a)}{b^2}$$

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Result(type 4, 138 leaves):
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$$\frac{(b x-1) e^{b x+a}}{2 b^2}+\frac{(b x+1) e^{-b x-a}}{2 b^2}-\frac{\ln\left(e^{b x+a}+1\right) x}{b}-\frac{\ln\left(e^{b x+a}+1\right) a}{b^2}-\frac{\operatorname{polylog}\left(2, -e^{b x+a}\right)}{b^2}+\frac{\ln\left(-e^{b x+a}+1\right) x}{b}+\frac{\ln\left(-e^{b x+a}+1\right) a}{b^2}$$
$$+\frac{\operatorname{polylog}\left(2, e^{b x+a}\right)}{b^2}+\frac{2 a \operatorname{arctanh}\left(e^{b x+a}\right)}{b^2}$$

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Problem 115: Result more than twice size of optimal antiderivative.
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$$\int x^3 \cosh(b x+a)^2 \operatorname{csch}(b x+a)^2\, dx$$

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Optimal(type 4, 83 leaves, 7 steps):
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$$-\frac{x^3}{b}+\frac{x^4}{4}-\frac{x^3 \coth(b x+a)}{b}+\frac{3 x^2 \ln\left(1-e^{2 b x+2 a}\right)}{b^2}+\frac{3 x \operatorname{polylog}\left(2, e^{2 b x+2 a}\right)}{b^3}-\frac{3 \operatorname{polylog}\left(3, e^{2 b x+2 a}\right)}{2 b^4}$$

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Result(type 4, 197 leaves):
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$$\frac{x^4}{4}-\frac{2 x^3}{\left(e^{2 b x+2 a}-1\right) b}-\frac{6 a^2 \ln\left(e^{b x+a}\right)}{b^4}+\frac{3 a^2 \ln\left(e^{b x+a}-1\right)}{b^4}-\frac{2 x^3}{b}+\frac{6 a^2 x}{b^3}+\frac{4 a^3}{b^4}+\frac{3 \ln\left(e^{b x+a}+1\right) x^2}{b^2}+\frac{6 x \operatorname{polylog}\left(2, -e^{b x+a}\right)}{b^3}$$
$$-\frac{6 \operatorname{polylog}\left(3, -e^{b x+a}\right)}{b^4}+\frac{3 \ln\left(-e^{b x+a}+1\right) x^2}{b^2}-\frac{3 \ln\left(-e^{b x+a}+1\right) a^2}{b^4}+\frac{6 x \operatorname{polylog}\left(2, e^{b x+a}\right)}{b^3}-\frac{6 \operatorname{polylog}\left(3, e^{b x+a}\right)}{b^4}$$

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Problem 124: Result more than twice size of optimal antiderivative.
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$$\int x^3 \cosh(b x+a)^3 \operatorname{csch}(b x+a)^3\, dx$$

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Optimal(type 4, 161 leaves, 13 steps):
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$$-\frac{3 x^2}{2 b^2}+\frac{x^3}{2 b}-\frac{x^4}{4}-\frac{3 x^2 \coth(b x+a)}{2 b^2}-\frac{x^3 \coth(b x+a)^2}{2 b}+\frac{3 x \ln\left(1-e^{2 b x+2 a}\right)}{b^3}+\frac{x^3 \ln\left(1-e^{2 b x+2 a}\right)}{b}+\frac{3 \operatorname{polylog}\left(2, e^{2 b x+2 a}\right)}{2 b^4}$$

$$+\frac{3 x^2 \operatorname{polylog}(2, e^{2 b x+2 a})}{2 b^2}-\frac{3 x \operatorname{polylog}(3, e^{2 b x+2 a})}{2 b^3}+\frac{3 \operatorname{polylog}(4, e^{2 b x+2 a})}{4 b^4}$$

Result(type 4, 374 leaves):

$$-\frac{6 a x}{b^3}+\frac{6 a \ln(e^{b x+a})}{b^4}-\frac{3 a \ln(e^{b x+a}-1)}{b^4}-\frac{a^3 \ln(e^{b x+a}-1)}{b^4}-\frac{3 x^2}{b^2}+\frac{3 \operatorname{polylog}(2, -e^{b x+a})}{b^4}+\frac{3 \operatorname{polylog}(2, e^{b x+a})}{b^4}+\frac{6 \operatorname{polylog}(4, -e^{b x+a})}{b^4}$$
$$+\frac{6 \operatorname{polylog}(4, e^{b x+a})}{b^4}-\frac{x^4}{4}+\frac{3 x^2 \operatorname{polylog}(2, -e^{b x+a})}{b^2}+\frac{3 x^2 \operatorname{polylog}(2, e^{b x+a})}{b^2}-\frac{6 x \operatorname{polylog}(3, -e^{b x+a})}{b^3}-\frac{6 x \operatorname{polylog}(3, e^{b x+a})}{b^3}-\frac{3 a^2}{b^4}$$
$$+\frac{3 \ln(e^{b x+a}+1) x}{b^3}+\frac{3 \ln(-e^{b x+a}+1) x}{b^3}+\frac{3 \ln(-e^{b x+a}+1) a}{b^4}+\frac{\ln(e^{b x+a}+1) x^3}{b}+\frac{\ln(-e^{b x+a}+1) x^3}{b}+\frac{\ln(-e^{b x+a}+1) a^3}{b^4}$$
$$-\frac{x^2 (2 e^{2 b x+2 a} b x+3 e^{2 b x+2 a}-3)}{b^2 (e^{2 b x+2 a}-1)^2}-\frac{3 a^4}{2 b^4}-\frac{2 a^3 x}{b^3}+\frac{2 a^3 \ln(e^{b x+a})}{b^4}$$

Problem 125: Result more than twice size of optimal antiderivative.

$$\int x \cosh(b x+a)^3 \operatorname{csch}(b x+a)^3 \, dx$$

Optimal(type 4, 72 leaves, 7 steps):

$$\frac{x}{2 b}-\frac{x^2}{2}-\frac{\coth(b x+a)}{2 b^2}-\frac{x \coth(b x+a)^2}{2 b}+\frac{x \ln(1-e^{2 b x+2 a})}{b}+\frac{\operatorname{polylog}(2, e^{2 b x+2 a})}{2 b^2}$$

Result(type 4, 163 leaves):

$$-\frac{x^2}{2}-\frac{2 e^{2 b x+2 a} b x+e^{2 b x+2 a}-1}{b^2 (e^{2 b x+2 a}-1)^2}-\frac{2 a x}{b}-\frac{a^2}{b^2}+\frac{\ln(e^{b x+a}+1) x}{b}+\frac{\operatorname{polylog}(2, -e^{b x+a})}{b^2}+\frac{\ln(-e^{b x+a}+1) x}{b}+\frac{\ln(-e^{b x+a}+1) a}{b^2}$$
$$+\frac{\operatorname{polylog}(2, e^{b x+a})}{b^2}+\frac{2 a \ln(e^{b x+a})}{b^2}-\frac{a \ln(e^{b x+a}-1)}{b^2}$$

Problem 128: Result more than twice size of optimal antiderivative.

$$\int x^2 \operatorname{csch}(b x+a) \operatorname{sech}(b x+a) \, dx$$

Optimal(type 4, 88 leaves, 8 steps):

$$-\frac{2 x^2 \operatorname{arctanh}(e^{2 b x+2 a})}{b}-\frac{x \operatorname{polylog}(2, -e^{2 b x+2 a})}{b^2}+\frac{x \operatorname{polylog}(2, e^{2 b x+2 a})}{b^2}+\frac{\operatorname{polylog}(3, -e^{2 b x+2 a})}{2 b^3}-\frac{\operatorname{polylog}(3, e^{2 b x+2 a})}{2 b^3}$$

Result(type 4, 185 leaves):

$$\frac{a^2 \ln(e^{b x+a}-1)}{b^3}-\frac{\ln(-e^{b x+a}+1) a^2}{b^3}-\frac{x^2 \ln(1+e^{2 b x+2 a})}{b}-\frac{x \operatorname{polylog}(2, -e^{2 b x+2 a})}{b^2}+\frac{\ln(e^{b x+a}+1) x^2}{b}+\frac{2 x \operatorname{polylog}(2, -e^{b x+a})}{b^2}$$
$$+\frac{\ln(-e^{b x+a}+1) x^2}{b}+\frac{2 x \operatorname{polylog}(2, e^{b x+a})}{b^2}+\frac{\operatorname{polylog}(3, -e^{2 b x+2 a})}{2 b^3}-\frac{2 \operatorname{polylog}(3, -e^{b x+a})}{b^3}-\frac{2 \operatorname{polylog}(3, e^{b x+a})}{b^3}$$

Problem 131: Unable to integrate problem.

$$\int x^3 \operatorname{csch}(b x+a) \operatorname{sech}(b x+a)^2 \, dx$$

Optimal(type 4, 206 leaves, 21 steps):

$$-\frac{6 x^2 \arctan(e^{b x+a})}{b^2}-\frac{2 x^3 \operatorname{arctanh}(e^{b x+a})}{b}-\frac{3 x^2 \operatorname{polylog}(2,-e^{b x+a})}{b^2}+\frac{6 I x \operatorname{polylog}(2,-I e^{b x+a})}{b^3}-\frac{6 I x \operatorname{polylog}(2, I e^{b x+a})}{b^3}+\frac{3 x^2 \operatorname{polylog}(2, e^{b x+a})}{b^2}$$
$$+\frac{6 x \operatorname{polylog}(3,-e^{b x+a})}{b^3}-\frac{6 I \operatorname{polylog}(3,-I e^{b x+a})}{b^4}+\frac{6 I \operatorname{polylog}(3, I e^{b x+a})}{b^4}-\frac{6 x \operatorname{polylog}(3, e^{b x+a})}{b^3}-\frac{6 \operatorname{polylog}(4,-e^{b x+a})}{b^4}$$
$$+\frac{6 \operatorname{polylog}(4, e^{b x+a})}{b^4}+\frac{x^3 \operatorname{sech}(b x+a)}{b}$$

Result(type 8, 95 leaves):

$$\frac{2 x^3 e^{b x+a}}{b\left((e^{b x+a})^2+1\right)}+8\left(\int \frac{x^2 e^{b x+a}\left((e^{b x+a})^2 b x+b x-3 (e^{b x+a})^2+3\right)}{4 b\left((e^{b x+a})^2+1\right)\left((e^{b x+a})^2-1\right)} \, dx\right)$$

Problem 139: Unable to integrate problem.

$$\int x^2 \operatorname{csch}(b x+a)^3 \operatorname{sech}(b x+a)^2 \, dx$$

Optimal(type 4, 181 leaves, 29 steps):

$$\frac{4 x \arctan(e^{b x+a})}{b^2}+\frac{3 x^2 \operatorname{arctanh}(e^{b x+a})}{b}-\frac{\operatorname{arctanh}(\cosh(b x+a))}{b^3}-\frac{x \operatorname{csch}(b x+a)}{b^2}+\frac{3 x \operatorname{polylog}(2,-e^{b x+a})}{b^2}-\frac{2 I \operatorname{polylog}(2,-I e^{b x+a})}{b^3}$$
$$+\frac{2 I \operatorname{polylog}(2, I e^{b x+a})}{b^3}-\frac{3 x \operatorname{polylog}(2, e^{b x+a})}{b^2}-\frac{3 \operatorname{polylog}(3,-e^{b x+a})}{b^3}+\frac{3 \operatorname{polylog}(3, e^{b x+a})}{b^3}-\frac{3 x^2 \operatorname{sech}(b x+a)}{2 b}$$
$$-\frac{x^2 \operatorname{csch}(b x+a)^2 \operatorname{sech}(b x+a)}{2 b}$$

Result(type 8, 168 leaves):

$$-\frac{x e^{b x+a}\left(3 (e^{b x+a})^4 x b-2 (e^{b x+a})^2 b x+2 (e^{b x+a})^4+3 b x-2\right)}{b^2\left((e^{b x+a})^2-1\right)^2\left((e^{b x+a})^2+1\right)}+32\left(\int\right.$$
$$\left.-\frac{e^{b x+a}\left(3 b^2 x^2 (e^{b x+a})^2+3 b^2 x^2-4 (e^{b x+a})^2 b x+4 b x-2 (e^{b x+a})^2-2\right)}{32 b^2\left((e^{b x+a})^2-1\right)\left((e^{b x+a})^2+1\right)} \, dx\right)$$

Problem 140: Result more than twice size of optimal antiderivative.

$$\int x^2 \operatorname{csch}(b x+a)^3 \operatorname{sech}(b x+a)^3 \, dx$$

Optimal(type 4, 144 leaves, 10 steps):

$$\frac{4 x^2 \operatorname{arctanh}(e^{2 b x+2 a})}{b}-\frac{\operatorname{arctanh}(\cosh(2 b x+2 a))}{b^3}-\frac{2 x \operatorname{csch}(2 b x+2 a)}{b^2}-\frac{2 x^2 \coth(2 b x+2 a) \operatorname{csch}(2 b x+2 a)}{b}+\frac{2 x \operatorname{polylog}(2,-e^{2 b x+2 a})}{b^2}$$

$$-\frac{2x\,\mathrm{polylog}(2, \mathrm{e}^{2bx+2a})}{b^2} - \frac{\mathrm{polylog}(3, -\mathrm{e}^{2bx+2a})}{b^3} + \frac{\mathrm{polylog}(3, \mathrm{e}^{2bx+2a})}{b^3}$$

