Mathematica 11.3 Integration Test Results

on the problems in "4 Trig functions\4.4 Cotangent"

Test results for the 52 problems in "4.4.0 (a trg)^m (b cot)^n.m"

Problem 39: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (b\,\mathrm{Cot}[e+f\,x])^n\,(a\,\mathrm{Sin}[e+f\,x])^m\,dx$$

Optimal (type 5, 87 leaves, 2 steps):

$$-\frac{1}{b\,f\,(1+n)}(b\,\mathrm{Cot}[e+f\,x])^{1+n}\,\mathrm{Hypergeometric2F1}\left[\frac{1+n}{2},\frac{1}{2}(1-m+n),\frac{3+n}{2},\mathrm{Cos}[e+f\,x]^2\right](a\,\mathrm{Sin}[e+f\,x])^m\left(\mathrm{Sin}[e+f\,x]^2\right)^{\frac{1}{2}(1-m+n)}$$

Result (type 6, 2957 leaves):

$$\left(2\,(3+m-n)\,\mathrm{AppellF1}\left[\frac{1}{2}(1+m-n),-n,1+m,\frac{1}{2}(3+m-n),\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\right.$$
$$\left.\mathrm{Cos}\left[\frac{1}{2}(e+f\,x)\right]^2\mathrm{Cot}\left[\frac{1}{2}(e+f\,x)\right]\mathrm{Cot}[e+f\,x]^n\,(b\,\mathrm{Cot}[e+f\,x])^n\,\mathrm{Sin}[e+f\,x]^m\,(a\,\mathrm{Sin}[e+f\,x])^m\right)\Big/$$
$$\left(f\,(1+m-n)\left(-2\,n\,\mathrm{AppellF1}\left[\frac{1}{2}(3+m-n),1-n,1+m,\frac{1}{2}(5+m-n),\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]-\right.\right.$$
$$2\,(1+m)\,\mathrm{AppellF1}\left[\frac{1}{2}(3+m-n),-n,2+m,\frac{1}{2}(5+m-n),\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]+$$
$$\left.(3+m-n)\,\mathrm{AppellF1}\left[\frac{1}{2}(1+m-n),-n,1+m,\frac{1}{2}(3+m-n),\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\mathrm{Cot}\left[\frac{1}{2}(e+f\,x)\right]^2\right)$$
$$\left(-\left(\left(2\,(3+m-n)\,n\,\mathrm{AppellF1}\left[\frac{1}{2}(1+m-n),-n,1+m,\frac{1}{2}(3+m-n),\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\mathrm{Cos}\left[\frac{1}{2}(e+f\,x)\right]^2\mathrm{Cot}\left[\frac{1}{2}(e+f\,x)\right]\right.\right.\right.$$
$$\left.\mathrm{Cot}[e+f\,x]^{-1+n}\,\mathrm{Sin}[e+f\,x]^{-2+m}\right)\Big/\left((1+m-n)\left(-2\,n\,\mathrm{AppellF1}\left[\frac{1}{2}(3+m-n),1-n,1+m,\frac{1}{2}(5+m-n),\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,\right.\right.\right.$$
$$\left.-\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]-2\,(1+m)\,\mathrm{AppellF1}\left[\frac{1}{2}(3+m-n),-n,2+m,\frac{1}{2}(5+m-n),\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]+$$
$$\left.\left.\left.(3+m-n)\,\mathrm{AppellF1}\left[\frac{1}{2}(1+m-n),-n,1+m,\frac{1}{2}(3+m-n),\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\mathrm{Cot}\left[\frac{1}{2}(e+f\,x)\right]^2\right)\right)\right)+$$

$$\left(2 m (3+m-n) \text{AppellF1}\left[\frac{1}{2} (1+m-n), -n, 1+m, \frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \text{Cos}\left[\frac{1}{2} (e+f x)\right]^2 \text{Cos}[e+f x] \text{Cot}\left[\frac{1}{2} (e+f x)\right] \text{Cot}[e+f x]^n \text{Sin}[e+f x]^{-1+m}\right) \Big/ \left((1+m-n) \left(-2 n \text{AppellF1}\left[\frac{1}{2} (3+m-n), 1-n, 1+m, \frac{1}{2} (5+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] - 2 (1+m) \text{AppellF1}\left[\frac{1}{2} (3+m-n), -n, 2+m, \frac{1}{2} (5+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] + (3+m-n) \text{AppellF1}\left[\frac{1}{2} (1+m-n), -n, 1+m, \frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \text{Cot}\left[\frac{1}{2} (e+f x)\right]^2\right)\right) -$$

$$\left(2 (3+m-n) \text{AppellF1}\left[\frac{1}{2} (1+m-n), -n, 1+m, \frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \text{Cos}\left[\frac{1}{2} (e+f x)\right]^2 \text{Cot}[e+f x]^n \text{Sin}[e+f x]^m\right) \Big/ \left((1+m-n) \left(-2 n \text{AppellF1}\left[\frac{1}{2} (3+m-n), 1-n, 1+m, \frac{1}{2} (5+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] - 2 (1+m) \text{AppellF1}\left[\frac{1}{2} (3+m-n), -n, 2+m, \frac{1}{2} (5+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] + (3+m-n) \text{AppellF1}\left[\frac{1}{2} (1+m-n), -n, 1+m, \frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \text{Cot}\left[\frac{1}{2} (e+f x)\right]^2\right)\right) -$$

$$\left((3+m-n) \text{AppellF1}\left[\frac{1}{2} (1+m-n), -n, 1+m, \frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \text{Cot}\left[\frac{1}{2} (e+f x)\right]^2 \text{Cot}[e+f x]^n \text{Sin}[e+f x]^m\right) \Big/ \left((1+m-n) \left(-2 n \text{AppellF1}\left[\frac{1}{2} (3+m-n), 1-n, 1+m, \frac{1}{2} (5+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] - 2 (1+m) \text{AppellF1}\left[\frac{1}{2} (3+m-n), -n, 2+m, \frac{1}{2} (5+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] + (3+m-n) \text{AppellF1}\left[\frac{1}{2} (1+m-n), -n, 1+m, \frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \text{Cot}\left[\frac{1}{2} (e+f x)\right]^2\right)\right) +$$

$$\left(2 (3+m-n) \text{Cos}\left[\frac{1}{2} (e+f x)\right]^2 \text{Cot}\left[\frac{1}{2} (e+f x)\right] \text{Cot}[e+f x]^n \text{Sin}[e+f x]^m \left(-\frac{1}{3+m-n} (1+m-n) n \text{AppellF1}\left[1+\frac{1}{2} (1+m-n), 1-n, 1+m, 1+\frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2} (e+f x)\right]^2 \text{Tan}\left[\frac{1}{2} (e+f x)\right] - \frac{1}{3+m-n} (1+m) (1+m-n) \text{AppellF1}\left[1+\frac{1}{2} (1+m-n), -n, 2+m, 1+\frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2} (e+f x)\right]^2 \text{Tan}\left[\frac{1}{2} (e+f x)\right]\right)\right) \Big/ \left((1+m-n) \left(-2 n \text{AppellF1}\left[\frac{1}{2} (3+m-n), 1-n, 1+m, \frac{1}{2} (5+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] - 2 (1+m) \text{AppellF1}\left[\frac{1}{2} (3+m-n), -n, 2+m, \frac{1}{2} (5+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] + (3+m-n) \text{AppellF1}\left[\frac{1}{2} (1+m-n), -n, 1+m, \frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \text{Cot}\left[\frac{1}{2} (e+f x)\right]^2\right)\right) -$$

$$\left(2 (3+m-n) \text{AppellF1}\left[\frac{1}{2} (1+m-n), -n, 1+m, \frac{1}{2} (3+m-n), \text{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]\right.$$

$$\text{Cos}\left[\frac{1}{2}(e+fx)\right]^2 \text{Cot}\left[\frac{1}{2}(e+fx)\right] \text{Cot}[e+fx]^n \text{Sin}[e+fx]^m$$

$$\Big(-(3+m-n)\,\text{AppellF1}\Big[\frac{1}{2}(1+m-n),-n,1+m,\frac{1}{2}(3+m-n),\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]\,\text{Cot}\Big[\frac{1}{2}(e+fx)\Big]\,\text{Csc}\Big[\frac{1}{2}(e+fx)\Big]^2+$$

$$(3+m-n)\,\text{Cot}\Big[\frac{1}{2}(e+fx)\Big]^2\Big(-\frac{1}{3+m-n}(1+m-n)\,n\,\text{AppellF1}\Big[1+\frac{1}{2}(1+m-n),1-n,1+m,1+\frac{1}{2}(3+m-n),$$

$$\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+fx)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]-\frac{1}{3+m-n}(1+m)\,(1+m-n)\,\text{AppellF1}\Big[1+$$

$$\frac{1}{2}(1+m-n),-n,2+m,1+\frac{1}{2}(3+m-n),\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+fx)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]\Big)-$$

$$2n\Big(-\frac{1}{5+m-n}(1+m)\,(3+m-n)\,\text{AppellF1}\Big[1+\frac{1}{2}(3+m-n),1-n,2+m,1+\frac{1}{2}(5+m-n),\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+fx)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]+\frac{1}{5+m-n}(1-n)\,(3+m-n)\,\text{AppellF1}\Big[1+\frac{1}{2}(3+m-n),2-$$

$$n,1+m,1+\frac{1}{2}(5+m-n),\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+fx)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]\Big)-$$

$$2\,(1+m)\Big(-\frac{1}{5+m-n}(3+m-n)\,n\,\text{AppellF1}\Big[1+\frac{1}{2}(3+m-n),1-n,2+m,1+\frac{1}{2}(5+m-n),\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+fx)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]-\frac{1}{5+m-n}(2+m)\,(3+m-n)\,\text{AppellF1}\Big[1+\frac{1}{2}(3+m-n),-n,3+$$

$$m,1+\frac{1}{2}(5+m-n),\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+fx)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]\Big)\Big)\Big)\Big/$$

$$\Big((1+m-n)\Big(-2n\,\text{AppellF1}\Big[\frac{1}{2}(3+m-n),1-n,1+m,\frac{1}{2}(5+m-n),\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]-$$

$$2\,(1+m)\,\text{AppellF1}\Big[\frac{1}{2}(3+m-n),-n,2+m,\frac{1}{2}(5+m-n),\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]+$$

$$(3+m-n)\,\text{AppellF1}\Big[\frac{1}{2}(1+m-n),-n,1+m,\frac{1}{2}(3+m-n),\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+fx)\Big]^2\Big]\,\text{Cot}\Big[\frac{1}{2}(e+fx)\Big]^2\Big)^2\Big)\Big)\Big)$$

Problem 46: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d\,\text{Cot}[e+fx])^n\,\text{Sin}[e+fx]^2\,dx$$

Optimal (type 5, 51 leaves, 2 steps):

$$-\frac{(d\,\text{Cot}[e+fx])^{1+n}\,\text{Hypergeometric2F1}\Big[2,\frac{1+n}{2},\frac{3+n}{2},-\text{Cot}[e+fx]^2\Big]}{d\,f\,(1+n)}$$

Result (type 6, 5097 leaves):

$$\Big(8\,(-3+n)\,\text{Cos}\big[\tfrac{1}{2}(e+f x)\big]^5\,(d\,\text{Cot}[e+f x])^n\,\text{Sin}\big[\tfrac{1}{2}(e+f x)\big]\,\Big(-\tfrac{1}{4}\text{Cos}[2(e+f x)]^3\,\text{Cot}[e+f x]^n+\tfrac{1}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]+$$

$$\tfrac{1}{2}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2-\tfrac{1}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^3+\text{Cos}[2(e+f x)]^2\Big(\tfrac{1}{2}\text{Cot}[e+f x]^n-\tfrac{1}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\Big)+$$

$$\text{Cos}[2(e+f x)]\Big(-\tfrac{1}{4}\text{Cot}[e+f x]^n-\tfrac{1}{4}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2\Big)\Big)$$

$$\Big(-\Big(\Big(\text{AppellF1}\big[\tfrac{1-n}{2},-n,2,\tfrac{3-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]\,\text{Sec}\big[\tfrac{1}{2}(e+f x)\big]^2\Big)\Big/$$

$$\Big((-3+n)\,\text{AppellF1}\big[\tfrac{1-n}{2},-n,2,\tfrac{3-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+2\Big(n\,\text{AppellF1}\big[\tfrac{3-n}{2},1-n,2,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,$$

$$-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+2\,\text{AppellF1}\big[\tfrac{3-n}{2},-n,3,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]\Big)\,\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\Big)\Big)+$$

$$\text{AppellF1}\big[\tfrac{1-n}{2},-n,3,\tfrac{3-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]\Big/\Big((-3+n)\,\text{AppellF1}\big[\tfrac{1-n}{2},-n,3,\tfrac{3-n}{2},$$

$$\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+2\Big(n\,\text{AppellF1}\big[\tfrac{3-n}{2},1-n,3,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+$$

$$3\,\text{AppellF1}\big[\tfrac{3-n}{2},-n,4,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]\Big)\,\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\Big)\Big)\Big)\Big/$$

$$\Big(f\,(-1+n)\,\Big(\frac{1}{-1+n}4\,(-3+n)\,\text{Cos}\big[\tfrac{1}{2}(e+f x)\big]^6\,\text{Cot}[e+f x]^n\,\Big(-\Big(\Big(\text{AppellF1}\big[\tfrac{1-n}{2},-n,2,\tfrac{3-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]$$

$$\text{Sec}\big[\tfrac{1}{2}(e+f x)\big]^2\Big)\Big/\Big((-3+n)\,\text{AppellF1}\big[\tfrac{1-n}{2},-n,2,\tfrac{3-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+$$

$$2\Big(n\,\text{AppellF1}\big[\tfrac{3-n}{2},1-n,2,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+$$

$$2\,\text{AppellF1}\big[\tfrac{3-n}{2},-n,3,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]\Big)\,\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\Big)\Big)+$$

$$\text{AppellF1}\big[\tfrac{1-n}{2},-n,3,\tfrac{3-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]\Big/\Big((-3+n)\,\text{AppellF1}\big[\tfrac{1-n}{2},-n,3,\tfrac{3-n}{2},$$

$$\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+2\Big(n\,\text{AppellF1}\big[\tfrac{3-n}{2},1-n,3,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+3$$

$$\text{AppellF1}\big[\tfrac{3-n}{2},-n,4,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]\Big)\,\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\Big)\Big)-$$

$$\frac{1}{-1+n}8\,(-3+n)\,n\,\text{Cos}\big[\tfrac{1}{2}(e+f x)\big]^5\,\text{Cot}[e+f x]^{-1+n}\,\text{Csc}[e+f x]^2\,\text{Sin}\big[\tfrac{1}{2}(e+f x)\big]$$

$$\Big(-\Big(\Big(\text{AppellF1}\big[\tfrac{1-n}{2},-n,2,\tfrac{3-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]\,\text{Sec}\big[\tfrac{1}{2}(e+f x)\big]^2\Big)\Big/\Big((-3+n)\,\text{AppellF1}\big[\tfrac{1-n}{2},-n,2,\tfrac{3-n}{2},$$

$$\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+2\Big(n\,\text{AppellF1}\big[\tfrac{3-n}{2},1-n,2,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]+$$

$$2\,\text{AppellF1}\big[\tfrac{3-n}{2},-n,3,\tfrac{5-n}{2},\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2,-\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\big]\Big)\,\text{Tan}\big[\tfrac{1}{2}(e+f x)\big]^2\Big)\Big)+\text{AppellF1}\big[\tfrac{1-n}{2},-n,3,\tfrac{3-n}{2},$$

$$\text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] \Big/ \Big((-3+n)\ \text{AppellF1}[\tfrac{1-n}{2},\ -n,\ 3,\ \tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$2\ \Big(n\ \text{AppellF1}[\tfrac{3-n}{2},\ 1-n,\ 3,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 3\ \text{AppellF1}[\tfrac{3-n}{2},\ -n,\ 4,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\Big)\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2\Big)\Big) - \frac{1}{-1+n} 20\ (-3+n)\ \text{Cos}[\tfrac{1}{2}(e+f x)]^4\ \text{Cot}[e+f x]^n\ \text{Sin}[\tfrac{1}{2}(e+f x)]^2$$

$$\Big(-\Big(\Big(\text{AppellF1}[\tfrac{1-n}{2},\ -n,\ 2,\ \tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\ \text{Sec}[\tfrac{1}{2}(e+f x)]^2\Big) \Big/ \Big((-3+n)\ \text{AppellF1}[\tfrac{1-n}{2},\ -n,\ 2,$$

$$\tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2\ \Big(n\ \text{AppellF1}[\tfrac{3-n}{2},\ 1-n,\ 2,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$2\ \text{AppellF1}[\tfrac{3-n}{2},\ -n,\ 3,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\Big)\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2\Big)\Big) +$$

$$\text{AppellF1}[\tfrac{1-n}{2},\ -n,\ 3,\ \tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] \Big/ \Big((-3+n)\ \text{AppellF1}[\tfrac{1-n}{2},\ -n,\ 3,\ \tfrac{3-n}{2},$$

$$\text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2\ \Big(n\ \text{AppellF1}[\tfrac{3-n}{2},\ 1-n,\ 3,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 3$$

$$\text{AppellF1}[\tfrac{3-n}{2},\ -n,\ 4,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\Big)\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2\Big)\Big) +$$

$$\frac{1}{-1+n} 8\ (-3+n)\ \text{Cos}[\tfrac{1}{2}(e+f x)]^5\ \text{Cot}[e+f x]^n\ \text{Sin}[\tfrac{1}{2}(e+f x)]\ \Big(-\Big(\Big(\text{AppellF1}[\tfrac{1-n}{2},\ -n,\ 2,\ \tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]$$

$$\text{Sec}[\tfrac{1}{2}(e+f x)]^2\ \text{Tan}[\tfrac{1}{2}(e+f x)]\Big) \Big/ \Big((-3+n)\ \text{AppellF1}[\tfrac{1-n}{2},\ -n,\ 2,\ \tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$2\ \Big(n\ \text{AppellF1}[\tfrac{3-n}{2},\ 1-n,\ 2,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$2\ \text{AppellF1}[\tfrac{3-n}{2},\ -n,\ 3,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\Big)\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2\Big)\Big) - \Big(\text{Sec}[\tfrac{1}{2}(e+f x)]^2$$

$$\Big(-\frac{1}{3-n}(1-n)\ n\ \text{AppellF1}[1+\tfrac{1-n}{2},\ 1-n,\ 2,\ 1+\tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\ \text{Sec}[\tfrac{1}{2}(e+f x)]^2\ \text{Tan}[\tfrac{1}{2}(e+f x)] -$$

$$\frac{1}{3-n} 2\ (1-n)\ \text{AppellF1}[1+\tfrac{1-n}{2},\ -n,\ 3,\ 1+\tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\ \text{Sec}[\tfrac{1}{2}(e+f x)]^2\ \text{Tan}[\tfrac{1}{2}(e+f x)]\Big)\Big) \Big/$$

$$\Big((-3+n)\ \text{AppellF1}[\tfrac{1-n}{2},\ -n,\ 2,\ \tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$2\ \Big(n\ \text{AppellF1}[\tfrac{3-n}{2},\ 1-n,\ 2,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2$$

$$\text{AppellF1}[\tfrac{3-n}{2},\ -n,\ 3,\ \tfrac{5-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\Big)\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2\Big) +$$

$$\Big(-\frac{1}{3-n}(1-n)\ n\ \text{AppellF1}[1+\tfrac{1-n}{2},\ 1-n,\ 3,\ 1+\tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\ \text{Sec}[\tfrac{1}{2}(e+f x)]^2\ \text{Tan}[\tfrac{1}{2}(e+f x)] -$$

$$\frac{1}{3-n} 3\ (1-n)\ \text{AppellF1}[1+\tfrac{1-n}{2},\ -n,\ 4,\ 1+\tfrac{3-n}{2},\ \text{Tan}[\tfrac{1}{2}(e+f x)]^2,\ -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\ \text{Sec}[\tfrac{1}{2}(e+f x)]^2\ \text{Tan}[\tfrac{1}{2}(e+f x)]\Big) \Big/$$

$$\Big((-3+n)\,\text{AppellF1}[\tfrac{1-n}{2},-n,3,\tfrac{3-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]+$$

$$2\Big(n\,\text{AppellF1}[\tfrac{3-n}{2},1-n,3,\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]+3$$

$$\text{AppellF1}[\tfrac{3-n}{2},-n,4,\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\Big)\,\text{Tan}[\tfrac{1}{2}(e+f x)]^2\Big)+$$

$$\Big(\text{AppellF1}[\tfrac{1-n}{2},-n,2,\tfrac{3-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2$$

$$\Big(2\Big(n\,\text{AppellF1}[\tfrac{3-n}{2},1-n,2,\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]+2\,\text{AppellF1}[\tfrac{3-n}{2},-n,3,\tfrac{5-n}{2},$$

$$\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\Big)\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]+(-3+n)\Big(-\frac{1}{3-n}(1-n)\,n$$

$$\text{AppellF1}[1+\tfrac{1-n}{2},1-n,2,1+\tfrac{3-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]-\frac{1}{3-n}$$

$$2(1-n)\,\text{AppellF1}[1+\tfrac{1-n}{2},-n,3,1+\tfrac{3-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]\Big)+$$

$$2\,\text{Tan}[\tfrac{1}{2}(e+f x)]^2\Big(n\Big(-\frac{1}{5-n}2(3-n)\,\text{AppellF1}[1+\tfrac{3-n}{2},1-n,3,1+\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]$$

$$\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]+\frac{1}{5-n}(1-n)(3-n)\,\text{AppellF1}[1+\tfrac{3-n}{2},2-n,2,1+\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]\Big)+2\Big(-\frac{1}{5-n}(3-n)\,n\,\text{AppellF1}[1+\tfrac{3-n}{2},1-n,$$

$$3,1+\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]-\frac{1}{5-n}3(3-n)$$

$$\text{AppellF1}[1+\tfrac{3-n}{2},-n,4,1+\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]\Big)\Big)\Big)\Big)\Big)\Big/$$

$$\Big((-3+n)\,\text{AppellF1}[\tfrac{1-n}{2},-n,2,\tfrac{3-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]+2\Big(n\,\text{AppellF1}[\tfrac{3-n}{2},1-n,2,$$

$$\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]+2\,\text{AppellF1}[\tfrac{3-n}{2},-n,3,\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\Big)$$

$$\text{Tan}[\tfrac{1}{2}(e+f x)]^2\Big)^2-\Big(\text{AppellF1}[\tfrac{1-n}{2},-n,3,\tfrac{3-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]$$

$$\Big(2\Big(n\,\text{AppellF1}[\tfrac{3-n}{2},1-n,3,\tfrac{5-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]+3\,\text{AppellF1}[\tfrac{3-n}{2},-n,4,\tfrac{5-n}{2},$$

$$\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\Big)\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]+(-3+n)\Big(-\frac{1}{3-n}(1-n)\,n$$

$$\text{AppellF1}[1+\tfrac{1-n}{2},1-n,3,1+\tfrac{3-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]-\frac{1}{3-n}$$

$$3(1-n)\,\text{AppellF1}[1+\tfrac{1-n}{2},-n,4,1+\tfrac{3-n}{2},\text{Tan}[\tfrac{1}{2}(e+f x)]^2,-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,\text{Tan}[\tfrac{1}{2}(e+f x)]\Big)+$$

$$2\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\left(n\left(-\frac{1}{5-n}3(3-n)\,\text{AppellF1}\left[1+\frac{3-n}{2},1-n,4,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\right.\right.$$
$$\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]+\frac{1}{5-n}(1-n)(3-n)\,\text{AppellF1}\left[1+\frac{3-n}{2},2-n,3,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.$$
$$\left.\left.-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]\right)+3\left(-\frac{1}{5-n}(3-n)\,n\,\text{AppellF1}\left[1+\frac{3-n}{2},1-n,\right.\right.$$
$$\left.4,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]-\frac{1}{5-n}4(3-n)$$
$$\left.\left.\left.\text{AppellF1}\left[1+\frac{3-n}{2},-n,5,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]\right)\right)\right)\Big/$$
$$\left(\left(-3+n\right)\text{AppellF1}\left[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+2\left(n\,\text{AppellF1}\left[\frac{3-n}{2},1-n,\right.\right.\right.$$
$$\left.3,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+$$
$$\left.\left.\left.3\,\text{AppellF1}\left[\frac{3-n}{2},-n,4,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)^2\right)\right)$$

Problem 47: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int(d\,\text{Cot}[e+f x])^n\,\text{Sin}[e+f x]^4\,dx$$

Optimal (type 5, 51 leaves, 2 steps):

$$-\frac{(d\,\text{Cot}[e+f x])^{1+n}\,\text{Hypergeometric2F1}\left[3,\frac{1+n}{2},\frac{3+n}{2},-\text{Cot}[e+f x]^2\right]}{d\,f\,(1+n)}$$

Result (type 6, 8475 leaves):

$$\left(2^{5-n}(-3+n)\,\text{Cot}[e+f x]^{-n}(d\,\text{Cot}[e+f x])^n\right.$$
$$\left(\text{Cos}[4(e+f x)]\left(\frac{1}{16}\text{Cot}[e+f x]^n-\frac{1}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]-\frac{3}{8}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2+\right.\right.$$
$$\left.\frac{1}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^3+\frac{1}{16}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^4\right)-\frac{1}{16}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[4(e+f x)]-$$
$$\frac{1}{4}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\,\text{Sin}[4(e+f x)]+\frac{3}{8}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2\,\text{Sin}[4(e+f x)]+$$
$$\frac{1}{4}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^3\,\text{Sin}[4(e+f x)]-\frac{1}{16}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^4\,\text{Sin}[4(e+f x)]+$$
$$\text{Cos}[2(e+f x)]^4\left(\frac{1}{16}\text{Cos}[4(e+f x)]\,\text{Cot}[e+f x]^n-\frac{1}{16}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[4(e+f x)]\right)+$$

$$\text{Cos}[2(e+f x)]^3 \Big(\text{Cos}[4(e+f x)] \Big(-\frac{1}{4}\text{Cot}[e+f x]^n+\frac{1}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\Big)+$$

$$\frac{1}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[4(e+f x)]+\frac{1}{4}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\,\text{Sin}[4(e+f x)]\Big)+$$

$$\text{Cos}[2(e+f x)]^2 \Big(\text{Cos}[4(e+f x)] \Big(\frac{3}{8}\text{Cot}[e+f x]^n-\frac{3}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]-\frac{3}{8}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2\Big)-$$

$$\frac{3}{8}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[4(e+f x)]-\frac{3}{4}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\,\text{Sin}[4(e+f x)]+\frac{3}{8}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2\,\text{Sin}[4(e+f x)]\Big)+$$

$$\text{Cos}[2(e+f x)] \Big(\text{Cos}[4(e+f x)] \Big(-\frac{1}{4}\text{Cot}[e+f x]^n+\frac{3}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]+\frac{3}{4}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2-\frac{1}{4}\,i\,\text{Cot}[e+f x]^n$$

$$\text{Sin}[2(e+f x)]^3\Big)+\frac{1}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[4(e+f x)]+\frac{3}{4}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\,\text{Sin}[4(e+f x)]-\frac{3}{4}\,i\,\text{Cot}[e+f x]^n$$

$$\text{Sin}[2(e+f x)]^2\,\text{Sin}[4(e+f x)]-\frac{1}{4}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^3\,\text{Sin}[4(e+f x)]\Big)\Big)\Big) \Big(\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Big)^n$$

$$\text{Tan}\Big[\frac{1}{2}(e+f x)\Big] \Big(-\Big(\Big(\text{AppellF1}\Big[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\Big(1+\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)^2\Big)\Big/$$

$$\Big((-3+n)\,\text{AppellF1}\Big[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+2\Big(n\,\text{AppellF1}\Big[\frac{3-n}{2},1-n,3,\frac{5-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+3\,\text{AppellF1}\Big[\frac{3-n}{2},-n,4,\frac{5-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\Big)\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)\Big)+$$

$$\Big(2\,\text{AppellF1}\Big[\frac{1-n}{2},-n,4,\frac{3-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\Big(1+\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)\Big)\Big/$$

$$\Big((-3+n)\,\text{AppellF1}\Big[\frac{1-n}{2},-n,4,\frac{3-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+2\Big(n\,\text{AppellF1}\Big[\frac{3-n}{2},1-n,4,\frac{5-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+4\,\text{AppellF1}\Big[\frac{3-n}{2},-n,5,\frac{5-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\Big)\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)-$$

$$\text{AppellF1}\Big[\frac{1-n}{2},-n,5,\frac{3-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\Big/\Big((-3+n)\,\text{AppellF1}\Big[\frac{1-n}{2},-n,5,\frac{3-n}{2},$$

$$\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+2\Big(n\,\text{AppellF1}\Big[\frac{3-n}{2},1-n,5,\frac{5-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+$$

$$5\,\text{AppellF1}\Big[\frac{3-n}{2},-n,6,\frac{5-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\Big)\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)\Big)\Big)\Big/$$

$$\Big(f(-1+n)\Big(1+\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)^5\Big(-\frac{1}{(-1+n)\Big(1+\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)^6}\,5\times 2^{5-n}(-3+n)\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\Big(\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Big)^n$$

$$\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big(-\Big(\Big(\text{AppellF1}\Big[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\Big(1+\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)^2\Big)\Big/\Big((-3+n)$$

$$\text{AppellF1}\Big[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+2\Big(n\,\text{AppellF1}\Big[\frac{3-n}{2},1-n,3,\frac{5-n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 3\,\text{AppellF1}[\tfrac{3-n}{2}, -n, 4, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2])\,\text{Tan}[\tfrac{1}{2}(e+f x)]^2)) +$$

$$(2\,\text{AppellF1}[\tfrac{1-n}{2}, -n, 4, \tfrac{3-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,(1+\text{Tan}[\tfrac{1}{2}(e+f x)]^2)) \Big/ ((-3+n)$$

$$\text{AppellF1}[\tfrac{1-n}{2}, -n, 4, \tfrac{3-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2\,(n\,\text{AppellF1}[\tfrac{3-n}{2}, 1-n, 4, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 4\,\text{AppellF1}[\tfrac{3-n}{2}, -n, 5, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2])\,\text{Tan}[\tfrac{1}{2}(e+f x)]^2) -$$

$$\text{AppellF1}[\tfrac{1-n}{2}, -n, 5, \tfrac{3-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] \Big/ ((-3+n)\,\text{AppellF1}[\tfrac{1-n}{2}, -n, 5, \tfrac{3-n}{2},$$

$$\text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2\,(n\,\text{AppellF1}[\tfrac{3-n}{2}, 1-n, 5, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$5\,\text{AppellF1}[\tfrac{3-n}{2}, -n, 6, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2])\,\text{Tan}[\tfrac{1}{2}(e+f x)]^2)) +$$

$$\frac{1}{(-1+n)\,(1+\text{Tan}[\frac{1}{2}(e+f x)]^2)^5}\,2^{4-n}\,(-3+n)\,\text{Sec}[\tfrac{1}{2}(e+f x)]^2\,(\text{Cot}[\tfrac{1}{2}(e+f x)] - \text{Tan}[\tfrac{1}{2}(e+f x)])^n$$

$$(-((\text{AppellF1}[\tfrac{1-n}{2}, -n, 3, \tfrac{3-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,(1+\text{Tan}[\tfrac{1}{2}(e+f x)]^2)^2) \Big/ ((-3+n)\,\text{AppellF1}[\tfrac{1-n}{2}, -n, 3,$$

$$\tfrac{3-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2\,(n\,\text{AppellF1}[\tfrac{3-n}{2}, 1-n, 3, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$3\,\text{AppellF1}[\tfrac{3-n}{2}, -n, 4, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2])\,\text{Tan}[\tfrac{1}{2}(e+f x)]^2)) +$$

$$(2\,\text{AppellF1}[\tfrac{1-n}{2}, -n, 4, \tfrac{3-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]\,(1+\text{Tan}[\tfrac{1}{2}(e+f x)]^2)) \Big/ ((-3+n)$$

$$\text{AppellF1}[\tfrac{1-n}{2}, -n, 4, \tfrac{3-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2\,(n\,\text{AppellF1}[\tfrac{3-n}{2}, 1-n, 4, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 4\,\text{AppellF1}[\tfrac{3-n}{2}, -n, 5, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2])\,\text{Tan}[\tfrac{1}{2}(e+f x)]^2) -$$

$$\text{AppellF1}[\tfrac{1-n}{2}, -n, 5, \tfrac{3-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] \Big/ ((-3+n)\,\text{AppellF1}[\tfrac{1-n}{2}, -n, 5, \tfrac{3-n}{2},$$

$$\text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2\,(n\,\text{AppellF1}[\tfrac{3-n}{2}, 1-n, 5, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 5$$

$$\text{AppellF1}[\tfrac{3-n}{2}, -n, 6, \tfrac{5-n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2])\,\text{Tan}[\tfrac{1}{2}(e+f x)]^2)) +$$

$$\frac{1}{(-1+n)\,(1+\text{Tan}[\frac{1}{2}(e+f x)]^2)^5}\,2^{5-n}\,(-3+n)\,n\,(-\tfrac{1}{2}\text{Csc}[\tfrac{1}{2}(e+f x)]^2 - \tfrac{1}{2}\text{Sec}[\tfrac{1}{2}(e+f x)]^2)$$

$$(\text{Cot}[\tfrac{1}{2}(e+f x)] - \text{Tan}[\tfrac{1}{2}(e+f x)])^{-1+n}\,\text{Tan}[\tfrac{1}{2}(e+f x)]$$

$$\left(-\left(\left(\text{AppellF1}\left[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\left(1+\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)^2\right)\Big/\left((-3+n)\,\text{AppellF1}\left[\frac{1-n}{2},-n,3,\right.\right.\right.\right.$$

$$\left.\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+2\left(n\,\text{AppellF1}\left[\frac{3-n}{2},1-n,3,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+\right.$$

$$\left.\left.\left.3\,\text{AppellF1}\left[\frac{3-n}{2},-n,4,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)\right)+$$

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

$$\text{AppellF1}\left[\frac{1-n}{2},-n,4,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+2\left(n\,\text{AppellF1}\left[\frac{3-n}{2},1-n,4,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.\right.$$

$$\left.\left.-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+4\,\text{AppellF1}\left[\frac{3-n}{2},-n,5,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)-$$