Result(type 4, 298 leaves):

$$-\frac{4x\mathrm{e}^{2bx+2a}\left(\mathrm{e}^{4bx+4a}xb+\mathrm{e}^{4bx+4a}+bx-1\right)}{b^2\left(\mathrm{e}^{2bx+2a}-1\right)^2\left(1+\mathrm{e}^{2bx+2a}\right)^2} + \frac{2\ln(-\mathrm{e}^{bx+a}+1)\,a^2}{b^3} - \frac{2a^2\ln(\mathrm{e}^{bx+a}-1)}{b^3} - \frac{2\ln(-\mathrm{e}^{bx+a}+1)\,x^2}{b} - \frac{4x\,\mathrm{polylog}(2, \mathrm{e}^{bx+a})}{b^2}$$
$$+ \frac{2x^2\ln(1+\mathrm{e}^{2bx+2a})}{b} + \frac{2x\,\mathrm{polylog}(2, -\mathrm{e}^{2bx+2a})}{b^2} - \frac{2\ln(\mathrm{e}^{bx+a}+1)\,x^2}{b} - \frac{4x\,\mathrm{polylog}(2, -\mathrm{e}^{bx+a})}{b^2} + \frac{4\,\mathrm{polylog}(3, -\mathrm{e}^{bx+a})}{b^3}$$
$$+ \frac{4\,\mathrm{polylog}(3, \mathrm{e}^{bx+a})}{b^3} - \frac{\mathrm{polylog}(3, -\mathrm{e}^{2bx+2a})}{b^3} + \frac{\ln(\mathrm{e}^{bx+a}+1)}{b^3} + \frac{\ln(\mathrm{e}^{bx+a}-1)}{b^3} - \frac{\ln(1+\mathrm{e}^{2bx+2a})}{b^3}$$

Problem 141: Unable to integrate problem.

$$\int x\cosh(bx+a)^{5/2}\sinh(bx+a)\,\mathrm{d}x$$

Optimal(type 4, 99 leaves, 4 steps):

$$\frac{2x\cosh(bx+a)^{7/2}}{7b} + \frac{20\,\mathrm{I}\sqrt{\cosh\left(\frac{a}{2}+\frac{bx}{2}\right)^2}\,\mathrm{EllipticF}\left(\mathrm{I}\sinh\left(\frac{a}{2}+\frac{bx}{2}\right), \sqrt{2}\right)}{147\cosh\left(\frac{a}{2}+\frac{bx}{2}\right)b^2} - \frac{4\cosh(bx+a)^{5/2}\sinh(bx+a)}{49b^2}$$
$$-\frac{20\sinh(bx+a)\sqrt{\cosh(bx+a)}}{147b^2}$$

Result(type 8, 18 leaves):

$$\int x\cosh(bx+a)^{5/2}\sinh(bx+a)\,\mathrm{d}x$$

Problem 142: Unable to integrate problem.

$$\int x\sinh(bx+a)\sqrt{\cosh(bx+a)}\,\mathrm{d}x$$

Optimal(type 4, 80 leaves, 3 steps):

$$\frac{2x\cosh(bx+a)^{3/2}}{3b} + \frac{4\,\mathrm{I}\sqrt{\cosh\left(\frac{a}{2}+\frac{bx}{2}\right)^2}\,\mathrm{EllipticF}\left(\mathrm{I}\sinh\left(\frac{a}{2}+\frac{bx}{2}\right), \sqrt{2}\right)}{9\cosh\left(\frac{a}{2}+\frac{bx}{2}\right)b^2} - \frac{4\sinh(bx+a)\sqrt{\cosh(bx+a)}}{9b^2}$$

Result(type 8, 18 leaves):

$$\int x\sinh(bx+a)\sqrt{\cosh(bx+a)}\,\mathrm{d}x$$

Problem 143: Unable to integrate problem.

$$\int x\,\mathrm{sech}(b x+a)^{9/2}\sinh(b x+a)\,dx$$

Optimal(type 4, 115 leaves, 5 steps):

$$-\frac{2 x\,\mathrm{sech}(b x+a)^{7/2}}{7 b}+\frac{4\,\mathrm{sech}(b x+a)^{5/2}\sinh(b x+a)}{35 b^2}+\frac{12\sinh(b x+a)\sqrt{\mathrm{sech}(b x+a)}}{35 b^2}$$
$$+\frac{12\,\mathrm{I}\sqrt{\cosh\left(\frac{a}{2}+\frac{b x}{2}\right)^2}\,\mathrm{EllipticE}\left(\mathrm{I}\sinh\left(\frac{a}{2}+\frac{b x}{2}\right),\sqrt{2}\right)\sqrt{\cosh(b x+a)}\sqrt{\mathrm{sech}(b x+a)}}{35\cosh\left(\frac{a}{2}+\frac{b x}{2}\right) b^2}$$

Result(type 8, 18 leaves):

$$\int x\,\mathrm{sech}(b x+a)^{9/2}\sinh(b x+a)\,dx$$

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

$$\int x\sqrt{\mathrm{sech}(b x+a)}\,\sinh(b x+a)\,dx$$

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

$$\frac{2 x}{b\sqrt{\mathrm{sech}(b x+a)}}+\frac{4\,\mathrm{I}\sqrt{\cosh\left(\frac{a}{2}+\frac{b x}{2}\right)^2}\,\mathrm{EllipticE}\left(\mathrm{I}\sinh\left(\frac{a}{2}+\frac{b x}{2}\right),\sqrt{2}\right)\sqrt{\cosh(b x+a)}\sqrt{\mathrm{sech}(b x+a)}}{\cosh\left(\frac{a}{2}+\frac{b x}{2}\right) b^2}$$

Result(type 4, 249 leaves):

$$\frac{(b x-2)\left(\left(e^{b x+a}\right)^2+1\right)\sqrt{2}\sqrt{\frac{e^{b x+a}}{\left(e^{b x+a}\right)^2+1}}}{b^2 e^{b x+a}}-\frac{1}{b^2 e^{b x+a}}\left(2\left(-\frac{2\left(\left(e^{b x+a}\right)^2+1\right)}{\sqrt{\left(\left(e^{b x+a}\right)^2+1\right)e^{b x+a}}}\right.\right.$$
$$\left.+\frac{\mathrm{I}\sqrt{-\mathrm{I}\left(e^{b x+a}+\mathrm{I}\right)}\sqrt{2}\sqrt{\mathrm{I}\left(e^{b x+a}-\mathrm{I}\right)}\sqrt{\mathrm{I}\,e^{b x+a}}\left(-2\,\mathrm{I}\,\mathrm{EllipticE}\left(\sqrt{-\mathrm{I}\left(e^{b x+a}+\mathrm{I}\right)},\frac{\sqrt{2}}{2}\right)+\mathrm{I}\,\mathrm{EllipticF}\left(\sqrt{-\mathrm{I}\left(e^{b x+a}+\mathrm{I}\right)},\frac{\sqrt{2}}{2}\right)\right)}{\sqrt{\left(e^{b x+a}\right)^3+e^{b x+a}}}\right)$$
$$\left.\sqrt{2}\sqrt{\frac{e^{b x+a}}{\left(e^{b x+a}\right)^2+1}}\sqrt{\left(\left(e^{b x+a}\right)^2+1\right)e^{b x+a}}\right)$$

Problem 145: Unable to integrate problem.

$$\int\frac{x\sinh(b x+a)}{\sqrt{\mathrm{sech}(b x+a)}}\,dx$$

Optimal(type 4, 96 leaves, 4 steps):

$$\frac{2x}{3b\operatorname{sech}(bx+a)^{3/2}}-\frac{4\sinh(bx+a)}{9b^2\sqrt{\operatorname{sech}(bx+a)}}+\frac{4I\sqrt{\cosh\left(\frac{a}{2}+\frac{bx}{2}\right)^2}\operatorname{EllipticF}\left(I\sinh\left(\frac{a}{2}+\frac{bx}{2}\right),\sqrt{2}\right)\sqrt{\cosh(bx+a)}\sqrt{\operatorname{sech}(bx+a)}}{9\cosh\left(\frac{a}{2}+\frac{bx}{2}\right)b^2}$$

Result(type 8, 18 leaves):

$$\int\frac{x\sinh(bx+a)}{\sqrt{\operatorname{sech}(bx+a)}}\,dx$$

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

$$\int\frac{x\cosh(bx+a)}{\sqrt{\sinh(bx+a)}}\,dx$$

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

$$\frac{2x\sqrt{\sinh(bx+a)}}{b}-\frac{4I\sqrt{\sin\left(\frac{Ia}{2}+\frac{\pi}{4}+\frac{Ibx}{2}\right)^2}\operatorname{EllipticE}\left(\cos\left(\frac{Ia}{2}+\frac{\pi}{4}+\frac{Ibx}{2}\right),\sqrt{2}\right)\sqrt{\sinh(bx+a)}}{\sin\left(\frac{Ia}{2}+\frac{\pi}{4}+\frac{Ibx}{2}\right)b^2\sqrt{I\sinh(bx+a)}}$$

Result(type 4, 228 leaves):

$$\frac{(bx-2)\left(\left(e^{bx+a}\right)^2-1\right)\sqrt{2}}{b^2\sqrt{\frac{\left(e^{bx+a}\right)^2-1}{e^{bx+a}}}\,e^{bx+a}}+\frac{1}{b^2\sqrt{\frac{\left(e^{bx+a}\right)^2-1}{e^{bx+a}}}\,e^{bx+a}}\left(2\left(\frac{2\left(\left(e^{bx+a}\right)^2-1\right)}{\sqrt{\left(\left(e^{bx+a}\right)^2-1\right)e^{bx+a}}}\right.\right.$$
$$\left.\left.-\frac{\sqrt{e^{bx+a}+1}\sqrt{-2e^{bx+a}+2}\sqrt{-e^{bx+a}}\left(-2\operatorname{EllipticE}\left(\sqrt{e^{bx+a}+1},\frac{\sqrt{2}}{2}\right)+\operatorname{EllipticF}\left(\sqrt{e^{bx+a}+1},\frac{\sqrt{2}}{2}\right)\right)}{\sqrt{\left(e^{bx+a}\right)^3-e^{bx+a}}}\right)\sqrt{2}\sqrt{\left(\left(e^{bx+a}\right)^2-1\right)e^{bx+a}}\right)$$

Problem 147: Unable to integrate problem.

$$\int x\cosh(bx+a)\operatorname{csch}(bx+a)^{7/2}\,dx$$

Optimal(type 4, 111 leaves, 4 steps):

$$-\frac{4\cosh(bx+a)\operatorname{csch}(bx+a)^{3/2}}{15b^2}-\frac{2x\operatorname{csch}(bx+a)^{5/2}}{5b}$$

$$-\frac{4 I \sqrt{\sin\left(\frac{I a}{2}+\frac{\pi}{4}+\frac{I b x}{2}\right)^2}\, \mathrm{EllipticF}\left(\cos\left(\frac{I a}{2}+\frac{\pi}{4}+\frac{I b x}{2}\right), \sqrt{2}\right) \sqrt{\mathrm{csch}(b x+a)}\, \sqrt{I \sinh(b x+a)}}{15 \sin\left(\frac{I a}{2}+\frac{\pi}{4}+\frac{I b x}{2}\right) b^2}$$

Result(type 8, 18 leaves):

$$\int x \cosh(b x+a)\, \mathrm{csch}(b x+a)^{7/2}\, dx$$

Problem 148: Result more than twice size of optimal antiderivative.

$$\int x \cosh(b x+a) \sqrt{\mathrm{csch}(b x+a)}\, dx$$

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

$$\frac{2 x}{b \sqrt{\mathrm{csch}(b x+a)}}-\frac{4 I \sqrt{\sin\left(\frac{I a}{2}+\frac{\pi}{4}+\frac{I b x}{2}\right)^2}\, \mathrm{EllipticE}\left(\cos\left(\frac{I a}{2}+\frac{\pi}{4}+\frac{I b x}{2}\right), \sqrt{2}\right)}{\sin\left(\frac{I a}{2}+\frac{\pi}{4}+\frac{I b x}{2}\right) b^2 \sqrt{\mathrm{csch}(b x+a)}\, \sqrt{I \sinh(b x+a)}}$$

Result(type 4, 228 leaves):

$$\frac{(b x-2)\left(\left(e^{b x+a}\right)^2-1\right) \sqrt{2} \sqrt{\frac{e^{b x+a}}{\left(e^{b x+a}\right)^2-1}}}{b^2 e^{b x+a}}+\frac{1}{b^2 e^{b x+a}}\left(2\left(\frac{2\left(\left(e^{b x+a}\right)^2-1\right)}{\sqrt{\left(\left(e^{b x+a}\right)^2-1\right) e^{b x+a}}}\right.\right.$$
$$\left.-\frac{\sqrt{e^{b x+a}+1}\, \sqrt{-2 e^{b x+a}+2}\, \sqrt{-e^{b x+a}}\left(-2\, \mathrm{EllipticE}\left(\sqrt{e^{b x+a}+1}, \frac{\sqrt{2}}{2}\right)+\mathrm{EllipticF}\left(\sqrt{e^{b x+a}+1}, \frac{\sqrt{2}}{2}\right)\right)}{\sqrt{\left(e^{b x+a}\right)^3-e^{b x+a}}}\right)$$
$$\left.\sqrt{2} \sqrt{\frac{e^{b x+a}}{\left(e^{b x+a}\right)^2-1}} \sqrt{\left(\left(e^{b x+a}\right)^2-1\right) e^{b x+a}}\right)$$

Problem 149: Unable to integrate problem.

$$\int \frac{x \cosh(b x+a)}{\sqrt{\mathrm{csch}(b x+a)}}\, dx$$

Optimal(type 4, 111 leaves, 4 steps):

$$\frac{2x}{3b\operatorname{csch}(bx+a)^{3/2}}-\frac{4\cosh(bx+a)}{9b^2\sqrt{\operatorname{csch}(bx+a)}}+\frac{4I\sqrt{\sin\left(\frac{Ia}{2}+\frac{\pi}{4}+\frac{Ibx}{2}\right)^2}\,\mathrm{EllipticF}\left(\cos\left(\frac{Ia}{2}+\frac{\pi}{4}+\frac{Ibx}{2}\right),\sqrt{2}\right)\sqrt{\operatorname{csch}(bx+a)}\,\sqrt{I\sinh(bx+a)}}{9\sin\left(\frac{Ia}{2}+\frac{\pi}{4}+\frac{Ibx}{2}\right)b^2}$$

Result(type 8, 18 leaves):

$$\int\frac{x\cosh(bx+a)}{\sqrt{\operatorname{csch}(bx+a)}}\,dx$$

Problem 150: Unable to integrate problem.

$$\int\frac{x\cosh(bx+a)}{\operatorname{csch}(bx+a)^{3/2}}\,dx$$

Optimal(type 4, 111 leaves, 4 steps):

$$\frac{2x}{5b\operatorname{csch}(bx+a)^{5/2}}-\frac{4\cosh(bx+a)}{25b^2\operatorname{csch}(bx+a)^{3/2}}+\frac{12I\sqrt{\sin\left(\frac{Ia}{2}+\frac{\pi}{4}+\frac{Ibx}{2}\right)^2}\,\mathrm{EllipticE}\left(\cos\left(\frac{Ia}{2}+\frac{\pi}{4}+\frac{Ibx}{2}\right),\sqrt{2}\right)}{25\sin\left(\frac{Ia}{2}+\frac{\pi}{4}+\frac{Ibx}{2}\right)b^2\sqrt{\operatorname{csch}(bx+a)}\,\sqrt{I\sinh(bx+a)}}$$

Result(type 8, 18 leaves):

$$\int\frac{x\cosh(bx+a)}{\operatorname{csch}(bx+a)^{3/2}}\,dx$$

Problem 151: Result more than twice size of optimal antiderivative.

$$\int\sqrt{\sinh(x)\tanh(x)}\,dx$$

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

$$2\coth(x)\sqrt{\sinh(x)\tanh(x)}$$

Result(type 3, 41 leaves):

$$\frac{\sqrt{2}\sqrt{\frac{(e^{2x}-1)^2e^{-x}}{e^{2x}+1}}\,(e^{2x}+1)}{e^{2x}-1}$$

Problem 152: Unable to integrate problem.

$$\int(\sinh(x)\tanh(x))^{3/2}\,dx$$

Optimal(type 3, 23 leaves, 4 steps):

$$\frac{8\,\mathrm{csch}(x)\,\sqrt{\sinh(x)\,\tanh(x)}}{3}+\frac{2\,\sinh(x)\,\sqrt{\sinh(x)\,\tanh(x)}}{3}$$

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Result(type 8, 9 leaves):
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$$\int (\sinh(x)\,\tanh(x))^{3/2}\,dx$$

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Problem 153: Result more than twice size of optimal antiderivative.
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$$\int \frac{b+c+\cosh(x)}{a-b\sinh(x)}\,dx$$

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Optimal(type 3, 47 leaves, 7 steps):
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$$-\frac{\ln(a-b\sinh(x))}{b}+\frac{2\,(b+c)\,\mathrm{arctanh}\left(\frac{b+a\tanh\left(\frac{x}{2}\right)}{\sqrt{a^2+b^2}}\right)}{\sqrt{a^2+b^2}}$$

```
Result(type 3, 118 leaves):
```

$$\frac{\ln\left(1+\tanh\left(\frac{x}{2}\right)\right)}{b}-\frac{\ln\left(a\tanh\left(\frac{x}{2}\right)^2+2\,b\tanh\left(\frac{x}{2}\right)-a\right)}{b}+\frac{2\,b\,\mathrm{arctanh}\left(\frac{2\,a\tanh\left(\frac{x}{2}\right)+2\,b}{2\sqrt{a^2+b^2}}\right)}{\sqrt{a^2+b^2}}+\frac{2\,\mathrm{arctanh}\left(\frac{2\,a\tanh\left(\frac{x}{2}\right)+2\,b}{2\sqrt{a^2+b^2}}\right)c}{\sqrt{a^2+b^2}}$$
$$+\frac{\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{b}$$

```
Problem 156: Maple result simpler than optimal antiderivative, IF it can be verified!
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$$\int \sqrt{a\cosh(x)+b\sinh(x)}\,dx$$

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

$$\frac{-2\,\mathrm{I}\sqrt{\cos\left(\frac{\mathrm{I}\,x}{2}-\frac{\arctan(a,-\mathrm{I}\,b)}{2}\right)^2}\,\mathrm{EllipticE}\left(\sin\left(\frac{\mathrm{I}\,x}{2}-\frac{\arctan(a,-\mathrm{I}\,b)}{2}\right),\sqrt{2}\right)\sqrt{a\cosh(x)+b\sinh(x)}}{\cos\left(\frac{\mathrm{I}\,x}{2}-\frac{\arctan(a,-\mathrm{I}\,b)}{2}\right)\sqrt{\frac{a\cosh(x)+b\sinh(x)}{\sqrt{a^2-b^2}}}}$$

```
Result(type 3, 32 leaves):
```

$$-\frac{\sqrt{a^2-b^2}\,\cosh(x)}{\sqrt{-\sinh(x)\,\sqrt{a^2-b^2}}}$$

Problem 157: Maple result simpler than optimal antiderivative, IF it can be verified!

$$\int \frac{1}{\sqrt{a \cosh(x) + b \sinh(x)}}\, dx$$

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

$$\frac{-2\,\mathrm{I}\sqrt{\cos\left(\frac{\mathrm{I}\,x}{2}-\frac{\arctan(a,-\mathrm{I}\,b)}{2}\right)^2}\;\mathrm{EllipticF}\left(\sin\left(\frac{\mathrm{I}\,x}{2}-\frac{\arctan(a,-\mathrm{I}\,b)}{2}\right),\sqrt{2}\right)\sqrt{\frac{a\cosh(x)+b\sinh(x)}{\sqrt{a^2-b^2}}}}{\cos\left(\frac{\mathrm{I}\,x}{2}-\frac{\arctan(a,-\mathrm{I}\,b)}{2}\right)\sqrt{a\cosh(x)+b\sinh(x)}}$$

Result(type 3, 96 leaves):

$$\frac{\sqrt{-\sinh(x)^3\sqrt{a^2-b^2}}\;\arctan\left(\frac{\sqrt{\sinh(x)\sqrt{a^2-b^2}}\;\cosh(x)}{\sqrt{-\sinh(x)^3\sqrt{a^2-b^2}}}\right)}{\sqrt{\sinh(x)\sqrt{a^2-b^2}}\;\sinh(x)\sqrt{-\sinh(x)\sqrt{a^2-b^2}}}$$

Problem 167: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(a\,\mathrm{sech}(x) + b\tanh(x))^3}\, dx$$

Optimal(type 3, 50 leaves, 4 steps):

$$\frac{\ln(a+b\sinh(x))}{b^3}+\frac{-a^2-b^2}{2\,b^3\,(a+b\sinh(x))^2}+\frac{2\,a}{b^3\,(a+b\sinh(x))}$$

Result(type 3, 240 leaves):

$$-\frac{\ln\left(1+\tanh\left(\frac{x}{2}\right)\right)}{b^3}+\frac{2\,a\tanh\left(\frac{x}{2}\right)^3}{b^2\left(a\tanh\left(\frac{x}{2}\right)^2-2\,b\tanh\left(\frac{x}{2}\right)-a\right)^2}-\frac{2\tanh\left(\frac{x}{2}\right)^3}{\left(a\tanh\left(\frac{x}{2}\right)^2-2\,b\tanh\left(\frac{x}{2}\right)-a\right)^2 a}-\frac{6\tanh\left(\frac{x}{2}\right)^2}{b\left(a\tanh\left(\frac{x}{2}\right)^2-2\,b\tanh\left(\frac{x}{2}\right)-a\right)^2}$$
$$+\frac{2\,b\tanh\left(\frac{x}{2}\right)^2}{\left(a\tanh\left(\frac{x}{2}\right)^2-2\,b\tanh\left(\frac{x}{2}\right)-a\right)^2 a^2}-\frac{2\,a\tanh\left(\frac{x}{2}\right)}{b^2\left(a\tanh\left(\frac{x}{2}\right)^2-2\,b\tanh\left(\frac{x}{2}\right)-a\right)^2}+\frac{2\tanh\left(\frac{x}{2}\right)}{\left(a\tanh\left(\frac{x}{2}\right)^2-2\,b\tanh\left(\frac{x}{2}\right)-a\right)^2 a}$$
$$+\frac{\ln\left(a\tanh\left(\frac{x}{2}\right)^2-2\,b\tanh\left(\frac{x}{2}\right)-a\right)}{b^3}-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{b^3}$$

Problem 168: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(a \operatorname{sech}(x) + b \tanh(x)\right)^4}\, dx$$

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

$$\frac{x}{b^4} + \frac{a\left(2a^2+3b^2\right)\operatorname{arctanh}\left(\frac{b - a\tanh\left(\frac{x}{2}\right)}{\sqrt{a^2+b^2}}\right)}{b^4\left(a^2+b^2\right)^{3/2}} - \frac{\cosh(x)^3}{3b\left(a+b\sinh(x)\right)^3} + \frac{a\cosh(x)^3}{2b\left(a^2+b^2\right)\left(a+b\sinh(x)\right)^2} - \frac{\cosh(x)\left(2a^2+2b^2+ab\sinh(x)\right)}{2b^3\left(a^2+b^2\right)\left(a+b\sinh(x)\right)}$$

```
Result(type 3, 971 leaves):
```

$$\frac{2b}{3\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)} + \frac{\ln\left(1+\tanh\left(\frac{x}{2}\right)\right)}{b^4} - \frac{\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{b^4} + \frac{2a\tanh\left(\frac{x}{2}\right)^5}{\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)}$$
$$- \frac{4b\tanh\left(\frac{x}{2}\right)^4}{\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)} - \frac{2a\tanh\left(\frac{x}{2}\right)^3}{\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)}$$
$$+ \frac{14b\tanh\left(\frac{x}{2}\right)^2}{\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)} + \frac{8a\tanh\left(\frac{x}{2}\right)}{\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)}$$
$$+ \frac{2a^4}{b^3\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)} + \frac{5a^2}{3b\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)} - \frac{2a^3\operatorname{arctanh}\left(\frac{2a\tanh\left(\frac{x}{2}\right) - 2b}{2\sqrt{a^2+b^2}}\right)}{b^4\left(a^2+b^2\right)^{3/2}}$$
$$- \frac{3a\operatorname{arctanh}\left(\frac{2a\tanh\left(\frac{x}{2}\right) - 2b}{2\sqrt{a^2+b^2}}\right)}{b^2\left(a^2+b^2\right)^{3/2}} + \frac{a^3\tanh\left(\frac{x}{2}\right)^5}{b^2\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)} + \frac{2b^2\tanh\left(\frac{x}{2}\right)^5}{\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3 a\left(a^2+b^2\right)}$$
$$+ \frac{2a^4\tanh\left(\frac{x}{2}\right)^4}{b^3\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)} - \frac{3a^2\tanh\left(\frac{x}{2}\right)^4}{b\left(a\tanh\left(\frac{x}{2}\right)^2 - 2b\tanh\left(\frac{x}{2}\right) - a\right)^3\left(a^2+b^2\right)}$$

$$- \frac{4 b^3 \tanh\left(\frac{x}{2}\right)^4}{\left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^3 (a^2 + b^2) a^2} - \frac{12 a^3 \tanh\left(\frac{x}{2}\right)^3}{b^2 \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^3 (a^2 + b^2)}$$

$$+ \frac{8 b^2 \tanh\left(\frac{x}{2}\right)^3}{3 \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^3 a (a^2 + b^2)} + \frac{8 b^4 \tanh\left(\frac{x}{2}\right)^3}{3 \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^3 a^3 (a^2 + b^2)}$$

$$- \frac{4 a^4 \tanh\left(\frac{x}{2}\right)^2}{b^3 \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^3 (a^2 + b^2)} + \frac{16 a^2 \tanh\left(\frac{x}{2}\right)^2}{b \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^3 (a^2 + b^2)}$$

$$+ \frac{4 b^3 \tanh\left(\frac{x}{2}\right)^2}{\left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^3 a^2 (a^2 + b^2)} + \frac{11 a^3 \tanh\left(\frac{x}{2}\right)}{b^2 \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^3 (a^2 + b^2)}$$

$$+ \frac{2 b^2 \tanh\left(\frac{x}{2}\right)}{\left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^3 a (a^2 + b^2)}$$

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

$$\int \frac{1}{(a \operatorname{sech}(x) + b \tanh(x))^5} \, dx$$

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

$$\frac{\ln(a + b \sinh(x))}{b^5} - \frac{(a^2 + b^2)^2}{4 b^5 (a + b \sinh(x))^4} + \frac{4 a (a^2 + b^2)}{3 b^5 (a + b \sinh(x))^3} + \frac{-3 a^2 - b^2}{b^5 (a + b \sinh(x))^2} + \frac{4 a}{b^5 (a + b \sinh(x))}$$

`Result(type 3, 720 leaves):`

$$-\frac{\ln\left(1 + \tanh\left(\frac{x}{2}\right)\right)}{b^5} + \frac{2 a^3 \tanh\left(\frac{x}{2}\right)^7}{b^4 \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^4} - \frac{2 \tanh\left(\frac{x}{2}\right)^7}{\left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^4 a} - \frac{14 a^2 \tanh\left(\frac{x}{2}\right)^6}{b^3 \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^4}$$

$$+ \frac{6 b \tanh\left(\frac{x}{2}\right)^6}{\left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^4 a^2} - \frac{6 a^3 \tanh\left(\frac{x}{2}\right)^5}{b^4 \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^4} + \frac{104 a \tanh\left(\frac{x}{2}\right)^5}{3 b^2 \left(a \tanh\left(\frac{x}{2}\right)^2 - 2 b \tanh\left(\frac{x}{2}\right) - a\right)^4}$$

$$+\frac{2\tanh\left(\frac{x}{2}\right)^{5}}{3\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}a}-\frac{8b^{2}\tanh\left(\frac{x}{2}\right)^{5}}{\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}a^{3}}+\frac{28a^{2}\tanh\left(\frac{x}{2}\right)^{4}}{b^{3}\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}}$$

$$-\frac{100\tanh\left(\frac{x}{2}\right)^{4}}{3b\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}}-\frac{28b\tanh\left(\frac{x}{2}\right)^{4}}{3\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}a^{2}}+\frac{4b^{3}\tanh\left(\frac{x}{2}\right)^{4}}{\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}a^{4}}$$

$$+\frac{6a^{3}\tanh\left(\frac{x}{2}\right)^{3}}{b^{4}\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}}-\frac{104a\tanh\left(\frac{x}{2}\right)^{3}}{3b^{2}\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}}-\frac{2\tanh\left(\frac{x}{2}\right)^{3}}{3\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}a}$$

$$+\frac{8b^{2}\tanh\left(\frac{x}{2}\right)^{3}}{\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}a^{3}}-\frac{14a^{2}\tanh\left(\frac{x}{2}\right)^{2}}{b^{3}\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}}+\frac{6b\tanh\left(\frac{x}{2}\right)^{2}}{\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}a^{2}}$$

$$-\frac{2a^{3}\tanh\left(\frac{x}{2}\right)}{b^{4}\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}}+\frac{2\tanh\left(\frac{x}{2}\right)}{\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)^{4}a}+\frac{\ln\left(a\tanh\left(\frac{x}{2}\right)^{2}-2b\tanh\left(\frac{x}{2}\right)-a\right)}{b^{5}}$$

$$-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{b^{5}}$$

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

$$\int(\operatorname{sech}(x)+\mathrm{I}\tanh(x))^{5}\,dx$$