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

$$\left.\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+2\left(n\,\text{AppellF1}\left[\frac{3-n}{2},1-n,5,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+5\right.$$

$$\left.\left.\text{AppellF1}\left[\frac{3-n}{2},-n,6,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)\right)+$$

$$\frac{1}{(-1+n)\left(1+\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)^5}\,2^{5-n}(-3+n)\left(\text{Cot}\left[\frac{1}{2}(e+f x)\right]-\text{Tan}\left[\frac{1}{2}(e+f x)\right]\right)^n\text{Tan}\left[\frac{1}{2}(e+f x)\right]$$

$$\left(-\left(\left(2\,\text{AppellF1}\left[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]\left(1+\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)\right)\Big/\right.\right.$$

$$\left((-3+n)\,\text{AppellF1}\left[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+\right.$$

$$2\left(n\,\text{AppellF1}\left[\frac{3-n}{2},1-n,3,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+\right.$$

$$\left.\left.\left.3\,\text{AppellF1}\left[\frac{3-n}{2},-n,4,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)\right)-$$

$$\left(\left(-\frac{1}{3-n}(1-n)\,n\,\text{AppellF1}\left[1+\frac{1-n}{2},1-n,3,1+\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]-\right.\right.$$

$$\left.\frac{1}{3-n}3(1-n)\,\text{AppellF1}\left[1+\frac{1-n}{2},-n,4,1+\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]\right)$$

$$\left.\left(1+\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)^2\right)\Big/\left((-3+n)\,\text{AppellF1}\left[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+\right.$$

$$2\left(n\,\text{AppellF1}\left[\frac{3-n}{2},1-n,3,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+3\right.$$

$$\left.\text{AppellF1}\left[\frac{3-n}{2},-n,4,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)+$$

$$\Big(2\,\text{AppellF1}\Big[\frac{1-n}{2},\,-n,\,4,\,\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]\Big)\Big/$$

$$\Big(\,(-3+n)\,\text{AppellF1}\Big[\frac{1-n}{2},\,-n,\,4,\,\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]+$$

$$2\,\Big(n\,\text{AppellF1}\Big[\frac{3-n}{2},\,1-n,\,4,\,\frac{5-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]+4$$

$$\text{AppellF1}\Big[\frac{3-n}{2},\,-n,\,5,\,\frac{5-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\Big)\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big)+$$

$$\Big(2\,\Big(-\frac{1}{3-n}\,(1-n)\,n\,\text{AppellF1}\Big[1+\frac{1-n}{2},\,1-n,\,4,\,1+\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]-$$

$$\frac{1}{3-n}4\,(1-n)\,\text{AppellF1}\Big[1+\frac{1-n}{2},\,-n,\,5,\,1+\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]\Big)$$

$$\Big(1+\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big)\Big)\Big/\Big(\,(-3+n)\,\text{AppellF1}\Big[\frac{1-n}{2},\,-n,\,4,\,\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]+$$

$$2\,\Big(n\,\text{AppellF1}\Big[\frac{3-n}{2},\,1-n,\,4,\,\frac{5-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]+4$$

$$\text{AppellF1}\Big[\frac{3-n}{2},\,-n,\,5,\,\frac{5-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\Big)\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big)-$$

$$\Big(-\frac{1}{3-n}\,(1-n)\,n\,\text{AppellF1}\Big[1+\frac{1-n}{2},\,1-n,\,5,\,1+\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]-$$

$$\frac{1}{3-n}5\,(1-n)\,\text{AppellF1}\Big[1+\frac{1-n}{2},\,-n,\,6,\,1+\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]\Big)\Big/$$

$$\Big(\,(-3+n)\,\text{AppellF1}\Big[\frac{1-n}{2},\,-n,\,5,\,\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]+$$

$$2\,\Big(n\,\text{AppellF1}\Big[\frac{3-n}{2},\,1-n,\,5,\,\frac{5-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]+5$$

$$\text{AppellF1}\Big[\frac{3-n}{2},\,-n,\,6,\,\frac{5-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\Big)\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big)+$$

$$\Big(\text{AppellF1}\Big[\frac{1-n}{2},\,-n,\,3,\,\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\,\Big(1+\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big)^2$$

$$\Big(2\,\Big(n\,\text{AppellF1}\Big[\frac{3-n}{2},\,1-n,\,3,\,\frac{5-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]+3\,\text{AppellF1}\Big[\frac{3-n}{2},\,-n,\,4,\,\frac{5-n}{2},$$

$$\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\Big)\,\text{Sec}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]+(-3+n)\,\Big(-\frac{1}{3-n}\,(1-n)\,n$$

$$\text{AppellF1}\Big[1+\frac{1-n}{2},\,1-n,\,3,\,1+\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]-\frac{1}{3-n}$$

$$3\,(1-n)\,\text{AppellF1}\Big[1+\frac{1-n}{2},\,-n,\,4,\,1+\frac{3-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]\Big)+$$

$$2\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\,\Big(n\,\Big(-\frac{1}{5-n}3\,(3-n)\,\text{AppellF1}\Big[1+\frac{3-n}{2},\,1-n,\,4,\,1+\frac{5-n}{2},\,\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(e+f\,x)\Big]^2\Big]$$

$$\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]+\frac{1}{5-n}(1-n)\ (3-n)\ \text{AppellF1}\left[1+\frac{3-n}{2},2-n,3,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]\Bigg)+3\Bigg(-\frac{1}{5-n}(3-n)\ n\ \text{AppellF1}\left[1+\frac{3-n}{2},1-n,\right.$$

$$\left.4,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]-\frac{1}{5-n}4\ (3-n)$$

$$\text{AppellF1}\left[1+\frac{3-n}{2},-n,5,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\Bigg((-3+n)\ \text{AppellF1}\left[\frac{1-n}{2},-n,3,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+2\Bigg(n\ \text{AppellF1}\left[\frac{3-n}{2},1-n,3,\right.$$

$$\left.\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+3\ \text{AppellF1}\left[\frac{3-n}{2},-n,4,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\Bigg)$$

$$\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg)^2-\Bigg(2\ \text{AppellF1}\left[\frac{1-n}{2},-n,4,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\ \left(1+\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right)$$

$$\Bigg(2\Bigg(n\ \text{AppellF1}\left[\frac{3-n}{2},1-n,4,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+4\ \text{AppellF1}\left[\frac{3-n}{2},-n,5,\frac{5-n}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\Bigg) \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]+(-3+n)\ \Bigg(-\frac{1}{3-n}(1-n)\ n$$

$$\text{AppellF1}\left[1+\frac{1-n}{2},1-n,4,1+\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]-\frac{1}{3-n}$$

$$4\ (1-n)\ \text{AppellF1}\left[1+\frac{1-n}{2},-n,5,1+\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]\Bigg)+$$

$$2\ \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\ \Bigg(n\ \Bigg(-\frac{1}{5-n}4\ (3-n)\ \text{AppellF1}\left[1+\frac{3-n}{2},1-n,5,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]$$

$$\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]+\frac{1}{5-n}(1-n)\ (3-n)\ \text{AppellF1}\left[1+\frac{3-n}{2},2-n,4,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]\Bigg)+4\ \Bigg(-\frac{1}{5-n}(3-n)\ n\ \text{AppellF1}\left[1+\frac{3-n}{2},1-n,\right.$$

$$\left.5,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]-\frac{1}{5-n}5\ (3-n)$$

$$\text{AppellF1}\left[1+\frac{3-n}{2},-n,6,1+\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\Bigg((-3+n)\ \text{AppellF1}\left[\frac{1-n}{2},-n,4,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+2\Bigg(n\ \text{AppellF1}\left[\frac{3-n}{2},1-n,4,\right.$$

$$\left.\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+4\ \text{AppellF1}\left[\frac{3-n}{2},-n,5,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\Bigg)$$

$$\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg)^2+\Bigg(\text{AppellF1}\left[\frac{1-n}{2},-n,5,\frac{3-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]$$

$$\Bigg(2\Bigg(n\ \text{AppellF1}\left[\frac{3-n}{2},1-n,5,\frac{5-n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+5\ \text{AppellF1}\left[\frac{3-n}{2},-n,6,\frac{5-n}{2},\right.$$

$$\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big]\Big) \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right] + (-3+n)\Big(-\frac{1}{3-n}(1-n)\, n$$
$$\text{AppellF1}\Big[1+\frac{1-n}{2}, 1-n, 5, 1+\frac{3-n}{2}, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right] - \frac{1}{3-n}$$
$$5(1-n)\, \text{AppellF1}\Big[1+\frac{1-n}{2}, -n, 6, 1+\frac{3-n}{2}, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]\Big) +$$
$$2\, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2 \Big(n\Big(-\frac{1}{5-n}5(3-n)\, \text{AppellF1}\Big[1+\frac{3-n}{2}, 1-n, 6, 1+\frac{5-n}{2}, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big]$$
$$\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right] + \frac{1}{5-n}(1-n)(3-n)\, \text{AppellF1}\Big[1+\frac{3-n}{2}, 2-n, 5, 1+\frac{5-n}{2}, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,$$
$$-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]\Big) + 5\Big(-\frac{1}{5-n}(3-n)\, n\, \text{AppellF1}\Big[1+\frac{3-n}{2}, 1-n,$$
$$6, 1+\frac{5-n}{2}, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right] - \frac{1}{5-n}6(3-n)$$
$$\text{AppellF1}\Big[1+\frac{3-n}{2}, -n, 7, 1+\frac{5-n}{2}, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big] \text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]\Big)\Big)\Big)\Big)\Big/$$
$$\Big((-3+n)\, \text{AppellF1}\Big[\frac{1-n}{2}, -n, 5, \frac{3-n}{2}, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big] + 2\Big(n\, \text{AppellF1}\Big[\frac{3-n}{2}, 1-n,$$
$$5, \frac{5-n}{2}, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big] +$$
$$5\, \text{AppellF1}\Big[\frac{3-n}{2}, -n, 6, \frac{5-n}{2}, \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2, -\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big]\Big) \text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big)^2\Big)\Big)$$

Problem 48: Result more than twice size of optimal antiderivative.

$$\int (d\, \text{Cot}[e+f x])^n\, \text{Csc}[e+f x]^3\, dx$$

Optimal (type 5, 79 leaves, 1 step):

$$-\frac{(d\, \text{Cot}[e+f x])^{1+n}\, \text{Csc}[e+f x]^3\, \text{Hypergeometric2F1}\left[\frac{1+n}{2}, \frac{4+n}{2}, \frac{3+n}{2}, \text{Cos}[e+f x]^2\right] \left(\text{Sin}[e+f x]^2\right)^{\frac{4+n}{2}}}{d\, f\, (1+n)}$$

Result (type 5, 190 leaves):

$$-\frac{1}{4 f n \left(-4+n^2\right)} (d \operatorname{Cot}[e+f x])^n \left((-2+n) n \operatorname{Cot}\left[\frac{1}{2} (e+f x)\right]^4 \text{Hypergeometric2F1}\left[-1-\frac{n}{2}, -n, -\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]+\right.$$
$$(2+n) \left(n \text{Hypergeometric2F1}\left[1-\frac{n}{2}, -n, 2-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]+\right.$$
$$\left.\left.2 (-2+n) \operatorname{Cot}\left[\frac{1}{2} (e+f x)\right]^2 \text{Hypergeometric2F1}\left[-n, -\frac{n}{2}, 1-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]\right)\right) \left(\operatorname{Cos}[e+f x] \operatorname{Sec}\left[\frac{1}{2} (e+f x)\right]^2\right)^{-n} \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2$$

Problem 50: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d \operatorname{Cot}[e+f x])^n \operatorname{Sin}[e+f x] \, dx$$

Optimal (type 5, 73 leaves, 1 step):

$$-\frac{(d \operatorname{Cot}[e+f x])^{1+n} \text{Hypergeometric2F1}\left[\frac{n}{2}, \frac{1+n}{2}, \frac{3+n}{2}, \operatorname{Cos}[e+f x]^2\right] \operatorname{Sin}[e+f x] \left(\operatorname{Sin}[e+f x]^2\right)^{n/2}}{d f (1+n)}$$

Result (type 6, 1973 leaves):

$$-\left(\left(4 (-4+n) \text{AppellF1}\left[1-\frac{n}{2}, -n, 2, 2-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]\right.\right.$$
$$\left.\operatorname{Cos}\left[\frac{1}{2} (e+f x)\right]^4 \operatorname{Cot}[e+f x]^n (d \operatorname{Cot}[e+f x])^n \operatorname{Sin}[e+f x]\right) \Big/$$
$$\left(f (-2+n) \left(2 n \text{AppellF1}\left[2-\frac{n}{2}, 1-n, 2, 3-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]+4 \text{AppellF1}\left[2-\frac{n}{2}, -n, 3, 3-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2,\right.\right.\right.$$
$$\left.\left.-\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]+(-4+n) \text{AppellF1}\left[1-\frac{n}{2}, -n, 2, 2-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \operatorname{Cot}\left[\frac{1}{2} (e+f x)\right]^2\right)$$
$$\left(\left(4 (-4+n) n \text{AppellF1}\left[1-\frac{n}{2}, -n, 2, 2-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \operatorname{Cos}\left[\frac{1}{2} (e+f x)\right]^4 \operatorname{Cot}[e+f x]^{-1+n} \operatorname{Csc}[e+f x]^2\right) \Big/\right.$$
$$\left((-2+n) \left(2 n \text{AppellF1}\left[2-\frac{n}{2}, 1-n, 2, 3-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]+\right.\right.$$
$$4 \text{AppellF1}\left[2-\frac{n}{2}, -n, 3, 3-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]+$$
$$\left.\left.(-4+n) \text{AppellF1}\left[1-\frac{n}{2}, -n, 2, 2-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \operatorname{Cot}\left[\frac{1}{2} (e+f x)\right]^2\right)\right)+$$
$$\left(8 (-4+n) \text{AppellF1}\left[1-\frac{n}{2}, -n, 2, 2-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right] \operatorname{Cos}\left[\frac{1}{2} (e+f x)\right]^3 \operatorname{Cot}[e+f x]^n \operatorname{Sin}\left[\frac{1}{2} (e+f x)\right]\right) \Big/$$
$$\left((-2+n) \left(2 n \text{AppellF1}\left[2-\frac{n}{2}, 1-n, 2, 3-\frac{n}{2}, \operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2, -\operatorname{Tan}\left[\frac{1}{2} (e+f x)\right]^2\right]+\right.\right.$$

$$4\,\text{AppellF1}\Big[2-\frac{n}{2},-n,3,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+(-4+n)\,\text{AppellF1}\Big[1-\frac{n}{2},-n,2,2-\frac{n}{2},$$

$$\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)\Big)-\Big(4\,(-4+n)\,\text{Cos}\Big[\frac{1}{2}(e+f x)\Big]^4\,\text{Cot}[e+f x]^n$$

$$\Big(-\frac{1}{2-\frac{n}{2}}\Big(1-\frac{n}{2}\Big)\,n\,\text{AppellF1}\Big[2-\frac{n}{2},1-n,2,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]-\frac{1}{2-\frac{n}{2}}$$

$$2\Big(1-\frac{n}{2}\Big)\,\text{AppellF1}\Big[2-\frac{n}{2},-n,3,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Big)\Big)\Big/\Big((-2+n)$$

$$\Big(2\,n\,\text{AppellF1}\Big[2-\frac{n}{2},1-n,2,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+4\,\text{AppellF1}\Big[2-\frac{n}{2},-n,3,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+(-4+n)\,\text{AppellF1}\Big[1-\frac{n}{2},-n,2,2-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)\Big)+$$

$$\Big(4\,(-4+n)\,\text{AppellF1}\Big[1-\frac{n}{2},-n,2,2-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Cos}\Big[\frac{1}{2}(e+f x)\Big]^4\,\text{Cot}[e+f x]^n\,\Big(-(-4+n)\,\text{AppellF1}\Big[$$

$$1-\frac{n}{2},-n,2,2-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]\,\text{Csc}\Big[\frac{1}{2}(e+f x)\Big]^2+(-4+n)\,\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]^2$$

$$\Big(-\frac{1}{2-\frac{n}{2}}\Big(1-\frac{n}{2}\Big)\,n\,\text{AppellF1}\Big[2-\frac{n}{2},1-n,2,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]-$$

$$\frac{1}{2-\frac{n}{2}}2\Big(1-\frac{n}{2}\Big)\,\text{AppellF1}\Big[2-\frac{n}{2},-n,3,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Big)+2\,n$$

$$\Big(-\frac{1}{3-\frac{n}{2}}2\Big(2-\frac{n}{2}\Big)\,\text{AppellF1}\Big[3-\frac{n}{2},1-n,3,4-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]+\frac{1}{3-\frac{n}{2}}$$

$$(1-n)\Big(2-\frac{n}{2}\Big)\,\text{AppellF1}\Big[3-\frac{n}{2},2-n,2,4-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Big)+$$

$$4\Big(-\frac{1}{3-\frac{n}{2}}\Big(2-\frac{n}{2}\Big)\,n\,\text{AppellF1}\Big[3-\frac{n}{2},1-n,3,4-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]-$$

$$\frac{1}{3-\frac{n}{2}}3\Big(2-\frac{n}{2}\Big)\,\text{AppellF1}\Big[3-\frac{n}{2},-n,4,4-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Big)\Big)\Big)\Big)\Big/$$

$$\Big((-2+n)\,\Big(2\,n\,\text{AppellF1}\Big[2-\frac{n}{2},1-n,2,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+4\,\text{AppellF1}\Big[2-\frac{n}{2},$$

$$-n,3,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+$$

$$(-4+n)\,\text{AppellF1}\left[1-\frac{n}{2},\,-n,\,2,\,2-\frac{n}{2},\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Cot}\left[\frac{1}{2}(e+f x)\right]^2\Big)^2\Big)\Big)\Big)\Big)$$

Problem 51: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (d\,\text{Cot}[e+f x])^n\,\text{Sin}[e+f x]^3\,dx$$

Optimal (type 5, 79 leaves, 1 step):

$$-\frac{1}{d f (1+n)}(d\,\text{Cot}[e+f x])^{1+n}\,\text{Hypergeometric2F1}\left[\frac{1}{2}(-2+n),\,\frac{1+n}{2},\,\frac{3+n}{2},\,\text{Cos}[e+f x]^2\right]\text{Sin}[e+f x]^3\left(\text{Sin}[e+f x]^2\right)^{\frac{1}{2}(-2+n)}$$

Result (type 6, 5173 leaves):

$$\Big(16\,(-4+n)\,\text{Cos}\left[\frac{1}{2}(e+f x)\right]^6(d\,\text{Cot}[e+f x])^n\,\text{Sin}\left[\frac{1}{2}(e+f x)\right]^2$$

$$\Big(\text{Cos}[3(e+f x)]\Big(-\frac{1}{8}\,i\,\text{Cot}[e+f x]^n-\frac{3}{8}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]+\frac{3}{8}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2+\frac{1}{8}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^3\Big)-$$

$$\frac{1}{8}\text{Cot}[e+f x]^n\,\text{Sin}[3(e+f x)]+\frac{3}{8}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\,\text{Sin}[3(e+f x)]+\frac{3}{8}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2\,\text{Sin}[3(e+f x)]-$$

$$\frac{1}{8}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^3\,\text{Sin}[3(e+f x)]+\text{Cos}[2(e+f x)]^3\Big(\frac{1}{8}\,i\,\text{Cos}[3(e+f x)]\,\text{Cot}[e+f x]^n+\frac{1}{8}\text{Cot}[e+f x]^n\,\text{Sin}[3(e+f x)]\Big)+$$

$$\text{Cos}[2(e+f x)]^2\Big(\text{Cos}[3(e+f x)]\Big(-\frac{3}{8}\,i\,\text{Cot}[e+f x]^n-\frac{3}{8}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\Big)-$$

$$\frac{3}{8}\text{Cot}[e+f x]^n\,\text{Sin}[3(e+f x)]+\frac{3}{8}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\,\text{Sin}[3(e+f x)]\Big)+$$

$$\text{Cos}[2(e+f x)]\Big(\text{Cos}[3(e+f x)]\Big(\frac{3}{8}\,i\,\text{Cot}[e+f x]^n+\frac{3}{4}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]-\frac{3}{8}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2\Big)+$$

$$\frac{3}{8}\text{Cot}[e+f x]^n\,\text{Sin}[3(e+f x)]-\frac{3}{4}\,i\,\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]\,\text{Sin}[3(e+f x)]-\frac{3}{8}\text{Cot}[e+f x]^n\,\text{Sin}[2(e+f x)]^2\,\text{Sin}[3(e+f x)]\Big)\Big)$$

$$\Big(-\Big(\Big(\text{AppellF1}\left[1-\frac{n}{2},\,-n,\,3,\,2-\frac{n}{2},\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\Big)\Big/$$

$$\Big((-4+n)\,\text{AppellF1}\left[1-\frac{n}{2},\,-n,\,3,\,2-\frac{n}{2},\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+2\Big(n\,\text{AppellF1}\left[2-\frac{n}{2},\,1-n,\,3,\,3-\frac{n}{2},\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+3\,\text{AppellF1}\left[2-\frac{n}{2},\,-n,\,4,\,3-\frac{n}{2},\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\Big)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Big)\Big)+$$

$$\text{AppellF1}\left[1-\frac{n}{2},\,-n,\,4,\,2-\frac{n}{2},\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\Big/\Big((-4+n)\,\text{AppellF1}\left[1-\frac{n}{2},\,-n,\,4,\,2-\frac{n}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+2\Big(n\,\text{AppellF1}\left[2-\frac{n}{2},\,1-n,\,4,\,3-\frac{n}{2},\,\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+$$

$$4\,\text{AppellF1}\left[2-\frac{n}{2},-n,5,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\Bigg(f(-2+n)\Bigg(\frac{1}{-2+n}16(-4+n)\text{Cos}\left[\frac{1}{2}(e+fx)\right]^7\text{Cot}[e+fx]^n\text{Sin}\left[\frac{1}{2}(e+fx)\right]$$

$$\Bigg(-\Bigg(\Bigg(\text{AppellF1}\left[1-\frac{n}{2},-n,3,2-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)\Bigg/\Bigg((-4+n)\text{AppellF1}\left[1-\frac{n}{2},-n,3,2-\frac{n}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+2\Bigg(n\,\text{AppellF1}\left[2-\frac{n}{2},1-n,3,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+$$

$$3\,\text{AppellF1}\left[2-\frac{n}{2},-n,4,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)\Bigg)+$$

$$\text{AppellF1}\left[1-\frac{n}{2},-n,4,2-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\Bigg/\Bigg((-4+n)\text{AppellF1}\left[1-\frac{n}{2},-n,4,2-\frac{n}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+2\Bigg(n\,\text{AppellF1}\left[2-\frac{n}{2},1-n,4,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+4$$

$$\text{AppellF1}\left[2-\frac{n}{2},-n,5,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)\Bigg)-$$

$$\frac{1}{-2+n}16(-4+n)\,n\,\text{Cos}\left[\frac{1}{2}(e+fx)\right]^6\text{Cot}[e+fx]^{-1+n}\text{Csc}[e+fx]^2\text{Sin}\left[\frac{1}{2}(e+fx)\right]^2$$

$$\Bigg(-\Bigg(\Bigg(\text{AppellF1}\left[1-\frac{n}{2},-n,3,2-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)\Bigg/\Bigg((-4+n)\text{AppellF1}\left[1-\frac{n}{2},-n,3,2-\frac{n}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+2\Bigg(n\,\text{AppellF1}\left[2-\frac{n}{2},1-n,3,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+$$

$$3\,\text{AppellF1}\left[2-\frac{n}{2},-n,4,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)\Bigg)+\text{AppellF1}\left[1-\frac{n}{2},-n,4,2-\frac{n}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\Bigg/\Bigg((-4+n)\text{AppellF1}\left[1-\frac{n}{2},-n,4,2-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+$$

$$2\Bigg(n\,\text{AppellF1}\left[2-\frac{n}{2},1-n,4,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+4\,\text{AppellF1}\left[2-\frac{n}{2},-n,5,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)\Bigg)-\frac{1}{-2+n}48(-4+n)\text{Cos}\left[\frac{1}{2}(e+fx)\right]^5\text{Cot}[e+fx]^n\text{Sin}\left[\frac{1}{2}(e+fx)\right]^3$$

$$\Bigg(-\Bigg(\Bigg(\text{AppellF1}\left[1-\frac{n}{2},-n,3,2-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)\Bigg/\Bigg((-4+n)\text{AppellF1}\left[1-\frac{n}{2},-n,3,\right.$$

$$\left.2-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+2\Bigg(n\,\text{AppellF1}\left[2-\frac{n}{2},1-n,3,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]+$$

$$3\,\text{AppellF1}\left[2-\frac{n}{2},-n,4,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\Bigg)\Bigg)+$$

$$\text{AppellF1}\left[1-\frac{n}{2},-n,4,2-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+fx)\right]^2\right]\Bigg/\Bigg((-4+n)\text{AppellF1}\left[1-\frac{n}{2},-n,4,2-\frac{n}{2},\right.$$

$$\text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2 (n\, \text{AppellF1}[2-\tfrac{n}{2}, 1-n, 4, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 4$$

$$\text{AppellF1}[2-\tfrac{n}{2}, -n, 5, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]) \text{Tan}[\tfrac{1}{2}(e+f x)]^2)) +$$

$$\frac{1}{-2+n} 16 (-4+n) \text{Cos}[\tfrac{1}{2}(e+f x)]^6 \text{Cot}[e+f x]^n \text{Sin}[\tfrac{1}{2}(e+f x)]^2 (-((\text{AppellF1}[1-\tfrac{n}{2}, -n, 3, 2-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(e+f x)]^2] \text{Sec}[\tfrac{1}{2}(e+f x)]^2 \text{Tan}[\tfrac{1}{2}(e+f x)]) / ((-4+n) \text{AppellF1}[1-\tfrac{n}{2}, -n, 3, 2-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2 (n\, \text{AppellF1}[2-\tfrac{n}{2}, 1-n, 3, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$3\, \text{AppellF1}[2-\tfrac{n}{2}, -n, 4, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]) \text{Tan}[\tfrac{1}{2}(e+f x)]^2)) - (\text{Sec}[\tfrac{1}{2}(e+f x)]^2$$

$$(-\frac{1}{2-\frac{n}{2}} (1-\tfrac{n}{2}) n\, \text{AppellF1}[2-\tfrac{n}{2}, 1-n, 3, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] \text{Sec}[\tfrac{1}{2}(e+f x)]^2 \text{Tan}[\tfrac{1}{2}(e+f x)] - \frac{1}{2-\frac{n}{2}}$$

$$3 (1-\tfrac{n}{2}) \text{AppellF1}[2-\tfrac{n}{2}, -n, 4, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] \text{Sec}[\tfrac{1}{2}(e+f x)]^2 \text{Tan}[\tfrac{1}{2}(e+f x)])) / ((-4+n)$$

$$\text{AppellF1}[1-\tfrac{n}{2}, -n, 3, 2-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 2 (n\, \text{AppellF1}[2-\tfrac{n}{2}, 1-n, 3, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 3\, \text{AppellF1}[2-\tfrac{n}{2}, -n, 4, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]) \text{Tan}[\tfrac{1}{2}(e+f x)]^2) +$$

$$(-\frac{1}{2-\frac{n}{2}} (1-\tfrac{n}{2}) n\, \text{AppellF1}[2-\tfrac{n}{2}, 1-n, 4, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] \text{Sec}[\tfrac{1}{2}(e+f x)]^2 \text{Tan}[\tfrac{1}{2}(e+f x)] -$$

$$\frac{1}{2-\frac{n}{2}} 4 (1-\tfrac{n}{2}) \text{AppellF1}[2-\tfrac{n}{2}, -n, 5, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] \text{Sec}[\tfrac{1}{2}(e+f x)]^2 \text{Tan}[\tfrac{1}{2}(e+f x)]) /$$

$$((-4+n) \text{AppellF1}[1-\tfrac{n}{2}, -n, 4, 2-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$2 (n\, \text{AppellF1}[2-\tfrac{n}{2}, 1-n, 4, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] + 4\, \text{AppellF1}[2-\tfrac{n}{2}, -n, 5, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(e+f x)]^2]) \text{Tan}[\tfrac{1}{2}(e+f x)]^2) + (\text{AppellF1}[1-\tfrac{n}{2}, -n, 3, 2-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]$$

$$\text{Sec}[\tfrac{1}{2}(e+f x)]^2 (2 (n\, \text{AppellF1}[2-\tfrac{n}{2}, 1-n, 3, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2] +$$

$$3\, \text{AppellF1}[2-\tfrac{n}{2}, -n, 4, 3-\tfrac{n}{2}, \text{Tan}[\tfrac{1}{2}(e+f x)]^2, -\text{Tan}[\tfrac{1}{2}(e+f x)]^2]) \text{Sec}[\tfrac{1}{2}(e+f x)]^2 \text{Tan}[\tfrac{1}{2}(e+f x)] + (-4+n)$$

$$\Bigg(-\frac{1}{2-\frac{n}{2}}\Big(1-\frac{n}{2}\Big)\, n\, \text{AppellF1}\Big[2-\frac{n}{2},1-n,3,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]-$$

$$\frac{1}{2-\frac{n}{2}}3\Big(1-\frac{n}{2}\Big)\,\text{AppellF1}\Big[2-\frac{n}{2},-n,4,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Bigg)+$$

$$2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Bigg(n\Bigg(-\frac{1}{3-\frac{n}{2}}3\Big(2-\frac{n}{2}\Big)\,\text{AppellF1}\Big[3-\frac{n}{2},1-n,4,4-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]$$

$$\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]+\frac{1}{3-\frac{n}{2}}(1-n)\Big(2-\frac{n}{2}\Big)\,\text{AppellF1}\Big[3-\frac{n}{2},2-n,3,4-\frac{n}{2},$$

$$\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Bigg)+3\Bigg(-\frac{1}{3-\frac{n}{2}}\Big(2-\frac{n}{2}\Big)\,n$$

$$\text{AppellF1}\Big[3-\frac{n}{2},1-n,4,4-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]-\frac{1}{3-\frac{n}{2}}$$

$$4\Big(2-\frac{n}{2}\Big)\,\text{AppellF1}\Big[3-\frac{n}{2},-n,5,4-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\Bigg((-4+n)\,\text{AppellF1}\Big[1-\frac{n}{2},-n,3,2-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+2\Bigg(n\,\text{AppellF1}\Big[2-\frac{n}{2},1-n,3,$$

$$3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+3\,\text{AppellF1}\Big[2-\frac{n}{2},-n,4,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\Bigg)$$

$$\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Bigg)^2-\Bigg(\text{AppellF1}\Big[1-\frac{n}{2},-n,4,2-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]$$

$$\Bigg(2\Bigg(n\,\text{AppellF1}\Big[2-\frac{n}{2},1-n,4,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+4\,\text{AppellF1}\Big[2-\frac{n}{2},-n,5,$$

$$3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\Bigg)\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]+(-4+n)$$

$$\Bigg(-\frac{1}{2-\frac{n}{2}}\Big(1-\frac{n}{2}\Big)\, n\,\text{AppellF1}\Big[2-\frac{n}{2},1-n,4,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]-$$

$$\frac{1}{2-\frac{n}{2}}4\Big(1-\frac{n}{2}\Big)\,\text{AppellF1}\Big[2-\frac{n}{2},-n,5,3-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Bigg)+$$

$$2\,\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Bigg(n\Bigg(-\frac{1}{3-\frac{n}{2}}4\Big(2-\frac{n}{2}\Big)\,\text{AppellF1}\Big[3-\frac{n}{2},1-n,5,4-\frac{n}{2},\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]$$

$$\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2 \text{Tan}\left[\frac{1}{2}(e+f x)\right]+\frac{1}{3-\frac{n}{2}}(1-n)\left(2-\frac{n}{2}\right)\text{AppellF1}\left[3-\frac{n}{2},2-n,4,4-\frac{n}{2},\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]\Bigg)+4\left(-\frac{1}{3-\frac{n}{2}}\left(2-\frac{n}{2}\right)n\right.$$
$$\text{AppellF1}\left[3-\frac{n}{2},1-n,5,4-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]-\frac{1}{3-\frac{n}{2}}$$
$$5\left(2-\frac{n}{2}\right)\text{AppellF1}\left[3-\frac{n}{2},-n,6,4-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f x)\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$
$$\Bigg((-4+n)\,\text{AppellF1}\left[1-\frac{n}{2},-n,4,2-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+2\Bigg(n\,\text{AppellF1}\left[2-\frac{n}{2},1-n,\right.$$
$$\left.4,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+$$
$$4\,\text{AppellF1}\left[2-\frac{n}{2},-n,5,3-\frac{n}{2},\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\Bigg)^2\Bigg)\Bigg)\Bigg)$$

Problem 52: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (b\,\text{Cot}[e+f x])^n\,(a\,\text{Csc}[e+f x])^m\,dx$$

Optimal (type 5, 83 leaves, 1 step):

$$-\frac{1}{b f(1+n)}(b\,\text{Cot}[e+f x])^{1+n}(a\,\text{Csc}[e+f x])^m\,\text{Hypergeometric2F1}\left[\frac{1+n}{2},\frac{1}{2}(1+m+n),\frac{3+n}{2},\text{Cos}[e+f x]^2\right]\left(\text{Sin}[e+f x]^2\right)^{\frac{1}{2}(1+m+n)}$$

Result (type 6, 3166 leaves):

$$-\Bigg(\Bigg(2(-3+m+n)\,\text{AppellF1}\left[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]$$
$$\text{Cos}\left[\frac{1}{2}(e+f x)\right]^2\text{Cot}\left[\frac{1}{2}(e+f x)\right]\text{Cot}[e+f x]^n\,(b\,\text{Cot}[e+f x])^n\,\text{Csc}[e+f x]^m\,(a\,\text{Csc}[e+f x])^m\Bigg)\Bigg/$$
$$\Bigg(f(-1+m+n)\Bigg(2n\,\text{AppellF1}\left[\frac{1}{2}(3-m-n),1-n,1-m,\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]-$$
$$2(-1+m)\,\text{AppellF1}\left[\frac{1}{2}(3-m-n),-n,2-m,\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]+$$
$$(-3+m+n)\,\text{AppellF1}\left[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Cot}\left[\frac{1}{2}(e+f x)\right]^2\Bigg)$$
$$\Bigg(\Bigg(2(-3+m+n)\,\text{AppellF1}\left[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f x)\right]^2\right]\text{Cos}\left[\frac{1}{2}(e+f x)\right]^2\text{Cot}[e+f x]^n$$

$$\text{Csc}[e+f x]^m\Big)\Big/\Big(\big(-1+m+n\big)\Big(2 n \text{AppellF1}\Big[\frac{1}{2}(3-m-n),1-n,1-m,\frac{1}{2}(5-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]-$$

$$2(-1+m)\text{AppellF1}\Big[\frac{1}{2}(3-m-n),-n,2-m,\frac{1}{2}(5-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+$$

$$(-3+m+n)\text{AppellF1}\Big[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)\Big)+$$

$$\Big((-3+m+n)\text{AppellF1}\Big[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]^2\text{Cot}[e+f x]^n$$

$$\text{Csc}[e+f x]^m\Big)\Big/\Big(\big(-1+m+n\big)\Big(2 n \text{AppellF1}\Big[\frac{1}{2}(3-m-n),1-n,1-m,\frac{1}{2}(5-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]-$$

$$2(-1+m)\text{AppellF1}\Big[\frac{1}{2}(3-m-n),-n,2-m,\frac{1}{2}(5-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+$$

$$(-3+m+n)\text{AppellF1}\Big[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)\Big)+$$

$$\Big(2 m(-3+m+n)\text{AppellF1}\Big[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]$$

$$\text{Cos}\Big[\frac{1}{2}(e+f x)\Big]^2\text{Cos}[e+f x]\,\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]\text{Cot}[e+f x]^n\,\text{Csc}[e+f x]^{1+m}\Big)\Big/$$

$$\Big(\big(-1+m+n\big)\Big(2 n \text{AppellF1}\Big[\frac{1}{2}(3-m-n),1-n,1-m,\frac{1}{2}(5-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]-$$

$$2(-1+m)\text{AppellF1}\Big[\frac{1}{2}(3-m-n),-n,2-m,\frac{1}{2}(5-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+$$

$$(-3+m+n)\text{AppellF1}\Big[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)\Big)+$$

$$\Big(2 n(-3+m+n)\text{AppellF1}\Big[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]$$

$$\text{Cos}\Big[\frac{1}{2}(e+f x)\Big]^2\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]\text{Cot}[e+f x]^{-1+n}\,\text{Csc}[e+f x]^{2+m}\Big)\Big/$$

$$\Big(\big(-1+m+n\big)\Big(2 n \text{AppellF1}\Big[\frac{1}{2}(3-m-n),1-n,1-m,\frac{1}{2}(5-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]-$$

$$2(-1+m)\text{AppellF1}\Big[\frac{1}{2}(3-m-n),-n,2-m,\frac{1}{2}(5-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]+$$

$$(-3+m+n)\text{AppellF1}\Big[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]^2\Big)\Big)-$$

$$\Big(2(-3+m+n)\text{Cos}\Big[\frac{1}{2}(e+f x)\Big]^2\text{Cot}\Big[\frac{1}{2}(e+f x)\Big]\text{Cot}[e+f x]^n\,\text{Csc}[e+f x]^m\Big(-\frac{1}{3-m-n}(1-m-n)\,n\,\text{AppellF1}\Big[1+\frac{1}{2}(1-m-n),1-n,1-m,$$

$$1+\frac{1}{2}(3-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]-\frac{1}{3-m-n}(1-m)(1-m-n)\text{AppellF1}\Big[$$

$$1+\frac{1}{2}(1-m-n),-n,2-m,1+\frac{1}{2}(3-m-n),\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2,-\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]^2\Big]\text{Sec}\Big[\frac{1}{2}(e+f x)\Big]^2\text{Tan}\Big[\frac{1}{2}(e+f x)\Big]\Big)\Big)\Big/$$

$$\left(\left(-1+m+n\right)\left(2\,n\,\text{AppellF1}\left[\frac{1}{2}(3-m-n),1-n,1-m,\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]-\right.\right.$$
$$2(-1+m)\,\text{AppellF1}\left[\frac{1}{2}(3-m-n),-n,2-m,\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]+$$
$$\left.(-3+m+n)\,\text{AppellF1}\left[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\text{Cot}\left[\frac{1}{2}(e+f\,x)\right]^2\right)\Bigg)+$$
$$\left(2(-3+m+n)\,\text{AppellF1}\left[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\right.$$
$$\text{Cos}\left[\frac{1}{2}(e+f\,x)\right]^2\text{Cot}\left[\frac{1}{2}(e+f\,x)\right]\text{Cot}[e+f\,x]^n\,\text{Csc}[e+f\,x]^m$$
$$\left(-(-3+m+n)\,\text{AppellF1}\left[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\text{Cot}\left[\frac{1}{2}(e+f\,x)\right]\right.$$
$$\text{Csc}\left[\frac{1}{2}(e+f\,x)\right]^2+(-3+m+n)\,\text{Cot}\left[\frac{1}{2}(e+f\,x)\right]^2\left(-\frac{1}{3-m-n}(1-m-n)\,n\,\text{AppellF1}\left[1+\frac{1}{2}(1-m-n),1-n,1-m,1+\frac{1}{2}(3-m-n),\right.\right.$$
$$\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\Big]\text{Sec}\left[\frac{1}{2}(e+f\,x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]-\frac{1}{3-m-n}(1-m)(1-m-n)\,\text{AppellF1}\Big[$$
$$\left.1+\frac{1}{2}(1-m-n),-n,2-m,1+\frac{1}{2}(3-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f\,x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]\Bigg)+$$
$$2\,n\left(-\frac{1}{5-m-n}(1-m)(3-m-n)\,\text{AppellF1}\left[1+\frac{1}{2}(3-m-n),1-n,2-m,1+\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,\right.\right.$$
$$-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\Big]\text{Sec}\left[\frac{1}{2}(e+f\,x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]+\frac{1}{5-m-n}(1-n)(3-m-n)\,\text{AppellF1}\Big[1+\frac{1}{2}(3-m-n),$$
$$\left.2-n,1-m,1+\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f\,x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]\Bigg)-$$
$$2(-1+m)\left(-\frac{1}{5-m-n}(3-m-n)\,n\,\text{AppellF1}\left[1+\frac{1}{2}(3-m-n),1-n,2-m,1+\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,\right.\right.$$
$$-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\Big]\text{Sec}\left[\frac{1}{2}(e+f\,x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]-\frac{1}{5-m-n}(2-m)(3-m-n)\,\text{AppellF1}\Big[1+\frac{1}{2}(3-m-n),$$
$$\left.-n,3-m,1+\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(e+f\,x)\right]^2\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]\Bigg)\Bigg)\Bigg)\Big/$$
$$\left(\left(-1+m+n\right)\left(2\,n\,\text{AppellF1}\left[\frac{1}{2}(3-m-n),1-n,1-m,\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]-\right.\right.$$
$$2(-1+m)\,\text{AppellF1}\left[\frac{1}{2}(3-m-n),-n,2-m,\frac{1}{2}(5-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]+$$
$$\left.\left.\left.(-3+m+n)\,\text{AppellF1}\left[\frac{1}{2}(1-m-n),-n,1-m,\frac{1}{2}(3-m-n),\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(e+f\,x)\right]^2\right]\text{Cot}\left[\frac{1}{2}(e+f\,x)\right]^2\right)^2\right)\right)\right)$$

Test results for the 61 problems in "4.4.10 (c+d x)^m (a+b cot)^n.m"

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

$$\int x \operatorname{Cot}[a+b x]\, dx$$

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

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

Result (type 4, 166 leaves):

$$\frac{1}{2} x^2 \operatorname{Cot}[a]-\left(\operatorname{Csc}[a] \operatorname{Sec}[a]\left(b^2 e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\operatorname{Tan}[a]^2}}\left(i b x(-\pi+2 \operatorname{ArcTan}[\operatorname{Tan}[a]])-\pi \operatorname{Log}\left[1+e^{-2 i b x}\right]-2(b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]) \operatorname{Log}\left[1-e^{2 i(b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[b x]]+2 \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]]]+i \operatorname{PolyLog}\left[2, e^{2 i(b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]\right) \operatorname{Tan}[a]\right)\right) \Big/ \left(2 b^2 \sqrt{\operatorname{Sec}[a]^2\left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)}\right)$$

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

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

Optimal (type 4, 74 leaves, 6 steps):

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

Result (type 4, 181 leaves):

$$-\frac{x^3}{3}+\frac{x^2 \operatorname{Csc}[a] \operatorname{Csc}[a+b x] \operatorname{Sin}[b x]}{b}-\left(\operatorname{Csc}[a] \operatorname{Sec}[a]\left(b^2 e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\operatorname{Tan}[a]^2}}\left(i b x(-\pi+2 \operatorname{ArcTan}[\operatorname{Tan}[a]])-\pi \operatorname{Log}\left[1+e^{-2 i b x}\right]-2(b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]) \operatorname{Log}\left[1-e^{2 i(b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[b x]]+2 \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]]]+i \operatorname{PolyLog}\left[2, e^{2 i(b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]\right) \operatorname{Tan}[a]\right)\right) \Big/ \left(b^3 \sqrt{\operatorname{Sec}[a]^2\left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)}\right)$$

Problem 13: Result more than twice size of optimal antiderivative.

$$\int x \operatorname{Cot}[a+b x]^3 \, dx$$

Optimal (type 4, 91 leaves, 7 steps):

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

Result (type 4, 201 leaves):

$$-\frac{1}{2} x^2 \operatorname{Cot}[a]-\frac{x \operatorname{Csc}[a+b x]^2}{2 b}+\frac{\operatorname{Csc}[a] \operatorname{Csc}[a+b x] \operatorname{Sin}[b x]}{2 b^2}+$$
$$\left(\operatorname{Csc}[a] \operatorname{Sec}[a] \left(b^2 e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\operatorname{Tan}[a]^2}} \left(i b x \left(-\pi+2 \operatorname{ArcTan}[\operatorname{Tan}[a]]\right)-\pi \operatorname{Log}\left[1+e^{-2 i b x}\right]-\right.\right.\right.$$
$$2 \left(b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]\right) \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[b x]]+2 \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]]]+$$
$$\left.\left.\left. i \operatorname{PolyLog}\left[2, e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]\right) \operatorname{Tan}[a]\right)\right) \Big/ \left(2 b^2 \sqrt{\operatorname{Sec}[a]^2 \left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)}\right)$$

Problem 37: Result more than twice size of optimal antiderivative.

$$\int (c+d x)^3 \left(a+b \operatorname{Cot}[e+f x]\right) dx$$

Optimal (type 4, 147 leaves, 8 steps):

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

Result (type 4, 524 leaves):

$$-\frac{1}{4 f^3} b c d^2 e^{-i e} \operatorname{Csc}[e] \left(2 f^2 x^2 \left(2 e^{2 i e} f x+3 i \left(-1+e^{2 i e}\right) \operatorname{Log}\left[1-e^{2 i (e+f x)}\right]\right)+6 \left(-1+e^{2 i e}\right) f x \operatorname{PolyLog}\left[2, e^{2 i (e+f x)}\right]+3 i \left(-1+e^{2 i e}\right) \operatorname{PolyLog}\left[3, e^{2 i (e+f x)}\right]\right)-\frac{1}{4} b d^3 e^{i e} \operatorname{Csc}[e] \left(x^4+\left(-1+e^{-2 i e}\right) x^4+\frac{1}{2 f^4} e^{-2 i e} \left(-1+e^{2 i e}\right) \left(2 f^4 x^4+4 i f^3 x^3 \operatorname{Log}\left[1-e^{2 i (e+f x)}\right]+6 f^2 x^2 \operatorname{PolyLog}\left[2, e^{2 i (e+f x)}\right]+6 i f x \operatorname{PolyLog}\left[3, e^{2 i (e+f x)}\right]-3 \operatorname{PolyLog}\left[4, e^{2 i (e+f x)}\right]\right)\right)+\frac{1}{4} x \left(4 c^3+6 c^2 d x+4 c d^2 x^2+d^3 x^3\right) \operatorname{Csc}[e] \left(b \operatorname{Cos}[e]+a \operatorname{Sin}[e]\right)+\frac{b c^3 \operatorname{Csc}[e] \left(-f x \operatorname{Cos}[e]+\operatorname{Log}[\operatorname{Cos}[f x] \operatorname{Sin}[e]+\operatorname{Cos}[e] \operatorname{Sin}[f x]] \operatorname{Sin}[e]\right)}{f \left(\operatorname{Cos}[e]^2+\operatorname{Sin}[e]^2\right)}-\left(3 b c^2 d \operatorname{Csc}[e] \operatorname{Sec}[e] \left(e^{i \operatorname{ArcTan}[\operatorname{Tan}[e]]} f^2 x^2+\frac{1}{\sqrt{1+\operatorname{Tan}[e]^2}} \left(i f x \left(-\pi+2 \operatorname{ArcTan}[\operatorname{Tan}[e]]\right)-\pi \operatorname{Log}\left[1+e^{-2 i f x}\right]-2 \left(f x+\operatorname{ArcTan}[\operatorname{Tan}[e]]\right) \operatorname{Log}\left[1-e^{2 i (f x+\operatorname{ArcTan}[\operatorname{Tan}[e]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[f x]]+2 \operatorname{ArcTan}[\operatorname{Tan}[e]] \operatorname{Log}[\operatorname{Sin}[f x+\operatorname{ArcTan}[\operatorname{Tan}[e]]]]+i \operatorname{PolyLog}\left[2, e^{2 i (f x+\operatorname{ArcTan}[\operatorname{Tan}[e]])}\right]\right) \operatorname{Tan}[e]\right)\right) \Big/ \left(2 f^2 \sqrt{\operatorname{Sec}[e]^2 \left(\operatorname{Cos}[e]^2+\operatorname{Sin}[e]^2\right)}\right)$$

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

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

Optimal (type 4, 112 leaves, 7 steps):

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

Result (type 4, 361 leaves):

$$-\frac{1}{12 f^3} b d^2 e^{-i e} \text{Csc}[e] \left(2 f^2 x^2 \left(2 e^{2 i e} f x+3 i \left(-1+e^{2 i e}\right) \text{Log}\left[1-e^{2 i (e+f x)}\right]\right)+6 \left(-1+e^{2 i e}\right) f x \text{PolyLog}\left[2, e^{2 i (e+f x)}\right]+3 i \left(-1+e^{2 i e}\right) \text{PolyLog}\left[3, e^{2 i (e+f x)}\right]\right)+$$
$$\frac{1}{3} x \left(3 c^2+3 c d x+d^2 x^2\right) \text{Csc}[e] (b \text{Cos}[e]+a \text{Sin}[e])+\frac{b c^2 \text{Csc}[e] (-f x \text{Cos}[e]+\text{Log}[\text{Cos}[f x] \text{Sin}[e]+\text{Cos}[e] \text{Sin}[f x]] \text{Sin}[e])}{f \left(\text{Cos}[e]^2+\text{Sin}[e]^2\right)}-$$
$$\left(b c d \text{Csc}[e] \text{Sec}[e] \left(e^{i \text{ArcTan}[\text{Tan}[e]]} f^2 x^2+\frac{1}{\sqrt{1+\text{Tan}[e]^2}} \left(i f x (-\pi+2 \text{ArcTan}[\text{Tan}[e]])-\pi \text{Log}\left[1+e^{-2 i f x}\right]-2 (f x+\text{ArcTan}[\text{Tan}[e]]) \text{Log}\left[1-e^{2 i (f x+\text{ArcTan}[\text{Tan}[e]])}\right]+\pi \text{Log}[\text{Cos}[f x]]+2 \text{ArcTan}[\text{Tan}[e]] \text{Log}[\text{Sin}[f x+\text{ArcTan}[\text{Tan}[e]]]]+i \text{PolyLog}\left[2, e^{2 i (f x+\text{ArcTan}[\text{Tan}[e]])}\right]\right) \text{Tan}[e]\right)\right) \Big/ \left(f^2 \sqrt{\text{Sec}[e]^2 \left(\text{Cos}[e]^2+\text{Sin}[e]^2\right)}\right)$$

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

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

Optimal (type 4, 83 leaves, 6 steps):

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

Result (type 4, 196 leaves):

$$a c x+\frac{1}{2} a d x^2+\frac{1}{2} b d x^2 \text{Cot}[e]+\frac{b c \text{Log}[\text{Sin}[e+f x]]}{f}-$$
$$\left(b d \text{Csc}[e] \text{Sec}[e] \left(e^{i \text{ArcTan}[\text{Tan}[e]]} f^2 x^2+\frac{1}{\sqrt{1+\text{Tan}[e]^2}} \left(i f x (-\pi+2 \text{ArcTan}[\text{Tan}[e]])-\pi \text{Log}\left[1+e^{-2 i f x}\right]-2 (f x+\text{ArcTan}[\text{Tan}[e]]) \text{Log}\left[1-e^{2 i (f x+\text{ArcTan}[\text{Tan}[e]])}\right]+\pi \text{Log}[\text{Cos}[f x]]+2 \text{ArcTan}[\text{Tan}[e]] \text{Log}[\text{Sin}[f x+\text{ArcTan}[\text{Tan}[e]]]]+i \text{PolyLog}\left[2, e^{2 i (f x+\text{ArcTan}[\text{Tan}[e]])}\right]\right) \text{Tan}[e]\right)\right) \Big/ \left(2 f^2 \sqrt{\text{Sec}[e]^2 \left(\text{Cos}[e]^2+\text{Sin}[e]^2\right)}\right)$$

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

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

Optimal (type 4, 295 leaves, 15 steps):

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

Result (type 4, 1313 leaves) :

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

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

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

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

$$\frac{1}{8 f} \mathrm{Csc}[e] \mathrm{Csc}[e + f x] \left(4 a^2 c^3 f x \,\mathrm{Cos}[f x] - 4 b^2 c^3 f x \,\mathrm{Cos}[f x] + 6 a^2 c^2 d f x^2 \mathrm{Cos}[f x] - 6 b^2 c^2 d f x^2 \mathrm{Cos}[f x] + 4 a^2 c d^2 f x^3 \mathrm{Cos}[f x] - 4 b^2 c d^2 f x^3 \mathrm{Cos}[f x] + a^2 d^3 f x^4 \mathrm{Cos}[f x] - b^2 d^3 f x^4 \mathrm{Cos}[f x] - 4 a^2 c^3 f x \,\mathrm{Cos}[2 e + f x] + 4 b^2 c^3 f x \,\mathrm{Cos}[2 e + f x] - 6 a^2 c^2 d f x^2 \mathrm{Cos}[2 e + f x] + 6 b^2 c^2 d f x^2 \mathrm{Cos}[2 e + f x] - 4 a^2 c d^2 f x^3 \mathrm{Cos}[2 e + f x] + 4 b^2 c d^2 f x^3 \mathrm{Cos}[2 e + f x] - a^2 d^3 f x^4 \mathrm{Cos}[2 e + f x] + b^2 d^3 f x^4 \mathrm{Cos}[2 e + f x] + 8 b^2 c^3 \mathrm{Sin}[f x] + 24 b^2 c^2 d x \,\mathrm{Sin}[f x] + 8 a b c^3 f x \,\mathrm{Sin}[f x] + 24 b^2 c d^2 x^2 \mathrm{Sin}[f x] + 12 a b c^2 d f x^2 \mathrm{Sin}[f x] + 8 b^2 d^3 x^3 \mathrm{Sin}[f x] + 8 a b c d^2 f x^3 \mathrm{Sin}[f x] + 2 a b d^3 f x^4 \mathrm{Sin}[f x] + 8 a b c^3 f x \,\mathrm{Sin}[2 e + f x] + 12 a b c^2 d f x^2 \mathrm{Sin}[2 e + f x] + 8 a b c d^2 f x^3 \mathrm{Sin}[2 e + f x] + 2 a b d^3 f x^4 \mathrm{Sin}[2 e + f x]\right) -$$

$$\left(3 b^2 c d^2 \mathrm{Csc}[e] \mathrm{Sec}[e] \left(e^{i \mathrm{ArcTan}[\mathrm{Tan}[e]]} f^2 x^2 + \frac{1}{\sqrt{1 + \mathrm{Tan}[e]^2}} \left(i f x \left(-\pi + 2 \mathrm{ArcTan}[\mathrm{Tan}[e]]\right) - \pi \mathrm{Log}\left[1 + e^{-2 i f x}\right] - 2 \left(f x + \mathrm{ArcTan}[\mathrm{Tan}[e]]\right) \mathrm{Log}\left[1 - e^{2 i (f x + \mathrm{ArcTan}[\mathrm{Tan}[e]])}\right] + \pi \mathrm{Log}[\mathrm{Cos}[f x]] + 2 \mathrm{ArcTan}[\mathrm{Tan}[e]] \mathrm{Log}[\mathrm{Sin}[f x + \mathrm{ArcTan}[\mathrm{Tan}[e]]]] + i \,\mathrm{PolyLog}\left[2, e^{2 i (f x + \mathrm{ArcTan}[\mathrm{Tan}[e]])}\right]\right) \mathrm{Tan}[e]\right)\right) \Big/ \left(f^3 \sqrt{\mathrm{Sec}[e]^2} \left(\mathrm{Cos}[e]^2 + \mathrm{Sin}[e]^2\right)\right) -$$

$$\left(3 a b c^2 d \,\mathrm{Csc}[e] \mathrm{Sec}[e] \left(e^{i \mathrm{ArcTan}[\mathrm{Tan}[e]]} f^2 x^2 + \frac{1}{\sqrt{1 + \mathrm{Tan}[e]^2}} \left(i f x \left(-\pi + 2 \mathrm{ArcTan}[\mathrm{Tan}[e]]\right) - \pi \mathrm{Log}\left[1 + e^{-2 i f x}\right] - 2 \left(f x + \mathrm{ArcTan}[\mathrm{Tan}[e]]\right) \mathrm{Log}\left[1 - e^{2 i (f x + \mathrm{ArcTan}[\mathrm{Tan}[e]])}\right] + \pi \mathrm{Log}[\mathrm{Cos}[f x]] + 2 \mathrm{ArcTan}[\mathrm{Tan}[e]] \mathrm{Log}[\mathrm{Sin}[f x + \mathrm{ArcTan}[\mathrm{Tan}[e]]]] + i \,\mathrm{PolyLog}\left[2, e^{2 i (f x + \mathrm{ArcTan}[\mathrm{Tan}[e]])}\right]\right) \mathrm{Tan}[e]\right)\right) \Big/ \left(f^2 \sqrt{\mathrm{Sec}[e]^2} \left(\mathrm{Cos}[e]^2 + \mathrm{Sin}[e]^2\right)\right)$$

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

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

Optimal (type 4, 227 leaves, 13 steps):

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

Result (type 4, 635 leaves):

$$-\frac{1}{6 f^3} a b d^2 e^{-i e} \operatorname{Csc}[e] \left(2 f^2 x^2 \left(2 e^{2 i e} f x+3 i \left(-1+e^{2 i e}\right) \operatorname{Log}\left[1-e^{2 i (e+f x)}\right]\right)+6 \left(-1+e^{2 i e}\right) f x \operatorname{PolyLog}\left[2, e^{2 i (e+f x)}\right]+3 i \left(-1+e^{2 i e}\right) \operatorname{PolyLog}\left[3, e^{2 i (e+f x)}\right]\right)+\frac{1}{3} x \left(3 c^2+3 c d x+d^2 x^2\right) \operatorname{Csc}[e] \left(2 a b \operatorname{Cos}[e]+a^2 \operatorname{Sin}[e]-b^2 \operatorname{Sin}[e]\right)+\frac{2 b^2 c d \operatorname{Csc}[e] (-f x \operatorname{Cos}[e]+\operatorname{Log}[\operatorname{Cos}[f x] \operatorname{Sin}[e]+\operatorname{Cos}[e] \operatorname{Sin}[f x]] \operatorname{Sin}[e])}{f^2 \left(\operatorname{Cos}[e]^2+\operatorname{Sin}[e]^2\right)}+\frac{2 a b c^2 \operatorname{Csc}[e] (-f x \operatorname{Cos}[e]+\operatorname{Log}[\operatorname{Cos}[f x] \operatorname{Sin}[e]+\operatorname{Cos}[e] \operatorname{Sin}[f x]] \operatorname{Sin}[e])}{f \left(\operatorname{Cos}[e]^2+\operatorname{Sin}[e]^2\right)}+\frac{\operatorname{Csc}[e] \operatorname{Csc}[e+f x] \left(b^2 c^2 \operatorname{Sin}[f x]+2 b^2 c d x \operatorname{Sin}[f x]+b^2 d^2 x^2 \operatorname{Sin}[f x]\right)}{f}-\left(b^2 d^2 \operatorname{Csc}[e] \operatorname{Sec}[e] \left(e^{i \operatorname{ArcTan}[\operatorname{Tan}[e]]} f^2 x^2+\frac{1}{\sqrt{1+\operatorname{Tan}[e]^2}} \left(i f x (-\pi+2 \operatorname{ArcTan}[\operatorname{Tan}[e]])-\pi \operatorname{Log}\left[1+e^{-2 i f x}\right]-2 (f x+\operatorname{ArcTan}[\operatorname{Tan}[e]]) \operatorname{Log}\left[1-e^{2 i (f x+\operatorname{ArcTan}[\operatorname{Tan}[e]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[f x]]+2 \operatorname{ArcTan}[\operatorname{Tan}[e]] \operatorname{Log}[\operatorname{Sin}[f x+\operatorname{ArcTan}[\operatorname{Tan}[e]]]]+i \operatorname{PolyLog}\left[2, e^{2 i (f x+\operatorname{ArcTan}[\operatorname{Tan}[e]])}\right]\right) \operatorname{Tan}[e]\right)\right) \Big/ \left(f^3 \sqrt{\operatorname{Sec}[e]^2 \left(\operatorname{Cos}[e]^2+\operatorname{Sin}[e]^2\right)}\right)-\left(2 a b c d \operatorname{Csc}[e] \operatorname{Sec}[e] \left(e^{i \operatorname{ArcTan}[\operatorname{Tan}[e]]} f^2 x^2+\frac{1}{\sqrt{1+\operatorname{Tan}[e]^2}} \left(i f x (-\pi+2 \operatorname{ArcTan}[\operatorname{Tan}[e]])-\pi \operatorname{Log}\left[1+e^{-2 i f x}\right]-2 (f x+\operatorname{ArcTan}[\operatorname{Tan}[e]]) \operatorname{Log}\left[1-e^{2 i (f x+\operatorname{ArcTan}[\operatorname{Tan}[e]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[f x]]+2 \operatorname{ArcTan}[\operatorname{Tan}[e]] \operatorname{Log}[\operatorname{Sin}[f x+\operatorname{ArcTan}[\operatorname{Tan}[e]]]]+i \operatorname{PolyLog}\left[2, e^{2 i (f x+\operatorname{ArcTan}[\operatorname{Tan}[e]])}\right]\right) \operatorname{Tan}[e]\right)\right) \Big/ \left(f^2 \sqrt{\operatorname{Sec}[e]^2 \left(\operatorname{Cos}[e]^2+\operatorname{Sin}[e]^2\right)}\right)$$

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

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

Optimal (type 4, 603 leaves, 28 steps):

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

Result (type 4, 2539 leaves):

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

$$\frac{9 a b^2 c^2 d \,\text{Csc}[e] \left(-f x \,\text{Cos}[e] + \text{Log}[\text{Cos}[f x] \,\text{Sin}[e] + \text{Cos}[e] \,\text{Sin}[f x]] \,\text{Sin}[e]\right)}{f^2 \left(\text{Cos}[e]^2 + \text{Sin}[e]^2\right)} +$$

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

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

$$\Big(3 x^2 \big(-a^3 c^2 d + 3 i a^2 b c^2 d + 3 a b^2 c^2 d - i b^3 c^2 d + a^3 c^2 d \,\text{Cos}[2 e] + 3 i a^2 b c^2 d \,\text{Cos}[2 e] - 3 a b^2 c^2 d \,\text{Cos}[2 e] - i b^3 c^2 d \,\text{Cos}[2 e] + i a^3 c^2 d \,\text{Sin}[2 e] - 3 a^2 b c^2 d \,\text{Sin}[2 e] - 3 i a b^2 c^2 d \,\text{Sin}[2 e] + b^3 c^2 d \,\text{Sin}[2 e]\big)\Big) \Big/ \big(2 \left(-1 + \text{Cos}[2 e] + i \,\text{Sin}[2 e]\right)\big) +$$

$$\Big(x^3 \big(-a^3 c d^2 + 3 i a^2 b c d^2 + 3 a b^2 c d^2 - i b^3 c d^2 + a^3 c d^2 \,\text{Cos}[2 e] + 3 i a^2 b c d^2 \,\text{Cos}[2 e] - 3 a b^2 c d^2 \,\text{Cos}[2 e] - i b^3 c d^2 \,\text{Cos}[2 e] + i a^3 c d^2 \,\text{Sin}[2 e] - 3 a^2 b c d^2 \,\text{Sin}[2 e] - 3 i a b^2 c d^2 \,\text{Sin}[2 e] + b^3 c d^2 \,\text{Sin}[2 e]\big)\Big) \Big/ \left(-1 + \text{Cos}[2 e] + i \,\text{Sin}[2 e]\right) +$$

$$\Big(x^4 \big(-a^3 d^3 + 3 i a^2 b d^3 + 3 a b^2 d^3 - i b^3 d^3 + a^3 d^3 \,\text{Cos}[2 e] + 3 i a^2 b d^3 \,\text{Cos}[2 e] - 3 a b^2 d^3 \,\text{Cos}[2 e] - i b^3 d^3 \,\text{Cos}[2 e] + i a^3 d^3 \,\text{Sin}[2 e] - 3 a^2 b d^3 \,\text{Sin}[2 e] - 3 i a b^2 d^3 \,\text{Sin}[2 e] + b^3 d^3 \,\text{Sin}[2 e]\big)\Big) \Big/ \big(4 \left(-1 + \text{Cos}[2 e] + i \,\text{Sin}[2 e]\right)\big) +$$

$$x \left(a^3 c^3 - 3 a b^2 c^3 + \frac{3 i a^2 b c^3}{-1 + \text{Cos}[2 e] + i \,\text{Sin}[2 e]} + \frac{3 i a^2 b c^3 \,\text{Cos}[2 e] - 3 a^2 b c^3 \,\text{Sin}[2 e]}{-1 + \text{Cos}[2 e] + i \,\text{Sin}[2 e]} + \frac{-2 i b^3 c^3 \,\text{Cos}[2 e] + 2 b^3 c^3 \,\text{Sin}[2 e]}{\left(-1 + \text{Cos}[2 e] + i \,\text{Sin}[2 e]\right) \left(1 + \text{Cos}[2 e] + \text{Cos}[4 e] + i \,\text{Sin}[2 e] + i \,\text{Sin}[4 e]\right)} + \frac{-2 i b^3 c^3 \,\text{Cos}[4 e] + 2 b^3 c^3 \,\text{Sin}[4 e]}{\left(-1 + \text{Cos}[2 e] + i \,\text{Sin}[2 e]\right) \left(1 + \text{Cos}[2 e] + \text{Cos}[4 e] + i \,\text{Sin}[2 e] + i \,\text{Sin}[4 e]\right)} - \frac{i b^3 c^3}{-1 + \text{Cos}[6 e] + i \,\text{Sin}[6 e]} + \frac{-i b^3 c^3 \,\text{Cos}[6 e] + b^3 c^3 \,\text{Sin}[6 e]}{-1 + \text{Cos}[6 e] + i \,\text{Sin}[6 e]}\right) + \frac{1}{2 f^2}$$

$$3 \,\text{Csc}[e] \,\text{Csc}[e + f x] \left(b^3 c^2 d \,\text{Sin}[f x] + 2 a b^2 c^3 f \,\text{Sin}[f x] + 2 b^3 c d^2 x \,\text{Sin}[f x] + 6 a b^2 c^2 d f x \,\text{Sin}[f x] + b^3 d^3 x^2 \,\text{Sin}[f x] + 6 a b^2 c d^2 f x^2 \,\text{Sin}[f x] + 2 a b^2 d^3 f x^3 \,\text{Sin}[f x]\right) - \Bigg(3 b^3 d^3 \,\text{Csc}[e] \,\text{Sec}[e] \Bigg(e^{i \,\text{ArcTan}[\text{Tan}[e]]} f^2 x^2 + \frac{1}{\sqrt{1 + \text{Tan}[e]^2}} \Big(i f x \left(-\pi + 2 \,\text{ArcTan}[\text{Tan}[e]]\right) - \pi \,\text{Log}\left[1 + e^{-2 i f x}\right] - 2 \left(f x + \text{ArcTan}[\text{Tan}[e]]\right) \text{Log}\left[1 - e^{2 i (f x + \text{ArcTan}[\text{Tan}[e]])}\right] + \pi \,\text{Log}[\text{Cos}[f x]] + 2 \,\text{ArcTan}[\text{Tan}[e]] \,\text{Log}[\text{Sin}[f x + \text{ArcTan}[\text{Tan}[e]]]] + i \,\text{PolyLog}\left[2, e^{2 i (f x + \text{ArcTan}[\text{Tan}[e]])}\right]\Big) \text{Tan}[e]\Bigg)\Bigg) \Bigg/$$

$$\left(2 f^4 \sqrt{\text{Sec}[e]^2 \left(\text{Cos}[e]^2 + \text{Sin}[e]^2\right)}\right) - \Bigg(9 a b^2 c d^2 \,\text{Csc}[e] \,\text{Sec}[e] \Bigg(e^{i \,\text{ArcTan}[\text{Tan}[e]]} f^2 x^2 + \frac{1}{\sqrt{1 + \text{Tan}[e]^2}} \Big(i f x \left(-\pi + 2 \,\text{ArcTan}[\text{Tan}[e]]\right) - \pi \,\text{Log}\left[1 + e^{-2 i f x}\right] - 2 \left(f x + \text{ArcTan}[\text{Tan}[e]]\right) \text{Log}\left[1 - e^{2 i (f x + \text{ArcTan}[\text{Tan}[e]])}\right] + \pi \,\text{Log}[\text{Cos}[f x]] + 2 \,\text{ArcTan}[\text{Tan}[e]] \,\text{Log}[\text{Sin}[f x + \text{ArcTan}[\text{Tan}[e]]]] + i \,\text{PolyLog}\left[2, e^{2 i (f x + \text{ArcTan}[\text{Tan}[e]])}\right]\Big) \text{Tan}[e]\Bigg)\Bigg) \Bigg/$$

$$\left(f^3 \sqrt{\text{Sec}[e]^2 \left(\text{Cos}[e]^2+\text{Sin}[e]^2\right)}\right) - \left(9 a^2 b c^2 d \,\text{Csc}[e]\, \text{Sec}[e] \left(e^{i\, \text{ArcTan}[\text{Tan}[e]]} f^2 x^2 + \frac{1}{\sqrt{1+\text{Tan}[e]^2}} \left(i f x \left(-\pi + 2\, \text{ArcTan}[\text{Tan}[e]]\right) - \pi\, \text{Log}\left[1+e^{-2 i f x}\right] - 2 \left(f x + \text{ArcTan}[\text{Tan}[e]]\right) \text{Log}\left[1-e^{2 i (f x+\text{ArcTan}[\text{Tan}[e]])}\right] + \pi\, \text{Log}[\text{Cos}[f x]] + 2\, \text{ArcTan}[\text{Tan}[e]]\, \text{Log}[\text{Sin}[f x+\text{ArcTan}[\text{Tan}[e]]]] + i\, \text{PolyLog}\left[2, e^{2 i (f x+\text{ArcTan}[\text{Tan}[e]])}\right]\right) \text{Tan}[e]\right)\right) \Big/$$

$$\left(2 f^2 \sqrt{\text{Sec}[e]^2 \left(\text{Cos}[e]^2+\text{Sin}[e]^2\right)}\right) + \left(3 b^3 c^2 d \,\text{Csc}[e]\, \text{Sec}[e] \left(e^{i\, \text{ArcTan}[\text{Tan}[e]]} f^2 x^2 + \frac{1}{\sqrt{1+\text{Tan}[e]^2}} \left(i f x \left(-\pi + 2\, \text{ArcTan}[\text{Tan}[e]]\right) - \pi\, \text{Log}\left[1+e^{-2 i f x}\right] - 2 \left(f x + \text{ArcTan}[\text{Tan}[e]]\right) \text{Log}\left[1-e^{2 i (f x+\text{ArcTan}[\text{Tan}[e]])}\right] + \pi\, \text{Log}[\text{Cos}[f x]] + 2\, \text{ArcTan}[\text{Tan}[e]]\, \text{Log}[\text{Sin}[f x+\text{ArcTan}[\text{Tan}[e]]]] + i\, \text{PolyLog}\left[2, e^{2 i (f x+\text{ArcTan}[\text{Tan}[e]])}\right]\right) \text{Tan}[e]\right)\right) \Big/ \left(2 f^2 \sqrt{\text{Sec}[e]^2 \left(\text{Cos}[e]^2+\text{Sin}[e]^2\right)}\right)$$

Problem 48: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 433 leaves, 22 steps) :

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

Result (type 4, 1825 leaves) :