```
Optimal(type 3, 34 leaves, 4 steps):
```

$$\mathrm{I}\ln(\mathrm{I}+\sinh(x))-\frac{2\,\mathrm{I}}{(1-\mathrm{I}\sinh(x))^{2}}+\frac{4\,\mathrm{I}}{1-\mathrm{I}\sinh(x)}$$

```
Result(type 3, 81 leaves):
```

$$\frac{8\left(\frac{\operatorname{sech}(x)^{3}}{4}+\frac{3\operatorname{sech}(x)}{8}\right)\tanh(x)}{3}+2\arctan(\mathrm{e}^{x})+\frac{15\,\mathrm{I}\sinh(x)^{2}}{4\cosh(x)^{4}}-\frac{5\,\mathrm{I}\sinh(x)^{2}}{4\cosh(x)^{2}}-\frac{5\sinh(x)}{3\cosh(x)^{4}}-\frac{5\sinh(x)^{3}}{\cosh(x)^{4}}+\mathrm{I}\ln(\cosh(x))-\frac{\mathrm{I}\tanh(x)^{2}}{2}$$

$$-\frac{\mathrm{I}\tanh(x)^{4}}{4}$$

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

$$\int \frac{1}{\operatorname{sech}(x) - \mathrm{I}\tanh(x)}\, dx$$

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

$$\mathrm{I}\ln(\mathrm{I} + \sinh(x))$$

Result(type 3, 32 leaves):

$$2\,\mathrm{I}\ln\left(\tanh\left(\frac{x}{2}\right) + \mathrm{I}\right) - \mathrm{I}\ln\left(1 + \tanh\left(\frac{x}{2}\right)\right) - \mathrm{I}\ln\left(\tanh\left(\frac{x}{2}\right) - 1\right)$$

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

$$\int \frac{1}{(a\coth(x) + b\operatorname{csch}(x))^3}\, dx$$

Optimal(type 3, 48 leaves, 4 steps):

$$\frac{a^2 - b^2}{2\,a^3\,(b + a\cosh(x))^2} + \frac{2\,b}{a^3\,(b + a\cosh(x))} + \frac{\ln(b + a\cosh(x))}{a^3}$$

Result(type 3, 143 leaves):

$$-\frac{\ln\left(1 + \tanh\left(\frac{x}{2}\right)\right)}{a^3} + \frac{\ln\left(a\tanh\left(\frac{x}{2}\right)^2 - \tanh\left(\frac{x}{2}\right)^2 b + a + b\right)}{a^3} + \frac{2}{(a-b)\left(a\tanh\left(\frac{x}{2}\right)^2 - \tanh\left(\frac{x}{2}\right)^2 b + a + b\right)^2}$$
$$+ \frac{2\,b}{a\,(a-b)\left(a\tanh\left(\frac{x}{2}\right)^2 - \tanh\left(\frac{x}{2}\right)^2 b + a + b\right)^2} - \frac{2}{a^2\left(a\tanh\left(\frac{x}{2}\right)^2 - \tanh\left(\frac{x}{2}\right)^2 b + a + b\right)} - \frac{\ln\left(\tanh\left(\frac{x}{2}\right) - 1\right)}{a^3}$$

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

$$\int (\coth(x) + \operatorname{csch}(x))^3\, dx$$

Optimal(type 3, 18 leaves, 4 steps):

$$\frac{2}{1 - \cosh(x)} + \ln(1 - \cosh(x))$$

Result(type 3, 38 leaves):

$$\ln(\sinh(x)) - \frac{\coth(x)^2}{2} - \frac{3\cosh(x)}{\sinh(x)^2} + \coth(x)\operatorname{csch}(x) - 2\operatorname{arctanh}\left(e^x\right) - \frac{3\cosh(x)^2}{2\sinh(x)^2}$$

Problem 179: Result more than twice size of optimal antiderivative.

$$\int (-\coth(x) + \operatorname{csch}(x))^5 \, dx$$

```
Optimal(type 3, 24 leaves, 4 steps):
```

$$\frac{2}{(1+\cosh(x))^2} - \frac{4}{1+\cosh(x)} - \ln(1+\cosh(x))$$

```
Result(type 3, 76 leaves):
```

$$-\ln(\sinh(x)) + \frac{\coth(x)^2}{2} + \frac{\coth(x)^4}{4} - \frac{5\cosh(x)^3}{\sinh(x)^4} + \frac{5\cosh(x)}{3\sinh(x)^4} + \frac{8\left(-\frac{\operatorname{csch}(x)^3}{4} + \frac{3\operatorname{csch}(x)}{8}\right)\coth(x)}{3} - 2\operatorname{arctanh}(e^x) + \frac{15\cosh(x)^2}{4\sinh(x)^4} + \frac{5\cosh(x)^2}{4\sinh(x)^2}$$

```
Problem 191: Result more than twice size of optimal antiderivative.
```

$$\int \frac{\cosh(x)^2}{(a\cosh(x) + b\sinh(x))^2} \, dx$$

```
Optimal(type 3, 67 leaves, 4 steps):
```

$$\frac{(a^2+b^2)x}{(a^2-b^2)^2} - \frac{2ab\ln(a\cosh(x) + b\sinh(x))}{(a^2-b^2)^2} + \frac{b}{(a^2-b^2)(a+b\tanh(x))}$$

```
Result(type 3, 148 leaves):
```

$$-\frac{2b^2 a\tanh\left(\frac{x}{2}\right)}{(a-b)^2(a+b)^2\left(a+2b\tanh\left(\frac{x}{2}\right)+a\tanh\left(\frac{x}{2}\right)^2\right)} + \frac{2b^4\tanh\left(\frac{x}{2}\right)}{(a-b)^2(a+b)^2 a\left(a+2b\tanh\left(\frac{x}{2}\right)+a\tanh\left(\frac{x}{2}\right)^2\right)}$$
$$- \frac{2ba\ln\left(a+2b\tanh\left(\frac{x}{2}\right)+a\tanh\left(\frac{x}{2}\right)^2\right)}{(a-b)^2(a+b)^2} + \frac{\ln\left(1+\tanh\left(\frac{x}{2}\right)\right)}{(a-b)^2} - \frac{\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{(a+b)^2}$$

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

$$\int \frac{\sinh(x)^3}{(a\cosh(x) + b\sinh(x))^3} \, dx$$

```
Optimal(type 3, 102 leaves, 5 steps):
```

$$-\frac{b(3a^2+b^2)x}{(a^2-b^2)^3} - \frac{a}{2(a^2-b^2)(b+a\coth(x))^2} + \frac{2ab}{(a^2-b^2)^2(b+a\coth(x))} + \frac{a(a^2+3b^2)\ln(a\cosh(x)+b\sinh(x))}{(a^2-b^2)^3}$$

```
Result(type 3, 403 leaves):
```

$$\frac{4a^4 b\tanh\left(\frac{x}{2}\right)^3}{(a-b)^3(a+b)^3\left(a+2b\tanh\left(\frac{x}{2}\right)+a\tanh\left(\frac{x}{2}\right)^2\right)^2} - \frac{4a^2b^3\tanh\left(\frac{x}{2}\right)^3}{(a-b)^3(a+b)^3\left(a+2b\tanh\left(\frac{x}{2}\right)+a\tanh\left(\frac{x}{2}\right)^2\right)^2}$$

$$-\frac{2 a^5 \tanh\left(\frac{x}{2}\right)^2}{(a-b)^3 (a+b)^3 \left(a+2 b \tanh\left(\frac{x}{2}\right)+a \tanh\left(\frac{x}{2}\right)^2\right)^2}+\frac{12 a^3 b^2 \tanh\left(\frac{x}{2}\right)^2}{(a-b)^3 (a+b)^3 \left(a+2 b \tanh\left(\frac{x}{2}\right)+a \tanh\left(\frac{x}{2}\right)^2\right)^2}$$

$$-\frac{10 a \tanh\left(\frac{x}{2}\right)^2 b^4}{(a-b)^3 (a+b)^3 \left(a+2 b \tanh\left(\frac{x}{2}\right)+a \tanh\left(\frac{x}{2}\right)^2\right)^2}+\frac{4 a^4 b \tanh\left(\frac{x}{2}\right)}{(a-b)^3 (a+b)^3 \left(a+2 b \tanh\left(\frac{x}{2}\right)+a \tanh\left(\frac{x}{2}\right)^2\right)^2}$$

$$-\frac{4 a^2 \tanh\left(\frac{x}{2}\right) b^3}{(a-b)^3 (a+b)^3 \left(a+2 b \tanh\left(\frac{x}{2}\right)+a \tanh\left(\frac{x}{2}\right)^2\right)^2}+\frac{a^3 \ln\left(a+2 b \tanh\left(\frac{x}{2}\right)+a \tanh\left(\frac{x}{2}\right)^2\right)}{(a-b)^3 (a+b)^3}$$

$$+\frac{3 a \ln\left(a+2 b \tanh\left(\frac{x}{2}\right)+a \tanh\left(\frac{x}{2}\right)^2\right) b^2}{(a-b)^3 (a+b)^3}-\frac{\ln\left(1+\tanh\left(\frac{x}{2}\right)\right)}{(a-b)^3}-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{(a+b)^3}$$

```
Problem 199: Result more than twice size of optimal antiderivative.
```

$$\int \frac{A+C\sinh(x)}{b\cosh(x)+c\sinh(x)}\, dx$$

```
Optimal(type 3, 76 leaves, 3 steps):
```

$$-\frac{c C x}{b^2-c^2}+\frac{b C \ln(b\cosh(x)+c\sinh(x))}{b^2-c^2}+\frac{A \arctan\left(\frac{c\cosh(x)+b\sinh(x)}{\sqrt{b^2-c^2}}\right)}{\sqrt{b^2-c^2}}$$