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

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

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

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

$$\frac{1}{12\,f^2}\text{Csc}[e]\,\text{Csc}[e+f\,x]^2\,\Big(6\,b^3\,c\,d\,\text{Cos}[e]+18\,a\,b^2\,c^2\,f\,\text{Cos}[e]+6\,b^3\,d^2\,x\,\text{Cos}[e]+36\,a\,b^2\,c\,d\,f\,x\,\text{Cos}[e]+18\,a^2\,b\,c^2\,f^2\,x\,\text{Cos}[e]-6\,b^3\,c^2\,f^2\,x\,\text{Cos}[e]+$$
$$18\,a\,b^2\,d^2\,f\,x^2\,\text{Cos}[e]+18\,a^2\,b\,c\,d\,f^2\,x^2\,\text{Cos}[e]-6\,b^3\,c\,d\,f^2\,x^2\,\text{Cos}[e]+6\,a^2\,b\,d^2\,f^2\,x^3\,\text{Cos}[e]-2\,b^3\,d^2\,f^2\,x^3\,\text{Cos}[e]-6\,b^3\,c\,d\,\text{Cos}[e+2\,f\,x]-$$
$$18\,a\,b^2\,c^2\,f\,\text{Cos}[e+2\,f\,x]-6\,b^3\,d^2\,x\,\text{Cos}[e+2\,f\,x]-36\,a\,b^2\,c\,d\,f\,x\,\text{Cos}[e+2\,f\,x]-9\,a^2\,b\,c^2\,f^2\,x\,\text{Cos}[e+2\,f\,x]+3\,b^3\,c^2\,f^2\,x\,\text{Cos}[e+2\,f\,x]-$$
$$18\,a\,b^2\,d^2\,f\,x^2\,\text{Cos}[e+2\,f\,x]-9\,a^2\,b\,c\,d\,f^2\,x^2\,\text{Cos}[e+2\,f\,x]+3\,b^3\,c\,d\,f^2\,x^2\,\text{Cos}[e+2\,f\,x]-3\,a^2\,b\,d^2\,f^2\,x^3\,\text{Cos}[e+2\,f\,x]+$$
$$b^3\,d^2\,f^2\,x^3\,\text{Cos}[e+2\,f\,x]-9\,a^2\,b\,c^2\,f^2\,x\,\text{Cos}[3\,e+2\,f\,x]+3\,b^3\,c^2\,f^2\,x\,\text{Cos}[3\,e+2\,f\,x]-9\,a^2\,b\,c\,d\,f^2\,x^2\,\text{Cos}[3\,e+2\,f\,x]+$$
$$3\,b^3\,c\,d\,f^2\,x^2\,\text{Cos}[3\,e+2\,f\,x]-3\,a^2\,b\,d^2\,f^2\,x^3\,\text{Cos}[3\,e+2\,f\,x]+b^3\,d^2\,f^2\,x^3\,\text{Cos}[3\,e+2\,f\,x]-6\,b^3\,c^2\,f\,\text{Sin}[e]-12\,b^3\,c\,d\,f\,x\,\text{Sin}[e]+$$
$$6\,a^3\,c^2\,f^2\,x\,\text{Sin}[e]-18\,a\,b^2\,c^2\,f^2\,x\,\text{Sin}[e]-6\,b^3\,d^2\,f\,x^2\,\text{Sin}[e]+6\,a^3\,c\,d\,f^2\,x^2\,\text{Sin}[e]-18\,a\,b^2\,c\,d\,f^2\,x^2\,\text{Sin}[e]+2\,a^3\,d^2\,f^2\,x^3\,\text{Sin}[e]-$$
$$6\,a\,b^2\,d^2\,f^2\,x^3\,\text{Sin}[e]+3\,a^3\,c^2\,f^2\,x\,\text{Sin}[e+2\,f\,x]-9\,a\,b^2\,c^2\,f^2\,x\,\text{Sin}[e+2\,f\,x]+3\,a^3\,c\,d\,f^2\,x^2\,\text{Sin}[e+2\,f\,x]-9\,a\,b^2\,c\,d\,f^2\,x^2\,\text{Sin}[e+2\,f\,x]+$$
$$a^3\,d^2\,f^2\,x^3\,\text{Sin}[e+2\,f\,x]-3\,a\,b^2\,d^2\,f^2\,x^3\,\text{Sin}[e+2\,f\,x]-3\,a^3\,c^2\,f^2\,x\,\text{Sin}[3\,e+2\,f\,x]+9\,a\,b^2\,c^2\,f^2\,x\,\text{Sin}[3\,e+2\,f\,x]-3\,a^3\,c\,d\,f^2\,x^2\,\text{Sin}[3\,e+2\,f\,x]+$$
$$9\,a\,b^2\,c\,d\,f^2\,x^2\,\text{Sin}[3\,e+2\,f\,x]-a^3\,d^2\,f^2\,x^3\,\text{Sin}[3\,e+2\,f\,x]+3\,a\,b^2\,d^2\,f^2\,x^3\,\text{Sin}[3\,e+2\,f\,x]\Big)-\Bigg(3\,a\,b^2\,d^2\,\text{Csc}[e]\,\text{Sec}[e]\,\Bigg(e^{i\,\text{ArcTan}[\text{Tan}[e]]}\,f^2\,x^2+$$
$$\frac{1}{\sqrt{1+\text{Tan}[e]^2}}\Big(i\,f\,x\,\left(-\pi+2\,\text{ArcTan}[\text{Tan}[e]]\right)-\pi\,\text{Log}\left[1+e^{-2\,i\,f\,x}\right]-2\,\left(f\,x+\text{ArcTan}[\text{Tan}[e]]\right)\,\text{Log}\left[1-e^{2\,i\,(f\,x+\text{ArcTan}[\text{Tan}[e]])}\right]+$$
$$\pi\,\text{Log}[\text{Cos}[f\,x]]+2\,\text{ArcTan}[\text{Tan}[e]]\,\text{Log}[\text{Sin}[f\,x+\text{ArcTan}[\text{Tan}[e]]]]+i\,\text{PolyLog}\left[2,e^{2\,i\,(f\,x+\text{ArcTan}[\text{Tan}[e]])}\right]\Big)\,\text{Tan}[e]\Bigg)\Bigg)\Big/$$
$$\left(f^3\,\sqrt{\text{Sec}[e]^2\,\left(\text{Cos}[e]^2+\text{Sin}[e]^2\right)}\right)-\Bigg(3\,a^2\,b\,c\,d\,\text{Csc}[e]\,\text{Sec}[e]\,\Bigg(e^{i\,\text{ArcTan}[\text{Tan}[e]]}\,f^2\,x^2+\frac{1}{\sqrt{1+\text{Tan}[e]^2}}$$
$$\Big(i\,f\,x\,\left(-\pi+2\,\text{ArcTan}[\text{Tan}[e]]\right)-\pi\,\text{Log}\left[1+e^{-2\,i\,f\,x}\right]-2\,\left(f\,x+\text{ArcTan}[\text{Tan}[e]]\right)\,\text{Log}\left[1-e^{2\,i\,(f\,x+\text{ArcTan}[\text{Tan}[e]])}\right]+$$
$$\pi\,\text{Log}[\text{Cos}[f\,x]]+2\,\text{ArcTan}[\text{Tan}[e]]\,\text{Log}[\text{Sin}[f\,x+\text{ArcTan}[\text{Tan}[e]]]]+i\,\text{PolyLog}\left[2,e^{2\,i\,(f\,x+\text{ArcTan}[\text{Tan}[e]])}\right]\Big)\,\text{Tan}[e]\Bigg)\Bigg)\Big/$$
$$\left(f^2\,\sqrt{\text{Sec}[e]^2\,\left(\text{Cos}[e]^2+\text{Sin}[e]^2\right)}\right)+\Bigg(b^3\,c\,d\,\text{Csc}[e]\,\text{Sec}[e]\,\Bigg(e^{i\,\text{ArcTan}[\text{Tan}[e]]}\,f^2\,x^2+\frac{1}{\sqrt{1+\text{Tan}[e]^2}}$$
$$\Big(i\,f\,x\,\left(-\pi+2\,\text{ArcTan}[\text{Tan}[e]]\right)-\pi\,\text{Log}\left[1+e^{-2\,i\,f\,x}\right]-2\,\left(f\,x+\text{ArcTan}[\text{Tan}[e]]\right)\,\text{Log}\left[1-e^{2\,i\,(f\,x+\text{ArcTan}[\text{Tan}[e]])}\right]+\pi\,\text{Log}[\text{Cos}[f\,x]]+2$$

$$\left.\left.\text{ArcTan}[\text{Tan}[e]]\,\text{Log}[\text{Sin}[f\,x+\text{ArcTan}[\text{Tan}[e]]]]+i\,\text{PolyLog}\left[2,\,e^{2\,i\,(f\,x+\text{ArcTan}[\text{Tan}[e]])}\right]\right)\text{Tan}[e]\right)\right)\Big/\left(f^2\sqrt{\text{Sec}[e]^2\left(\text{Cos}[e]^2+\text{Sin}[e]^2\right)}\right)$$

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

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

Optimal (type 4, 839 leaves, 21 steps):

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

Result (type 4, 2706 leaves):

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

$$2\,a\,(a-i\,b)\,c^3\,e^{-2\,i\,e}\,\left(a\,\left(-1+e^{2\,i\,e}\right)+i\,b\,\left(1+e^{2\,i\,e}\right)\right)\,f^3$$

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

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

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

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

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

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

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

$$\left.\left.6\,f^2\,x^2\,\text{PolyLog}\left[2,\frac{(a+i\,b)\,e^{2\,i\,(e+f\,x)}}{a-i\,b}\right]+6\,i\,f\,x\,\text{PolyLog}\left[3,\frac{(a+i\,b)\,e^{2\,i\,(e+f\,x)}}{a-i\,b}\right]-3\,\text{PolyLog}\left[4,\frac{(a+i\,b)\,e^{2\,i\,(e+f\,x)}}{a-i\,b}\right]\right)\right)+$$

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

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

$$\frac{x^4\,\left(-a\,d^3-i\,b\,d^3+a\,d^3\,\text{Cos}[2\,e]-i\,b\,d^3\,\text{Cos}[2\,e]+i\,a\,d^3\,\text{Sin}[2\,e]+b\,d^3\,\text{Sin}[2\,e]\right)}{4\,(a-i\,b)\,(a+i\,b)\,\left(-a+i\,b+a\,\text{Cos}[2\,e]+i\,b\,\text{Cos}[2\,e]+i\,a\,\text{Sin}[2\,e]-b\,\text{Sin}[2\,e]\right)}+$$

$$x$$

$$\left(c^3\Big/\left(a^2-2\,i\,a\,b-b^2+a^2\,\text{Cos}[4\,e]+2\,i\,a\,b\,\text{Cos}[4\,e]-b^2\,\text{Cos}[4\,e]+i\,a^2\,\text{Sin}[4\,e]-2\,a\,b\,\text{Sin}[4\,e]-i\,b^2\,\text{Sin}[4\,e]\right)+\right.$$

$$\left(\left(-i\,a-b-i\,a\,\text{Cos}[2\,e]+b\,\text{Cos}[2\,e]+a\,\text{Sin}[2\,e]+i\,b\,\text{Sin}[2\,e]\right)\,\left(4\,a\,b\,c^3\,\text{Cos}[2\,e]+4\,i\,a\,b\,c^3\,\text{Sin}[2\,e]\right)\right)\Big/$$

$$\left((a-i\,b)\,(a+i\,b)\,\left(-a+i\,b+a\,\text{Cos}[2\,e]+i\,b\,\text{Cos}[2\,e]+i\,a\,\text{Sin}[2\,e]-b\,\text{Sin}[2\,e]\right)\right.$$

$$\left.\left(a^2-2\,i\,a\,b-b^2+a^2\,\text{Cos}[4\,e]+2\,i\,a\,b\,\text{Cos}[4\,e]-b^2\,\text{Cos}[4\,e]+i\,a^2\,\text{Sin}[4\,e]-2\,a\,b\,\text{Sin}[4\,e]-i\,b^2\,\text{Sin}[4\,e]\right)\right)+$$

$$\left.\left(c^3\,\text{Cos}[4\,e]+i\,c^3\,\text{Sin}[4\,e]\right)\Big/\left(a^2-2\,i\,a\,b-b^2+a^2\,\text{Cos}[4\,e]+2\,i\,a\,b\,\text{Cos}[4\,e]-b^2\,\text{Cos}[4\,e]+i\,a^2\,\text{Sin}[4\,e]-2\,a\,b\,\text{Sin}[4\,e]-i\,b^2\,\text{Sin}[4\,e]\right)\right)+$$

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

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

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

Optimal (type 4, 650 leaves, 18 steps):

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

Result (type 4, 1309 leaves):

$$\frac{1}{3\left(a^2+b^2\right)^2\left(-i a\left(-1+e^{2 i e}\right)+b\left(1+e^{2 i e}\right)\right) f^3} b\left(f\left(-12 a b c d e^{2 i e} f x-12 i b^2 c d e^{2 i e} f x+12 a^2 c^2 e^{2 i e} f^2 x+12 i a b c^2 e^{2 i e} f^2 x-6 a b d^2 e^{2 i e} f x^2-6 i b^2 d^2 e^{2 i e} f x^2+12 a^2 c d e^{2 i e} f^2 x^2+\right.\right.$$

$$12 i a b c d e^{2 i e} f^2 x^2+4 a^2 d^2 e^{2 i e} f^2 x^3+4 i a b d^2 e^{2 i e} f^2 x^3-6 c\left(a\left(-1+e^{2 i e}\right)+i b\left(1+e^{2 i e}\right)\right)(-b d+a c f) \operatorname{ArcTan}\left[\right.$$

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

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

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

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

$$\left.3 i a^2 c^2 e^{2 i e} f \operatorname{Log}\left[a^2\left(-1+e^{2 i(e+f x)}\right)^2+b^2\left(1+e^{2 i(e+f x)}\right)^2\right]-3 a b c^2 e^{2 i e} f \operatorname{Log}\left[a^2\left(-1+e^{2 i(e+f x)}\right)^2+b^2\left(1+e^{2 i(e+f x)}\right)^2\right]\right)+$$

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

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

$$\left(3 a^2 c^2 f x \operatorname{Cos}[f x]-3 b^2 c^2 f x \operatorname{Cos}[f x]+3 a^2 c d f x^2 \operatorname{Cos}[f x]-3 b^2 c d f x^2 \operatorname{Cos}[f x]+a^2 d^2 f x^3 \operatorname{Cos}[f x]-\right.$$

$$b^2 d^2 f x^3 \operatorname{Cos}[f x]-3 a^2 c^2 f x \operatorname{Cos}[2 e+f x]-3 b^2 c^2 f x \operatorname{Cos}[2 e+f x]-$$

$$3 a^2 c d f x^2 \operatorname{Cos}[2 e+f x]-3 b^2 c d f x^2 \operatorname{Cos}[2 e+f x]-a^2 d^2 f x^3 \operatorname{Cos}[2 e+f x]-$$

$$b^2 d^2 f x^3 \operatorname{Cos}[2 e+f x]+6 b^2 c^2 \operatorname{Sin}[f x]+12 b^2 c d x \operatorname{Sin}[f x]-6 a b c^2 f x \operatorname{Sin}[f x]+$$

$$\left.6 b^2 d^2 x^2 \operatorname{Sin}[f x]-6 a b c d f x^2 \operatorname{Sin}[f x]-2 a b d^2 f x^3 \operatorname{Sin}[f x]\right) /$$

$$(6(a-i b)(a+i b) f(b \operatorname{Cos}[e]+a \operatorname{Sin}[e])(b \operatorname{Cos}[e+f x]+a \operatorname{Sin}[e+f x]))$$

Problem 59: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 213 leaves, 5 steps):

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

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

Result (type 4, 730 leaves):

$$-\frac{(e+f x)\,(-2 d e+2 c f+d\,(e+f x))\,\text{Csc}[e+f x]^2\,(b\,\text{Cos}[e+f x]+a\,\text{Sin}[e+f x])^2}{2\,(-i\,a+b)\,(i\,a+b)\,f^2\,(a+b\,\text{Cot}[e+f x])^2}+$$

$$\frac{b\,d\,\text{Csc}[e+f x]^2\,(-a\,(e+f x)+b\,\text{Log}[b\,\text{Cos}[e+f x]+a\,\text{Sin}[e+f x]])\,(b\,\text{Cos}[e+f x]+a\,\text{Sin}[e+f x])^2}{(-i\,a+b)\,(i\,a+b)\,(a^2+b^2)\,f^2\,(a+b\,\text{Cot}[e+f x])^2}+$$

$$\left(2\,a\,d\,e\,\text{Csc}[e+f x]^2\,(-a\,(e+f x)+b\,\text{Log}[b\,\text{Cos}[e+f x]+a\,\text{Sin}[e+f x]])\,(b\,\text{Cos}[e+f x]+a\,\text{Sin}[e+f x])^2\right)\Big/$$
$$\left((-i\,a+b)\,(i\,a+b)\,(a^2+b^2)\,f^2\,(a+b\,\text{Cot}[e+f x])^2\right)-$$

$$\left(2\,a\,c\,\text{Csc}[e+f x]^2\,(-a\,(e+f x)+b\,\text{Log}[b\,\text{Cos}[e+f x]+a\,\text{Sin}[e+f x]])\,(b\,\text{Cos}[e+f x]+a\,\text{Sin}[e+f x])^2\right)\Big/$$
$$\left((-i\,a+b)\,(i\,a+b)\,(a^2+b^2)\,f\,(a+b\,\text{Cot}[e+f x])^2\right)+$$

$$\left(d\,\text{Csc}[e+f x]^2\left(e^{i\,\text{ArcTan}\left[\frac{b}{a}\right]}\,(e+f x)^2+\frac{1}{a\sqrt{1+\frac{b^2}{a^2}}}b\left(i\,(e+f x)\left(-\pi+2\,\text{ArcTan}\left[\frac{b}{a}\right]\right)-\pi\,\text{Log}\left[1+e^{-2 i (e+f x)}\right]-2\left(e+f x+\text{ArcTan}\left[\frac{b}{a}\right]\right)\right.\right.\right.$$
$$\left.\left.\text{Log}\left[1-e^{2 i \left(e+f x+\text{ArcTan}\left[\frac{b}{a}\right]\right)}\right]+\pi\,\text{Log}[\text{Cos}[e+f x]]+2\,\text{ArcTan}\left[\frac{b}{a}\right]\text{Log}\left[\text{Sin}\left[e+f x+\text{ArcTan}\left[\frac{b}{a}\right]\right]\right]+i\,\text{PolyLog}\left[2,e^{2 i \left(e+f x+\text{ArcTan}\left[\frac{b}{a}\right]\right)}\right]\right)\right)$$
$$\left.(b\,\text{Cos}[e+f x]+a\,\text{Sin}[e+f x])^2\right)\Big/\left((-i\,a+b)\,(i\,a+b)\,\sqrt{\frac{a^2+b^2}{a^2}}\,f^2\,(a+b\,\text{Cot}[e+f x])^2\right)+$$

$$\left(\text{Csc}[e+f x]^2\,(b\,\text{Cos}[e+f x]+a\,\text{Sin}[e+f x])\,(-b\,d\,e\,\text{Sin}[e+f x]+b\,c\,f\,\text{Sin}[e+f x]+b\,d\,(e+f x)\,\text{Sin}[e+f x])\right)\Big/$$
$$\left((-i\,a+b)\,(i\,a+b)\,f^2\,(a+b\,\text{Cot}[e+f x])^2\right)$$

Test results for the 23 problems in "4.4.1.2 (d csc)^m (a+b cot)^n.m"

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

$$\int\frac{\text{Csc}[x]^3}{i+\text{Cot}[x]}\,dx$$

Optimal (type 3, 12 leaves, 2 steps):

$i\,\text{ArcTanh}[\text{Cos}[x]] - \text{Csc}[x]$

Result (type 3, 26 leaves):

$$-\text{Csc}[x] + i\left(\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right] - \text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]\right)$$

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

$$\int \frac{\text{Csc}[x]^5}{i + \text{Cot}[x]}\,dx$$

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

$$\frac{1}{2} i\,\text{ArcTanh}[\text{Cos}[x]] + \frac{1}{2} i\,\text{Cot}[x]\,\text{Csc}[x] - \frac{\text{Csc}[x]^3}{3}$$

Result (type 3, 67 leaves):

$$\frac{1}{24} i\,\text{Csc}[x]^3\left(8 i + 9\left(\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right] - \text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]\right)\text{Sin}[x] + 6\,\text{Sin}[2 x] - 3\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right]\text{Sin}[3 x] + 3\,\text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]\text{Sin}[3 x]\right)$$

Problem 11: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Csc}[x]^7}{i + \text{Cot}[x]}\,dx$$

Optimal (type 3, 40 leaves, 4 steps):

$$\frac{3}{8} i\,\text{ArcTanh}[\text{Cos}[x]] + \frac{3}{8} i\,\text{Cot}[x]\,\text{Csc}[x] + \frac{1}{4} i\,\text{Cot}[x]\,\text{Csc}[x]^3 - \frac{\text{Csc}[x]^5}{5}$$

Result (type 3, 99 leaves):

$$\frac{1}{640} i\,\text{Csc}[x]^5\left(128 i + 150\left(\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right] - \text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]\right)\text{Sin}[x] + 140\,\text{Sin}[2 x] - 75\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right]\text{Sin}[3 x] + 75\,\text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]\text{Sin}[3 x] - 30\,\text{Sin}[4 x] + 15\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right]\text{Sin}[5 x] - 15\,\text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]\text{Sin}[5 x]\right)$$

Problem 15: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 72 leaves, 7 steps):

$$\frac{a\left(a^2+3 b^2\right) x}{2\left(a^2+b^2\right)^2}-\frac{b^3 \operatorname{Log}[b \operatorname{Cos}[x]+a \operatorname{Sin}[x]]}{\left(a^2+b^2\right)^2}-\frac{(b+a \operatorname{Cot}[x]) \operatorname{Sin}[x]^2}{2\left(a^2+b^2\right)}$$

Result (type 3, 94 leaves):

$$\frac{1}{4\left(a^2+b^2\right)^2}\left(2 a^3 x+6 a b^2 x-4 i b^3 x+4 i b^3 \operatorname{ArcTan}[\operatorname{Tan}[x]]+b\left(a^2+b^2\right) \operatorname{Cos}[2 x]-2 b^3 \operatorname{Log}\left[(b \operatorname{Cos}[x]+a \operatorname{Sin}[x])^2\right]-a^3 \operatorname{Sin}[2 x]-a b^2 \operatorname{Sin}[2 x]\right)$$

Test results for the 19 problems in "4.4.1.3 (d cos)^m (a+b cot)^n.m"

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

$$\int \frac{\operatorname{Sec}[x]}{i+\operatorname{Cot}[x]} \, dx$$

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

$$-i \operatorname{ArcTanh}[\operatorname{Sin}[x]]-\operatorname{Cos}[x]+i \operatorname{Sin}[x]$$

Result (type 3, 44 leaves):

$$-\operatorname{Cos}[x]+i\left(\operatorname{Log}\left[\operatorname{Cos}\left[\frac{x}{2}\right]-\operatorname{Sin}\left[\frac{x}{2}\right]\right]-\operatorname{Log}\left[\operatorname{Cos}\left[\frac{x}{2}\right]+\operatorname{Sin}\left[\frac{x}{2}\right]\right]+\operatorname{Sin}[x]\right)$$

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

$$\int \frac{\operatorname{Sec}[x]^3}{i+\operatorname{Cot}[x]} \, dx$$

Optimal (type 3, 22 leaves, 8 steps):

$$\frac{1}{2} i \operatorname{ArcTanh}[\operatorname{Sin}[x]]+\operatorname{Sec}[x]-\frac{1}{2} i \operatorname{Sec}[x] \operatorname{Tan}[x]$$

Result (type 3, 48 leaves):

$$-\frac{1}{2} i\left(\operatorname{Log}\left[\operatorname{Cos}\left[\frac{x}{2}\right]-\operatorname{Sin}\left[\frac{x}{2}\right]\right]-\operatorname{Log}\left[\operatorname{Cos}\left[\frac{x}{2}\right]+\operatorname{Sin}\left[\frac{x}{2}\right]\right]+\operatorname{Sec}[x](2 i+\operatorname{Tan}[x])\right)$$

Problem 11: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\operatorname{Cos}[x]^4}{a+b \operatorname{Cot}[x]} \, dx$$

Optimal (type 3, 126 leaves, 8 steps):

$$\frac{a\left(3a^4-6a^2b^2-b^4\right)x}{8\left(a^2+b^2\right)^3}-\frac{a^4 b\,\text{Log}[b\,\text{Cos}[x]+a\,\text{Sin}[x]]}{\left(a^2+b^2\right)^3}+\frac{\left(4b\left(2a^2+b^2\right)+a\left(5a^2+b^2\right)\text{Cot}[x]\right)\text{Sin}[x]^2}{8\left(a^2+b^2\right)^2}-\frac{\left(b+a\,\text{Cot}[x]\right)\text{Sin}[x]^4}{4\left(a^2+b^2\right)}$$

Result (type 3, 179 leaves):

$$\frac{1}{32\left(a^2+b^2\right)^3}\Big(12a^5x-32\,\mathrm{i}\,a^4bx-24a^3b^2x-4ab^4x+32\,\mathrm{i}\,a^4b\,\text{ArcTan}[\text{Tan}[x]]-4b\left(3a^4+4a^2b^2+b^4\right)\text{Cos}[2x]-a^4b\,\text{Cos}[4x]-2a^2b^3\,\text{Cos}[4x]-b^5\,\text{Cos}[4x]-16a^4b\,\text{Log}\left[\left(b\,\text{Cos}[x]+a\,\text{Sin}[x]\right)^2\right]+8a^5\,\text{Sin}[2x]+8a^3b^2\,\text{Sin}[2x]+a^5\,\text{Sin}[4x]+2a^3b^2\,\text{Sin}[4x]+ab^4\,\text{Sin}[4x]\Big)$$

Problem 13: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 73 leaves, 7 steps):

$$\frac{a\left(a^2-b^2\right)x}{2\left(a^2+b^2\right)^2}-\frac{a^2b\,\text{Log}[b\,\text{Cos}[x]+a\,\text{Sin}[x]]}{\left(a^2+b^2\right)^2}+\frac{\left(b+a\,\text{Cot}[x]\right)\text{Sin}[x]^2}{2\left(a^2+b^2\right)}$$

Result (type 3, 82 leaves):

$$\frac{1}{4\left(a^2+b^2\right)^2}\left(4\,\mathrm{i}\,a^2b\,\text{ArcTan}[\text{Tan}[x]]-b\left(a^2+b^2\right)\text{Cos}[2x]+a\left(2\left(a-\mathrm{i}\,b\right)^2x-2ab\,\text{Log}\left[\left(b\,\text{Cos}[x]+a\,\text{Sin}[x]\right)^2\right]+\left(a^2+b^2\right)\text{Sin}[2x]\right)\right)$$

Problem 17: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 79 leaves, 9 steps):

$$\frac{\text{ArcTanh}[\text{Sin}[x]]}{2a}+\frac{b^2\,\text{ArcTanh}[\text{Sin}[x]]}{a^3}+\frac{b\sqrt{a^2+b^2}\,\text{ArcTanh}\left[\frac{a\,\text{Cos}[x]-b\,\text{Sin}[x]}{\sqrt{a^2+b^2}}\right]}{a^3}-\frac{b\,\text{Sec}[x]}{a^2}+\frac{\text{Sec}[x]\,\text{Tan}[x]}{2a}$$

Result (type 3, 192 leaves):

$$-\frac{1}{4 a^3}\left(8 b \sqrt{a^2+b^2}\, \text{ArcTanh}\left[\frac{-a+b \,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{a^2+b^2}}\right]+\text{Sec}[x]^2 \left(4 a b \,\text{Cos}[x]+a^2 \,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]\right]+2 b^2 \,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]\right]+\left(a^2+2 b^2\right) \text{Cos}[2 x] \left(\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]\right]-\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]+\text{Sin}\left[\frac{x}{2}\right]\right]\right)-a^2 \,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]+\text{Sin}\left[\frac{x}{2}\right]\right]-2 b^2 \,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]+\text{Sin}\left[\frac{x}{2}\right]\right]-2 a^2 \,\text{Sin}[x]\right)\right)$$

Problem 19: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 25 leaves, 6 steps):

$$\frac{2 \,\text{ArcTanh}\left[\frac{\text{Cos}[x]-2 \,\text{Sin}[x]}{\sqrt{5}}\right]}{\sqrt{5}}+\text{ArcTanh}[\text{Sin}[x]]$$

Result (type 3, 57 leaves):

$$\frac{4 \,\text{ArcTanh}\left[\frac{1-2 \,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{5}}\right]}{\sqrt{5}}-\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]\right]+\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]+\text{Sin}\left[\frac{x}{2}\right]\right]$$

Test results for the 106 problems in "4.4.2.1 (a+b cot)^m (c+d cot)^n.m"

Problem 1: Result more than twice size of optimal antiderivative.

$$\int (a+i a \,\text{Cot}[c+d x])^n \, dx$$

Optimal (type 5, 49 leaves, 2 steps):

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

Result (type 5, 112 leaves):

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

Problem 41: Result unnecessarily involves imaginary or complex numbers.

$$\int \text{Cot}[x]^2 \sqrt{1+\text{Cot}[x]}\, dx$$

Optimal (type 3, 223 leaves, 12 steps):

$$-\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}-2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]+\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}+2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]-$$

$$\frac{2}{3}\left(1+\text{Cot}[x]\right)^{3/2}+\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{1+\text{Cot}[x]}\right]}{2\sqrt{2\left(1+\sqrt{2}\right)}}-\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{1+\text{Cot}[x]}\right]}{2\sqrt{2\left(1+\sqrt{2}\right)}}$$

Result (type 3, 69 leaves):

$$-i\sqrt{1-i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1-i}}\right]+i\sqrt{1+i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1+i}}\right]-\frac{2}{3}\left(1+\text{Cot}[x]\right)^{3/2}$$

Problem 42: Result unnecessarily involves imaginary or complex numbers.

$$\int \text{Cot}[x] \sqrt{1+\text{Cot}[x]}\, dx$$

Optimal (type 3, 135 leaves, 6 steps):

$$\sqrt{\frac{1}{2}\left(-1+\sqrt{2}\right)}\ \text{ArcTan}\left[\frac{4-3\sqrt{2}+\left(2-\sqrt{2}\right)\text{Cot}[x]}{2\sqrt{-7+5\sqrt{2}}\ \sqrt{1+\text{Cot}[x]}}\right]+\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\ \text{ArcTanh}\left[\frac{4+3\sqrt{2}+\left(2+\sqrt{2}\right)\text{Cot}[x]}{2\sqrt{7+5\sqrt{2}}\ \sqrt{1+\text{Cot}[x]}}\right]-2\sqrt{1+\text{Cot}[x]}$$

Result (type 3, 61 leaves):

$$\sqrt{1-i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1-i}}\right]+\sqrt{1+i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1+i}}\right]-2\sqrt{1+\text{Cot}[x]}$$

Problem 43: Result unnecessarily involves imaginary or complex numbers.

$$\int \text{Cot}[x]^2 \left(1+\text{Cot}[x]\right)^{3/2} dx$$

Optimal (type 3, 139 leaves, 8 steps):

$$-\sqrt{-1+\sqrt{2}}\ \text{ArcTan}\left[\frac{3-2\sqrt{2}+\left(1-\sqrt{2}\right)\text{Cot}[x]}{\sqrt{2\left(-7+5\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}}\right]-\sqrt{1+\sqrt{2}}\ \text{ArcTanh}\left[\frac{3+2\sqrt{2}+\left(1+\sqrt{2}\right)\text{Cot}[x]}{\sqrt{2\left(7+5\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}}\right]+2\sqrt{1+\text{Cot}[x]}-\frac{2}{5}\left(1+\text{Cot}[x]\right)^{5/2}$$

Result (type 3, 96 leaves):

$$\frac{1}{\left(\text{Cos}[x]+\text{Sin}[x]\right)^2}\ \text{Sin}[x]\left(-2\left(\frac{\text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1-i}}\right]}{\sqrt{1-i}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1+i}}\right]}{\sqrt{1+i}}\right)\left(1+\text{Cot}[x]\right)^2\text{Sin}[x]-\frac{2}{5}\left(1+\text{Cot}[x]\right)^{5/2}\left(-5+2\,\text{Cot}[x]+\text{Csc}[x]^2\right)\text{Sin}[x]\right)$$

Problem 44: Result unnecessarily involves imaginary or complex numbers.

$$\int \text{Cot}[x]\left(1+\text{Cot}[x]\right)^{3/2}\,dx$$

Optimal (type 3, 221 leaves, 14 steps):

$$-\sqrt{1+\sqrt{2}}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}-2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]+\sqrt{1+\sqrt{2}}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}+2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]-2\sqrt{1+\text{Cot}[x]}-$$

$$\frac{2}{3}\left(1+\text{Cot}[x]\right)^{3/2}-\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]-\sqrt{2\left(1+\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}\right]}{2\sqrt{1+\sqrt{2}}}+\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]+\sqrt{2\left(1+\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}\right]}{2\sqrt{1+\sqrt{2}}}$$

Result (type 3, 98 leaves):

$$\frac{1}{\left(\text{Cos}[x]+\text{Sin}[x]\right)^2}\text{Sin}[x]\left(\left(1+i\right)\left(-i\sqrt{1-i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1-i}}\right]+\sqrt{1+i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1+i}}\right]\right)\left(1+\text{Cot}[x]\right)^2\text{Sin}[x]-\right.$$

$$\left.\frac{2}{3}\left(1+\text{Cot}[x]\right)^{3/2}\left(4+\text{Cot}[x]\right)\left(\text{Cos}[x]+\text{Sin}[x]\right)\right)$$

Problem 45: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 214 leaves, 12 steps):

$$-\frac{1}{2}\sqrt{1+\sqrt{2}}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}-2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]+\frac{1}{2}\sqrt{1+\sqrt{2}}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}+2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]-2\sqrt{1+\text{Cot}[x]}-\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]-\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{1+\text{Cot}[x]}\right]}{4\sqrt{1+\sqrt{2}}}+\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]+\sqrt{2\left(1+\sqrt{2}\right)}\sqrt{1+\text{Cot}[x]}\right]}{4\sqrt{1+\sqrt{2}}}$$

Result (type 3, 67 leaves):

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

Problem 46: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cot}[x]}{\sqrt{1+\text{Cot}[x]}}\,dx$$

Optimal (type 3, 121 leaves, 5 steps):

$$\frac{1}{2}\sqrt{-1+\sqrt{2}}\ \text{ArcTan}\left[\frac{3-2\sqrt{2}+\left(1-\sqrt{2}\right)\text{Cot}[x]}{\sqrt{2\left(-7+5\sqrt{2}\right)}\sqrt{1+\text{Cot}[x]}}\right]+\frac{1}{2}\sqrt{1+\sqrt{2}}\ \text{ArcTanh}\left[\frac{3+2\sqrt{2}+\left(1+\sqrt{2}\right)\text{Cot}[x]}{\sqrt{2\left(7+5\sqrt{2}\right)}\sqrt{1+\text{Cot}[x]}}\right]$$

Result (type 3, 51 leaves):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1-i}}\right]}{\sqrt{1-i}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1+i}}\right]}{\sqrt{1+i}}$$

Problem 47: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cot}[x]^2}{(1+\text{Cot}[x])^{3/2}}\,dx$$

Optimal (type 3, 139 leaves, 6 steps):

$$\frac{1}{2}\sqrt{\frac{1}{2}\left(-1+\sqrt{2}\right)}\ \text{ArcTan}\left[\frac{4-3\sqrt{2}+\left(2-\sqrt{2}\right)\text{Cot}[x]}{2\sqrt{-7+5\sqrt{2}}\ \sqrt{1+\text{Cot}[x]}}\right]+\frac{1}{2}\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\ \text{ArcTanh}\left[\frac{4+3\sqrt{2}+\left(2+\sqrt{2}\right)\text{Cot}[x]}{2\sqrt{7+5\sqrt{2}}\ \sqrt{1+\text{Cot}[x]}}\right]+\frac{1}{\sqrt{1+\text{Cot}[x]}}$$

Result (type 3, 65 leaves):

$$\frac{1}{2}\sqrt{1-i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1-i}}\right]+\frac{1}{2}\sqrt{1+i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1+i}}\right]+\frac{1}{\sqrt{1+\text{Cot}[x]}}$$

Problem 48: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cot}[x]}{(1+\text{Cot}[x])^{3/2}}\,dx$$

Optimal (type 3, 226 leaves, 13 steps):

$$\frac{1}{2}\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}-2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]-\frac{1}{2}\sqrt{\frac{1}{2}\left(1+\sqrt{2}\right)}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}+2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]-$$

$$\frac{1}{\sqrt{1+\text{Cot}[x]}}-\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]-\sqrt{2\left(1+\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}\right]}{4\sqrt{2\left(1+\sqrt{2}\right)}}+\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]+\sqrt{2\left(1+\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}\right]}{4\sqrt{2\left(1+\sqrt{2}\right)}}$$

Result (type 3, 71 leaves):

$$\frac{1}{2}i\sqrt{1-i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1-i}}\right]-\frac{1}{2}i\sqrt{1+i}\ \text{ArcTanh}\left[\frac{\sqrt{1+\text{Cot}[x]}}{\sqrt{1+i}}\right]-\frac{1}{\sqrt{1+\text{Cot}[x]}}$$

Problem 49: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cot}[x]^2}{(1+\text{Cot}[x])^{5/2}} \, dx$$

Optimal (type 3, 143 leaves, 8 steps):

$$\frac{1}{4}\sqrt{-1+\sqrt{2}}\ \text{ArcTan}\left[\frac{3-2\sqrt{2}+\left(1-\sqrt{2}\right)\text{Cot}[x]}{\sqrt{2\left(-7+5\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}}\right]+\frac{1}{4}\sqrt{1+\sqrt{2}}\ \text{ArcTanh}\left[\frac{3+2\sqrt{2}+\left(1+\sqrt{2}\right)\text{Cot}[x]}{\sqrt{2\left(7+5\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}}\right]+\frac{1}{3\,(1+\text{Cot}[x])^{3/2}}-\frac{1}{\sqrt{1+\text{Cot}[x]}}$$

Result (type 3, 75 leaves):

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

Problem 50: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cot}[x]}{(1+\text{Cot}[x])^{5/2}} \, dx$$

Optimal (type 3, 216 leaves, 13 steps):

$$\frac{1}{4}\sqrt{1+\sqrt{2}}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}-2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]-\frac{1}{4}\sqrt{1+\sqrt{2}}\ \text{ArcTan}\left[\frac{\sqrt{2\left(1+\sqrt{2}\right)}+2\sqrt{1+\text{Cot}[x]}}{\sqrt{2\left(-1+\sqrt{2}\right)}}\right]-$$

$$\frac{1}{3\,(1+\text{Cot}[x])^{3/2}}+\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]-\sqrt{2\left(1+\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}\right]}{8\sqrt{1+\sqrt{2}}}-\frac{\text{Log}\left[1+\sqrt{2}+\text{Cot}[x]+\sqrt{2\left(1+\sqrt{2}\right)}\ \sqrt{1+\text{Cot}[x]}\right]}{8\sqrt{1+\sqrt{2}}}$$

Result (type 3, 69 leaves):

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

Problem 75: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(e \operatorname{Cot}[c+d x])^{7/2}}{(a+b \operatorname{Cot}[c+d x])^2} \, dx$$

Optimal (type 3, 437 leaves, 16 steps):

$$\frac{a^{5/2} \left(3 a^2+7 b^2\right) e^{7/2} \operatorname{ArcTan}\left[\frac{\sqrt{b} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{a} \sqrt{e}}\right]}{b^{5/2} \left(a^2+b^2\right)^2 d}+\frac{\left(a^2-2 a b-b^2\right) e^{7/2} \operatorname{ArcTan}\left[1-\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2} \left(a^2+b^2\right)^2 d}-$$

$$\frac{\left(a^2-2 a b-b^2\right) e^{7/2} \operatorname{ArcTan}\left[1+\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2} \left(a^2+b^2\right)^2 d}-\frac{\left(3 a^2+2 b^2\right) e^3 \sqrt{e \operatorname{Cot}[c+d x]}}{b^2 \left(a^2+b^2\right) d}+\frac{a^2 e^2 (e \operatorname{Cot}[c+d x])^{3/2}}{b \left(a^2+b^2\right) d (a+b \operatorname{Cot}[c+d x])}+$$

$$\frac{\left(a^2+2 a b-b^2\right) e^{7/2} \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]-\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2} \left(a^2+b^2\right)^2 d}-\frac{\left(a^2+2 a b-b^2\right) e^{7/2} \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]+\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2} \left(a^2+b^2\right)^2 d}$$

Result (type 3, 775 leaves):

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

$$(e\,\text{Cot}[c+d\,x])^{7/2}\,\text{Sec}[c+d\,x]^2\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^2\left(-\frac{2}{b^2}-\frac{a^3\,\text{Sin}[c+d\,x]}{b^2\,(-\mathrm{i}\,a+b)\,(\mathrm{i}\,a+b)\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])}\right)\text{Tan}[c+d\,x]-$$

$$\frac{1}{2\,(a-\mathrm{i}\,b)\,(a+\mathrm{i}\,b)\,b^2\,d\,\text{Cot}[c+d\,x]^{7/2}\,(a+b\,\text{Cot}[c+d\,x])^2}\,(e\,\text{Cot}[c+d\,x])^{7/2}\,\text{Csc}[c+d\,x]^2\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^2$$

$$\left(-\frac{2\,(3\,a^3+3\,a\,b^2)\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right](a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^3\,\text{Sec}[c+d\,x]}{\sqrt{a}\,\sqrt{b}\,(1+\text{Cot}[c+d\,x]^2)^2\,(b+a\,\text{Tan}[c+d\,x])}-\left(a\,b^2\,\text{Cos}[2\,(c+d\,x)]\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^3\right.\right.$$

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

$$\left.\left.\left.(a+b)\,\left(\text{Log}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]-\text{Log}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]\right)\right)\right)\text{Sec}[c+d\,x]\right)\Big/$$

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

$$b^3\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^2$$

$$\left(-8\,\sqrt{a}\,\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]+\sqrt{2}\,\left(-2\,(a+b)\,\text{ArcTan}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+2\,(a+b)\,\text{ArcTan}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+\right.\right.$$

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

Problem 76: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 393 leaves, 15 steps) :

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

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

$$\frac{\left(a^2-2 a b-b^2\right) e^{5/2} \text{Log}\left[\sqrt{e}+\sqrt{e}\, \text{Cot}[c+d x]-\sqrt{2} \sqrt{e \,\text{Cot}[c+d x]}\right]}{2 \sqrt{2}\left(a^2+b^2\right)^2 d}-\frac{\left(a^2-2 a b-b^2\right) e^{5/2} \text{Log}\left[\sqrt{e}+\sqrt{e}\, \text{Cot}[c+d x]+\sqrt{2} \sqrt{e \,\text{Cot}[c+d x]}\right]}{2 \sqrt{2}\left(a^2+b^2\right)^2 d}$$

Result (type 3, 731 leaves):

$$\frac{a^2 (e \,\text{Cot}[c+d x])^{5/2} \text{Sec}[c+d x] (b \,\text{Cos}[c+d x]+a \,\text{Sin}[c+d x]) \text{Tan}[c+d x]}{b (-i a+b) (i a+b) d (a+b \,\text{Cot}[c+d x])^2}+$$

$$\frac{1}{2 (a-i b) (a+i b) b d \,\text{Cot}[c+d x]^{5/2} (a+b \,\text{Cot}[c+d x])^2}(e \,\text{Cot}[c+d x])^{5/2} \text{Csc}[c+d x]^2 (b \,\text{Cos}[c+d x]+a \,\text{Sin}[c+d x])^2$$

$$\left(-\frac{2\left(a^2+b^2\right) \text{ArcTan}\left[\frac{\sqrt{b} \sqrt{\text{Cot}[c+d x]}}{\sqrt{a}}\right] (a+b \,\text{Cot}[c+d x]) \text{Csc}[c+d x]^3 \text{Sec}[c+d x]}{\sqrt{a} \sqrt{b}\left(1+\text{Cot}[c+d x]^2\right)^2 (b+a \,\text{Tan}[c+d x])}-\left(b^2 \text{Cos}[2 (c+d x)] (a+b \,\text{Cot}[c+d x]) \text{Csc}[c+d x]^3\right.\right.$$

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

$$\left.\left.\left.(a+b)\left(\text{Log}\left[1-\sqrt{2} \sqrt{\text{Cot}[c+d x]}+\text{Cot}[c+d x]\right]-\text{Log}\left[1+\sqrt{2} \sqrt{\text{Cot}[c+d x]}+\text{Cot}[c+d x]\right]\right)\right)\right) \text{Sec}[c+d x]\right) \Big/$$

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

$$a b (a+b \,\text{Cot}[c+d x]) \text{Csc}[c+d x]^2$$

$$\left(-8 \sqrt{a} \sqrt{b} \,\text{ArcTan}\left[\frac{\sqrt{b} \sqrt{\text{Cot}[c+d x]}}{\sqrt{a}}\right]+\sqrt{2}\left(-2 (a+b) \text{ArcTan}\left[1-\sqrt{2} \sqrt{\text{Cot}[c+d x]}\right]+2 (a+b) \text{ArcTan}\left[1+\sqrt{2} \sqrt{\text{Cot}[c+d x]}\right]+\right.\right.$$

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

Problem 80: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(e \operatorname{Cot}[c+d x])^{3/2} (a+b \operatorname{Cot}[c+d x])^2} \, dx$$

Optimal (type 3, 437 leaves, 16 steps):

$$\frac{b^{5/2} (7 a^2+3 b^2) \operatorname{ArcTan}\left[\frac{\sqrt{b} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{a} \sqrt{e}}\right]}{a^{5/2} (a^2+b^2)^2 d e^{3/2}} - \frac{(a^2+2 a b-b^2) \operatorname{ArcTan}\left[1-\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2} (a^2+b^2)^2 d e^{3/2}} +$$

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

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

Result (type 3, 773 leaves):

$$\frac{\text{Cot}[c+d x]^2 \,\text{Csc}[c+d x]^2 \,(b \,\text{Cos}[c+d x]+a \,\text{Sin}[c+d x])^2 \left(\frac{b^3 \,\text{Sin}[c+d x]}{a^2 \,(a^2+b^2) \,(b \,\text{Cos}[c+d x]+a \,\text{Sin}[c+d x])}+\frac{2 \,\text{Tan}[c+d x]}{a^2}\right)}{d \,(e \,\text{Cot}[c+d x])^{3/2} \,(a+b \,\text{Cot}[c+d x])^2}-$$

$$\frac{1}{2 a^2 \,(-\mathrm{i}\, a+b) \,(\mathrm{i}\, a+b) \,d \,(e \,\text{Cot}[c+d x])^{3/2} \,(a+b \,\text{Cot}[c+d x])^2} \text{Cot}[c+d x]^{3/2} \,\text{Csc}[c+d x]^2 \,(b \,\text{Cos}[c+d x]+a \,\text{Sin}[c+d x])^2$$

$$\left(-\frac{2 \,(3 a^2 b+3 b^3) \,\text{ArcTan}\left[\frac{\sqrt{b} \,\sqrt{\text{Cot}[c+d x]}}{\sqrt{a}}\right] (a+b \,\text{Cot}[c+d x]) \,\text{Csc}[c+d x]^3 \,\text{Sec}[c+d x]}{\sqrt{a} \,\sqrt{b} \,(1+\text{Cot}[c+d x]^2)^2 \,(b+a \,\text{Tan}[c+d x])}+\left(a^2 b \,\text{Cos}[2 \,(c+d x)] \,(a+b \,\text{Cot}[c+d x]) \,\text{Csc}[c+d x]^3\right.\right.$$

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

$$\left.\left.\left.(a+b) \,\left(\text{Log}\left[1-\sqrt{2} \,\sqrt{\text{Cot}[c+d x]}+\text{Cot}[c+d x]\right]-\text{Log}\left[1+\sqrt{2} \,\sqrt{\text{Cot}[c+d x]}+\text{Cot}[c+d x]\right]\right)\right)\right) \text{Sec}[c+d x]\right) \Big/$$

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

$$a^3 \,(a+b \,\text{Cot}[c+d x]) \,\text{Csc}[c+d x]^2$$

$$\left(-8 \sqrt{a} \,\sqrt{b} \,\text{ArcTan}\left[\frac{\sqrt{b} \,\sqrt{\text{Cot}[c+d x]}}{\sqrt{a}}\right]+\sqrt{2} \,\left(-2 \,(a+b) \,\text{ArcTan}\left[1-\sqrt{2} \,\sqrt{\text{Cot}[c+d x]}\right]+2 \,(a+b) \,\text{ArcTan}\left[1+\sqrt{2} \,\sqrt{\text{Cot}[c+d x]}\right]+\right.\right.$$

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

Problem 81: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(e \,\text{Cot}[c+d x])^{9/2}}{(a+b \,\text{Cot}[c+d x])^3} \,dx$$

Optimal (type 3, 529 leaves, 17 steps) :

$$\frac{a^{5/2}\left(15 a^4+46 a^2 b^2+63 b^4\right) e^{9/2} \text{ArcTan}\left[\frac{\sqrt{b}\sqrt{e \text{Cot}[c+d x]}}{\sqrt{a}\sqrt{e}}\right]}{4 b^{7/2}\left(a^2+b^2\right)^3 d}+\frac{(a-b)\left(a^2+4 a b+b^2\right) e^{9/2} \text{ArcTan}\left[1-\frac{\sqrt{2}\sqrt{e \text{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2}\left(a^2+b^2\right)^3 d}-$$

$$\frac{(a-b)\left(a^2+4 a b+b^2\right) e^{9/2} \text{ArcTan}\left[1+\frac{\sqrt{2}\sqrt{e \text{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2}\left(a^2+b^2\right)^3 d}-\frac{\left(15 a^4+31 a^2 b^2+8 b^4\right) e^4 \sqrt{e \text{Cot}[c+d x]}}{4 b^3\left(a^2+b^2\right)^2 d}+\frac{a^2 e^2 (e \text{Cot}[c+d x])^{5/2}}{2 b\left(a^2+b^2\right) d (a+b \text{Cot}[c+d x])^2}+$$

$$\frac{a^2\left(5 a^2+13 b^2\right) e^3 (e \text{Cot}[c+d x])^{3/2}}{4 b^2\left(a^2+b^2\right)^2 d (a+b \text{Cot}[c+d x])}-\frac{(a+b)\left(a^2-4 a b+b^2\right) e^{9/2} \text{Log}\left[\sqrt{e}+\sqrt{e} \text{Cot}[c+d x]-\sqrt{2}\sqrt{e \text{Cot}[c+d x]}\right]}{2\sqrt{2}\left(a^2+b^2\right)^3 d}+$$

$$\frac{(a+b)\left(a^2-4 a b+b^2\right) e^{9/2} \text{Log}\left[\sqrt{e}+\sqrt{e} \text{Cot}[c+d x]+\sqrt{2}\sqrt{e \text{Cot}[c+d x]}\right]}{2\sqrt{2}\left(a^2+b^2\right)^3 d}$$

Result (type 3, 897 leaves) :

$$\frac{1}{d\,(a+b\,\text{Cot}[c+d\,x])^3}(e\,\text{Cot}[c+d\,x])^{9/2}\,\text{Sec}[c+d\,x]^3\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^3\left(-\frac{5\,a^4+8\,a^2\,b^2+4\,b^4}{2\,b^3\,(-\mathrm{i}\,a+b)^2\,(\mathrm{i}\,a+b)^2}+\frac{a^4}{2\,b\,(-\mathrm{i}\,a+b)^2\,(\mathrm{i}\,a+b)^2\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^2}+\frac{-5\,a^5\,\text{Sin}[c+d\,x]-17\,a^3\,b^2\,\text{Sin}[c+d\,x]}{4\,b^3\,(-\mathrm{i}\,a+b)^2\,(\mathrm{i}\,a+b)^2\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])}\right)\text{Tan}[c+d\,x]-$$

$$\frac{1}{8\,(a-\mathrm{i}\,b)^2\,(a+\mathrm{i}\,b)^2\,b^3\,d\,\text{Cot}[c+d\,x]^{9/2}\,(a+b\,\text{Cot}[c+d\,x])^3}(e\,\text{Cot}[c+d\,x])^{9/2}\,\text{Csc}[c+d\,x]^3\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^3$$

$$\left(-\frac{2\,(15\,a^5+31\,a^3\,b^2+16\,a\,b^4)\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^3\,\text{Sec}[c+d\,x]}{\sqrt{a}\,\sqrt{b}\,(1+\text{Cot}[c+d\,x]^2)^2\,(b+a\,\text{Tan}[c+d\,x])}-\right.$$

$$\frac{1}{(a^2+b^2)\,(-1+\text{Cot}[c+d\,x]^2)\,(1+\text{Cot}[c+d\,x]^2)\,(b+a\,\text{Tan}[c+d\,x])}4\,a\,b^4\,\text{Cos}[2\,(c+d\,x)]\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^3$$

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

$$\left.\left.(a+b)\,\left(\text{Log}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]-\text{Log}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]\right)\right)\right)\text{Sec}[c+d\,x]-$$

$$\frac{1}{4\,(a^2+b^2)\,(1+\text{Cot}[c+d\,x]^2)\,(b+a\,\text{Tan}[c+d\,x])}(-4\,a^2\,b^3+4\,b^5)\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^2$$

$$\left(-8\,\sqrt{a}\,\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]+\sqrt{2}\,\left(-2\,(a+b)\,\text{ArcTan}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+2\,(a+b)\,\text{ArcTan}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+\right.\right.$$

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

Problem 82: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(e\,\text{Cot}[c+d\,x])^{7/2}}{(a+b\,\text{Cot}[c+d\,x])^3}\,dx$$

Optimal (type 3, 476 leaves, 16 steps):

$$-\frac{a^{3/2}\left(3 a^4+6 a^2 b^2+35 b^4\right) e^{7/2} \operatorname{ArcTan}\left[\frac{\sqrt{b} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{a} \sqrt{e}}\right]}{4 b^{5/2}\left(a^2+b^2\right)^3 d}+\frac{(a+b)\left(a^2-4 a b+b^2\right) e^{7/2} \operatorname{ArcTan}\left[1-\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2}\left(a^2+b^2\right)^3 d}-$$

$$\frac{(a+b)\left(a^2-4 a b+b^2\right) e^{7/2} \operatorname{ArcTan}\left[1+\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2}\left(a^2+b^2\right)^3 d}+\frac{a^2 e^2 (e \operatorname{Cot}[c+d x])^{3/2}}{2 b\left(a^2+b^2\right) d (a+b \operatorname{Cot}[c+d x])^2}+$$

$$\frac{a^2\left(3 a^2+11 b^2\right) e^3 \sqrt{e \operatorname{Cot}[c+d x]}}{4 b^2\left(a^2+b^2\right)^2 d (a+b \operatorname{Cot}[c+d x])}+\frac{(a-b)\left(a^2+4 a b+b^2\right) e^{7/2} \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]-\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2}\left(a^2+b^2\right)^3 d}-$$

$$\frac{(a-b)\left(a^2+4 a b+b^2\right) e^{7/2} \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]+\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2}\left(a^2+b^2\right)^3 d}$$

Result (type 3, 870 leaves) :

$$\frac{1}{d\,(a+b\,\text{Cot}[c+d\,x])^3}\,(e\,\text{Cot}[c+d\,x])^{7/2}\,\text{Sec}[c+d\,x]^3\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^3\,\left(\frac{a^3}{2\,b^2\,(-\mathrm{i}\,a+b)^2\,(\mathrm{i}\,a+b)^2}-\right.$$

$$\left.\frac{a^3}{2\,(-\mathrm{i}\,a+b)^2\,(\mathrm{i}\,a+b)^2\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^2}+\frac{a^4\,\text{Sin}[c+d\,x]+13\,a^2\,b^2\,\text{Sin}[c+d\,x]}{4\,b^2\,(-\mathrm{i}\,a+b)^2\,(\mathrm{i}\,a+b)^2\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])}\right)+$$

$$\frac{1}{8\,(a-\mathrm{i}\,b)^2\,(a+\mathrm{i}\,b)^2\,b^2\,d\,\text{Cot}[c+d\,x]^{7/2}\,(a+b\,\text{Cot}[c+d\,x])^3}\,(e\,\text{Cot}[c+d\,x])^{7/2}\,\text{Csc}[c+d\,x]^3\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^3$$

$$\left(-\frac{2\,(3\,a^4+7\,a^2\,b^2+4\,b^4)\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^3\,\text{Sec}[c+d\,x]}{\sqrt{a}\,\sqrt{b}\,(1+\text{Cot}[c+d\,x]^2)^2\,(b+a\,\text{Tan}[c+d\,x])}-\right.$$

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

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

$$\left.\left.\left.(a+b)\,\left(\text{Log}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]-\text{Log}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]\right)\right)\right)\,\text{Sec}[c+d\,x]\right)\Big/$$

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

$$2\,a\,b^3\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^2$$

$$\left(-8\,\sqrt{a}\,\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]+\sqrt{2}\,\left(-2\,(a+b)\,\text{ArcTan}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+2\,(a+b)\,\text{ArcTan}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+\right.\right.$$

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

Problem 83: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(e \operatorname{Cot}[c+d x])^{5/2}}{(a+b \operatorname{Cot}[c+d x])^3} \, dx$$

Optimal (type 3, 470 leaves, 16 steps):

$$-\frac{\sqrt{a}\left(a^4+18 a^2 b^2-15 b^4\right) e^{5/2} \operatorname{ArcTan}\left[\frac{\sqrt{b} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{a} \sqrt{e}}\right]}{4 b^{3/2}\left(a^2+b^2\right)^3 d}-\frac{(a-b)\left(a^2+4 a b+b^2\right) e^{5/2} \operatorname{ArcTan}\left[1-\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2}\left(a^2+b^2\right)^3 d}+\frac{(a-b)\left(a^2+4 a b+b^2\right) e^{5/2} \operatorname{ArcTan}\left[1+\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2}\left(a^2+b^2\right)^3 d}+\frac{a^2 e^2 \sqrt{e \operatorname{Cot}[c+d x]}}{2 b\left(a^2+b^2\right) d(a+b \operatorname{Cot}[c+d x])^2}-\frac{a\left(a^2+9 b^2\right) e^2 \sqrt{e \operatorname{Cot}[c+d x]}}{4 b\left(a^2+b^2\right)^2 d(a+b \operatorname{Cot}[c+d x])}+\frac{(a+b)\left(a^2-4 a b+b^2\right) e^{5/2} \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]-\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2}\left(a^2+b^2\right)^3 d}-\frac{(a+b)\left(a^2-4 a b+b^2\right) e^{5/2} \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]+\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2}\left(a^2+b^2\right)^3 d}$$

Result (type 3, 864 leaves):

$$\frac{1}{d\,(a+b\,\text{Cot}[c+d\,x])^3}\,(e\,\text{Cot}[c+d\,x])^{5/2}\,\text{Csc}[c+d\,x]\,\text{Sec}[c+d\,x]^2\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^3\left(-\frac{a^2}{2\,b\,(-\mathrm{i}\,a+b)^2\,(\mathrm{i}\,a+b)^2}+\right.$$

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

$$\frac{1}{8\,(a-\mathrm{i}\,b)^2\,(a+\mathrm{i}\,b)^2\,b\,d\,\text{Cot}[c+d\,x]^{5/2}\,(a+b\,\text{Cot}[c+d\,x])^3}\,(e\,\text{Cot}[c+d\,x])^{5/2}\,\text{Csc}[c+d\,x]^3\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^3$$

$$\left(-\frac{2\,(a^3+a\,b^2)\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^3\,\text{Sec}[c+d\,x]}{\sqrt{a}\,\sqrt{b}\,(1+\text{Cot}[c+d\,x]^2)^2\,(b+a\,\text{Tan}[c+d\,x])}-\right.$$

$$\frac{1}{(a^2+b^2)\,(-1+\text{Cot}[c+d\,x]^2)\,(1+\text{Cot}[c+d\,x]^2)\,(b+a\,\text{Tan}[c+d\,x])}\,4\,a\,b^2\,\text{Cos}[2\,(c+d\,x)]\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^3$$

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

$$\left.\left.(a+b)\,\left(\text{Log}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]-\text{Log}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]\right)\right)\right)\,\text{Sec}[c+d\,x]-$$

$$\frac{1}{4\,(a^2+b^2)\,(1+\text{Cot}[c+d\,x]^2)\,(b+a\,\text{Tan}[c+d\,x])}\,(-4\,a^2\,b+4\,b^3)\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^2$$

$$\left(-8\,\sqrt{a}\,\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]+\sqrt{2}\,\left(-2\,(a+b)\,\text{ArcTan}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+2\,(a+b)\,\text{ArcTan}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+\right.\right.$$

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

Problem 84: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 461 leaves, 16 steps) :

$$-\frac{\left(3 a^4-26 a^2 b^2+3 b^4\right) e^{3/2} \operatorname{ArcTan}\left[\frac{\sqrt{b} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{a} \sqrt{e}}\right]}{4 \sqrt{a} \sqrt{b} \left(a^2+b^2\right)^3 d}-\frac{(a+b) \left(a^2-4 a b+b^2\right) e^{3/2} \operatorname{ArcTan}\left[1-\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2} \left(a^2+b^2\right)^3 d}+$$

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

$$\frac{\left(3 a^2-5 b^2\right) e \sqrt{e \operatorname{Cot}[c+d x]}}{4 \left(a^2+b^2\right)^2 d (a+b \operatorname{Cot}[c+d x])}-\frac{(a-b) \left(a^2+4 a b+b^2\right) e^{3/2} \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]-\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2} \left(a^2+b^2\right)^3 d}+$$

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

Result (type 3, 851 leaves) :

$$\frac{1}{d\left(a+b\,\text{Cot}[c+d\,x]\right)^{3}}\left(e\,\text{Cot}[c+d\,x]\right)^{3/2}\text{Csc}[c+d\,x]^{2}\,\text{Sec}[c+d\,x]\,\left(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]\right)^{3}$$

$$\left(\frac{a}{2\left(-\mathrm{i}\,a+b\right)^{2}\left(\mathrm{i}\,a+b\right)^{2}}-\frac{a\,b^{2}}{2\left(-\mathrm{i}\,a+b\right)^{2}\left(\mathrm{i}\,a+b\right)^{2}\left(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]\right)^{2}}+\frac{-7\,a^{2}\,\text{Sin}[c+d\,x]+5\,b^{2}\,\text{Sin}[c+d\,x]}{4\left(-\mathrm{i}\,a+b\right)^{2}\left(\mathrm{i}\,a+b\right)^{2}\left(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]\right)}\right)+$$

$$\frac{1}{8\left(a-\mathrm{i}\,b\right)^{2}\left(a+\mathrm{i}\,b\right)^{2}d\,\text{Cot}[c+d\,x]^{3/2}\left(a+b\,\text{Cot}[c+d\,x]\right)^{3}}\left(e\,\text{Cot}[c+d\,x]\right)^{3/2}\text{Csc}[c+d\,x]^{3}$$

$$\left(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]\right)^{3}\left(-\frac{2\left(-a^{2}-b^{2}\right)\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]\left(a+b\,\text{Cot}[c+d\,x]\right)\text{Csc}[c+d\,x]^{3}\,\text{Sec}[c+d\,x]}{\sqrt{a}\,\sqrt{b}\left(1+\text{Cot}[c+d\,x]^{2}\right)^{2}\left(b+a\,\text{Tan}[c+d\,x]\right)}-\right.$$

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

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

$$\left.\left.\left(a+b\right)\left(\text{Log}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]-\text{Log}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]\right)\right)\right)\text{Sec}[c+d\,x]\Big)\Big/$$

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

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

$$\left(-8\sqrt{a}\,\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]+\sqrt{2}\left(-2\left(a+b\right)\text{ArcTan}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+2\left(a+b\right)\text{ArcTan}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+\right.\right.$$

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

Problem 85: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 463 leaves, 16 steps):

$$\frac{\sqrt{b}\left(15 a^4-18 a^2 b^2-b^4\right) \sqrt{e} \operatorname{ArcTan}\left[\frac{\sqrt{b} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{a} \sqrt{e}}\right]}{4 a^{3/2}\left(a^2+b^2\right)^3 d}+\frac{(a-b)\left(a^2+4 a b+b^2\right) \sqrt{e} \operatorname{ArcTan}\left[1-\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2}\left(a^2+b^2\right)^3 d}-$$

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

$$\frac{b\left(7 a^2-b^2\right) \sqrt{e \operatorname{Cot}[c+d x]}}{4 a\left(a^2+b^2\right)^2 d(a+b \operatorname{Cot}[c+d x])}-\frac{(a+b)\left(a^2-4 a b+b^2\right) \sqrt{e} \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]-\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2}\left(a^2+b^2\right)^3 d}+$$

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

Result (type 3, 852 leaves):

$$\frac{1}{d\,(a+b\,\text{Cot}[c+d\,x])^3}\sqrt{e\,\text{Cot}[c+d\,x]}\;\text{Csc}[c+d\,x]^3\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^3$$

$$\left(-\frac{b}{2\,(-i\,a+b)^2\,(i\,a+b)^2}+\frac{b^3}{2\,(-i\,a+b)^2\,(i\,a+b)^2\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^2}+\frac{11\,a^2\,b\,\text{Sin}[c+d\,x]-b^3\,\text{Sin}[c+d\,x]}{4\,a\,(-i\,a+b)^2\,(i\,a+b)^2\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])}\right)+$$

$$\frac{1}{8\,a\,(a-i\,b)^2\,(a+i\,b)^2\,d\,\sqrt{\text{Cot}[c+d\,x]}\;(a+b\,\text{Cot}[c+d\,x])^3}\sqrt{e\,\text{Cot}[c+d\,x]}\;\text{Csc}[c+d\,x]^3$$

$$(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^3\left(-\frac{2\,(a^2\,b+b^3)\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^3\,\text{Sec}[c+d\,x]}{\sqrt{a}\,\sqrt{b}\,(1+\text{Cot}[c+d\,x]^2)^2\,(b+a\,\text{Tan}[c+d\,x])}+\right.$$

$$\frac{1}{(a^2+b^2)\,(-1+\text{Cot}[c+d\,x]^2)\,(1+\text{Cot}[c+d\,x]^2)\,(b+a\,\text{Tan}[c+d\,x])}4\,a^2\,b\,\text{Cos}[2\,(c+d\,x)]\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^3$$

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

$$\left.\left.(a+b)\,\left(\text{Log}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]-\text{Log}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}+\text{Cot}[c+d\,x]\right]\right)\right)\right)\,\text{Sec}[c+d\,x]-$$

$$\frac{1}{4\,(a^2+b^2)\,(1+\text{Cot}[c+d\,x]^2)\,(b+a\,\text{Tan}[c+d\,x])}(4\,a^3-4\,a\,b^2)\,(a+b\,\text{Cot}[c+d\,x])\,\text{Csc}[c+d\,x]^2$$

$$\left(-8\,\sqrt{a}\,\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d\,x]}}{\sqrt{a}}\right]+\sqrt{2}\,\left(-2\,(a+b)\,\text{ArcTan}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+2\,(a+b)\,\text{ArcTan}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d\,x]}\right]+\right.\right.$$

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

Problem 86: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{e\,\text{Cot}[c+d\,x]}\;(a+b\,\text{Cot}[c+d\,x])^3}\,dx$$

Optimal (type 3, 476 leaves, 16 steps):

$$-\frac{b^{3/2}\left(35 a^4+6 a^2 b^2+3 b^4\right) \text{ArcTan}\left[\frac{\sqrt{b} \sqrt{e \text{Cot}[c+d x]}}{\sqrt{a} \sqrt{e}}\right]}{4 a^{5/2}\left(a^2+b^2\right)^3 d \sqrt{e}}+\frac{(a+b)\left(a^2-4 a b+b^2\right) \text{ArcTan}\left[1-\frac{\sqrt{2} \sqrt{e \text{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2}\left(a^2+b^2\right)^3 d \sqrt{e}}-$$

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

$$\frac{b^2\left(11 a^2+3 b^2\right) \sqrt{e \text{Cot}[c+d x]}}{4 a^2\left(a^2+b^2\right)^2 d e(a+b \text{Cot}[c+d x])}+\frac{(a-b)\left(a^2+4 a b+b^2\right) \text{Log}\left[\sqrt{e}+\sqrt{e} \text{Cot}[c+d x]-\sqrt{2} \sqrt{e \text{Cot}[c+d x]}\right]}{2 \sqrt{2}\left(a^2+b^2\right)^3 d \sqrt{e}}-$$

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

Result (type 3, 879 leaves) :

$$\left(\text{Cot}[c+d x]\,\text{Csc}[c+d x]^3\,\left(b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x]\right)^3\left(\frac{b^2}{2\,a\,\left(-\mathbb{i}\,a+b\right)^2\,\left(\mathbb{i}\,a+b\right)^2}-\frac{b^4}{2\,a\,\left(-\mathbb{i}\,a+b\right)^2\,\left(\mathbb{i}\,a+b\right)^2\,\left(b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x]\right)^2}-\right.\right.$$

$$\left.\left.\frac{3\,\left(5\,a^2\,b^2\,\text{Sin}[c+d x]+b^4\,\text{Sin}[c+d x]\right)}{4\,a^2\,\left(-\mathbb{i}\,a+b\right)^2\,\left(\mathbb{i}\,a+b\right)^2\,\left(b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x]\right)}\right)\right)\Big/\left(d\,\sqrt{e\,\text{Cot}[c+d x]}\,\left(a+b\,\text{Cot}[c+d x]\right)^3\right)-$$

$$\frac{1}{8\,a^2\,\left(a-\mathbb{i}\,b\right)^2\,\left(a+\mathbb{i}\,b\right)^2\,d\,\sqrt{e\,\text{Cot}[c+d x]}\,\left(a+b\,\text{Cot}[c+d x]\right)^3}\sqrt{\text{Cot}[c+d x]}\,\text{Csc}[c+d x]^3\,\left(b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x]\right)^3$$

$$\left(-\frac{2\,\left(-4\,a^4-7\,a^2\,b^2-3\,b^4\right)\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d x]}}{\sqrt{a}}\right]\,\left(a+b\,\text{Cot}[c+d x]\right)\,\text{Csc}[c+d x]^3\,\text{Sec}[c+d x]}{\sqrt{a}\,\sqrt{b}\,\left(1+\text{Cot}[c+d x]^2\right)^2\,\left(b+a\,\text{Tan}[c+d x]\right)}-\right.$$

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

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

$$\left.\left.\left.\left(a+b\right)\,\left(\text{Log}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d x]}+\text{Cot}[c+d x]\right]-\text{Log}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d x]}+\text{Cot}[c+d x]\right]\right)\right)\right)\,\text{Sec}[c+d x]\right)\Big/$$

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

$$2\,a^3\,b\,\left(a+b\,\text{Cot}[c+d x]\right)\,\text{Csc}[c+d x]^2$$

$$\left(-8\,\sqrt{a}\,\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{\text{Cot}[c+d x]}}{\sqrt{a}}\right]+\sqrt{2}\,\left(-2\,\left(a+b\right)\,\text{ArcTan}\left[1-\sqrt{2}\,\sqrt{\text{Cot}[c+d x]}\right]+2\,\left(a+b\right)\,\text{ArcTan}\left[1+\sqrt{2}\,\sqrt{\text{Cot}[c+d x]}\right]+\right.\right.$$

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

Problem 87: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(e \operatorname{Cot}[c+d x])^{3/2} (a+b \operatorname{Cot}[c+d x])^3} \, dx$$

Optimal (type 3, 529 leaves, 17 steps):

$$\frac{b^{5/2} \left(63 a^4+46 a^2 b^2+15 b^4\right) \operatorname{ArcTan}\left[\frac{\sqrt{b} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{a} \sqrt{e}}\right]}{4 a^{7/2} \left(a^2+b^2\right)^3 d e^{3/2}}-\frac{(a-b) \left(a^2+4 a b+b^2\right) \operatorname{ArcTan}\left[1-\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2} \left(a^2+b^2\right)^3 d e^{3/2}}+$$
$$\frac{(a-b) \left(a^2+4 a b+b^2\right) \operatorname{ArcTan}\left[1+\frac{\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}}{\sqrt{e}}\right]}{\sqrt{2} \left(a^2+b^2\right)^3 d e^{3/2}}+\frac{8 a^4+31 a^2 b^2+15 b^4}{4 a^3 \left(a^2+b^2\right)^2 d e \sqrt{e \operatorname{Cot}[c+d x]}}-\frac{b^2}{2 a \left(a^2+b^2\right) d e \sqrt{e \operatorname{Cot}[c+d x]} (a+b \operatorname{Cot}[c+d x])^2}-$$
$$\frac{b^2 \left(13 a^2+5 b^2\right)}{4 a^2 \left(a^2+b^2\right)^2 d e \sqrt{e \operatorname{Cot}[c+d x]} (a+b \operatorname{Cot}[c+d x])}+\frac{(a+b) \left(a^2-4 a b+b^2\right) \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]-\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2} \left(a^2+b^2\right)^3 d e^{3/2}}-$$
$$\frac{(a+b) \left(a^2-4 a b+b^2\right) \operatorname{Log}\left[\sqrt{e}+\sqrt{e} \operatorname{Cot}[c+d x]+\sqrt{2} \sqrt{e \operatorname{Cot}[c+d x]}\right]}{2 \sqrt{2} \left(a^2+b^2\right)^3 d e^{3/2}}$$

Result (type 3, 894 leaves):

$$\left(\text{Cot}[c+d x]^2\,\text{Csc}[c+d x]^3\,(b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x])^3\left(-\frac{b^3}{2 a^2 (-i a+b)^2 (i a+b)^2}+\frac{b^5}{2 a^2 (-i a+b)^2 (i a+b)^2 (b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x])^2}+\frac{19 a^2 b^3\,\text{Sin}[c+d x]+7 b^5\,\text{Sin}[c+d x]}{4 a^3 (-i a+b)^2 (i a+b)^2 (b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x])}+\frac{2\,\text{Tan}[c+d x]}{a^3}\right)\right)\Big/$$

$$\left(d\,(e\,\text{Cot}[c+d x])^{3/2}\,(a+b\,\text{Cot}[c+d x])^3\right)-\frac{1}{8 a^3 (a-i b)^2 (a+i b)^2 d\,(e\,\text{Cot}[c+d x])^{3/2}\,(a+b\,\text{Cot}[c+d x])^3}$$

$$\text{Cot}[c+d x]^{3/2}\,\text{Csc}[c+d x]^3\,(b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x])^3$$

$$\left(-\frac{2\left(16 a^4 b+31 a^2 b^3+15 b^5\right)\text{ArcTan}\left[\frac{\sqrt{b}\sqrt{\text{Cot}[c+d x]}}{\sqrt{a}}\right](a+b\,\text{Cot}[c+d x])\,\text{Csc}[c+d x]^3\,\text{Sec}[c+d x]}{\sqrt{a}\sqrt{b}\left(1+\text{Cot}[c+d x]^2\right)^2 (b+a\,\text{Tan}[c+d x])}+\right.$$