```
Result(type 3, 180 leaves):
```

$$\frac{b C \ln\left(\tanh\left(\frac{x}{2}\right)^2 b+2 c \tanh\left(\frac{x}{2}\right)+b\right)}{(b-c)(b+c)}+\frac{2 \arctan\left(\frac{2 b \tanh\left(\frac{x}{2}\right)+2 c}{2\sqrt{b^2-c^2}}\right) A b^2}{(b-c)(b+c)\sqrt{b^2-c^2}}-\frac{2 \arctan\left(\frac{2 b \tanh\left(\frac{x}{2}\right)+2 c}{2\sqrt{b^2-c^2}}\right) A c^2}{(b-c)(b+c)\sqrt{b^2-c^2}}-\frac{2 C \ln\left(1+\tanh\left(\frac{x}{2}\right)\right)}{2b-2c}$$

$$-\frac{2 C \ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{2b+2c}$$

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Problem 205: Result more than twice size of optimal antiderivative.
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$$\int \frac{1}{(a+b\cosh(x)+c\sinh(x))^2}\, dx$$

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Optimal(type 3, 85 leaves, 5 steps):
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$$-\frac{2\,a\,\operatorname{arctanh}\left(\frac{c-(a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{a^2-b^2+c^2}}\right)}{\left(a^2-b^2+c^2\right)^{3/2}}+\frac{-c\cosh(x)-b\sinh(x)}{\left(a^2-b^2+c^2\right)\left(a+b\cosh(x)+c\sinh(x)\right)}$$

Result(type 3, 190 leaves):

$$-\frac{2\left(-\frac{\left(a\,b-b^2+c^2\right)\tanh\left(\frac{x}{2}\right)}{a^3-a^2\,b-a\,b^2+a\,c^2+b^3-c^2\,b}-\frac{a\,c}{a^3-a^2\,b-a\,b^2+a\,c^2+b^3-c^2\,b}\right)}{a\tanh\left(\frac{x}{2}\right)^2-\tanh\left(\frac{x}{2}\right)^2 b-2\,c\tanh\left(\frac{x}{2}\right)-a-b}-\frac{2\,a\arctan\left(\frac{2\,(a-b)\tanh\left(\frac{x}{2}\right)-2\,c}{2\sqrt{-a^2+b^2-c^2}}\right)}{\left(a^2-b^2+c^2\right)\sqrt{-a^2+b^2-c^2}}$$

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

$$\int\frac{1}{\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^2}\,dx$$

Optimal(type 3, 91 leaves, 2 steps):

$$\frac{c\cosh(x)+b\sinh(x)}{3\sqrt{b^2-c^2}\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^2}+\frac{-c-\sinh(x)\sqrt{b^2-c^2}}{3\,c\,\left(c\cosh(x)+b\sinh(x)\right)\sqrt{b^2-c^2}}$$

Result(type 3, 216 leaves):

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

Problem 209: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^4}\,dx$$

Optimal(type 3, 176 leaves, 4 steps):

$$\frac{c\cosh(x)+b\sinh(x)}{7\sqrt{b^2-c^2}\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^4}+\frac{3\,\left(c\cosh(x)+b\sinh(x)\right)}{35\,\left(b^2-c^2\right)\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^3}$$
$$+\frac{2\,\left(c\cosh(x)+b\sinh(x)\right)}{35\,\left(b^2-c^2\right)^{3/2}\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^2}-\frac{2\left(c+\sinh(x)\sqrt{b^2-c^2}\right)}{35\,c\,\left(b^2-c^2\right)^{3/2}\left(c\cosh(x)+b\sinh(x)\right)}$$

Result(type 3, 827 leaves):

$$\left(2\left(\frac{\left(8\sqrt{b^2-c^2}\,b^3-4\sqrt{b^2-c^2}\,b\,c^2+8\,b^4-8\,b^2c^2+c^4\right)\tanh\left(\frac{x}{2}\right)^6}{c^2}\right.\right.$$
$$+\frac{3\left(16\sqrt{b^2-c^2}\,b^4-12\sqrt{b^2-c^2}\,b^2c^2+\sqrt{b^2-c^2}\,c^4+16\,b^5-20\,b^3c^2+5\,c^4b\right)\tanh\left(\frac{x}{2}\right)^5}{c^3}$$
$$+\frac{2\left(80\sqrt{b^2-c^2}\,b^5-84\sqrt{b^2-c^2}\,b^3c^2+17\sqrt{b^2-c^2}\,b\,c^4+80\,b^6-124\,b^4c^2+49\,b^2c^4-3\,c^6\right)\tanh\left(\frac{x}{2}\right)^4}{c^4}$$
$$+\frac{2\left(160\,b^7-288\,b^5c^2+150\,b^3c^4-20\,b\,c^6+160\sqrt{b^2-c^2}\,b^6-208\sqrt{b^2-c^2}\,b^4c^2+66\sqrt{b^2-c^2}\,b^2c^4-3\sqrt{b^2-c^2}\,c^6\right)\tanh\left(\frac{x}{2}\right)^3}{c^5}$$
$$+\frac{1}{5\,c^6}\left(3\left(640\,b^7\sqrt{b^2-c^2}-992\sqrt{b^2-c^2}\,b^5c^2+440\sqrt{b^2-c^2}\,b^3c^4-50\sqrt{b^2-c^2}\,b\,c^6+640\,b^8-1312\,b^6c^2+856\,b^4c^4-186\,b^2c^6\right.\right.$$
$$\left.\left.+7\,c^8\right)\tanh\left(\frac{x}{2}\right)^2\right)+\frac{1}{5\,c^7}\left(\left(1280\,b^9-2944\,b^7c^2+2288\,b^5c^4-676\,b^3c^6+57\,b\,c^8+1280\sqrt{b^2-c^2}\,b^8-2304\sqrt{b^2-c^2}\,b^6c^2+1296\sqrt{b^2-c^2}\,b^4c^4\right.\right.$$
$$\left.\left.-236\sqrt{b^2-c^2}\,b^2c^6+7\sqrt{b^2-c^2}\,c^8\right)\tanh\left(\frac{x}{2}\right)\right)+\frac{1}{35\,c^8}\left(4\left(640\sqrt{b^2-c^2}\,b^9-1312\sqrt{b^2-c^2}\,b^7c^2+896\sqrt{b^2-c^2}\,b^5c^4-238\sqrt{b^2-c^2}\,b^3c^6\right.\right.$$
$$\left.\left.\left.\left.+21\sqrt{b^2-c^2}\,b\,c^8+640\,b^{10}-1632\,b^8c^2+1472\,b^6c^4-562\,b^4c^6+85\,b^2c^8-3\,c^{10}\right)\right)\right)\right)\Bigg/\left(c^6\left(\tanh\left(\frac{x}{2}\right)^2+\frac{2\sqrt{b^2-c^2}\tanh\left(\frac{x}{2}\right)}{c}\right.\right.$$
$$\left.\left.+\frac{2\,b\tanh\left(\frac{x}{2}\right)}{c}+\frac{2\sqrt{b^2-c^2}\,b}{c^2}+\frac{2\,b^2}{c^2}-1\right)^3\left(\tanh\left(\frac{x}{2}\right)+\frac{\sqrt{b^2-c^2}}{c}+\frac{b}{c}\right)\right)$$

Problem 210: Maple result simpler than optimal antiderivative, IF it can be verified!

$$\int\sqrt{a+b\cosh(x)+c\sinh(x)}\,dx$$

Optimal(type 4, 125 leaves, 2 steps):

$$\frac{-2\,\mathrm{I}\sqrt{\cos\left(\frac{\mathrm{I}\,x}{2}-\frac{\arctan(b,-\mathrm{I}\,c)}{2}\right)^2}\,\mathrm{EllipticE}\left(\sin\left(\frac{\mathrm{I}\,x}{2}-\frac{\arctan(b,-\mathrm{I}\,c)}{2}\right),\sqrt{2}\sqrt{\frac{\sqrt{b^2-c^2}}{a+\sqrt{b^2-c^2}}}\right)\sqrt{a+b\cosh(x)+c\sinh(x)}}{\cos\left(\frac{\mathrm{I}\,x}{2}-\frac{\arctan(b,-\mathrm{I}\,c)}{2}\right)\sqrt{\frac{a+b\cosh(x)+c\sinh(x)}{a+\sqrt{b^2-c^2}}}}$$

Result(type 3, 313 leaves):

$$\frac{\left(-b^2+c^2\right)\cosh(x)}{\sqrt{b^2-c^2}\sqrt{\frac{-\sinh(x)\, b^2+\sinh(x)\, c^2+a\sqrt{b^2-c^2}}{\sqrt{b^2-c^2}}}}$$

$$+\frac{1}{\left(-\sinh(x)\, b^2+\sinh(x)\, c^2+a\sqrt{b^2-c^2}\right)\sinh(x)}\left(\sqrt{\frac{\left(-\sinh(x)\, b^2+\sinh(x)\, c^2+a\sqrt{b^2-c^2}\right)\sinh(x)^2}{\sqrt{b^2-c^2}}}\, a\ln\left(1\Bigg/\left(\sqrt{b^2-c^2}\sqrt{\frac{-\sinh(x)\, b^2+\sinh(x)\, c^2+a\sqrt{b^2-c^2}}{\sqrt{b^2-c^2}}}\right)\left(\cosh(x)\sinh(x)\left(-b^2+c^2\right)+\cosh(x)\sqrt{b^2-c^2}\, a\right.\right.\right.$$

$$\left.\left.\left.+\sqrt{\frac{\left(-b^2+c^2\right)\sinh(x)^3}{\sqrt{b^2-c^2}}+a\sinh(x)^2}\sqrt{b^2-c^2}\sqrt{\frac{\left(-b^2+c^2\right)\sinh(x)}{\sqrt{b^2-c^2}}+a}\right)\right)\sqrt{b^2-c^2}\right)$$

Problem 211: Result more than twice size of optimal antiderivative.

$$\int\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^{5/2}\, dx$$

Optimal(type 3, 120 leaves, 3 steps):

$$\frac{2\left(c\cosh(x)+b\sinh(x)\right)\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^{3/2}}{5}+\frac{64\left(b^2-c^2\right)\left(c\cosh(x)+b\sinh(x)\right)}{15\sqrt{b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}}}$$

$$+\frac{16\left(c\cosh(x)+b\sinh(x)\right)\sqrt{b^2-c^2}\sqrt{b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}}}{15}$$

Result(type 3, 517 leaves):

$$\frac{-\frac{\left(b^2-c^2\right)^{3/2}\cosh(x)^3}{3}-\frac{\left(-2\, b^2+2\, c^2\right)\left(-b^2+c^2\right)\cosh(x)}{\sqrt{b^2-c^2}}}{\sqrt{-\frac{\sinh(x)\, b^2-\sinh(x)\, c^2-b^2+c^2}{\sqrt{b^2-c^2}}}}$$

$$-\left(\left(\cosh(x)\sqrt{\sinh(x)\sqrt{b^2-c^2}-\sqrt{b^2-c^2}}\sqrt{-\sqrt{b^2-c^2}\sinh(x)^3+\sqrt{b^2-c^2}\sinh(x)^2}\left(b^2-c^2\right)-\sinh(x)\left(b^2-c^2\right)^{3/2}\arctan\left(\frac{\sqrt{\sinh(x)\sqrt{b^2-c^2}-\sqrt{\ldots}}}{\sqrt{-\sqrt{b^2-c^2}\sinh(x)^3+\ldots}}\right.\right.\right.$$

$$\left.\left.+\sqrt{b^2-c^2}\arctan\left(\frac{\sqrt{\sinh(x)\sqrt{b^2-c^2}-\sqrt{b^2-c^2}}\cosh(x)}{\sqrt{-\sqrt{b^2-c^2}\sinh(x)^3+\sqrt{b^2-c^2}\sinh(x)^2}}\right)b^2-\sqrt{b^2-c^2}\arctan\left(\frac{\sqrt{\sinh(x)\sqrt{b^2-c^2}-\sqrt{b^2-c^2}}\cosh(x)}{\sqrt{-\sqrt{b^2-c^2}\sinh(x)^3+\sqrt{b^2-c^2}\sinh(x)^2}}\right)c^2\right)$$

$$\sqrt{-\sqrt{b^2-c^2}\,\sinh(x)^2\,(-1+\sinh(x))}\Bigg/\left(2\sqrt{\sqrt{b^2-c^2}\,(-1+\sinh(x))}\,(-1+\sinh(x))\sinh(x)\sqrt{-\frac{\sinh(x)\,b^2-\sinh(x)\,c^2-b^2+c^2}{\sqrt{b^2-c^2}}}\right)$$

Problem 212: Attempted integration timed out after 120 seconds.

$$\int\frac{1}{\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^{3/2}}\,\mathrm{d}x$$

Optimal(type 3, 128 leaves, 4 steps):

$$\frac{\arctan\left(\frac{(b^2-c^2)^{1/4}\sinh(x+\mathrm{I}\arctan(b,-\mathrm{I}c))\sqrt{2}}{2\sqrt{\sqrt{b^2-c^2}+\cosh(x+\mathrm{I}\arctan(b,-\mathrm{I}c))\sqrt{b^2-c^2}}}\right)\sqrt{2}}{4\,(b^2-c^2)^{3/4}}+\frac{c\cosh(x)+b\sinh(x)}{2\sqrt{b^2-c^2}\left(b\cosh(x)+c\sinh(x)+\sqrt{b^2-c^2}\right)^{3/2}}$$

Result(type 1, 1 leaves):???

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

$$\int\left(b\cosh(x)+c\sinh(x)-\sqrt{b^2-c^2}\right)^{3/2}\mathrm{d}x$$

Optimal(type 3, 82 leaves, 2 steps):

$$-\frac{8\,(c\cosh(x)+b\sinh(x))\sqrt{b^2-c^2}}{3\sqrt{b\cosh(x)+c\sinh(x)-\sqrt{b^2-c^2}}}+\frac{2\,(c\cosh(x)+b\sinh(x))\sqrt{b\cosh(x)+c\sinh(x)-\sqrt{b^2-c^2}}}{3}$$

Result(type 3, 189 leaves):

$$\frac{(2b^2-2c^2)\cosh(x)}{\sqrt{-\frac{\sinh(x)\,b^2-\sinh(x)\,c^2+b^2-c^2}{\sqrt{b^2-c^2}}}}+\frac{\sqrt{-\sqrt{b^2-c^2}\,\sinh(x)^2\,(\sinh(x)+1)}\arctan\left(\frac{\sqrt{\sqrt{b^2-c^2}\,(\sinh(x)+1)}\cosh(x)}{\sqrt{-\sqrt{b^2-c^2}\,\sinh(x)^2\,(\sinh(x)+1)}}\right)(b^2-c^2)}{\sqrt{\sqrt{b^2-c^2}\,(\sinh(x)+1)}\sinh(x)\sqrt{-\frac{\sinh(x)\,b^2-\sinh(x)\,c^2+b^2-c^2}{\sqrt{b^2-c^2}}}}$$

Problem 214: Attempted integration timed out after 120 seconds.

$$\int\frac{1}{\left(b\cosh(x)+c\sinh(x)-\sqrt{b^2-c^2}\right)^{3/2}}\,\mathrm{d}x$$

Optimal(type 3, 134 leaves, 4 steps):

$$\frac{\operatorname{arctanh}\left(\frac{(b^2-c^2)^{1/4}\sinh(x+\mathrm{I}\arctan(b,-\mathrm{I}c))\sqrt{2}}{2\sqrt{-\sqrt{b^2-c^2}+\cosh(x+\mathrm{I}\arctan(b,-\mathrm{I}c))\sqrt{b^2-c^2}}}\right)\sqrt{2}}{4\,(b^2-c^2)^{3/4}}+\frac{-c\cosh(x)-b\sinh(x)}{2\left(b\cosh(x)+c\sinh(x)-\sqrt{b^2-c^2}\right)^{3/2}\sqrt{b^2-c^2}}$$

Result(type 1, 1 leaves):???

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

$$\int\frac{\sinh(x)}{a+b\cosh(x)+c\sinh(x)}\,dx$$

Optimal(type 3, 98 leaves, 4 steps):

$$-\frac{cx}{b^2-c^2}+\frac{b\ln(a+b\cosh(x)+c\sinh(x))}{b^2-c^2}-\frac{2ac\operatorname{arctanh}\left(\frac{c-(a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{a^2-b^2+c^2}}\right)}{(b^2-c^2)\sqrt{a^2-b^2+c^2}}$$

Result(type 3, 428 leaves):

$$\frac{\ln\left(a\tanh\left(\frac{x}{2}\right)^2-\tanh\left(\frac{x}{2}\right)^2b-2c\tanh\left(\frac{x}{2}\right)-a-b\right)ab}{(b-c)\,(b+c)\,(a-b)}-\frac{\ln\left(a\tanh\left(\frac{x}{2}\right)^2-\tanh\left(\frac{x}{2}\right)^2b-2c\tanh\left(\frac{x}{2}\right)-a-b\right)b^2}{(b-c)\,(b+c)\,(a-b)}$$

$$-\frac{2\arctan\left(\frac{2\,(a-b)\tanh\left(\frac{x}{2}\right)-2c}{2\sqrt{-a^2+b^2-c^2}}\right)ac}{(b-c)\,(b+c)\sqrt{-a^2+b^2-c^2}}-\frac{2\arctan\left(\frac{2\,(a-b)\tanh\left(\frac{x}{2}\right)-2c}{2\sqrt{-a^2+b^2-c^2}}\right)cb}{(b-c)\,(b+c)\sqrt{-a^2+b^2-c^2}}+\frac{2\arctan\left(\frac{2\,(a-b)\tanh\left(\frac{x}{2}\right)-2c}{2\sqrt{-a^2+b^2-c^2}}\right)cab}{(b-c)\,(b+c)\sqrt{-a^2+b^2-c^2}\,(a-b)}$$

$$-\frac{2\arctan\left(\frac{2\,(a-b)\tanh\left(\frac{x}{2}\right)-2c}{2\sqrt{-a^2+b^2-c^2}}\right)cb^2}{(b-c)\,(b+c)\sqrt{-a^2+b^2-c^2}\,(a-b)}-\frac{4\ln\left(1+\tanh\left(\frac{x}{2}\right)\right)}{4b-4c}-\frac{4\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{4b+4c}$$

Problem 217: Result more than twice size of optimal antiderivative.

$$\int\frac{B\cosh(x)+C\sinh(x)}{(a+b\cosh(x)+c\sinh(x))^2}\,dx$$

Optimal(type 3, 99 leaves, 4 steps):

$$\frac{2\,(Bb-Cc)\operatorname{arctanh}\left(\frac{c-(a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{a^2-b^2+c^2}}\right)}{(a^2-b^2+c^2)^{3/2}}+\frac{-Bc+bC+aC\cosh(x)+aB\sinh(x)}{(a^2-b^2+c^2)\,(a+b\cosh(x)+c\sinh(x))}$$

Result(type 3, 286 leaves):

$$\frac{2\left(-\frac{\left(B a^2-B a b+B c^2+C a c-C b c\right)\tanh\left(\frac{x}{2}\right)}{a^3-a^2 b-a b^2+a c^2+b^3-c^2 b}-\frac{B c b+C a^2-C b^2}{a^3-a^2 b-a b^2+a c^2+b^3-c^2 b}\right)}{a\tanh\left(\frac{x}{2}\right)^2-\tanh\left(\frac{x}{2}\right)^2 b-2 c\tanh\left(\frac{x}{2}\right)-a-b}+\frac{2\arctan\left(\frac{2\left(a-b\right)\tanh\left(\frac{x}{2}\right)-2 c}{2\sqrt{-a^2+b^2-c^2}}\right)B b}{\left(a^2-b^2+c^2\right)\sqrt{-a^2+b^2-c^2}}$$

$$-\frac{2\arctan\left(\frac{2\left(a-b\right)\tanh\left(\frac{x}{2}\right)-2 c}{2\sqrt{-a^2+b^2-c^2}}\right)C c}{\left(a^2-b^2+c^2\right)\sqrt{-a^2+b^2-c^2}}$$

Problem 220: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\cosh(x)^2+\sinh(x)^2}\,dx$$

Optimal(type 3, 3 leaves, 2 steps):

$$\arctan(\tanh(x))$$

Result(type 3, 115 leaves):

$$\frac{2\sqrt{2}\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{-2+2\sqrt{2}}\right)}{-2+2\sqrt{2}}-\frac{2\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{-2+2\sqrt{2}}\right)}{-2+2\sqrt{2}}-\frac{2\sqrt{2}\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{2+2\sqrt{2}}\right)}{2+2\sqrt{2}}-\frac{2\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{2+2\sqrt{2}}\right)}{2+2\sqrt{2}}$$

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

$$\int\frac{1}{\operatorname{sech}(x)^2-\tanh(x)^2}\,dx$$

Optimal(type 3, 15 leaves, 4 steps):

$$-x+\operatorname{arctanh}\left(\sqrt{2}\tanh(x)\right)\sqrt{2}$$

Result(type 3, 53 leaves):

$$\sqrt{2}\operatorname{arctanh}\left(\frac{\left(2\tanh\left(\frac{x}{2}\right)-2\right)\sqrt{2}}{4}\right)+\sqrt{2}\operatorname{arctanh}\left(\frac{\left(2\tanh\left(\frac{x}{2}\right)+2\right)\sqrt{2}}{4}\right)-\ln\left(1+\tanh\left(\frac{x}{2}\right)\right)+\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)$$

Problem 222: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(\coth(x)^2-\operatorname{csch}(x)^2\right)^2}\,dx$$

Optimal(type 1, 1 leaves, 2 steps):

$$x$$

Result(type 3, 7 leaves):

$$2 \operatorname{arctanh}\left(\tanh\left(\frac{x}{2}\right)\right)$$

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

$$\int \frac{1}{a + b \sinh(x) + c \sinh(x)^2}\, dx$$

Optimal(type 3, 227 leaves, 7 steps):

$$\frac{2 c \arctan\left(\frac{\left(2 I c - \left(I b + \sqrt{4 a c - b^2}\right) \tanh\left(\frac{x}{2}\right)\right) \sqrt{2}}{2 \sqrt{b^2 - 2 (a - c) c - I b \sqrt{4 a c - b^2}}}\right) \sqrt{2}}{\sqrt{4 a c - b^2}\, \sqrt{b^2 - 2 (a - c) c - I b \sqrt{4 a c - b^2}}} - \frac{2 c \arctan\left(\frac{\left(2 I c - I b \tanh\left(\frac{x}{2}\right) + \sqrt{4 a c - b^2} \tanh\left(\frac{x}{2}\right)\right) \sqrt{2}}{2 \sqrt{b^2 - 2 (a - c) c + I b \sqrt{4 a c - b^2}}}\right) \sqrt{2}}{\sqrt{4 a c - b^2}\, \sqrt{b^2 - 2 (a - c) c + I b \sqrt{4 a c - b^2}}}$$

Result(type 7, 73 leaves):

$$\sum_{\_R = RootOf(a\_Z^4 - 2 b\_Z^3 + (-2 a + 4 c)\_Z^2 + 2 b\_Z + a)} \frac{(-\_R^2 + 1) \ln\left(\tanh\left(\frac{x}{2}\right) - \_R\right)}{2\_R^3 a - 3\_R^2 b - 2\_R a + 4\_R c + b}$$

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

$$\int \frac{a + b \sinh(x)}{b^2 - 2 a b \sinh(x) + a^2 \sinh(x)^2}\, dx$$

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

$$\frac{\cosh(x)}{b - a \sinh(x)}$$

Result(type 3, 35 leaves):

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

Problem 225: Result more than twice size of optimal antiderivative.

$$\int \frac{\cosh(x)}{a + b \cosh(x) + c \cosh(x)^2}\, dx$$

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Optimal(type 3, 190 leaves, 6 steps):
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$$\frac{2\,\mathrm{arctanh}\left(\frac{\sqrt{b-2c-\sqrt{-4ac+b^2}}\,\tanh\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{-4ac+b^2}}}\right)\left(1-\frac{b}{\sqrt{-4ac+b^2}}\right)}{\sqrt{b-2c-\sqrt{-4ac+b^2}}\,\sqrt{b+2c-\sqrt{-4ac+b^2}}}+\frac{2\,\mathrm{arctanh}\left(\frac{\sqrt{b-2c+\sqrt{-4ac+b^2}}\,\tanh\left(\frac{x}{2}\right)}{\sqrt{b+2c+\sqrt{-4ac+b^2}}}\right)\left(1+\frac{b}{\sqrt{-4ac+b^2}}\right)}{\sqrt{b-2c+\sqrt{-4ac+b^2}}\,\sqrt{b+2c+\sqrt{-4ac+b^2}}}$$

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Result(type 3, 1261 leaves):
```