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

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

$$\left.\left.(a+b)\left(\text{Log}\left[1-\sqrt{2}\sqrt{\text{Cot}[c+d x]}+\text{Cot}[c+d x]\right]-\text{Log}\left[1+\sqrt{2}\sqrt{\text{Cot}[c+d x]}+\text{Cot}[c+d x]\right]\right)\right)\right)\text{Sec}[c+d x]-$$

$$\frac{1}{4 (a^2+b^2)\left(1+\text{Cot}[c+d x]^2\right)(b+a\,\text{Tan}[c+d x])}\left(4 a^5-4 a^3 b^2\right)(a+b\,\text{Cot}[c+d x])\,\text{Csc}[c+d x]^2$$

$$\left(-8\sqrt{a}\sqrt{b}\,\text{ArcTan}\left[\frac{\sqrt{b}\sqrt{\text{Cot}[c+d x]}}{\sqrt{a}}\right]+\sqrt{2}\left(-2 (a+b)\,\text{ArcTan}\left[1-\sqrt{2}\sqrt{\text{Cot}[c+d x]}\right]+2 (a+b)\,\text{ArcTan}\left[1+\sqrt{2}\sqrt{\text{Cot}[c+d x]}\right]+\right.\right.$$

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

Problem 88: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 167 leaves, 5 steps):

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

Result (type 5, 161 leaves):

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

Problem 89: Unable to integrate problem.

$$\int (a+b\,\mathrm{Cot}[e+f\,x])^m\,(d\,\mathrm{Tan}[e+f\,x])^n\,dx$$

Optimal (type 6, 193 leaves, 8 steps):

$$-\frac{1}{2\,f\,(1-n)}\mathrm{AppellF1}\left[1-n,-m,1,2-n,-\frac{b\,\mathrm{Cot}[e+f\,x]}{a},-i\,\mathrm{Cot}[e+f\,x]\right]\mathrm{Cot}[e+f\,x]\,(a+b\,\mathrm{Cot}[e+f\,x])^m\left(1+\frac{b\,\mathrm{Cot}[e+f\,x]}{a}\right)^{-m}(d\,\mathrm{Tan}[e+f\,x])^n-\frac{1}{2\,f\,(1-n)}\mathrm{AppellF1}\left[1-n,-m,1,2-n,-\frac{b\,\mathrm{Cot}[e+f\,x]}{a},i\,\mathrm{Cot}[e+f\,x]\right]\mathrm{Cot}[e+f\,x]\,(a+b\,\mathrm{Cot}[e+f\,x])^m\left(1+\frac{b\,\mathrm{Cot}[e+f\,x]}{a}\right)^{-m}(d\,\mathrm{Tan}[e+f\,x])^n$$

Result (type 8, 25 leaves):

$$\int (a+b\,\mathrm{Cot}[e+f\,x])^m\,(d\,\mathrm{Tan}[e+f\,x])^n\,dx$$

Problem 91: Result more than twice size of optimal antiderivative.

$$\int \frac{1-i\,\mathrm{Cot}[c+d\,x]}{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}\,dx$$

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

$$-\frac{2\,i\,\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]}{\sqrt{a+i\,b}\,d}$$

Result (type 3, 128 leaves):

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

Problem 93: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 111 leaves, 3 steps):

$$\frac{\left(a^2\,A-A\,b^2+2\,a\,b\,B\right)\,x}{\left(a^2+b^2\right)^2}+\frac{A\,b-a\,B}{\left(a^2+b^2\right)\,d\,\left(a+b\,\text{Cot}[c+d\,x]\right)}-\frac{\left(2\,a\,A\,b-a^2\,B+b^2\,B\right)\,\text{Log}[b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]]}{\left(a^2+b^2\right)^2\,d}$$

Result (type 3, 352 leaves):

$$\frac{1}{2\,\left(a^2+b^2\right)^2\,d\,\left(a+b\,\text{Cot}[c+d\,x]\right)}$$
$$\Big(2\,a^2\,A\,b+2\,A\,b^3-2\,a^3\,B-2\,a\,b^2\,B+2\,a^3\,A\,c-4\,i\,a^2\,A\,b\,c-2\,a\,A\,b^2\,c+2\,i\,a^3\,B\,c+4\,a^2\,b\,B\,c-2\,i\,a\,b^2\,B\,c+2\,a^3\,A\,d\,x-4\,i\,a^2\,A\,b\,d\,x-$$
$$2\,a\,A\,b^2\,d\,x+2\,i\,a^3\,B\,d\,x+4\,a^2\,b\,B\,d\,x-2\,i\,a\,b^2\,B\,d\,x-2\,i\,\left(-2\,a\,A\,b+a^2\,B-b^2\,B\right)\,\text{ArcTan}[\text{Tan}[c+d\,x]]\,\left(a+b\,\text{Cot}[c+d\,x]\right)-$$
$$2\,a^2\,A\,b\,\text{Log}\left[\left(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]\right)^2\right]+a^3\,B\,\text{Log}\left[\left(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]\right)^2\right]-a\,b^2\,B\,\text{Log}\left[\left(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]\right)^2\right]+$$
$$b\,\text{Cot}[c+d\,x]\,\left(2\,(a-i\,b)^2\,(A+i\,B)\,(c+d\,x)+\left(-2\,a\,A\,b+a^2\,B-b^2\,B\right)\,\text{Log}\left[\left(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]\right)^2\right]\right)\Big)$$

Problem 94: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{A+B\,\text{Cot}[c+d\,x]}{(a+b\,\text{Cot}[c+d\,x])^3}\,dx$$

Optimal (type 3, 175 leaves, 4 steps):

$$\frac{\left(a^3\,A-3\,a\,A\,b^2+3\,a^2\,b\,B-b^3\,B\right)\,x}{\left(a^2+b^2\right)^3}+\frac{A\,b-a\,B}{2\,\left(a^2+b^2\right)\,d\,\left(a+b\,\text{Cot}[c+d\,x]\right)^2}+$$
$$\frac{2\,a\,A\,b-a^2\,B+b^2\,B}{\left(a^2+b^2\right)^2\,d\,\left(a+b\,\text{Cot}[c+d\,x]\right)}-\frac{\left(3\,a^2\,A\,b-A\,b^3-a^3\,B+3\,a\,b^2\,B\right)\,\text{Log}[b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]]}{\left(a^2+b^2\right)^3\,d}$$

Result (type 3, 863 leaves):

$$\frac{b^2 (A b - a B) (A + B \text{Cot}[c + d x]) \text{Csc}[c + d x]^2 (b \text{Cos}[c + d x] + a \text{Sin}[c + d x])}{2 (-i a + b)^2 (i a + b)^2 d (a + b \text{Cot}[c + d x])^3 (B \text{Cos}[c + d x] + A \text{Sin}[c + d x])} -$$

$$\left((-a^3 A + 3 a A b^2 - 3 a^2 b B + b^3 B) (c + d x) (A + B \text{Cot}[c + d x]) \text{Csc}[c + d x]^2 (b \text{Cos}[c + d x] + a \text{Sin}[c + d x])^3\right) \Big/ \left((-i a + b)^3 (i a + b)^3 d (a + b \text{Cot}[c + d x])^3 (B \text{Cos}[c + d x] + A \text{Sin}[c + d x])\right) +$$

$$\left((-3 i a^7 A b^3 + 3 a^6 A b^4 - 5 i a^5 A b^5 + 5 a^4 A b^6 - i a^3 A b^7 + a^2 A b^8 + i a A b^9 - A b^{10} + i a^8 b^2 B - a^7 b^3 B - i a^6 b^4 B + a^5 b^5 B - 5 i a^4 b^6 B + 5 a^3 b^7 B - 3 i a^2 b^8 B + 3 a b^9 B) (c + d x) (A + B \text{Cot}[c + d x]) \text{Csc}[c + d x]^2 (b \text{Cos}[c + d x] + a \text{Sin}[c + d x])^3\right) \Big/ \left((a - i b)^2 (a + i b)^3 b^2 (-i a + b)^3 (i a + b)^3 d (a + b \text{Cot}[c + d x])^3 (B \text{Cos}[c + d x] + A \text{Sin}[c + d x])\right) -$$

$$\left(i (-3 a^2 A b + A b^3 + a^3 B - 3 a b^2 B) \text{ArcTan}[\text{Tan}[c + d x]] (A + B \text{Cot}[c + d x]) \text{Csc}[c + d x]^2 (b \text{Cos}[c + d x] + a \text{Sin}[c + d x])^3\right) \Big/ \left((a^2 + b^2)^3 d (a + b \text{Cot}[c + d x])^3 (B \text{Cos}[c + d x] + A \text{Sin}[c + d x])\right) +$$

$$\left((-3 a^2 A b + A b^3 + a^3 B - 3 a b^2 B) (A + B \text{Cot}[c + d x]) \text{Csc}[c + d x]^2 \text{Log}\left[(b \text{Cos}[c + d x] + a \text{Sin}[c + d x])^2\right] (b \text{Cos}[c + d x] + a \text{Sin}[c + d x])^3\right) \Big/ \left(2 (a^2 + b^2)^3 d (a + b \text{Cot}[c + d x])^3 (B \text{Cos}[c + d x] + A \text{Sin}[c + d x])\right) +$$

$$\left((A + B \text{Cot}[c + d x]) \text{Csc}[c + d x]^2 (b \text{Cos}[c + d x] + a \text{Sin}[c + d x])^2 (3 a A b \text{Sin}[c + d x] - 2 a^2 B \text{Sin}[c + d x] + b^2 B \text{Sin}[c + d x])\right) \Big/ \left((-i a + b)^2 (i a + b)^2 d (a + b \text{Cot}[c + d x])^3 (B \text{Cos}[c + d x] + A \text{Sin}[c + d x])\right)$$

Problem 95: Result more than twice size of optimal antiderivative.

$$\int (a + b \text{Cot}[c + d x])^{5/2} (A + B \text{Cot}[c + d x]) \, dx$$

Optimal (type 3, 188 leaves, 10 steps):

$$\frac{(a - i b)^{5/2} (i A + B) \text{ArcTanh}\left[\frac{\sqrt{a+b \text{Cot}[c+d x]}}{\sqrt{a-i b}}\right]}{d} - \frac{(a + i b)^{5/2} (i A - B) \text{ArcTanh}\left[\frac{\sqrt{a+b \text{Cot}[c+d x]}}{\sqrt{a+i b}}\right]}{d} - \frac{2 (2 a A b + a^2 B - b^2 B) \sqrt{a + b \text{Cot}[c + d x]}}{d} - \frac{2 (A b + a B) (a + b \text{Cot}[c + d x])^{3/2}}{3 d} - \frac{2 B (a + b \text{Cot}[c + d x])^{5/2}}{5 d}$$

Result (type 3, 505 leaves):

$$\left(i\,(a^3 A-3 a A b^2-3 a^2 b B+b^3 B)\left(\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d x]}}{\sqrt{a-i b}}\right]}{\sqrt{a-i b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d x]}}{\sqrt{a+i b}}\right]}{\sqrt{a+i b}}\right)(a+b\,\text{Cot}[c+d x])^3\,(A+B\,\text{Cot}[c+d x])\,\text{Sin}[c+d x]^4\right)\Big/$$
$$\left(d\,(b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x])^3\,(B\,\text{Cos}[c+d x]+A\,\text{Sin}[c+d x])\right)+$$
$$\left((3 a^2 A b-A b^3+a^3 B-3 a b^2 B)\left(\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d x]}}{\sqrt{a-i b}}\right]}{\sqrt{a-i b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d x]}}{\sqrt{a+i b}}\right]}{\sqrt{a+i b}}\right)(a+b\,\text{Cot}[c+d x])^3\,(A+B\,\text{Cot}[c+d x])\,\text{Sin}[c+d x]^4\right)\Big/$$
$$\left(d\,(b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x])^3\,(B\,\text{Cos}[c+d x]+A\,\text{Sin}[c+d x])\right)+\Big((a+b\,\text{Cot}[c+d x])^{5/2}\,(A+B\,\text{Cot}[c+d x])$$
$$\left(\frac{2}{15}(-35 a A b-23 a^2 B+18 b^2 B)-\frac{2}{15}(5 A b^2\,\text{Cos}[c+d x]+11 a b B\,\text{Cos}[c+d x])\,\text{Csc}[c+d x]-\frac{2}{5} b^2 B\,\text{Csc}[c+d x]^2\right)\text{Sin}[c+d x]^3\Big)\Big/$$
$$\left(d\,(b\,\text{Cos}[c+d x]+a\,\text{Sin}[c+d x])^2\,(B\,\text{Cos}[c+d x]+A\,\text{Sin}[c+d x])\right)$$

Problem 96: Result more than twice size of optimal antiderivative.

$$\int (a+b\,\text{Cot}[c+d x])^{3/2}\,(A+B\,\text{Cot}[c+d x])\,dx$$

Optimal (type 3, 150 leaves, 9 steps):

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

Result (type 3, 441 leaves):

$$\left(i\left(a^2 A-A b^2-2 a b B\right)\left(\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b \text{Cot}[c+d x]}}{\sqrt{a-i b}}\right]}{\sqrt{a-i b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b \text{Cot}[c+d x]}}{\sqrt{a+i b}}\right]}{\sqrt{a+i b}}\right)(a+b \text{Cot}[c+d x])^2 (A+B \text{Cot}[c+d x]) \text{Sin}[c+d x]^3\right) \Big/$$

$$\left(d (b \text{Cos}[c+d x]+a \text{Sin}[c+d x])^2 (B \text{Cos}[c+d x]+A \text{Sin}[c+d x])\right)+$$

$$\left(\left(2 a A b+a^2 B-b^2 B\right)\left(\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b \text{Cot}[c+d x]}}{\sqrt{a-i b}}\right]}{\sqrt{a-i b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b \text{Cot}[c+d x]}}{\sqrt{a+i b}}\right]}{\sqrt{a+i b}}\right)(a+b \text{Cot}[c+d x])^2 (A+B \text{Cot}[c+d x]) \text{Sin}[c+d x]^3\right) \Big/$$

$$\left(d (b \text{Cos}[c+d x]+a \text{Sin}[c+d x])^2 (B \text{Cos}[c+d x]+A \text{Sin}[c+d x])\right)+$$

$$\frac{(a+b \text{Cot}[c+d x])^{3/2} (A+B \text{Cot}[c+d x]) \left(-\frac{2}{3} (3 A b+4 a B)-\frac{2}{3} b B \text{Cot}[c+d x]\right) \text{Sin}[c+d x]^2}{d (b \text{Cos}[c+d x]+a \text{Sin}[c+d x]) (B \text{Cos}[c+d x]+A \text{Sin}[c+d x])}$$

Problem 98: Result more than twice size of optimal antiderivative.

$$\int(-a+b \text{Cot}[c+d x]) (a+b \text{Cot}[c+d x])^{5/2} \, dx$$

Optimal (type 3, 151 leaves, 10 steps):

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

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

Result (type 3, 479 leaves):

$$\left((-a+b\,\text{Cot}[c+d\,x])\,(a+b\,\text{Cot}[c+d\,x])^{5/2}\left(-\frac{4}{5}\,b\,\left(2\,a^2+3\,b^2\right)+\frac{4}{5}\,a\,b^2\,\text{Cot}[c+d\,x]+\frac{2}{5}\,b^3\,\text{Csc}[c+d\,x]^2\right)\text{Sin}[c+d\,x]^3\right)\Big/$$
$$\left(d\,(-b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^2\right)+$$

$$\left(\left(a^2+b^2\right)(-a+b\,\text{Cot}[c+d\,x])\,(a+b\,\text{Cot}[c+d\,x])^{5/2}\left(\frac{i\,\left(a^2-b^2\right)\left(\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{a-i\,b}}\right]}{\sqrt{a-i\,b}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]}{\sqrt{a+i\,b}}\right)\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{\text{Csc}[c+d\,x]}\,\sqrt{b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]}}+\right.\right.$$
$$\left.\left.\frac{2\,a\,b\left(\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{a-i\,b}}\right]}{\sqrt{a-i\,b}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]}{\sqrt{a+i\,b}}\right)\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{\text{Csc}[c+d\,x]}\,\sqrt{b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]}}\right)\right)\Big/$$
$$\left(d\,\text{Csc}[c+d\,x]^{7/2}\,(-b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])\,(b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x])^{5/2}\right)$$

Problem 99: Result unnecessarily involves imaginary or complex numbers.

$$\int(-a+b\,\text{Cot}[c+d\,x])\,(a+b\,\text{Cot}[c+d\,x])^{3/2}\,dx$$

Optimal (type 3, 408 leaves, 13 steps):

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

Result (type 3, 178 leaves):

$$\left(\left(-a+b\,\text{Cot}[c+d\,x]\right)\left(a+b\,\text{Cot}[c+d\,x]\right)\left(3\,i\,\sqrt{a-i\,b}\,\left(a^2+b^2\right)\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{a-i\,b}}\right]-3\,i\,\sqrt{a+i\,b}\,\left(a^2+b^2\right)\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]+2\,b\,\left(a+b\,\text{Cot}[c+d\,x]\right)^{3/2}\right)\text{Sin}[c+d\,x]^2\right)\Big/\left(-3\,b^2\,d\,\text{Cos}[c+d\,x]^2+3\,a^2\,d\,\text{Sin}[c+d\,x]^2\right)$$

Problem 100: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(-a+b\,\text{Cot}[c+d\,x]\right)\sqrt{a+b\,\text{Cot}[c+d\,x]}\,dx$$

Optimal (type 3, 422 leaves, 13 steps):

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

Result (type 3, 158 leaves):

$$\left(\left(-a+b\,\text{Cot}[c+d\,x]\right)\left(\frac{i\,\left(a^2+b^2\right)\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{a-i\,b}}\right]}{\sqrt{a-i\,b}}-\frac{i\,\left(a^2+b^2\right)\text{ArcTanh}\left[\frac{\sqrt{a+b\,\text{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]}{\sqrt{a+i\,b}}+2\,b\,\sqrt{a+b\,\text{Cot}[c+d\,x]}\right)\text{Sin}[c+d\,x]\right)\Big/\left(d\,\left(-b\,\text{Cos}[c+d\,x]+a\,\text{Sin}[c+d\,x]\right)\right)$$

Problem 102: Result more than twice size of optimal antiderivative.

$$\int \frac{A+B\,\mathrm{Cot}[c+d\,x]}{(a+b\,\mathrm{Cot}[c+d\,x])^{3/2}}\,dx$$

Optimal (type 3, 138 leaves, 8 steps):

$$\frac{(i\,A+B)\,\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a-i\,b}}\right]}{(a-i\,b)^{3/2}\,d}-\frac{(i\,A-B)\,\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]}{(a+i\,b)^{3/2}\,d}+\frac{2\,(A\,b-a\,B)}{(a^2+b^2)\,d\,\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}$$

Result (type 3, 476 leaves):

$$\frac{2\,(A+B\,\mathrm{Cot}[c+d\,x])\,\mathrm{Csc}[c+d\,x]\,(b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x])\,(A\,b\,\mathrm{Sin}[c+d\,x]-a\,B\,\mathrm{Sin}[c+d\,x])}{(-i\,a+b)\,(i\,a+b)\,d\,(a+b\,\mathrm{Cot}[c+d\,x])^{3/2}\,(B\,\mathrm{Cos}[c+d\,x]+A\,\mathrm{Sin}[c+d\,x])}+$$

$$\left((A+B\,\mathrm{Cot}[c+d\,x])\,\sqrt{\mathrm{Csc}[c+d\,x]}\,(b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x])^{3/2}\left(\frac{i\,(a\,A+b\,B)\left(\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a-i\,b}}\right]}{\sqrt{a-i\,b}}-\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]}{\sqrt{a+i\,b}}\right)\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{\mathrm{Csc}[c+d\,x]}\,\sqrt{b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x]}}+\frac{(-A\,b+a\,B)\left(\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a-i\,b}}\right]}{\sqrt{a-i\,b}}+\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]}{\sqrt{a+i\,b}}\right)\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{\mathrm{Csc}[c+d\,x]}\,\sqrt{b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x]}}\right)\right)\Big/$$

$$\left((a-i\,b)\,(a+i\,b)\,d\,(a+b\,\mathrm{Cot}[c+d\,x])^{3/2}\,(B\,\mathrm{Cos}[c+d\,x]+A\,\mathrm{Sin}[c+d\,x])\right)$$

Problem 103: Result more than twice size of optimal antiderivative.

$$\int \frac{A+B\,\mathrm{Cot}[c+d\,x]}{(a+b\,\mathrm{Cot}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 3, 185 leaves, 9 steps):

$$\frac{(\mathrm{i} A+B) \operatorname{ArcTanh}\left[\frac{\sqrt{a+b \operatorname{Cot}[c+d x]}}{\sqrt{a-\mathrm{i} b}}\right]}{(a-\mathrm{i} b)^{5/2} d}-\frac{(\mathrm{i} A-B) \operatorname{ArcTanh}\left[\frac{\sqrt{a+b \operatorname{Cot}[c+d x]}}{\sqrt{a+\mathrm{i} b}}\right]}{(a+\mathrm{i} b)^{5/2} d}+\frac{2 (A b-a B)}{3 \left(a^2+b^2\right) d (a+b \operatorname{Cot}[c+d x])^{3/2}}+\frac{2 \left(2 a A b-a^2 B+b^2 B\right)}{\left(a^2+b^2\right)^2 d \sqrt{a+b \operatorname{Cot}[c+d x]}}$$

Result (type 3, 620 leaves):

$$\left((A+B \operatorname{Cot}[c+d x]) \operatorname{Csc}[c+d x]^{3/2} (b \operatorname{Cos}[c+d x]+a \operatorname{Sin}[c+d x])^{5/2}\left(\frac{\mathrm{i} \left(a^2 A-A b^2+2 a b B\right)\left(\frac{\operatorname{ArcTanh}\left[\frac{\sqrt{a+b \operatorname{Cot}[c+d x]}}{\sqrt{a-\mathrm{i} b}}\right]}{\sqrt{a-\mathrm{i} b}}-\frac{\operatorname{ArcTanh}\left[\frac{\sqrt{a+b \operatorname{Cot}[c+d x]}}{\sqrt{a+\mathrm{i} b}}\right]}{\sqrt{a+\mathrm{i} b}}\right)\sqrt{a+b \operatorname{Cot}[c+d x]}}{\sqrt{\operatorname{Csc}[c+d x]}\sqrt{b \operatorname{Cos}[c+d x]+a \operatorname{Sin}[c+d x]}}+\frac{\left(-2 a A b+a^2 B-b^2 B\right)\left(\frac{\operatorname{ArcTanh}\left[\frac{\sqrt{a+b \operatorname{Cot}[c+d x]}}{\sqrt{a-\mathrm{i} b}}\right]}{\sqrt{a-\mathrm{i} b}}+\frac{\operatorname{ArcTanh}\left[\frac{\sqrt{a+b \operatorname{Cot}[c+d x]}}{\sqrt{a+\mathrm{i} b}}\right]}{\sqrt{a+\mathrm{i} b}}\right)\sqrt{a+b \operatorname{Cot}[c+d x]}}{\sqrt{\operatorname{Csc}[c+d x]}\sqrt{b \operatorname{Cos}[c+d x]+a \operatorname{Sin}[c+d x]}}\right)\right)\Big/$$

$$\left((a-\mathrm{i} b)^2 (a+\mathrm{i} b)^2 d (a+b \operatorname{Cot}[c+d x])^{5/2} (B \operatorname{Cos}[c+d x]+A \operatorname{Sin}[c+d x])\right)+$$

$$\left((A+B \operatorname{Cot}[c+d x]) \operatorname{Csc}[c+d x]^2 (b \operatorname{Cos}[c+d x]+a \operatorname{Sin}[c+d x])^3\left(-\frac{2 (A b-a B)}{3 (-\mathrm{i} a+b)^2 (\mathrm{i} a+b)^2}+\frac{2 b^2 (A b-a B)}{3 (-\mathrm{i} a+b)^2 (\mathrm{i} a+b)^2 (b \operatorname{Cos}[c+d x]+a \operatorname{Sin}[c+d x])^2}+\frac{2 \left(8 a A b \operatorname{Sin}[c+d x]-5 a^2 B \operatorname{Sin}[c+d x]+3 b^2 B \operatorname{Sin}[c+d x]\right)}{3 (-\mathrm{i} a+b)^2 (\mathrm{i} a+b)^2 (b \operatorname{Cos}[c+d x]+a \operatorname{Sin}[c+d x])}\right)\right)\Big/\left(d (a+b \operatorname{Cot}[c+d x])^{5/2} (B \operatorname{Cos}[c+d x]+A \operatorname{Sin}[c+d x])\right)$$

Problem 106: Result more than twice size of optimal antiderivative.

$$\int \frac{-a+b\,\text{Cot}[c+d\,x]}{(a+b\,\text{Cot}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 3, 174 leaves, 9 steps):

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

Result (type 3, 587 leaves):

$$\left((-a+b\,\mathrm{Cot}[c+d\,x])\,\mathrm{Csc}[c+d\,x]^{3/2}\right.$$

$$(b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x])^{5/2}\left(\frac{i\,(a^3-3\,a\,b^2)\left(\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a-i\,b}}\right]}{\sqrt{a-i\,b}}-\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]}{\sqrt{a+i\,b}}\right)\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{\mathrm{Csc}[c+d\,x]}\,\sqrt{b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x]}}+\right.$$

$$\left.\left.\frac{(-3\,a^2\,b+b^3)\left(\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a-i\,b}}\right]}{\sqrt{a-i\,b}}+\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{a+i\,b}}\right]}{\sqrt{a+i\,b}}\right)\sqrt{a+b\,\mathrm{Cot}[c+d\,x]}}{\sqrt{\mathrm{Csc}[c+d\,x]}\,\sqrt{b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x]}}\right)\right)\Big/$$

$$\left((a-i\,b)^2\,(a+i\,b)^2\,d\,(a+b\,\mathrm{Cot}[c+d\,x])^{5/2}\,(-b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x])\right)+$$

$$\left((-a+b\,\mathrm{Cot}[c+d\,x])\,\mathrm{Csc}[c+d\,x]^2\,(b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x])^3\right.$$

$$\left(-\frac{4\,a\,b}{3\,(-i\,a+b)^2\,(i\,a+b)^2}+\frac{4\,a\,b^3}{3\,(-i\,a+b)^2\,(i\,a+b)^2\,(b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x])^2}-\right.$$

$$\left.\left.\frac{2\,(-13\,a^2\,b\,\mathrm{Sin}[c+d\,x]+3\,b^3\,\mathrm{Sin}[c+d\,x])}{3\,(-i\,a+b)^2\,(i\,a+b)^2\,(b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x])}\right)\right)\Big/\left(d\,(a+b\,\mathrm{Cot}[c+d\,x])^{5/2}\,(-b\,\mathrm{Cos}[c+d\,x]+a\,\mathrm{Sin}[c+d\,x])\right)$$

Test results for the 64 problems in "4.4.7 (d trig)^m (a+b (c cot)^n)^p.m"

Problem 8: Result more than twice size of optimal antiderivative.

$$\int\left(1+\mathrm{Cot}[x]^2\right)^{3/2}\,dx$$

Optimal (type 3, 22 leaves, 4 steps):

$$-\frac{1}{2}\text{ArcSinh}[\text{Cot}[x]]-\frac{1}{2}\text{Cot}[x]\sqrt{\text{Csc}[x]^2}$$

Result (type 3, 51 leaves):

$$\frac{1}{8}\sqrt{\text{Csc}[x]^2}\left(-\text{Csc}\left[\frac{x}{2}\right]^2-4\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right]+4\,\text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]+\text{Sec}\left[\frac{x}{2}\right]^2\right)\text{Sin}[x]$$

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

$$\int\sqrt{1+\text{Cot}[x]^2}\,dx$$

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

$$-\text{ArcSinh}[\text{Cot}[x]]$$

Result (type 3, 28 leaves):

$$\sqrt{\text{Csc}[x]^2}\left(-\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right]+\text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]\right)\text{Sin}[x]$$

Problem 12: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 14 leaves, 4 steps):

$$\text{ArcTan}\left[\frac{\text{Cot}[x]}{\sqrt{-\text{Csc}[x]^2}}\right]$$

Result (type 3, 30 leaves):

$$\frac{\text{Csc}[x]\left(\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right]-\text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]\right)}{\sqrt{-\text{Csc}[x]^2}}$$

Problem 19: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 66 leaves, 6 steps):

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

Result (type 4, 505 leaves):

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

$$\left(2\,i\,(a-b)\,(1+\text{Cos}[x])\,\sqrt{\frac{-1+\text{Cos}[2\,x]}{(1+\text{Cos}[x])^2}}\,\sqrt{\frac{-a-b+(a-b)\,\text{Cos}[2\,x]}{-1+\text{Cos}[2\,x]}}\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2\,a+2\,\sqrt{a\,(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\right.\right.\right.$$

$$\left.\frac{-2\,a-2\,\sqrt{a\,(a-b)}+b}{-2\,a+2\,\sqrt{a\,(a-b)}+b}\right]-2\,\text{EllipticPi}\left[\frac{2\,a+2\,\sqrt{a\,(a-b)}-b}{b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2\,a+2\,\sqrt{a\,(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\,\frac{-2\,a-2\,\sqrt{a\,(a-b)}+b}{-2\,a+2\,\sqrt{a\,(a-b)}+b}\right]\Bigg)$$

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

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

Problem 20: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 363 leaves):

$$\frac{1}{\sqrt{2}}\sqrt{-(-a-b+(a-b)\,\text{Cos}[2x])\,\text{Csc}[x]^2}\;\Bigg(-1+\Bigg(8\,i\,(a-b)\,\text{Cos}\Big[\frac{x}{2}\Big]^3\Bigg(\text{EllipticF}\Bigg[i\,\text{ArcSinh}\Bigg[\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\;\text{Tan}\Big[\frac{x}{2}\Big]\Bigg],\frac{-2a-2\sqrt{a(a-b)}+b}{-2a+2\sqrt{a(a-b)}+b}\Bigg]-$$

$$2\,\text{EllipticPi}\Bigg[\frac{2a+2\sqrt{a(a-b)}-b}{b},\,i\,\text{ArcSinh}\Bigg[\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\;\text{Tan}\Big[\frac{x}{2}\Big]\Bigg],\frac{-2a-2\sqrt{a(a-b)}+b}{-2a+2\sqrt{a(a-b)}+b}\Bigg]\Bigg)\,\text{Sin}\Big[\frac{x}{2}\Big]$$

$$\sqrt{1+\frac{b\,\text{Tan}\big[\frac{x}{2}\big]^2}{2a+2\sqrt{a(a-b)}-b}}\;\sqrt{1-\frac{b\,\text{Tan}\big[\frac{x}{2}\big]^2}{-2a+2\sqrt{a(a-b)}+b}}\Bigg)\Bigg/\Bigg(\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\;(a+b+(-a+b)\,\text{Cos}[2x])\Bigg)\Bigg)$$

Problem 21: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 60 leaves, 7 steps):

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

Result (type 3, 197 leaves):

$$\frac{1}{2\sqrt{a-b}\;\sqrt{b+a\,\text{Tan}[x]^2}}\sqrt{a+b\,\text{Cot}[x]^2}\;\Bigg(2\sqrt{a}\;\sqrt{a-b}\;\text{Log}\Big[a\,\text{Tan}[x]+\sqrt{a}\;\sqrt{b+a\,\text{Tan}[x]^2}\Big]+$$

$$(a-b)\Bigg(\text{Log}\Bigg[\frac{4\left(b+i\,a\,\text{Tan}[x]-i\sqrt{a-b}\;\sqrt{b+a\,\text{Tan}[x]^2}\right)}{(a-b)^{3/2}\,(-i+\text{Tan}[x])}\Bigg]-\text{Log}\Bigg[\frac{4\,i\left(i\,b+a\,\text{Tan}[x]+\sqrt{a-b}\;\sqrt{b+a\,\text{Tan}[x]^2}\right)}{(a-b)^{3/2}\,(i+\text{Tan}[x])}\Bigg]\Bigg)\Bigg)\,\text{Tan}[x]$$

Problem 22: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 89 leaves, 7 steps):

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

Result (type 3, 2937 leaves) :

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

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

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

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

$$2b\,\text{Log}\left[b+(2a-b)\ \text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\ \sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4a\,\text{Tan}\left[\frac{x}{2}\right]^2}\right]+$$

$$a\,\text{Log}\left[2a-b+b\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\ \sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4a\,\text{Tan}\left[\frac{x}{2}\right]^2}\right]-2b\,\text{Log}\left[2a-b+b\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\ \sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4a\,\text{Tan}\left[\frac{x}{2}\right]^2}\right]-$$

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

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

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

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

$$\left.\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}\,\right]-2\,b\,\text{Log}\left[2\,a-b+b\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}\,\right]-$$

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

$$\frac{1}{\sqrt{2}\,\sqrt{a+b\,\text{Cot}[x]^2}\,\sqrt{(a+b+(-a+b)\,\text{Cos}[2\,x])\,\text{Sec}\left[\frac{x}{2}\right]^4}}\sqrt{b}\,\text{Cot}[x]\,\text{Csc}[x]^2$$

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

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

$$\left.\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}\,\right]-2\,b\,\text{Log}\left[2\,a-b+b\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}\,\right]-$$

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

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

$$(a-2\,b)\,\text{Log}\left[\text{Tan}\left[\frac{x}{2}\right]^2\right]-a\,\text{Log}\left[b+(2\,a-b)\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}\,\right]+$$

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

$$\left.\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}\,\right]-2\,b\,\text{Log}\left[2\,a-b+b\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}\,\right]-$$

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

$$\text{Tan}\left[\frac{x}{2}\right]\,\left(-2\,(-a+b)\,\text{Sec}\left[\frac{x}{2}\right]^4\,\text{Sin}[2\,x]+2\,(a+b+(-a+b)\,\text{Cos}[2\,x])\,\text{Sec}\left[\frac{x}{2}\right]^4\,\text{Tan}\left[\frac{x}{2}\right]\right)+$$

$$\frac{1}{\sqrt{2}\,\sqrt{b}\,\sqrt{\left(a+b+(-a+b)\,\text{Cos}[2\,x]\right)\,\text{Sec}\left[\frac{x}{2}\right]^4}}\sqrt{a+b\,\text{Cot}[x]^2}\;\text{Tan}\left[\frac{x}{2}\right]\Bigg((a-2\,b)\,\text{Csc}\left[\frac{x}{2}\right]\,\text{Sec}\left[\frac{x}{2}\right]+4\,\sqrt{b}\,\sqrt{-a+b}\,\text{Tan}\left[\frac{x}{2}\right]-$$

$$\frac{a\left((2\,a-b)\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+\frac{\sqrt{b}\,\left(-2\,b\,\text{Cos}[x]\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Sin}[x]+4\,a\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+2\,b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Tan}\left[\frac{x}{2}\right]\right)}{2\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}}\right)}{b+(2\,a-b)\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}}+$$

$$\left(2\,b\left((2\,a-b)\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+\frac{\sqrt{b}\,\left(-2\,b\,\text{Cos}[x]\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Sin}[x]+4\,a\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+2\,b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Tan}\left[\frac{x}{2}\right]\right)}{2\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}}\right)\right)\Big/$$

$$\left(b+(2\,a-b)\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}\right)+$$

$$\frac{a\left(b\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+\frac{\sqrt{b}\,\left(-2\,b\,\text{Cos}[x]\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Sin}[x]+4\,a\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+2\,b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Tan}\left[\frac{x}{2}\right]\right)}{2\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}}\right)}{2\,a-b+b\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}}-$$

$$\frac{2\,b\left(b\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+\frac{\sqrt{b}\,\left(-2\,b\,\text{Cos}[x]\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Sin}[x]+4\,a\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+2\,b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Tan}\left[\frac{x}{2}\right]\right)}{2\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}}\right)}{2\,a-b+b\,\text{Tan}\left[\frac{x}{2}\right]^2+\sqrt{b}\,\sqrt{b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4+4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2}}-\Bigg(4\,\sqrt{b}\,\sqrt{-a+b}$$

$$\left((a-b)\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+\left(\sqrt{-a+b}\,\left(-2\,b\,\text{Cos}[x]\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Sin}[x]+4\,a\,\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]+2\,b\,\text{Cos}[x]^2\,\text{Sec}\left[\frac{x}{2}\right]^4\text{Tan}\left[\frac{x}{2}\right]\right)\right)\right)\Big/$$

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

Problem 23: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 65 leaves, 6 steps):

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

Result (type 3, 167 leaves):

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

Problem 24: Result more than twice size of optimal antiderivative.

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

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

$$\sqrt{a-b}\,\text{ArcTan}\left[\frac{\sqrt{a-b}\,\text{Cot}[x]}{\sqrt{a+b\,\text{Cot}[x]^2}}\right]+\sqrt{a+b\,\text{Cot}[x]^2}\,\text{Tan}[x]$$

Result (type 3, 129 leaves):

$$\left(\sqrt{-\left(-a-b+(a-b)\,\text{Cos}[2x]\right)\text{Csc}[x]^2}\left(-2\sqrt{a-b}\,\text{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{a-b}\,\text{Cos}[x]}{\sqrt{-a-b+(a-b)\,\text{Cos}[2x]}}\right]+\sqrt{-2\,(a+b)+2\,(a-b)\,\text{Cos}[2x]}\,\text{Sec}[x]\right)\text{Sin}[x]\right)\Big/\left(2\sqrt{-a-b+(a-b)\,\text{Cos}[2x]}\right)$$

Problem 26: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 531 leaves):

$$\sqrt{\frac{-a-b+a\,\text{Cos}[2x]-b\,\text{Cos}[2x]}{-1+\text{Cos}[2x]}}\left(-\frac{3a^2-26\,a\,b+23\,b^2}{15\,b}+\frac{1}{15}\,(-6\,a+11\,b)\,\text{Csc}[x]^2-\frac{1}{5}\,b\,\text{Csc}[x]^4\right)+$$
$$\left(2\,i\,(a-b)^2\,(1+\text{Cos}[x])\sqrt{\frac{-1+\text{Cos}[2x]}{(1+\text{Cos}[x])^2}}\sqrt{\frac{-a-b+(a-b)\,\text{Cos}[2x]}{-1+\text{Cos}[2x]}}\right.$$
$$\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a\,(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a\,(a-b)}+b}{-2a+2\sqrt{a\,(a-b)}+b}\right]-\right.$$
$$\left.2\,\text{EllipticPi}\left[\frac{2a+2\sqrt{a\,(a-b)}-b}{b},i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a\,(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a\,(a-b)}+b}{-2a+2\sqrt{a\,(a-b)}+b}\right]\right)\text{Tan}\left[\frac{x}{2}\right]$$
$$\left.\sqrt{1+\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{2a+2\sqrt{a\,(a-b)}-b}}\sqrt{1-\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{-2a+2\sqrt{a\,(a-b)}+b}}\right)\Big/$$
$$\left(\sqrt{\frac{b}{2a+2\sqrt{a\,(a-b)}-b}}\sqrt{-a-b+(a-b)\,\text{Cos}[2x]}\sqrt{-\text{Tan}\left[\frac{x}{2}\right]^2}\left(1+\text{Tan}\left[\frac{x}{2}\right]^2\right)\sqrt{-\frac{4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2+b\left(-1+\text{Tan}\left[\frac{x}{2}\right]^2\right)^2}{\left(1+\text{Tan}\left[\frac{x}{2}\right]^2\right)^2}}\right)$$

Problem 28: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 69 leaves, 6 steps):

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

Result (type 4, 503 leaves):

$$\sqrt{\frac{-a-b+a\,\text{Cos}[2\,x]-b\,\text{Cos}[2\,x]}{-1+\text{Cos}[2\,x]}}\left(-\frac{4}{3}\,(a-b)-\frac{1}{3}\,b\,\text{Csc}[x]^2\right)-$$
$$\left(2\,i\,(a-b)^2\,(1+\text{Cos}[x])\,\sqrt{\frac{-1+\text{Cos}[2\,x]}{(1+\text{Cos}[x])^2}}\,\sqrt{\frac{-a-b+(a-b)\,\text{Cos}[2\,x]}{-1+\text{Cos}[2\,x]}}\,\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2\,a+2\,\sqrt{a\,(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\right.\right.\right.$$
$$\left.\frac{-2\,a-2\,\sqrt{a\,(a-b)}+b}{-2\,a+2\,\sqrt{a\,(a-b)}+b}\right]-2\,\text{EllipticPi}\left[\frac{2\,a+2\,\sqrt{a\,(a-b)}-b}{b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2\,a+2\,\sqrt{a\,(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\,\left.\frac{-2\,a-2\,\sqrt{a\,(a-b)}+b}{-2\,a+2\,\sqrt{a\,(a-b)}+b}\right]\right)$$
$$\left.\text{Tan}\left[\frac{x}{2}\right]\,\sqrt{1+\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{2\,a+2\,\sqrt{a\,(a-b)}-b}}\,\sqrt{1-\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{-2\,a+2\,\sqrt{a\,(a-b)}+b}}\right)\Bigg/$$
$$\left(\sqrt{\frac{b}{2\,a+2\,\sqrt{a\,(a-b)}-b}}\,\sqrt{-a-b+(a-b)\,\text{Cos}[2\,x]}\,\sqrt{-\text{Tan}\left[\frac{x}{2}\right]^2}\,\left(1+\text{Tan}\left[\frac{x}{2}\right]^2\right)\,\sqrt{-\frac{4\,a\,\text{Tan}\left[\frac{x}{2}\right]^2+b\,\left(-1+\text{Tan}\left[\frac{x}{2}\right]^2\right)^2}{\left(1+\text{Tan}\left[\frac{x}{2}\right]^2\right)^2}}\right)$$

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

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

Optimal (type 3, 75 leaves, 8 steps):

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

Result (type 3, 230 leaves):

$$-\frac{b\sqrt{\left(a+b+(-a+b)\,\mathrm{Cos}[2x]\right)\mathrm{Csc}[x]^2}}{\sqrt{2}}+\frac{1}{2\sqrt{a-b}\,\sqrt{b+a\,\mathrm{Tan}[x]^2}}\sqrt{a+b\,\mathrm{Cot}[x]^2}\left(2a^{3/2}\sqrt{a-b}\,\mathrm{Log}\left[a\,\mathrm{Tan}[x]+\sqrt{a}\,\sqrt{b+a\,\mathrm{Tan}[x]^2}\right]+(a-b)^2\left(\mathrm{Log}\left[\frac{4\left(b+i\,a\,\mathrm{Tan}[x]-i\sqrt{a-b}\,\sqrt{b+a\,\mathrm{Tan}[x]^2}\right)}{(a-b)^{5/2}\,(-i+\mathrm{Tan}[x])}\right]-\mathrm{Log}\left[\frac{4\,i\left(i\,b+a\,\mathrm{Tan}[x]+\sqrt{a-b}\,\sqrt{b+a\,\mathrm{Tan}[x]^2}\right)}{(a-b)^{5/2}\,(i+\mathrm{Tan}[x])}\right]\right)\right)\mathrm{Tan}[x]$$

Problem 30: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 80 leaves, 7 steps):

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

Result (type 3, 222 leaves):

$$\left(\sqrt{-\left(-a-b+(a-b)\,\mathrm{Cos}[2x]\right)\mathrm{Csc}[x]^2}\left(-\sqrt{2}\,(a-b)^2\sqrt{-b}\,\mathrm{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{a-b}\,\mathrm{Cos}[x]}{\sqrt{-a-b+(a-b)\,\mathrm{Cos}[2x]}}\right]+\sqrt{a-b}\left(\sqrt{2}\,b^2\,\mathrm{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{-b}\,\mathrm{Cos}[x]}{\sqrt{-a-b+(a-b)\,\mathrm{Cos}[2x]}}\right]+a\sqrt{-b}\,\sqrt{-a-b+(a-b)\,\mathrm{Cos}[2x]}\,\mathrm{Sec}[x]\right)\right)\mathrm{Sin}[x]\right)\Big/\left(\sqrt{2}\,\sqrt{a-b}\,\sqrt{-b}\,\sqrt{-a-b+(a-b)\,\mathrm{Cos}[2x]}\right)$$

Problem 31: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(a+b\,\mathrm{Cot}[c+d\,x]^2\right)^{5/2}dx$$

Optimal (type 3, 171 leaves, 8 steps):

$$-\frac{(a-b)^{5/2}\,\text{ArcTan}\left[\frac{\sqrt{a-b}\,\text{Cot}[c+d\,x]}{\sqrt{a+b\,\text{Cot}[c+d\,x]^2}}\right]}{d}-\frac{\sqrt{b}\,\left(15\,a^2-20\,a\,b+8\,b^2\right)\,\text{ArcTanh}\left[\frac{\sqrt{b}\,\text{Cot}[c+d\,x]}{\sqrt{a+b\,\text{Cot}[c+d\,x]^2}}\right]}{8\,d}-\frac{(7\,a-4\,b)\,b\,\text{Cot}[c+d\,x]\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}}{8\,d}-\frac{b\,\text{Cot}[c+d\,x]\,\left(a+b\,\text{Cot}[c+d\,x]^2\right)^{3/2}}{4\,d}$$

Result (type 3, 259 leaves):

$$-\frac{1}{8\,d}\left(b\,\text{Cot}[c+d\,x]\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}\,\left(9\,a-4\,b+2\,b\,\text{Cot}[c+d\,x]^2\right)-4\,i\,(a-b)^{5/2}\,\text{Log}\left[-\frac{4\,i\,\left(a-i\,b\,\text{Cot}[c+d\,x]+\sqrt{a-b}\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}\right)}{(a-b)^{7/2}\,(i+\text{Cot}[c+d\,x])}\right]+4\,i\,(a-b)^{5/2}\,\text{Log}\left[\frac{4\,i\,\left(a+i\,b\,\text{Cot}[c+d\,x]+\sqrt{a-b}\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}\right)}{(a-b)^{7/2}\,(-i+\text{Cot}[c+d\,x])}\right]+\sqrt{b}\,\left(15\,a^2-20\,a\,b+8\,b^2\right)\,\text{Log}\left[b\,\text{Cot}[c+d\,x]+\sqrt{b}\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}\right]\right)$$

Problem 32: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 126 leaves, 7 steps):

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

Result (type 3, 234 leaves):

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

Problem 33: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 87 leaves, 6 steps):

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

Result (type 3, 202 leaves):

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

Problem 34: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

Result (type 3, 151 leaves):

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

Problem 35: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(a+b\,\text{Cot}[c+d\,x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 85 leaves, 4 steps):

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

Result (type 3, 189 leaves):

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

Problem 36: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+b\,\text{Cot}[c+d\,x]^2\right)^{5/2}}\,dx$$

Optimal (type 3, 135 leaves, 6 steps):

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

Result (type 3, 229 leaves):

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

$$\left.\frac{i\,\text{Log}\left[-\frac{4\,i\,(a-b)^{3/2}\,\left(a-i\,b\,\text{Cot}[c+d\,x]+\sqrt{a-b}\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}\right)}{i+\text{Cot}[c+d\,x]}\right]}{(a-b)^{5/2}}-\frac{i\,\text{Log}\left[\frac{4\,i\,(a-b)^{3/2}\,\left(a+i\,b\,\text{Cot}[c+d\,x]+\sqrt{a-b}\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}\right)}{-i+\text{Cot}[c+d\,x]}\right]}{(a-b)^{5/2}}\right)$$

Problem 37: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(a+b\,\text{Cot}[c+d\,x]^2\right)^{7/2}}\,dx$$

Optimal (type 3, 190 leaves, 7 steps):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{a-b}\,\text{Cot}[c+d\,x]}{\sqrt{a+b\,\text{Cot}[c+d\,x]^2}}\right]}{(a-b)^{7/2}\,d}+\frac{b\,\text{Cot}[c+d\,x]}{5\,a\,(a-b)\,d\,\left(a+b\,\text{Cot}[c+d\,x]^2\right)^{5/2}}+\frac{(9\,a-4\,b)\,b\,\text{Cot}[c+d\,x]}{15\,a^2\,(a-b)^2\,d\,\left(a+b\,\text{Cot}[c+d\,x]^2\right)^{3/2}}+\frac{b\,\left(33\,a^2-26\,a\,b+8\,b^2\right)\,\text{Cot}[c+d\,x]}{15\,a^3\,(a-b)^3\,d\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}}$$

Result (type 3, 478 leaves):

$$-\frac{\sqrt{a+b\,\text{Cot}[c+d\,x]^2}\,\left(-\frac{b\,\text{Cot}[c+d\,x]}{5\,a\,(a-b)\,\left(a+b\,\text{Cot}[c+d\,x]^2\right)^3}-\frac{(9\,a-4\,b)\,b\,\text{Cot}[c+d\,x]}{15\,a^2\,(a-b)^2\,\left(a+b\,\text{Cot}[c+d\,x]^2\right)^2}-\frac{b\,\left(33\,a^2-26\,a\,b+8\,b^2\right)\,\text{Cot}[c+d\,x]}{15\,a^3\,(a-b)^3\,\left(a+b\,\text{Cot}[c+d\,x]^2\right)}\right)}{d}-$$

$$\frac{i\,\text{Log}\left[\frac{4\,\left(i\,a^4-3\,i\,a^3\,b+3\,i\,a^2\,b^2-i\,a\,b^3-a^3\,b\,\text{Cot}[c+d\,x]+3\,a^2\,b^2\,\text{Cot}[c+d\,x]-3\,a\,b^3\,\text{Cot}[c+d\,x]+b^4\,\text{Cot}[c+d\,x]\right)}{\sqrt{a-b}\,\left(-i+\text{Cot}[c+d\,x]\right)}+\frac{4\,i\,(a-b)^3\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}}{-i+\text{Cot}[c+d\,x]}\right]}{2\,(a-b)^{7/2}\,d}+$$

$$\frac{i\,\text{Log}\left[\frac{4\,\left(-i\,a^4+3\,i\,a^3\,b-3\,i\,a^2\,b^2+i\,a\,b^3-a^3\,b\,\text{Cot}[c+d\,x]+3\,a^2\,b^2\,\text{Cot}[c+d\,x]-3\,a\,b^3\,\text{Cot}[c+d\,x]+b^4\,\text{Cot}[c+d\,x]\right)}{\sqrt{a-b}\,\left(i+\text{Cot}[c+d\,x]\right)}-\frac{4\,i\,(a-b)^3\,\sqrt{a+b\,\text{Cot}[c+d\,x]^2}}{i+\text{Cot}[c+d\,x]}\right]}{2\,(a-b)^{7/2}\,d}$$

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

$$\int \left(1-\text{Cot}[x]^2\right)^{3/2}\,dx$$

Optimal (type 3, 54 leaves, 6 steps):

$$\frac{5}{2}\,\text{ArcSin}[\text{Cot}[x]]-2\,\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{2}\,\text{Cot}[x]}{\sqrt{1-\text{Cot}[x]^2}}\right]+\frac{1}{2}\,\text{Cot}[x]\,\sqrt{1-\text{Cot}[x]^2}$$

Result (type 3, 123 leaves):

$$\frac{1}{2}\,\left(1-\text{Cot}[x]^2\right)^{3/2}\,\text{Sec}[2\,x]^2\,\left(\text{ArcTan}\left[\frac{\text{Cos}[x]}{\sqrt{-\text{Cos}[2\,x]}}\right]\,\sqrt{-\text{Cos}[2\,x]}\,\text{Sin}[x]^3+\right.$$

$$\left.4\,\text{ArcTanh}\left[\frac{\text{Cos}[x]}{\sqrt{\text{Cos}[2\,x]}}\right]\,\sqrt{\text{Cos}[2\,x]}\,\text{Sin}[x]^3-4\,\sqrt{2}\,\sqrt{\text{Cos}[2\,x]}\,\text{Log}\left[\sqrt{2}\,\text{Cos}[x]+\sqrt{\text{Cos}[2\,x]}\right]\,\text{Sin}[x]^3-\frac{1}{4}\,\text{Sin}[4\,x]\right)$$

Problem 44: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 481 leaves):

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

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

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

Optimal (type 3, 64 leaves, 6 steps):

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

Result (type 3, 158 leaves):

$$\left(\left(-\sqrt{-b}\,\text{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{a-b}\,\text{Cos}[x]}{\sqrt{-a-b+(a-b)\,\text{Cos}[2x]}}\right]+\sqrt{a-b}\,\text{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{-b}\,\text{Cos}[x]}{\sqrt{-a-b+(a-b)\,\text{Cos}[2x]}}\right]\right)\sqrt{(a+b+(-a+b)\,\text{Cos}[2x])\,\text{Csc}[x]^2}\,\text{Sin}[x]\right)\Big/\left(\sqrt{a-b}\,\sqrt{-b}\,\sqrt{-a-b+(a-b)\,\text{Cos}[2x]}\right)$$

Problem 46: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 33 leaves, 4 steps):

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

Result (type 4, 352 leaves):

$$\left(2\,i\,\text{Cos}\left[\frac{x}{2}\right](1+\text{Cos}[x])\sqrt{-(-a-b+(a-b)\,\text{Cos}[2x])\,\text{Csc}[x]^2}\right.$$
$$\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a(a-b)}+b}{-2a+2\sqrt{a(a-b)}+b}\right]-\right.$$
$$\left.2\,\text{EllipticPi}\left[\frac{2a+2\sqrt{a(a-b)}-b}{b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a(a-b)}+b}{-2a+2\sqrt{a(a-b)}+b}\right]\right)\text{Sin}\left[\frac{x}{2}\right]$$
$$\left.\sqrt{1+\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{2a+2\sqrt{a(a-b)}-b}}\,\sqrt{1-\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{-2a+2\sqrt{a(a-b)}+b}}\right)\Big/\left(\sqrt{\frac{b}{4a+4\sqrt{a(a-b)}-2b}}\,(a+b+(-a+b)\,\text{Cos}[2x])\right)$$

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

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

Optimal (type 3, 60 leaves, 7 steps):

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

Result (type 3, 204 leaves):

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

Problem 48: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 54 leaves, 5 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{a-b}\,\text{Cot}[x]}{\sqrt{a+b\,\text{Cot}[x]^2}}\right]}{\sqrt{a-b}}+\frac{\sqrt{a+b\,\text{Cot}[x]^2}\,\text{Tan}[x]}{a}$$

Result (type 3, 149 leaves):

$$\left(\sqrt{-\left(-a-b+(a-b)\,\text{Cos}[2x]\right)\text{Csc}[x]^2}\left(-\sqrt{2}\,a\,\text{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{a-b}\,\text{Cos}[x]}{\sqrt{-a-b+(a-b)\,\text{Cos}[2x]}}\right]\text{Sin}[x]+\sqrt{a-b}\,\sqrt{-a-b+(a-b)\,\text{Cos}[2x]}\,\text{Tan}[x]\right)\right)\Big/$$
$$\left(\sqrt{2}\,a\,\sqrt{a-b}\,\sqrt{-a-b+(a-b)\,\text{Cos}[2x]}\right)$$

Problem 49: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 59 leaves, 5 steps):

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

Result (type 4, 489 leaves):

$$-\frac{1}{(a-b)\,b\,\sqrt{\frac{b}{4a+4\sqrt{a(a-b)}-2b}}\,\left(a+b+(-a+b)\,\text{Cos}[2x]\right)}\,4\,i\,\text{Cos}\left[\frac{x}{2}\right]^2\sqrt{-\left(-a-b+(a-b)\,\text{Cos}[2x]\right)\text{Csc}[x]^2}\,\text{Sin}\left[\frac{x}{2}\right]$$
$$\left(i\,a\,\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\,\text{Sin}\left[\frac{x}{2}\right]+b\,\text{Cos}\left[\frac{x}{2}\right]\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a(a-b)}+b}{-2a+2\sqrt{a(a-b)}+b}\right]\right.$$
$$\sqrt{1+\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{2a+2\sqrt{a(a-b)}-b}}\,\sqrt{1-\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{-2a+2\sqrt{a(a-b)}+b}}-2\,b\,\text{Cos}\left[\frac{x}{2}\right]\,\text{EllipticPi}\left[\frac{2a+2\sqrt{a(a-b)}-b}{b},\right.$$
$$\left.\left.i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a(a-b)}+b}{-2a+2\sqrt{a(a-b)}+b}\right]\sqrt{1+\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{2a+2\sqrt{a(a-b)}-b}}\,\sqrt{1-\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{-2a+2\sqrt{a(a-b)}+b}}\right)$$

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

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

Optimal (type 3, 59 leaves, 4 steps):

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

Result (type 3, 157 leaves):

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

Problem 51: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 55 leaves, 5 steps):

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

Result (type 4, 483 leaves):

$$-\frac{1}{(a-b)\,\sqrt{\frac{b}{4a+4\sqrt{a\,(a-b)}-2b}}\,\left(a+b+(-a+b)\,\text{Cos}[2x]\right)}4\,\text{Cos}\left[\frac{x}{2}\right]^2\sqrt{-(-a-b+(a-b)\,\text{Cos}[2x])\,\text{Csc}[x]^2}\,\text{Sin}\left[\frac{x}{2}\right]$$
$$\left(\sqrt{\frac{b}{2a+2\sqrt{a\,(a-b)}-b}}\,\text{Sin}\left[\frac{x}{2}\right]-i\,\text{Cos}\left[\frac{x}{2}\right]\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a\,(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a\,(a-b)}+b}{-2a+2\sqrt{a\,(a-b)}+b}\right]\right.$$
$$\sqrt{1+\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{2a+2\sqrt{a\,(a-b)}-b}}\,\sqrt{1-\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{-2a+2\sqrt{a\,(a-b)}+b}}+2\,i\,\text{Cos}\left[\frac{x}{2}\right]\,\text{EllipticPi}\left[\frac{2a+2\sqrt{a\,(a-b)}-b}{b},\right.$$
$$\left.\left.i\,\text{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a\,(a-b)}-b}}\,\text{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a\,(a-b)}+b}{-2a+2\sqrt{a\,(a-b)}+b}\right]\sqrt{1+\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{2a+2\sqrt{a\,(a-b)}-b}}\,\sqrt{1-\frac{b\,\text{Tan}\left[\frac{x}{2}\right]^2}{-2a+2\sqrt{a\,(a-b)}+b}}\right)$$

Problem 52: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 84 leaves, 8 steps):

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

Result (type 3, 243 leaves) :

$$\frac{\sqrt{2}\,b}{a\,(a-b)\,\sqrt{\left(a+b+(-a+b)\,\text{Cos}[2\,x]\right)\,\text{Csc}[x]^2}}+$$
$$\left(\text{Cot}[x]\left(2\,(a-b)^{3/2}\,\text{Log}\left[a\,\text{Tan}[x]+\sqrt{a}\,\sqrt{b+a\,\text{Tan}[x]^2}\,\right]+a^{3/2}\left(\text{Log}\left[\frac{4\,i\left(i\,b-a\,\text{Tan}[x]+\sqrt{a-b}\,\sqrt{b+a\,\text{Tan}[x]^2}\right)}{a\,\sqrt{a-b}\,\left(-i+\text{Tan}[x]\right)}\right]-\right.\right.\right.$$
$$\left.\left.\left.\text{Log}\left[\frac{4\left(b-i\left(a\,\text{Tan}[x]+\sqrt{a-b}\,\sqrt{b+a\,\text{Tan}[x]^2}\right)\right)}{a\,\sqrt{a-b}\,\left(i+\text{Tan}[x]\right)}\right]\right)\right)\sqrt{b+a\,\text{Tan}[x]^2}\right)\Big/\left(2\,a^{3/2}\,(a-b)^{3/2}\,\sqrt{a+b\,\text{Cot}[x]^2}\right)$$

Problem 54: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 82 leaves, 6 steps) :

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

Result (type 4, 579 leaves) :

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

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

$$\left(\mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\,\mathrm{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a(a-b)}+b}{-2a+2\sqrt{a(a-b)}+b}\right]-\right.$$

$$\left.2\,\mathrm{EllipticPi}\left[\frac{2a+2\sqrt{a(a-b)}-b}{b},\,i\,\mathrm{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a(a-b)}-b}}\,\mathrm{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a(a-b)}+b}{-2a+2\sqrt{a(a-b)}+b}\right]\right)\mathrm{Tan}\left[\frac{x}{2}\right]$$

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

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

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

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

Optimal (type 3, 94 leaves, 6 steps):

$$\frac{\mathrm{ArcTan}\left[\frac{\sqrt{a-b}\,\mathrm{Cot}[x]}{\sqrt{a+b\,\mathrm{Cot}[x]^2}}\right]}{(a-b)^{5/2}}-\frac{\mathrm{Cot}[x]}{3(a-b)\left(a+b\,\mathrm{Cot}[x]^2\right)^{3/2}}-\frac{(2a+b)\,\mathrm{Cot}[x]}{3a(a-b)^2\sqrt{a+b\,\mathrm{Cot}[x]^2}}$$

Result (type 3, 194 leaves):

$$-\left(\left(\left(6\sqrt{2}\ a\ \text{ArcTanh}\left[\frac{\sqrt{2}\ \sqrt{a-b}\ \text{Cos}[x]}{\sqrt{-a-b+(a-b)\ \text{Cos}[2x]}}\right]\ (a+b+(-a+b)\ \text{Cos}[2x])^2+\right.\right.\right.$$
$$\left.2\sqrt{a-b}\ \sqrt{-a-b+(a-b)\ \text{Cos}[2x]}\ \left(3\ (a+b)^2\ \text{Cos}[x]+\left(-3a^2+2ab+b^2\right)\ \text{Cos}[3x]\right)\right)$$
$$\left.\left.\sqrt{-(-a-b+(a-b)\ \text{Cos}[2x])\ \text{Csc}[x]^2}\ \text{Sin}[x]\right)\Big/\left(6\sqrt{2}\ a\ (a-b)^{5/2}\ (-a-b+(a-b)\ \text{Cos}[2x])^{5/2}\right)\right)$$

Problem 56: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 566 leaves):

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

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

$$\left(\mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a\,(a-b)}-b}}\,\mathrm{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a\,(a-b)}+b}{-2a+2\sqrt{a\,(a-b)}+b}\right]-\right.$$

$$\left.2\,\mathrm{EllipticPi}\left[\frac{2a+2\sqrt{a\,(a-b)}-b}{b},\,i\,\mathrm{ArcSinh}\left[\sqrt{\frac{b}{2a+2\sqrt{a\,(a-b)}-b}}\,\mathrm{Tan}\left[\frac{x}{2}\right]\right],\frac{-2a-2\sqrt{a\,(a-b)}+b}{-2a+2\sqrt{a\,(a-b)}+b}\right]\right)\mathrm{Tan}\left[\frac{x}{2}\right]$$

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

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

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

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

Optimal (type 3, 118 leaves, 9 steps):

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

Result (type 3, 982 leaves):

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

$$\left(\sqrt{\frac{-a-b+a\,\text{Cos}[2x]-b\,\text{Cos}[2x]}{-1+\text{Cos}[2x]}}\,(-i+\text{Cot}[x])\,(i+\text{Cot}[x])\,(a+b\,\text{Cot}[x]^2)\left(2(a-b)^{5/2}\,\text{Log}\left[a\,\text{Tan}[x]+\sqrt{a}\,\sqrt{b+a\,\text{Tan}[x]^2}\right]+\right.\right.$$

$$a^{5/2}\left(\text{Log}\left[\frac{4\left(b+i\,a\,\text{Tan}[x]-i\sqrt{a-b}\,\sqrt{b+a\,\text{Tan}[x]^2}\right)}{a^2\sqrt{a-b}\,(-i+\text{Tan}[x])}\right]-\text{Log}\left[\frac{4\,i\left(i\,b+a\,\text{Tan}[x]+\sqrt{a-b}\,\sqrt{b+a\,\text{Tan}[x]^2}\right)}{a^2\sqrt{a-b}\,(i+\text{Tan}[x])}\right]\right)\Bigg)$$

$$(-3a^2+8ab-4b^2+a^2\,\text{Csc}[x]\,\text{Sin}[3x])\,\text{Tan}[x]\left(-a+i\,b\,\text{Cot}[x]+\sqrt{a-b}\,\text{Cot}[x]\,\sqrt{b+a\,\text{Tan}[x]^2}\right)$$

$$\left.\left(a+i\,b\,\text{Cot}[x]+\sqrt{a-b}\,\text{Cot}[x]\,\sqrt{b+a\,\text{Tan}[x]^2}\right)\right)\Big/$$

$$\Big(4a^{5/2}(a-b)^2(-a-b+a\,\text{Cos}[2x]-b\,\text{Cos}[2x])\,\Big(2\,i\,a^4 b\,\text{Csc}[x]^2-6\,i\,a^3 b^2\,\text{Csc}[x]^2+6\,i\,a^2 b^3\,\text{Csc}[x]^2-2\,i\,a\,b^4\,\text{Csc}[x]^2-$$
$$2\,i\,a^3 b^2\,\text{Cot}[x]^2\,\text{Csc}[x]^2+4\,i\,a\,b^4\,\text{Cot}[x]^2\,\text{Csc}[x]^2-2\,i\,b^5\,\text{Cot}[x]^2\,\text{Csc}[x]^2-4\,i\,a^2 b^3\,\text{Cot}[x]^4\,\text{Csc}[x]^2+$$
$$6\,i\,a\,b^4\,\text{Cot}[x]^4\,\text{Csc}[x]^2-2\,i\,b^5\,\text{Cot}[x]^4\,\text{Csc}[x]^2-a^3\sqrt{a-b}\,b\,\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}+2a^2\sqrt{a-b}\,b^2\,\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}-$$
$$a\sqrt{a-b}\,b^3\,\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}+a^3\sqrt{a-b}\,b\,\text{Cot}[x]^2\,\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}-2a^2\sqrt{a-b}\,b^2\,\text{Cot}[x]^2\,\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}+$$
$$4a\sqrt{a-b}\,b^3\,\text{Cot}[x]^2\,\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}-2\sqrt{a-b}\,b^4\,\text{Cot}[x]^2\,\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}-2a^2\sqrt{a-b}\,b^2\,\text{Cot}[x]^4$$
$$\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}+5a\sqrt{a-b}\,b^3\,\text{Cot}[x]^4\,\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}-2\sqrt{a-b}\,b^4\,\text{Cot}[x]^4\,\text{Csc}[x]^2\sqrt{b+a\,\text{Tan}[x]^2}\Big)\Big)$$

Problem 60: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 90 leaves, 8 steps):

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

Result (type 3, 1081 leaves):

$$-\frac{1}{2}\sqrt{\frac{3\,a+3\,b-4\,a\,\text{Cos}[2\,x]+4\,b\,\text{Cos}[2\,x]+a\,\text{Cos}[4\,x]+b\,\text{Cos}[4\,x]}{3-4\,\text{Cos}[2\,x]+\text{Cos}[4\,x]}}\;+$$

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

$$\left(-\sqrt{a+b}\;\text{Log}\left[\text{Sec}[x]^2\right]+\sqrt{b}\;\text{Log}\left[\text{Tan}[x]^2\right]-\sqrt{b}\;\text{Log}\left[b+\sqrt{b}\;\sqrt{b+a\,\text{Tan}[x]^4}\;\right]+\sqrt{a+b}\;\text{Log}\left[b-a\,\text{Tan}[x]^2+\sqrt{a+b}\;\sqrt{b+a\,\text{Tan}[x]^4}\;\right]\right)$$

$$\left.\left(2\,a\,\text{Sin}[2\,x]-2\,b\,\text{Sin}[2\,x]-a\,\text{Sin}[4\,x]-b\,\text{Sin}[4\,x]\right)\left(\sqrt{b}+\sqrt{b+a\,\text{Tan}[x]^4}\right)\left(a-b\,\text{Cot}[x]^2-\sqrt{a+b}\;\text{Cot}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}\right)\right)\Big/$$

$$\left(2\left(-3\,a-3\,b+4\,a\,\text{Cos}[2\,x]-4\,b\,\text{Cos}[2\,x]-a\,\text{Cos}[4\,x]-b\,\text{Cos}[4\,x]\right)\right.$$

$$\left(-a^3-a^2\,b+a^2\,\sqrt{b}\;\sqrt{a+b}\;\text{Cot}[x]^2-2\,a^2\,b\,\text{Cot}[x]^4-2\,a\,b^2\,\text{Cot}[x]^4-a\,b^{3/2}\,\sqrt{a+b}\;\text{Cot}[x]^4+a\,b^{3/2}\,\sqrt{a+b}\;\text{Cot}[x]^6-a\,b^2\,\text{Cot}[x]^8-b^3\,\text{Cot}[x]^8-\right.$$

$$b^{5/2}\,\sqrt{a+b}\;\text{Cot}[x]^8+a^3\,\text{Csc}[x]^2+a^2\,b\,\text{Csc}[x]^2-a^2\,b\,\text{Cot}[x]^2\,\text{Csc}[x]^2-a^2\,\sqrt{b}\;\sqrt{a+b}\;\text{Cot}[x]^2\,\text{Csc}[x]^2+a^2\,b\,\text{Cot}[x]^4\,\text{Csc}[x]^2+$$

$$2\,a\,b^2\,\text{Cot}[x]^4\,\text{Csc}[x]^2+a\,b^{3/2}\,\sqrt{a+b}\;\text{Cot}[x]^4\,\text{Csc}[x]^2-a\,b^2\,\text{Cot}[x]^6\,\text{Csc}[x]^2-a\,b^{3/2}\,\sqrt{a+b}\;\text{Cot}[x]^6\,\text{Csc}[x]^2+b^3\,\text{Cot}[x]^8\,\text{Csc}[x]^2+$$

$$b^{5/2}\,\sqrt{a+b}\;\text{Cot}[x]^8\,\text{Csc}[x]^2+a^2\,\sqrt{a+b}\;\text{Cot}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}-a^2\,\sqrt{b}\;\text{Cot}[x]^4\,\sqrt{b+a\,\text{Tan}[x]^4}-a\,b^{3/2}\,\text{Cot}[x]^4\,\sqrt{b+a\,\text{Tan}[x]^4}-$$

$$a\,b\,\sqrt{a+b}\;\text{Cot}[x]^4\,\sqrt{b+a\,\text{Tan}[x]^4}+a\,b\,\sqrt{a+b}\;\text{Cot}[x]^6\,\sqrt{b+a\,\text{Tan}[x]^4}-a\,b^{3/2}\,\text{Cot}[x]^8\,\sqrt{b+a\,\text{Tan}[x]^4}-b^{5/2}\,\text{Cot}[x]^8\,\sqrt{b+a\,\text{Tan}[x]^4}-$$

$$b^2\,\sqrt{a+b}\;\text{Cot}[x]^8\,\sqrt{b+a\,\text{Tan}[x]^4}-a^2\,\sqrt{a+b}\;\text{Cot}[x]^2\,\text{Csc}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}+a^2\,\sqrt{b}\;\text{Cot}[x]^4\,\text{Csc}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}+$$

$$a\,b^{3/2}\,\text{Cot}[x]^4\,\text{Csc}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}+a\,b\,\sqrt{a+b}\;\text{Cot}[x]^4\,\text{Csc}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}-a\,b^{3/2}\,\text{Cot}[x]^6\,\text{Csc}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}-$$

$$\left.\left.a\,b\,\sqrt{a+b}\;\text{Cot}[x]^6\,\text{Csc}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}+b^{5/2}\,\text{Cot}[x]^8\,\text{Csc}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}+b^2\,\sqrt{a+b}\;\text{Cot}[x]^8\,\text{Csc}[x]^2\,\sqrt{b+a\,\text{Tan}[x]^4}\right)\right)$$

Problem 61: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 126 leaves, 9 steps):

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

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

Result (type 3, 1837 leaves):

$$\sqrt{\frac{3\,a+3\,b-4\,a\,\mathrm{Cos}[2\,x]+4\,b\,\mathrm{Cos}[2\,x]+a\,\mathrm{Cos}[4\,x]+b\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}}\,\left(\frac{1}{12}\,(-8\,a-11\,b)+\frac{7}{12}\,b\,\mathrm{Csc}[x]^2-\frac{1}{6}\,b\,\mathrm{Csc}[x]^4\right)+$$

$$\left(\sqrt{a+b\,\mathrm{Cot}[x]^4}\,\left(2\,(a+b)^{3/2}\,\mathrm{Log}\left[\mathrm{Sec}[x]^2\right]-\sqrt{b}\,(3\,a+2\,b)\,\mathrm{Log}\left[\mathrm{Tan}[x]^2\right]+\right.\right.$$