$$\frac{c\,\mathrm{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}+\frac{2c\,\mathrm{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)a}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}$$

$$-\frac{c\,\mathrm{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)b}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}-\frac{2c\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)a}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

$$+\frac{c\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)b}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}+\frac{c\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

$$+\frac{a\,\mathrm{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}+\frac{2\,\mathrm{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)a^2}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}$$

$$-\frac{3a\,\mathrm{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)b}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}-\frac{2\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)a^2}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

$$+\frac{3a\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)b}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}+\frac{a\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

$$- \frac{b \operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}} + \frac{\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)b^2}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}$$

$$- \frac{\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)b^2}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}} - \frac{b\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

```
Problem 226: Result more than twice size of optimal antiderivative.
```

$$\int \frac{\cosh(x)^2}{a+b\cosh(x)+c\cosh(x)^2}\,dx$$

```
Optimal(type 3, 216 leaves, 7 steps):
```

$$\frac{x}{c} - \frac{2\operatorname{arctanh}\left(\frac{\sqrt{b-2c-\sqrt{-4ac+b^2}}\,\tanh\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{-4ac+b^2}}}\right)\left(b+\frac{2ac-b^2}{\sqrt{-4ac+b^2}}\right)}{c\sqrt{b-2c-\sqrt{-4ac+b^2}}\,\sqrt{b+2c-\sqrt{-4ac+b^2}}} - \frac{2\operatorname{arctanh}\left(\frac{\sqrt{b-2c+\sqrt{-4ac+b^2}}\,\tanh\left(\frac{x}{2}\right)}{\sqrt{b+2c+\sqrt{-4ac+b^2}}}\right)\left(b+\frac{-2ac+b^2}{\sqrt{-4ac+b^2}}\right)}{c\sqrt{b-2c+\sqrt{-4ac+b^2}}\,\sqrt{b+2c+\sqrt{-4ac+b^2}}}$$

```
Result(type 3, 1956 leaves):
```

$$- \frac{2\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)a^2}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}} + \frac{2\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)a^2}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

$$+ \frac{\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)b^2}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}} - \frac{\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)b^2}{\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

$$+ \frac{a^2\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)}{c\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}} + \frac{a^2\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)}{c\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

$$
\begin{aligned}
&+\frac{b^{2}\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\right)}{c\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}+\frac{b^{2}\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}\right)}{c\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}\\
&+\frac{a\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\right)b}{\sqrt{-4ac+b^{2}}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}-\frac{a\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}\right)b}{\sqrt{-4ac+b^{2}}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}\\
&-\frac{b\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}+\frac{a\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\\
&+\frac{a\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}-\frac{b\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\right)}{(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}+\frac{\ln\left(1+\tanh\left(\frac{x}{2}\right)\right)}{c}\\
&-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{c}-\frac{2c\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\right)a}{\sqrt{-4ac+b^{2}}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\\
&+\frac{2c\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}\right)a}{\sqrt{-4ac+b^{2}}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}-\frac{2ab\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\right)}{c\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\\
&-\frac{2ab\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}\right)}{c\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}-a+c\right)(c+a-b)}}-\frac{\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}\right)b^{3}}{c\sqrt{-4ac+b^{2}}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^{2}}+a-c\right)(c+a-b)}}
\end{aligned}
$$

$$+\frac{\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)b^3}{c\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}-\frac{a^2\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)b}{c\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}$$

$$+\frac{2a\operatorname{arctanh}\left(\frac{(-a+b-c)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}\right)b^2}{c\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}+a-c\right)(c+a-b)}}+\frac{a^2\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)b}{c\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

$$-\frac{2a\arctan\left(\frac{(c+a-b)\tanh\left(\frac{x}{2}\right)}{\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}\right)b^2}{c\sqrt{-4ac+b^2}\,(c+a-b)\sqrt{\left(\sqrt{-4ac+b^2}-a+c\right)(c+a-b)}}$$

Problem 227: Result more than twice size of optimal antiderivative.

$$\int\frac{d+e\cosh(x)}{a+b\cosh(x)+c\cosh(x)^2}\,dx$$

Optimal(type 3, 204 leaves, 5 steps):

$$\frac{2\operatorname{arctanh}\left(\frac{\sqrt{b-2c-\sqrt{-4ac+b^2}}\tanh\left(\frac{x}{2}\right)}{\sqrt{b+2c-\sqrt{-4ac+b^2}}}\right)\left(e+\frac{-eb+2dc}{\sqrt{-4ac+b^2}}\right)}{\sqrt{b-2c-\sqrt{-4ac+b^2}}\sqrt{b+2c-\sqrt{-4ac+b^2}}}+\frac{2\operatorname{arctanh}\left(\frac{\sqrt{b-2c+\sqrt{-4ac+b^2}}\tanh\left(\frac{x}{2}\right)}{\sqrt{b+2c+\sqrt{-4ac+b^2}}}\right)\left(e+\frac{eb-2dc}{\sqrt{-4ac+b^2}}\right)}{\sqrt{b-2c+\sqrt{-4ac+b^2}}\sqrt{b+2c+\sqrt{-4ac+b^2}}}$$

Result(type ?, 2555 leaves): Display of huge result suppressed!

Problem 228: Result more than twice size of optimal antiderivative.

$$\int\frac{\sinh(x)^3}{\cosh(x)^3+\sinh(x)^3}\,dx$$

Optimal(type 3, 29 leaves, 6 steps):

$$\frac{x}{2}+\frac{2\arctan\left(\frac{(1-2\tanh(x))\sqrt{3}}{3}\right)\sqrt{3}}{9}+\frac{1}{6(1+\tanh(x))}$$

Result(type 3, 95 leaves):

$$\frac{1}{3\left(1+\tanh\left(\frac{x}{2}\right)\right)^2}-\frac{1}{3\left(1+\tanh\left(\frac{x}{2}\right)\right)}+\frac{\ln\left(1+\tanh\left(\frac{x}{2}\right)\right)}{2}-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)-1\right)}{2}+\frac{I\sqrt{3}\ln\left(\tanh\left(\frac{x}{2}\right)^2+\left(I\sqrt{3}-1\right)\tanh\left(\frac{x}{2}\right)+1\right)}{9}$$
$$-\frac{I\sqrt{3}\ln\left(\tanh\left(\frac{x}{2}\right)^2+\left(-I\sqrt{3}-1\right)\tanh\left(\frac{x}{2}\right)+1\right)}{9}$$

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

$$\int \frac{x^2\,\mathrm{csch}(x)\,\mathrm{sech}(x)}{\sqrt{a\,\mathrm{sech}(x)^2}}\,dx$$

Optimal(type 4, 89 leaves, 8 steps):

$$-\frac{2x^2\,\mathrm{arctanh}(e^x)\,\mathrm{sech}(x)}{\sqrt{a\,\mathrm{sech}(x)^2}}-\frac{2x\,\mathrm{polylog}(2,-e^x)\,\mathrm{sech}(x)}{\sqrt{a\,\mathrm{sech}(x)^2}}+\frac{2x\,\mathrm{polylog}(2,e^x)\,\mathrm{sech}(x)}{\sqrt{a\,\mathrm{sech}(x)^2}}+\frac{2\,\mathrm{polylog}(3,-e^x)\,\mathrm{sech}(x)}{\sqrt{a\,\mathrm{sech}(x)^2}}-\frac{2\,\mathrm{polylog}(3,e^x)\,\mathrm{sech}(x)}{\sqrt{a\,\mathrm{sech}(x)^2}}$$

Result(type 4, 208 leaves):

$$-\frac{e^x x^2\ln(1+e^x)}{\sqrt{\frac{a\,e^{2x}}{(e^{2x}+1)^2}}\,(e^{2x}+1)}-\frac{2\,e^x x\,\mathrm{polylog}(2,-e^x)}{\sqrt{\frac{a\,e^{2x}}{(e^{2x}+1)^2}}\,(e^{2x}+1)}+\frac{2\,e^x\,\mathrm{polylog}(3,-e^x)}{\sqrt{\frac{a\,e^{2x}}{(e^{2x}+1)^2}}\,(e^{2x}+1)}+\frac{e^x x^2\ln(-e^x+1)}{\sqrt{\frac{a\,e^{2x}}{(e^{2x}+1)^2}}\,(e^{2x}+1)}+\frac{2\,e^x x\,\mathrm{polylog}(2,e^x)}{\sqrt{\frac{a\,e^{2x}}{(e^{2x}+1)^2}}\,(e^{2x}+1)}$$
$$-\frac{2\,e^x\,\mathrm{polylog}(3,e^x)}{\sqrt{\frac{a\,e^{2x}}{(e^{2x}+1)^2}}\,(e^{2x}+1)}$$

Problem 232: Unable to integrate problem.

$$\int \frac{x^3}{a+b\cosh(x)\sinh(x)}\,dx$$

Optimal(type 4, 334 leaves, 13 steps):

$$\frac{x^3\ln\left(1+\frac{b\,e^{2x}}{2a-\sqrt{4a^2+b^2}}\right)}{\sqrt{4a^2+b^2}}-\frac{x^3\ln\left(1+\frac{b\,e^{2x}}{2a+\sqrt{4a^2+b^2}}\right)}{\sqrt{4a^2+b^2}}+\frac{3x^2\,\mathrm{polylog}\left(2,-\frac{b\,e^{2x}}{2a-\sqrt{4a^2+b^2}}\right)}{2\sqrt{4a^2+b^2}}-\frac{3x^2\,\mathrm{polylog}\left(2,-\frac{b\,e^{2x}}{2a+\sqrt{4a^2+b^2}}\right)}{2\sqrt{4a^2+b^2}}$$
$$-\frac{3x\,\mathrm{polylog}\left(3,-\frac{b\,e^{2x}}{2a-\sqrt{4a^2+b^2}}\right)}{2\sqrt{4a^2+b^2}}+\frac{3x\,\mathrm{polylog}\left(3,-\frac{b\,e^{2x}}{2a+\sqrt{4a^2+b^2}}\right)}{2\sqrt{4a^2+b^2}}+\frac{3\,\mathrm{polylog}\left(4,-\frac{b\,e^{2x}}{2a-\sqrt{4a^2+b^2}}\right)}{4\sqrt{4a^2+b^2}}$$

$$-\frac{3\,\mathrm{polylog}\left(4, -\frac{b\,e^{2x}}{2a+\sqrt{4a^2+b^2}}\right)}{4\sqrt{4a^2+b^2}}$$

Result(type 8, 16 leaves):

$$\int \frac{x^3}{a+b\cosh(x)\sinh(x)}\,dx$$

Problem 236: Unable to integrate problem.

$$\int e^{bx+a}\,\mathrm{csch}(dx+c)\,dx$$

Optimal(type 5, 46 leaves, 1 step):

$$-\frac{2\,e^{bx+dx+a+c}\,\mathrm{hypergeom}\left(\left[1, \frac{b+d}{2d}\right], \left[\frac{3}{2}+\frac{b}{2d}\right], e^{2dx+2c}\right)}{b+d}$$

Result(type 8, 15 leaves):

$$\int e^{bx+a}\,\mathrm{csch}(dx+c)\,dx$$

Problem 237: Unable to integrate problem.

$$\int F^{c(bx+a)}\,\mathrm{sech}(ex+d)^n\,dx$$

Optimal(type 5, 88 leaves, 2 steps):

$$\frac{\left(1+e^{2ex+2d}\right)^n F^{bcx+ac}\,\mathrm{hypergeom}\left(\left[n, \frac{en+bc\ln(F)}{2e}\right], \left[1+\frac{en+bc\ln(F)}{2e}\right], -e^{2ex+2d}\right)\mathrm{sech}(ex+d)^n}{en+bc\ln(F)}$$

Result(type 8, 20 leaves):

$$\int F^{c(bx+a)}\,\mathrm{sech}(ex+d)^n\,dx$$

Problem 244: Result is not expressed in closed-form.

$$\int e^x\,\mathrm{sech}(2x)^2\tanh(2x)\,dx$$

Optimal(type 3, 92 leaves, 13 steps):

$$-\frac{e^{5x}}{\left(1+e^{4x}\right)^2}-\frac{e^x}{4\left(1+e^{4x}\right)}+\frac{\arctan\left(e^x\sqrt{2}-1\right)\sqrt{2}}{16}+\frac{\arctan\left(1+e^x\sqrt{2}\right)\sqrt{2}}{16}-\frac{\ln\left(1+e^{2x}-e^x\sqrt{2}\right)\sqrt{2}}{32}+\frac{\ln\left(1+e^{2x}+e^x\sqrt{2}\right)\sqrt{2}}{32}$$

Result(type 7, 43 leaves):

$$-\frac{e^{x}\left(5\,e^{4x}+1\right)}{4\left(1+e^{4x}\right)^{2}}+4\left(\sum_{\_R=RootOf(16777216\,\_Z^{4}+1)}\_R\ln\left(e^{x}+64\,\_R\right)\right)$$

```
Problem 248: Unable to integrate problem.
```

$$\int e^{dx+c}\cosh(bx+a)\,\mathrm{csch}(bx+a)^{3}\,dx$$

```
Optimal(type 5, 103 leaves, 4 steps):
```

$$\frac{4\,e^{2a+c+(2b+d)x}\,\mathrm{hypergeom}\left(\left[2,1+\frac{d}{2b}\right],\left[2+\frac{d}{2b}\right],e^{2bx+2a}\right)}{2b+d}-\frac{8\,e^{2a+c+(2b+d)x}\,\mathrm{hypergeom}\left(\left[3,1+\frac{d}{2b}\right],\left[2+\frac{d}{2b}\right],e^{2bx+2a}\right)}{2b+d}$$

```
Result(type 8, 23 leaves):
```

$$\int e^{dx+c}\cosh(bx+a)\,\mathrm{csch}(bx+a)^{3}\,dx$$

```
Problem 250: Unable to integrate problem.
```

$$\int e^{dx+c}\cosh(bx+a)^{2}\,\mathrm{csch}(bx+a)\,dx$$

```
Optimal(type 5, 94 leaves, 6 steps):
```

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

```
Result(type 8, 23 leaves):
```

$$\int e^{dx+c}\cosh(bx+a)^{2}\,\mathrm{csch}(bx+a)\,dx$$

```
Problem 251: Unable to integrate problem.
```

$$\int e^{dx+c}\cosh(bx+a)^{2}\,\mathrm{csch}(bx+a)^{3}\,dx$$

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

$$-\frac{2\,e^{a+c+(b+d)x}\,\mathrm{hypergeom}\left(\left[1,\frac{b+d}{2b}\right],\left[\frac{3b+d}{2b}\right],e^{2bx+2a}\right)}{b+d}+\frac{8\,e^{a+c+(b+d)x}\,\mathrm{hypergeom}\left(\left[2,\frac{b+d}{2b}\right],\left[\frac{3b+d}{2b}\right],e^{2bx+2a}\right)}{b+d}$$
$$-\frac{8\,e^{a+c+(b+d)x}\,\mathrm{hypergeom}\left(\left[3,\frac{b+d}{2b}\right],\left[\frac{3b+d}{2b}\right],e^{2bx+2a}\right)}{b+d}$$

```
Result(type 8, 25 leaves):
```

$$\int e^{dx+c}\cosh(bx+a)^{2}\,\mathrm{csch}(bx+a)^{3}\,dx$$

Problem 253: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{sech}(x)^2}{1+\tanh(x)^2}\, dx$$

Optimal(type 3, 3 leaves, 2 steps):

$$\arctan(\tanh(x))$$

Result(type 3, 115 leaves):

$$\frac{2\sqrt{2}\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{-2+2\sqrt{2}}\right)}{-2+2\sqrt{2}}-\frac{2\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{-2+2\sqrt{2}}\right)}{-2+2\sqrt{2}}-\frac{2\sqrt{2}\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{2+2\sqrt{2}}\right)}{2+2\sqrt{2}}-\frac{2\arctan\left(\frac{2\tanh\left(\frac{x}{2}\right)}{2+2\sqrt{2}}\right)}{2+2\sqrt{2}}$$

Problem 254: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{sech}(x)^2}{2+2\tanh(x)+\tanh(x)^2}\, dx$$

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

$$\arctan(1+\tanh(x))$$

Result(type 3, 41 leaves):

$$\frac{I\ln\left(\tanh\left(\frac{x}{2}\right)^2+(1-I)\tanh\left(\frac{x}{2}\right)+1\right)}{2}-\frac{I\ln\left(\tanh\left(\frac{x}{2}\right)^2+(1+I)\tanh\left(\frac{x}{2}\right)+1\right)}{2}$$

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

$$\int \frac{\operatorname{sech}(x)^2}{11-5\tanh(x)+5\tanh(x)^2}\, dx$$

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

$$-\frac{2\arctan\left(\frac{\sqrt{195}\,(1-2\tanh(x))}{39}\right)\sqrt{195}}{195}$$

Result(type 3, 61 leaves):

$$\frac{I\sqrt{195}\ln\left(11\tanh\left(\frac{x}{2}\right)^2+\left(-I\sqrt{195}-5\right)\tanh\left(\frac{x}{2}\right)+11\right)}{195}-\frac{I\sqrt{195}\ln\left(11\tanh\left(\frac{x}{2}\right)^2+\left(I\sqrt{195}-5\right)\tanh\left(\frac{x}{2}\right)+11\right)}{195}$$

Problem 256: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{sech}(x)^2\,(a+b\tanh(x))}{c+d\tanh(x)}\, dx$$

Optimal(type 3, 28 leaves, 3 steps):

$$-\frac{(-d a+c b) \ln(c+d \tanh(x))}{d^2}+\frac{b \tanh(x)}{d}$$

Result(type 3, 99 leaves):

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

Problem 257: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{sech}(x)^2 (a+b \tanh(x))^2}{c+d \tanh(x)} \, dx$$

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

$$\frac{(-d a+c b)^2 \ln(c+d \tanh(x))}{d^3}-\frac{b(-d a+c b) \tanh(x)}{d^2}+\frac{(a+b \tanh(x))^2}{2 d}$$

Result(type 3, 250 leaves):

$$\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2 c+2 \tanh\left(\frac{x}{2}\right) d+c\right) a^2}{d}-\frac{2 \ln\left(\tanh\left(\frac{x}{2}\right)^2 c+2 \tanh\left(\frac{x}{2}\right) d+c\right) a c b}{d^2}+\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2 c+2 \tanh\left(\frac{x}{2}\right) d+c\right) b^2 c^2}{d^3}$$
$$+\frac{4 \tanh\left(\frac{x}{2}\right)^3 a b}{d\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^2}-\frac{2 \tanh\left(\frac{x}{2}\right)^3 b^2 c}{d^2\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^2}+\frac{2 b^2 \tanh\left(\frac{x}{2}\right)^2}{d\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^2}+\frac{4 \tanh\left(\frac{x}{2}\right) a b}{d\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^2}-\frac{2 \tanh\left(\frac{x}{2}\right) b^2 c}{d^2\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^2}$$
$$-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2+1\right) a^2}{d}+\frac{2 \ln\left(\tanh\left(\frac{x}{2}\right)^2+1\right) a c b}{d^2}-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2+1\right) b^2 c^2}{d^3}$$

Problem 258: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{sech}(x)^2 (a+b \tanh(x))^3}{c+d \tanh(x)} \, dx$$

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

$$-\frac{(-d a+c b)^3 \ln(c+d \tanh(x))}{d^4}+\frac{b(-d a+c b)^2 \tanh(x)}{d^3}-\frac{(-d a+c b)(a+b \tanh(x))^2}{2 d^2}+\frac{(a+b \tanh(x))^3}{3 d}$$

Result(type 3, 541 leaves):

$$\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2 c+2\tanh\left(\frac{x}{2}\right) d+c\right) a^3}{d}-\frac{3\ln\left(\tanh\left(\frac{x}{2}\right)^2 c+2\tanh\left(\frac{x}{2}\right) d+c\right) a^2 b c}{d^2}+\frac{3\ln\left(\tanh\left(\frac{x}{2}\right)^2 c+2\tanh\left(\frac{x}{2}\right) d+c\right) a b^2 c^2}{d^3}$$
$$-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2 c+2\tanh\left(\frac{x}{2}\right) d+c\right) b^3 c^3}{d^4}+\frac{6\tanh\left(\frac{x}{2}\right)^5 a^2 b}{d\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}-\frac{6\tanh\left(\frac{x}{2}\right)^5 a b^2 c}{d^2\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}+\frac{2\tanh\left(\frac{x}{2}\right)^5 b^3 c^2}{d^3\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}+\frac{6\tanh\left(\frac{x}{2}\right)^4 a b^2}{d\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}$$
$$-\frac{2\tanh\left(\frac{x}{2}\right)^4 b^3 c}{d^2\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}+\frac{12\tanh\left(\frac{x}{2}\right)^3 a^2 b}{d\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}-\frac{12\tanh\left(\frac{x}{2}\right)^3 a b^2 c}{d^2\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}+\frac{4\tanh\left(\frac{x}{2}\right)^3 b^3 c^2}{d^3\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}+\frac{8\tanh\left(\frac{x}{2}\right)^3 b^3}{3d\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}$$
$$+\frac{6\tanh\left(\frac{x}{2}\right)^2 a b^2}{d\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}-\frac{2\tanh\left(\frac{x}{2}\right)^2 b^3 c}{d^2\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}+\frac{6\tanh\left(\frac{x}{2}\right) a^2 b}{d\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}-\frac{6\tanh\left(\frac{x}{2}\right) a b^2 c}{d^2\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}+\frac{2\tanh\left(\frac{x}{2}\right) b^3 c^2}{d^3\left(\tanh\left(\frac{x}{2}\right)^2+1\right)^3}$$
$$-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2+1\right) a^3}{d}+\frac{3\ln\left(\tanh\left(\frac{x}{2}\right)^2+1\right) a^2 b c}{d^2}-\frac{3\ln\left(\tanh\left(\frac{x}{2}\right)^2+1\right) a b^2 c^2}{d^3}+\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2+1\right) b^3 c^3}{d^4}$$

Problem 260: Unable to integrate problem.

$$\int \frac{\operatorname{sech}(x)^2}{\sqrt{4-\operatorname{sech}(x)^2}}\,dx$$

Optimal(type 3, 8 leaves, 2 steps):

$$\operatorname{arcsinh}\left(\frac{\tanh(x)\sqrt{3}}{3}\right)$$

Result(type 8, 17 leaves):

$$\int \frac{\operatorname{sech}(x)^2}{\sqrt{4-\operatorname{sech}(x)^2}}\,dx$$

Problem 261: Unable to integrate problem.

$$\int \frac{\operatorname{sech}(x)^2}{\sqrt{-4+\tanh(x)^2}}\,dx$$

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

$$\operatorname{arctanh}\left(\frac{\tanh(x)}{\sqrt{-4+\tanh(x)^2}}\right)$$

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Result(type 8, 15 leaves):
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$$\int \frac{\operatorname{sech}(x)^2}{\sqrt{-4+\tanh(x)^2}}\,dx$$

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Problem 267: Result more than twice size of optimal antiderivative.
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$$\int \frac{(a+b\coth(x))^2\operatorname{csch}(x)^2}{c+d\coth(x)}\,dx$$

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Optimal(type 3, 51 leaves, 3 steps):
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$$\frac{b(-da+cb)\coth(x)}{d^2}-\frac{(a+b\coth(x))^2}{2d}-\frac{(-da+cb)^2\ln(c+d\coth(x))}{d^3}$$

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Result(type 3, 202 leaves):
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$$-\frac{b^2\tanh\left(\frac{x}{2}\right)^2}{8d}-\frac{b\tanh\left(\frac{x}{2}\right)a}{d}+\frac{b^2\tanh\left(\frac{x}{2}\right)c}{2d^2}-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2 d+2c\tanh\left(\frac{x}{2}\right)+d\right)a^2}{d}+\frac{2\ln\left(\tanh\left(\frac{x}{2}\right)^2 d+2c\tanh\left(\frac{x}{2}\right)+d\right)acb}{d^2}$$
$$-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2 d+2c\tanh\left(\frac{x}{2}\right)+d\right)b^2c^2}{d^3}-\frac{b^2}{8d\tanh\left(\frac{x}{2}\right)^2}+\frac{\ln\left(\tanh\left(\frac{x}{2}\right)\right)a^2}{d}-\frac{2\ln\left(\tanh\left(\frac{x}{2}\right)\right)acb}{d^2}+\frac{\ln\left(\tanh\left(\frac{x}{2}\right)\right)b^2c^2}{d^3}$$
$$-\frac{ba}{d\tanh\left(\frac{x}{2}\right)}+\frac{b^2c}{2d^2\tanh\left(\frac{x}{2}\right)}$$

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Problem 268: Result more than twice size of optimal antiderivative.
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$$\int \frac{(a+b\coth(x))^3\operatorname{csch}(x)^2}{c+d\coth(x)}\,dx$$

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Optimal(type 3, 74 leaves, 3 steps):
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$$-\frac{b(-da+cb)^2\coth(x)}{d^3}+\frac{(-da+cb)(a+b\coth(x))^2}{2d^2}-\frac{(a+b\coth(x))^3}{3d}+\frac{(-da+cb)^3\ln(c+d\coth(x))}{d^4}$$

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Result(type 3, 377 leaves):
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$$-\frac{b^3\tanh\left(\frac{x}{2}\right)^3}{24d}-\frac{3b^2\tanh\left(\frac{x}{2}\right)^2a}{8d}+\frac{b^3\tanh\left(\frac{x}{2}\right)^2c}{8d^2}-\frac{3b\tanh\left(\frac{x}{2}\right)a^2}{2d}+\frac{3b^2\tanh\left(\frac{x}{2}\right)ac}{2d^2}-\frac{b^3\tanh\left(\frac{x}{2}\right)c^2}{2d^3}-\frac{b^3\tanh\left(\frac{x}{2}\right)}{8d}$$

$$-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2 d+2c\tanh\left(\frac{x}{2}\right)+d\right)a^3}{d}+\frac{3\ln\left(\tanh\left(\frac{x}{2}\right)^2 d+2c\tanh\left(\frac{x}{2}\right)+d\right)a^2 b c}{d^2}-\frac{3\ln\left(\tanh\left(\frac{x}{2}\right)^2 d+2c\tanh\left(\frac{x}{2}\right)+d\right)a b^2 c^2}{d^3}$$
$$+\frac{\ln\left(\tanh\left(\frac{x}{2}\right)^2 d+2c\tanh\left(\frac{x}{2}\right)+d\right)b^3 c^3}{d^4}-\frac{b^3}{24\, d\tanh\left(\frac{x}{2}\right)^3}+\frac{\ln\left(\tanh\left(\frac{x}{2}\right)\right)a^3}{d}-\frac{3\ln\left(\tanh\left(\frac{x}{2}\right)\right)a^2 b c}{d^2}+\frac{3\ln\left(\tanh\left(\frac{x}{2}\right)\right)a b^2 c^2}{d^3}$$
$$-\frac{\ln\left(\tanh\left(\frac{x}{2}\right)\right)b^3 c^3}{d^4}-\frac{3 b a^2}{2 d\tanh\left(\frac{x}{2}\right)}+\frac{3 b^2 a c}{2 d^2\tanh\left(\frac{x}{2}\right)}-\frac{b^3 c^2}{2 d^3\tanh\left(\frac{x}{2}\right)}-\frac{b^3}{8 d\tanh\left(\frac{x}{2}\right)}-\frac{3 b^2 a}{8 d\tanh\left(\frac{x}{2}\right)^2}+\frac{b^3 c}{8 d^2\tanh\left(\frac{x}{2}\right)^2}$$

Problem 273: Result more than twice size of optimal antiderivative.

$$\int \frac{\cosh(b x+a)^3-\sinh(b x+a)^3}{\cosh(b x+a)^3+\sinh(b x+a)^3}\,dx$$

Optimal(type 3, 40 leaves, 5 steps):

$$-\frac{4\arctan\left(\frac{(1-2\tanh(b x+a))\sqrt{3}}{3}\right)\sqrt{3}}{9 b}-\frac{1}{3 b\,(1+\tanh(b x+a))}$$

Result(type 3, 119 leaves):

$$-\frac{2}{3 b\left(\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)+1\right)^2}+\frac{2}{3 b\left(\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)+1\right)}+\frac{2 I\sqrt{3}\ln\left(\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)^2+\left(-I\sqrt{3}-1\right)\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)+1\right)}{9 b}$$
$$-\frac{2 I\sqrt{3}\ln\left(\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)^2+\left(I\sqrt{3}-1\right)\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)+1\right)}{9 b}$$

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

$$\int \frac{-\operatorname{csch}(b x+a)+\operatorname{sech}(b x+a)}{\operatorname{csch}(b x+a)+\operatorname{sech}(b x+a)}\,dx$$

Optimal(type 3, 14 leaves, 2 steps):

$$\frac{1}{b\,(1+\tanh(b x+a))}$$

Result(type 3, 35 leaves):

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

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

$$\int \frac{-\operatorname{csch}(b x+a)^{4}+\operatorname{sech}(b x+a)^{4}}{\operatorname{csch}(b x+a)^{4}+\operatorname{sech}(b x+a)^{4}}\, dx$$

Optimal(type 3, 43 leaves, 6 steps):

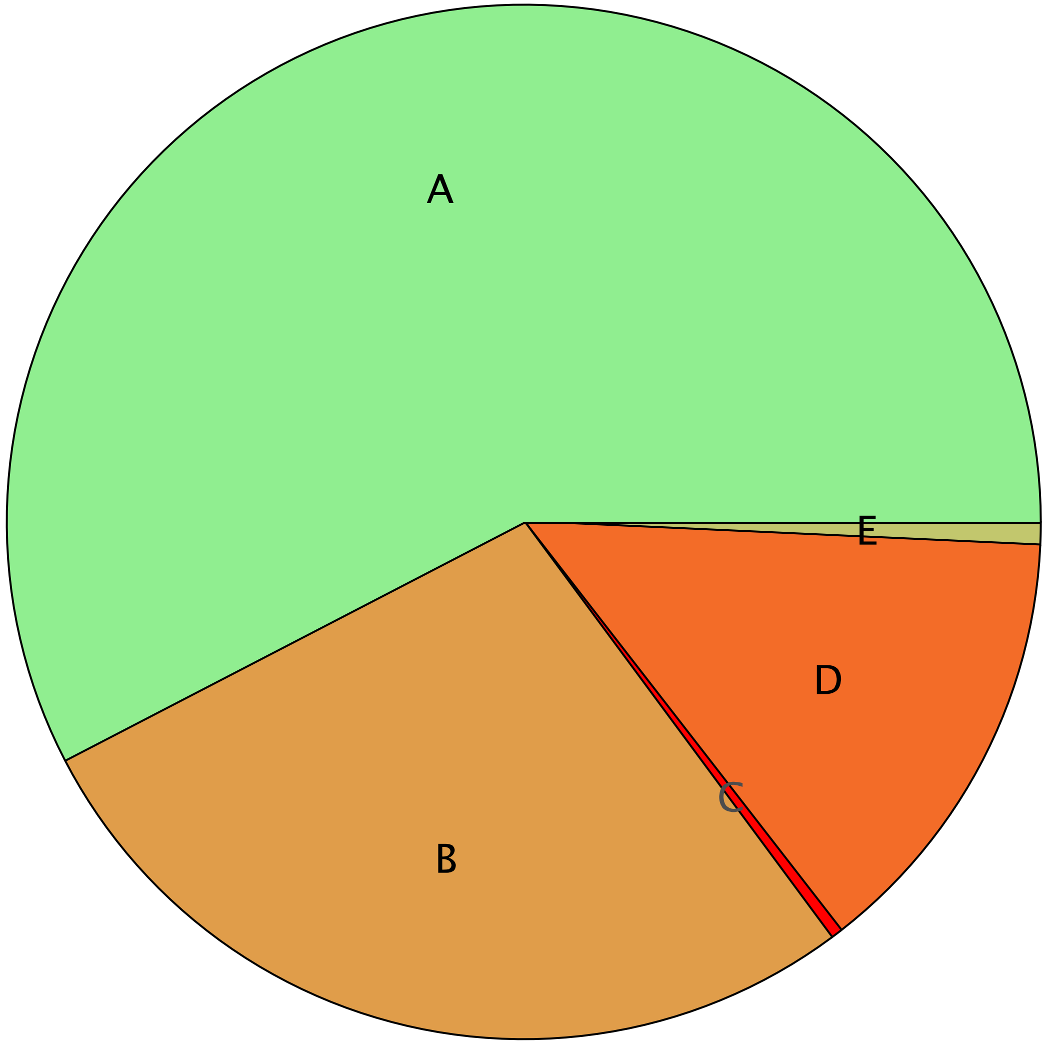
$$-\frac{\arctan\left(\sqrt{2}\tanh(b x+a)-1\right)\sqrt{2}}{2 b}-\frac{\arctan\left(1+\sqrt{2}\tanh(b x+a)\right)\sqrt{2}}{2 b}$$

Result(type 3, 137 leaves):

$$\frac{I\sqrt{2}\ln\left(2 I\sqrt{2}\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)^{3}+\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)^{4}+2 I\sqrt{2}\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)-2\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)^{2}+1\right)}{4 b}$$
$$-\frac{I\sqrt{2}\ln\left(-2 I\sqrt{2}\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)^{3}+\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)^{4}-2 I\sqrt{2}\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)-2\tanh\left(\frac{a}{2}+\frac{b x}{2}\right)^{2}+1\right)}{4 b}$$

Summary of Integration Test Results

276 integration problems



A - 159 optimal antiderivatives
B - 76 more than twice size of optimal antiderivatives
C - 1 unnecessarily complex antiderivatives
D - 38 unable to integrate problems
E - 2 integration timeouts