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

$$\left(\left(2\,a^2\,\sqrt{\left(\frac{3\,a}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{3\,b}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}-\frac{4\,a\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{4\,b\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{a\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{b\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}\right)}\,\mathrm{Sin}[2\,x]\right)\Big/\left(3\,a+3\,b-4\,a\,\mathrm{Cos}[2\,x]+4\,b\,\mathrm{Cos}[2\,x]+a\,\mathrm{Cos}[4\,x]+b\,\mathrm{Cos}[4\,x]\right)-$$

$$\left(2\,a\,b\,\sqrt{\left(\frac{3\,a}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{3\,b}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}-\frac{4\,a\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{4\,b\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{a\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{b\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}\right)}\,\mathrm{Sin}[2\,x]\right)\Big/\left(3\,a+3\,b-4\,a\,\mathrm{Cos}[2\,x]+4\,b\,\mathrm{Cos}[2\,x]+a\,\mathrm{Cos}[4\,x]+b\,\mathrm{Cos}[4\,x]\right)-$$

$$\left(2\,b^2\,\sqrt{\left(\frac{3\,a}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{3\,b}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}-\frac{4\,a\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{4\,b\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{a\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{b\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}\right)}\,\mathrm{Sin}[2\,x]\right)\Big/\left(3\,a+3\,b-4\,a\,\mathrm{Cos}[2\,x]+4\,b\,\mathrm{Cos}[2\,x]+a\,\mathrm{Cos}[4\,x]+b\,\mathrm{Cos}[4\,x]\right)-$$

$$\left(a^2\,\sqrt{\left(\frac{3\,a}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{3\,b}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}-\frac{4\,a\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{4\,b\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{a\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{b\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}\right)}\,\mathrm{Sin}[4\,x]\right)\Big/\left(3\,a+3\,b-4\,a\,\mathrm{Cos}[2\,x]+4\,b\,\mathrm{Cos}[2\,x]+a\,\mathrm{Cos}[4\,x]+b\,\mathrm{Cos}[4\,x]\right)-$$

$$\left(2\,a\,b\,\sqrt{\left(\frac{3\,a}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{3\,b}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}-\frac{4\,a\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{4\,b\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{a\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{b\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}\right)}\,\mathrm{Sin}[4\,x]\right)\Big/\left(3\,a+3\,b-4\,a\,\mathrm{Cos}[2\,x]+4\,b\,\mathrm{Cos}[2\,x]+a\,\mathrm{Cos}[4\,x]+b\,\mathrm{Cos}[4\,x]\right)-$$

$$\left.\left(b^2\,\sqrt{\left(\frac{3\,a}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{3\,b}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}-\frac{4\,a\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{4\,b\,\mathrm{Cos}[2\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{a\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}+\frac{b\,\mathrm{Cos}[4\,x]}{3-4\,\mathrm{Cos}[2\,x]+\mathrm{Cos}[4\,x]}\right)}\,\mathrm{Sin}[4\,x]\right)\Big/\left(3\,a+3\,b-4\,a\,\mathrm{Cos}[2\,x]+4\,b\,\mathrm{Cos}[2\,x]+a\,\mathrm{Cos}[4\,x]+b\,\mathrm{Cos}[4\,x]\right)\right)$$

$$\left.\mathrm{Tan}[x]^2\right)\Big/\left(4\,\sqrt{b+a\,\mathrm{Tan}[x]^4}\,\left(-\frac{1}{2\,\left(b+a\,\mathrm{Tan}[x]^4\right)^{3/2}}a\,\sqrt{a+b\,\mathrm{Cot}[x]^4}\,\left(2\,(a+b)^{3/2}\,\mathrm{Log}\left[\mathrm{Sec}[x]^2\right]-\sqrt{b}\,(3\,a+2\,b)\,\mathrm{Log}\left[\mathrm{Tan}[x]^2\right]+\right.\right.\right.$$

$$\sqrt{b}\,(3a+2b)\,\text{Log}\left[b+\sqrt{b}\,\sqrt{b+a\,\text{Tan}[x]^4}\right]-2\,(a+b)^{3/2}\,\text{Log}\left[b-a\,\text{Tan}[x]^2+\sqrt{a+b}\,\sqrt{b+a\,\text{Tan}[x]^4}\right]\Big)\Big)\,\text{Sec}[x]^2\,\text{Tan}[x]^5-$$

$$\Big(b\,\text{Cot}[x]\,\text{Csc}[x]^2\,\Big(2\,(a+b)^{3/2}\,\text{Log}\left[\text{Sec}[x]^2\right]-\sqrt{b}\,(3a+2b)\,\text{Log}\left[\text{Tan}[x]^2\right]+\sqrt{b}\,(3a+2b)\,\text{Log}\left[b+\sqrt{b}\,\sqrt{b+a\,\text{Tan}[x]^4}\right]-$$

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

$$\sqrt{a+b\,\text{Cot}[x]^4}\,\Big(2\,(a+b)^{3/2}\,\text{Log}\left[\text{Sec}[x]^2\right]-\sqrt{b}\,(3a+2b)\,\text{Log}\left[\text{Tan}[x]^2\right]+\sqrt{b}\,(3a+2b)\,\text{Log}\left[b+\sqrt{b}\,\sqrt{b+a\,\text{Tan}[x]^4}\right]-$$

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

$$\frac{1}{4\sqrt{b+a\,\text{Tan}[x]^4}}\sqrt{a+b\,\text{Cot}[x]^4}\,\text{Tan}[x]^2\,\Bigg(-2\sqrt{b}\,(3a+2b)\,\text{Csc}[x]\,\text{Sec}[x]+4\,(a+b)^{3/2}\,\text{Tan}[x]+$$

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

Problem 62: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 41 leaves, 4 steps):

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

Result (type 4, 72 807 leaves): Display of huge result suppressed!

Problem 63: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 61 450 leaves) : Display of huge result suppressed!

Problem 64: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 117 leaves, 7 steps) :

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

Result (type 4, 73 108 leaves) : Display of huge result suppressed!

Test results for the 32 problems in "4.4.9 trig^m (a+b cot^n+c cot^(2 n))^p.m"

Problem 1: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 547 leaves, 15 steps) :

$$-\frac{\sqrt{a-c-\sqrt{a^2+b^2-2ac+c^2}}\ \text{ArcTanh}\left[\frac{a-c-\sqrt{a^2+b^2-2ac+c^2}+b\,\text{Cot}[d+e x]}{\sqrt{2}\sqrt{a-c-\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a+b\,\text{Cot}[d+e x]+c\,\text{Cot}[d+e x]^2}}\right]}{\sqrt{2}\sqrt{a^2+b^2-2ac+c^2}\ e}+$$

$$\frac{\sqrt{a-c+\sqrt{a^2+b^2-2ac+c^2}}\ \text{ArcTanh}\left[\frac{a-c+\sqrt{a^2+b^2-2ac+c^2}+b\,\text{Cot}[d+e x]}{\sqrt{2}\sqrt{a-c+\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a+b\,\text{Cot}[d+e x]+c\,\text{Cot}[d+e x]^2}}\right]}{\sqrt{2}\sqrt{a^2+b^2-2ac+c^2}\ e}-\frac{b\,\text{ArcTanh}\left[\frac{b+2c\,\text{Cot}[d+e x]}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+e x]+c\,\text{Cot}[d+e x]^2}}\right]}{2c^{3/2}\,e}+$$

$$\frac{b\left(5b^2-12ac\right)\text{ArcTanh}\left[\frac{b+2c\,\text{Cot}[d+e x]}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+e x]+c\,\text{Cot}[d+e x]^2}}\right]}{16c^{7/2}\,e}+\frac{\sqrt{a+b\,\text{Cot}[d+e x]+c\,\text{Cot}[d+e x]^2}}{c\,e}-$$

$$\frac{\text{Cot}[d+e x]^2\sqrt{a+b\,\text{Cot}[d+e x]+c\,\text{Cot}[d+e x]^2}}{3c\,e}-\frac{\left(15b^2-16ac-10bc\,\text{Cot}[d+e x]\right)\sqrt{a+b\,\text{Cot}[d+e x]+c\,\text{Cot}[d+e x]^2}}{24c^3\,e}$$

Result (type 3, 3681 leaves):

$$\frac{\left(\frac{-15b^2+16ac+32c^2}{24c^3}+\frac{5b\,\text{Cot}[d+e x]}{12c^2}-\frac{\text{Csc}[d+e x]^2}{3c}\right)\sqrt{\frac{-a-c+a\,\text{Cos}[2(d+e x)]-c\,\text{Cos}[2(d+e x)]-b\,\text{Sin}[2(d+e x)]}{-1+\text{Cos}[2(d+e x)]}}}{e}+$$

$$\Bigg(\Big(b\sqrt{a-\mathrm{i}b-c}\sqrt{a+\mathrm{i}b-c}\left(-5b^2+4c(3a+2c)\right)\text{Log}[\text{Tan}[d+e x]]-$$

$$8\sqrt{a+\mathrm{i}b-c}\,c^{7/2}\,\text{Log}\Big[\Big(-2c-2\mathrm{i}a\,\text{Tan}[d+e x]-b(\mathrm{i}+\text{Tan}[d+e x])+2\mathrm{i}\sqrt{a-\mathrm{i}b-c}\sqrt{c+\text{Tan}[d+e x](b+a\,\text{Tan}[d+e x])}\Big)\Big/$$

$$\left(8\sqrt{a-\mathrm{i}b-c}\,c^3(-\mathrm{i}+\text{Tan}[d+e x])\right)\Big]+\sqrt{a-\mathrm{i}b-c}\,\Big(b\sqrt{a+\mathrm{i}b-c}\left(5b^2-4c(3a+2c)\right)$$

$$\text{Log}\left[2c+b\,\text{Tan}[d+e x]+2\sqrt{c}\sqrt{c+\text{Tan}[d+e x](b+a\,\text{Tan}[d+e x])}\right]+8c^{7/2}\,\text{Log}\Big[\Big(2c+b(-\mathrm{i}+\text{Tan}[d+e x])-$$

$$2\mathrm{i}\left(a\,\text{Tan}[d+e x]+\sqrt{a+\mathrm{i}b-c}\sqrt{c+\text{Tan}[d+e x](b+a\,\text{Tan}[d+e x])}\right)\Big)\Big/\left(8\sqrt{a+\mathrm{i}b-c}\,c^3(\mathrm{i}+\text{Tan}[d+e x])\right)\Big]\Big)\Big)$$

$$\left(-\frac{5b^3\sqrt{-\frac{a}{-1+\text{Cos}[2(d+e x)]}-\frac{c}{-1+\text{Cos}[2(d+e x)]}+\frac{a\,\text{Cos}[2(d+e x)]}{-1+\text{Cos}[2(d+e x)]}-\frac{c\,\text{Cos}[2(d+e x)]}{-1+\text{Cos}[2(d+e x)]}-\frac{b\,\text{Sin}[2(d+e x)]}{-1+\text{Cos}[2(d+e x)]}}}{8c^3\left(a+c-a\,\text{Cos}[2(d+e x)]+c\,\text{Cos}[2(d+e x)]+b\,\text{Sin}[2(d+e x)]\right)}+\right.$$

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

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

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

$$\left.\text{Tan}[d+e\,x]\,\sqrt{a+\text{Cot}[d+e\,x]^2\,(c+b\,\text{Tan}[d+e\,x])}\right)\Big/$$

$$\left(16\,\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,c^{7/2}\,e\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)$$

$$\Bigg(-\Bigg(\Bigg(\Bigg(b\,\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,\left(-5\,b^2+4\,c\,(3\,a+2\,c)\right)\,\text{Log}[\text{Tan}[d+e\,x]]-8\,\sqrt{a+\mathbb{i}\,b-c}\,c^{7/2}\,\text{Log}\Big[\Big(-2\,c-2\,\mathbb{i}\,a\,\text{Tan}[d+e\,x]-$$

$$b\,(\mathbb{i}+\text{Tan}[d+e\,x])+2\,\mathbb{i}\,\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big/\left(8\,\sqrt{a-\mathbb{i}\,b-c}\,c^3\,(-\mathbb{i}+\text{Tan}[d+e\,x])\right)\Big]+$$

$$\sqrt{a-\mathbb{i}\,b-c}\,\Big(b\,\sqrt{a+\mathbb{i}\,b-c}\,\left(5\,b^2-4\,c\,(3\,a+2\,c)\right)\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big]+$$

$$8\,c^{7/2}\,\text{Log}\Big[\Big(2\,c+b\,(-\mathbb{i}+\text{Tan}[d+e\,x])-2\,\mathbb{i}\,\Big(a\,\text{Tan}[d+e\,x]+\sqrt{a+\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big)\Big/$$

$$\left(8\,\sqrt{a+\mathbb{i}\,b-c}\,c^3\,(\mathbb{i}+\text{Tan}[d+e\,x])\right)\Big]\Big)\Bigg)\,\text{Tan}[d+e\,x]\,\left(a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\text{Sec}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x])\right)$$

$$\sqrt{a+\text{Cot}[d+e\,x]^2\,(c+b\,\text{Tan}[d+e\,x])}\Bigg)\Big/\left(32\,\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,c^{7/2}\,\left(c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])\right)^{3/2}\right)\Bigg)+$$

$$\Bigg(\Bigg(b\,\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,\left(-5\,b^2+4\,c\,(3\,a+2\,c)\right)\,\text{Log}[\text{Tan}[d+e\,x]]-8\,\sqrt{a+\mathbb{i}\,b-c}\,c^{7/2}\,\text{Log}\Big[\Big(-2\,c-2\,\mathbb{i}\,a\,\text{Tan}[d+e\,x]-$$

$$b\,(\mathbb{i}+\text{Tan}[d+e\,x])+2\,\mathbb{i}\,\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big/\left(8\,\sqrt{a-\mathbb{i}\,b-c}\,c^3\,(-\mathbb{i}+\text{Tan}[d+e\,x])\right)\Big]+$$

$$\sqrt{a-\mathbb{i}\,b-c}\,\Big(b\,\sqrt{a+\mathbb{i}\,b-c}\,\left(5\,b^2-4\,c\,(3\,a+2\,c)\right)\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big]+$$

$$8\, c^{7/2}\, \text{Log}\Big[\Big(2\, c + b\, (-\mathrm{i} + \text{Tan}[d + e\, x]) - 2\, \mathrm{i}\, \Big(a\, \text{Tan}[d + e\, x] + \sqrt{a + \mathrm{i}\, b - c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\Big)\Big) \Big/$$

$$\Big(8\, \sqrt{a + \mathrm{i}\, b - c}\, c^{3}\, (\mathrm{i} + \text{Tan}[d + e\, x])\Big)\Big]\Big)\Big)\, \text{Sec}[d + e\, x]^{2}$$

$$\sqrt{a + \text{Cot}[d + e\, x]^{2}\, (c + b\, \text{Tan}[d + e\, x])}\,\Big) \Big/ \Big(16\, \sqrt{a - \mathrm{i}\, b - c}\, \sqrt{a + \mathrm{i}\, b - c}\, c^{7/2}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\Big) +$$

$$\Big(\Big(b\, \sqrt{a - \mathrm{i}\, b - c}\, \sqrt{a + \mathrm{i}\, b - c}\, \big(-5\, b^{2} + 4\, c\, (3\, a + 2\, c)\big)\, \text{Log}[\text{Tan}[d + e\, x]] - 8\, \sqrt{a + \mathrm{i}\, b - c}\, c^{7/2}\, \text{Log}\Big[\Big(-2\, c - 2\, \mathrm{i}\, a\, \text{Tan}[d + e\, x] -$$

$$b\, (\mathrm{i} + \text{Tan}[d + e\, x]) + 2\, \mathrm{i}\, \sqrt{a - \mathrm{i}\, b - c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\Big) \Big/ \Big(8\, \sqrt{a - \mathrm{i}\, b - c}\, c^{3}\, (-\mathrm{i} + \text{Tan}[d + e\, x])\Big)\Big] +$$

$$\sqrt{a - \mathrm{i}\, b - c}\, \Big(b\, \sqrt{a + \mathrm{i}\, b - c}\, \big(5\, b^{2} - 4\, c\, (3\, a + 2\, c)\big)\, \text{Log}\Big[2\, c + b\, \text{Tan}[d + e\, x] + 2\, \sqrt{c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\Big] +$$

$$8\, c^{7/2}\, \text{Log}\Big[\Big(2\, c + b\, (-\mathrm{i} + \text{Tan}[d + e\, x]) - 2\, \mathrm{i}\, \Big(a\, \text{Tan}[d + e\, x] + \sqrt{a + \mathrm{i}\, b - c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\Big)\Big) \Big/$$

$$\Big(8\, \sqrt{a + \mathrm{i}\, b - c}\, c^{3}\, (\mathrm{i} + \text{Tan}[d + e\, x])\Big)\Big]\Big)\Big)\, \text{Tan}[d + e\, x]\, \big(b\, \text{Csc}[d + e\, x]^{2} - 2\, \text{Cot}[d + e\, x]\, \text{Csc}[d + e\, x]^{2}\, (c + b\, \text{Tan}[d + e\, x])\big)\Big) \Big/$$

$$\Big(32\, \sqrt{a - \mathrm{i}\, b - c}\, \sqrt{a + \mathrm{i}\, b - c}\, c^{7/2}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\, \sqrt{a + \text{Cot}[d + e\, x]^{2}\, (c + b\, \text{Tan}[d + e\, x])}\Big) +$$

$$\Big(\text{Tan}[d + e\, x]\, \sqrt{a + \text{Cot}[d + e\, x]^{2}\, (c + b\, \text{Tan}[d + e\, x])}$$

$$\Big(b\, \sqrt{a - \mathrm{i}\, b - c}\, \sqrt{a + \mathrm{i}\, b - c}\, \big(-5\, b^{2} + 4\, c\, (3\, a + 2\, c)\big)\, \text{Csc}[d + e\, x]\, \text{Sec}[d + e\, x] - \Big(64\, \sqrt{a - \mathrm{i}\, b - c}\, \sqrt{a + \mathrm{i}\, b - c}\, c^{13/2}\, (-\mathrm{i} + \text{Tan}[d + e\, x])$$

$$\Bigg(\Bigg(-2\, \mathrm{i}\, a\, \text{Sec}[d + e\, x]^{2} - b\, \text{Sec}[d + e\, x]^{2} + \frac{\mathrm{i}\, \sqrt{a - \mathrm{i}\, b - c}\, \big(a\, \text{Sec}[d + e\, x]^{2}\, \text{Tan}[d + e\, x] + \text{Sec}[d + e\, x]^{2}\, (b + a\, \text{Tan}[d + e\, x])\big)}{\sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}}\Bigg) \Bigg/$$

$$\Big(8\, \sqrt{a - \mathrm{i}\, b - c}\, c^{3}\, (-\mathrm{i} + \text{Tan}[d + e\, x])\Big) - \Big(\text{Sec}[d + e\, x]^{2}\, \Big(-2\, c - 2\, \mathrm{i}\, a\, \text{Tan}[d + e\, x] - b\, (\mathrm{i} + \text{Tan}[d + e\, x]) +$$

$$2\, \mathrm{i}\, \sqrt{a - \mathrm{i}\, b - c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\Big)\Big) \Big/ \Big(8\, \sqrt{a - \mathrm{i}\, b - c}\, c^{3}\, (-\mathrm{i} + \text{Tan}[d + e\, x])^{2}\Big)\Bigg)\Bigg) \Bigg/$$

$$\Big(-2\, c - 2\, \mathrm{i}\, a\, \text{Tan}[d + e\, x] - b\, (\mathrm{i} + \text{Tan}[d + e\, x]) + 2\, \mathrm{i}\, \sqrt{a - \mathrm{i}\, b - c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\Big) + \sqrt{a - \mathrm{i}\, b - c}$$

$$\Bigg(\Bigg(b\, \sqrt{a + \mathrm{i}\, b - c}\, \big(5\, b^{2} - 4\, c\, (3\, a + 2\, c)\big)\, \Bigg(b\, \text{Sec}[d + e\, x]^{2} + \frac{\sqrt{c}\, \big(a\, \text{Sec}[d + e\, x]^{2}\, \text{Tan}[d + e\, x] + \text{Sec}[d + e\, x]^{2}\, (b + a\, \text{Tan}[d + e\, x])\big)}{\sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}}\Bigg)\Bigg) \Bigg/$$

$$\Big(2\, c + b\, \text{Tan}[d + e\, x] + 2\, \sqrt{c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\Big) + \Big(64\, \sqrt{a + \mathrm{i}\, b - c}\, c^{13/2}\, (\mathrm{i} + \text{Tan}[d + e\, x])$$

$$\Big(\Big(b\, \text{Sec}[d + e\, x]^{2} - 2\, \mathrm{i}\, \Big(a\, \text{Sec}[d + e\, x]^{2} + \Big(\sqrt{a + \mathrm{i}\, b - c}\, \big(a\, \text{Sec}[d + e\, x]^{2}\, \text{Tan}[d + e\, x] + \text{Sec}[d + e\, x]^{2}\, (b + a\, \text{Tan}[d + e\, x])\big)\Big)\Big) \Big/$$

$$\left(2\sqrt{c+\text{Tan}[d+e\,x]}\,\left(b+a\,\text{Tan}[d+e\,x]\right)\right)\Big)\Big)\Big/\left(8\sqrt{a+i\,b-c}\;c^3\,\left(i+\text{Tan}[d+e\,x]\right)\right)-$$

$$\Big(\text{Sec}[d+e\,x]^2\,\Big(2\,c+b\,\left(-i+\text{Tan}[d+e\,x]\right)-2\,i\,\Big(a\,\text{Tan}[d+e\,x]+\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]}\,\left(b+a\,\text{Tan}[d+e\,x]\right)\Big)\Big)\Big)\Big/$$

$$\left(8\sqrt{a+i\,b-c}\;c^3\,\left(i+\text{Tan}[d+e\,x]\right)^2\right)\Big)\Big)\Big/\Big(2\,c+b\,\left(-i+\text{Tan}[d+e\,x]\right)-2\,i\,\Big(a\,\text{Tan}[d+e\,x]+\sqrt{a+i\,b-c}$$

$$\sqrt{c+\text{Tan}[d+e\,x]}\,\left(b+a\,\text{Tan}[d+e\,x]\right)\Big)\Big)\Big)\Big)\Big)\Big/\left(16\sqrt{a-i\,b-c}\,\sqrt{a+i\,b-c}\;c^{7/2}\,\sqrt{c+\text{Tan}[d+e\,x]}\,\left(b+a\,\text{Tan}[d+e\,x]\right)\right)\Big)$$

Problem 2: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

$$\frac{\sqrt{a-c-\sqrt{a^2+b^2-2\,a\,c+c^2}}\;\text{ArcTanh}\Big[\frac{a-c-\sqrt{a^2+b^2-2\,a\,c+c^2}+b\,\text{Cot}[d+e\,x]}{\sqrt{2}\,\sqrt{a-c-\sqrt{a^2+b^2-2\,a\,c+c^2}}\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}}\Big]}{\sqrt{2}\,\sqrt{a^2+b^2-2\,a\,c+c^2}\;e}-$$

$$\frac{\sqrt{a-c+\sqrt{a^2+b^2-2\,a\,c+c^2}}\;\text{ArcTanh}\Big[\frac{a-c+\sqrt{a^2+b^2-2\,a\,c+c^2}+b\,\text{Cot}[d+e\,x]}{\sqrt{2}\,\sqrt{a-c+\sqrt{a^2+b^2-2\,a\,c+c^2}}\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}}\Big]}{\sqrt{2}\,\sqrt{a^2+b^2-2\,a\,c+c^2}\;e}+$$

$$\frac{b\,\text{ArcTanh}\Big[\frac{b+2\,c\,\text{Cot}[d+e\,x]}{2\,\sqrt{c}\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}}\Big]}{2\,c^{3/2}\,e}-\frac{\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}}{c\,e}$$

Result (type 3, 3144 leaves):

$$-\frac{\sqrt{\frac{-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{c\,e}-$$

$$\Bigg(\Big(b\,\sqrt{a-i\,b-c}\,\sqrt{a+i\,b-c}\;\text{Log}[\text{Tan}[d+e\,x]]-\sqrt{a+i\,b-c}\;c^{3/2}\,\text{Log}\Big[\Big(-2\,c-2\,i\,a\,\text{Tan}[d+e\,x]-b\,\left(i+\text{Tan}[d+e\,x]\right)+$$

$$2\,i\,\sqrt{a-i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,\left(b+a\,\text{Tan}[d+e\,x]\right)}\Bigg)\Bigg/\left(\sqrt{a-i\,b-c}\,c\,\left(-i+\text{Tan}[d+e\,x]\right)\right)\Bigg]+$$

$$\sqrt{a-i\,b-c}\,\Bigg(-b\,\sqrt{a+i\,b-c}\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,\left(b+a\,\text{Tan}[d+e\,x]\right)}\Big]+c^{3/2}\,\text{Log}\Big[\Big(2\,c+b\,\left(-i+\text{Tan}[d+e\,x]\right)-$$

$$2\,i\,\Big(a\,\text{Tan}[d+e\,x]+\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,\left(b+a\,\text{Tan}[d+e\,x]\right)}\Big)\Big)\Big/\left(\sqrt{a+i\,b-c}\,c\,\left(i+\text{Tan}[d+e\,x]\right)\right)\Big]\Bigg)\Bigg)$$

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

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

$$\left.\text{Tan}[d+e\,x]\,\sqrt{a+\text{Cot}[d+e\,x]^2\,\left(c+b\,\text{Tan}[d+e\,x]\right)}\right)\Bigg/$$

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

$$\left(\left(\Big(b\,\sqrt{a-i\,b-c}\,\sqrt{a+i\,b-c}\,\text{Log}[\text{Tan}[d+e\,x]]-\sqrt{a+i\,b-c}\,c^{3/2}\,\text{Log}\Big[\Big(-2\,c-2\,i\,a\,\text{Tan}[d+e\,x]-b\,\left(i+\text{Tan}[d+e\,x]\right)+\right.\right.\right.$$

$$2\,i\,\sqrt{a-i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,\left(b+a\,\text{Tan}[d+e\,x]\right)}\Big)\Big/\left(\sqrt{a-i\,b-c}\,c\,\left(-i+\text{Tan}[d+e\,x]\right)\right)\Big]+\sqrt{a-i\,b-c}$$

$$\Big(-b\,\sqrt{a+i\,b-c}\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,\left(b+a\,\text{Tan}[d+e\,x]\right)}\Big]+c^{3/2}\,\text{Log}\Big[\Big(2\,c+b\,\left(-i+\text{Tan}[d+e\,x]\right)-$$

$$2\,i\,\Big(a\,\text{Tan}[d+e\,x]+\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,\left(b+a\,\text{Tan}[d+e\,x]\right)}\Big)\Big)\Big/\left(\sqrt{a+i\,b-c}\,c\,\left(i+\text{Tan}[d+e\,x]\right)\right)\Big]\Big)\Big)$$

$$\text{Tan}[d+e\,x]\,\left(a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\text{Sec}[d+e\,x]^2\,\left(b+a\,\text{Tan}[d+e\,x]\right)\right)\,\sqrt{a+\text{Cot}[d+e\,x]^2\,\left(c+b\,\text{Tan}[d+e\,x]\right)}\Bigg)\Bigg/$$

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

$$\frac{1}{2\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,c^{3/2}\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}$$
$$\Big(b\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,\text{Log}[\text{Tan}[d+e\,x]]-\sqrt{a+\mathbb{i}\,b-c}\,c^{3/2}\,\text{Log}\Big[\Big(-2\,c-2\,\mathbb{i}\,a\,\text{Tan}[d+e\,x]-b\,(\mathbb{i}+\text{Tan}[d+e\,x])+2$$
$$\mathbb{i}\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big/\Big(\sqrt{a-\mathbb{i}\,b-c}\,c\,(-\mathbb{i}+\text{Tan}[d+e\,x])\Big)\Big]+$$
$$\sqrt{a-\mathbb{i}\,b-c}\,\Big(-b\sqrt{a+\mathbb{i}\,b-c}\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]+2\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big]+$$
$$c^{3/2}\,\text{Log}\Big[\Big(2\,c+b\,(-\mathbb{i}+\text{Tan}[d+e\,x])-2\,\mathbb{i}\,\Big(a\,\text{Tan}[d+e\,x]+\sqrt{a+\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big)\Big/$$
$$\Big(\sqrt{a+\mathbb{i}\,b-c}\,c\,(\mathbb{i}+\text{Tan}[d+e\,x])\Big)\Big]\Big)\Big)\,\text{Sec}[d+e\,x]^2\sqrt{a+\text{Cot}[d+e\,x]^2\,(c+b\,\text{Tan}[d+e\,x])}\,-$$
$$\Big(\Big(b\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,\text{Log}[\text{Tan}[d+e\,x]]-\sqrt{a+\mathbb{i}\,b-c}\,c^{3/2}\,\text{Log}\Big[\Big(-2\,c-2\,\mathbb{i}\,a\,\text{Tan}[d+e\,x]-b\,(\mathbb{i}+\text{Tan}[d+e\,x])+$$
$$2\,\mathbb{i}\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big/\Big(\sqrt{a-\mathbb{i}\,b-c}\,c\,(-\mathbb{i}+\text{Tan}[d+e\,x])\Big)\Big]+\sqrt{a-\mathbb{i}\,b-c}$$
$$\Big(-b\sqrt{a+\mathbb{i}\,b-c}\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]+2\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big]+c^{3/2}\,\text{Log}\Big[\Big(2\,c+b\,(-\mathbb{i}+\text{Tan}[d+e\,x])-$$
$$2\,\mathbb{i}\,\Big(a\,\text{Tan}[d+e\,x]+\sqrt{a+\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big)\Big/\Big(\sqrt{a+\mathbb{i}\,b-c}\,c\,(\mathbb{i}+\text{Tan}[d+e\,x])\Big)\Big]\Big)\Big)$$
$$\text{Tan}[d+e\,x]\,\Big(b\,\text{Csc}[d+e\,x]^2-2\,\text{Cot}[d+e\,x]\,\text{Csc}[d+e\,x]^2\,(c+b\,\text{Tan}[d+e\,x])\Big)\Big)\Big/\Big(4\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,c^{3/2}$$
$$\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\,\sqrt{a+\text{Cot}[d+e\,x]^2\,(c+b\,\text{Tan}[d+e\,x])}\Big)-$$
$$\frac{1}{2\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,c^{3/2}\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}\,\text{Tan}[d+e\,x]\sqrt{a+\text{Cot}[d+e\,x]^2\,(c+b\,\text{Tan}[d+e\,x])}$$
$$\Bigg(b\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,\text{Csc}[d+e\,x]\,\text{Sec}[d+e\,x]-\Bigg(\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{a+\mathbb{i}\,b-c}\,c^{5/2}\,(-\mathbb{i}+\text{Tan}[d+e\,x])$$
$$\left(\frac{-2\,\mathbb{i}\,a\,\text{Sec}[d+e\,x]^2-b\,\text{Sec}[d+e\,x]^2+\frac{\mathbb{i}\sqrt{a-\mathbb{i}\,b-c}\,\left(a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\text{Sec}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x])\right)}{\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}}{\sqrt{a-\mathbb{i}\,b-c}\,c\,(-\mathbb{i}+\text{Tan}[d+e\,x])}-\right.$$
$$\Big(\text{Sec}[d+e\,x]^2\,\Big(-2\,c-2\,\mathbb{i}\,a\,\text{Tan}[d+e\,x]-b\,(\mathbb{i}+\text{Tan}[d+e\,x])+2\,\mathbb{i}\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big)\Big/$$

$$\left(\sqrt{a-i\,b-c}\;c\;(-i+\text{Tan}[d+e\,x])^2\right)\Bigg)\Bigg)\Bigg/$$

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

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

$$\left(\sqrt{a+i\,b-c}\;c^{5/2}\,(i+\text{Tan}[d+e\,x])\right)\left(\left(b\,\text{Sec}[d+e\,x]^2-2\,i\left(a\,\text{Sec}[d+e\,x]^2+\left(\sqrt{a+i\,b-c}\right.\right.\right.\right.$$

$$\left.\left.\left.\left(a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\text{Sec}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x])\right)\right)\right)\Big/\left(2\,\sqrt{c+\text{Tan}[d+e\,x]}\,(b+a\,\text{Tan}[d+e\,x])\right)\right)\right)\Big/$$

$$\left(\sqrt{a+i\,b-c}\;c\;(i+\text{Tan}[d+e\,x])\right)\Big)-\left(\text{Sec}[d+e\,x]^2\left(2\,c+b\,(-i+\text{Tan}[d+e\,x])-2\,i\left(a\,\text{Tan}[d+e\,x]+\right.\right.\right.$$

$$\left.\left.\left.\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]}\,(b+a\,\text{Tan}[d+e\,x])\right)\right)\right)\Big/\left(\sqrt{a+i\,b-c}\;c\;(i+\text{Tan}[d+e\,x])^2\right)\Big)\Big)\Big/$$

$$\left(2\,c+b\,(-i+\text{Tan}[d+e\,x])-2\,i\left(a\,\text{Tan}[d+e\,x]+\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]}\,(b+a\,\text{Tan}[d+e\,x])\right)\right)\Bigg)\Bigg)\Bigg)\Bigg)$$

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

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

Optimal (type 3, 294 leaves, 6 steps):

$$-\frac{\sqrt{a-c-\sqrt{a^2+b^2-2\,a\,c+c^2}}\;\text{ArcTanh}\left[\frac{a-c-\sqrt{a^2+b^2-2\,a\,c+c^2}+b\,\text{Cot}[d+e\,x]}{\sqrt{2}\,\sqrt{a-c-\sqrt{a^2+b^2-2\,a\,c+c^2}}\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}}\right]}{\sqrt{2}\,\sqrt{a^2+b^2-2\,a\,c+c^2}\;e}+$$

$$\frac{\sqrt{a-c+\sqrt{a^2+b^2-2\,a\,c+c^2}}\;\text{ArcTanh}\left[\frac{a-c+\sqrt{a^2+b^2-2\,a\,c+c^2}+b\,\text{Cot}[d+e\,x]}{\sqrt{2}\,\sqrt{a-c+\sqrt{a^2+b^2-2\,a\,c+c^2}}\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}}\right]}{\sqrt{2}\,\sqrt{a^2+b^2-2\,a\,c+c^2}\;e}$$

Result (type 3, 2104 leaves) :

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

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

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

$$\left.\text{Tan}[d+e x]\sqrt{a+\text{Cot}[d+e x]^2\,(c+b\,\text{Tan}[d+e x])}\right)\Bigg/$$

$$\left(2\sqrt{a-i b-c}\ \sqrt{a+i b-c}\ e\,(-a-c+(a-c)\,\text{Cos}[2(d+e x)]-b\,\text{Sin}[2(d+e x)])\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\right.$$

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

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

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

$$\text{Tan}[d+e x]\left(a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+\text{Sec}[d+e x]^2\,(b+a\,\text{Tan}[d+e x])\right)\Big)\sqrt{a+\text{Cot}[d+e x]^2\,(c+b\,\text{Tan}[d+e x])}\ +$$

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

$$\sqrt{a+\mathrm{i}\,b-c}\,\mathrm{Log}\Big[\frac{2\left(-\frac{b(\mathrm{i}+\mathrm{Tan}[d+e\,x])+2(c+\mathrm{i}\,a\,\mathrm{Tan}[d+e\,x])}{\sqrt{a-\mathrm{i}\,b-c}}+2\,\mathrm{i}\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\right)}{-\mathrm{i}+\mathrm{Tan}[d+e\,x]}\Big]\Bigg)\,\mathrm{Sec}[d+e\,x]^2$$

$$\sqrt{a+\mathrm{Cot}[d+e\,x]^2\,(c+b\,\mathrm{Tan}[d+e\,x])}\Bigg)\Big/\left(2\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{a+\mathrm{i}\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\right)+$$

$$\Bigg(\Bigg(\sqrt{a-\mathrm{i}\,b-c}\,\mathrm{Log}\Big[\frac{2\left(\frac{b(-\mathrm{i}+\mathrm{Tan}[d+e\,x])+2(c-\mathrm{i}\,a\,\mathrm{Tan}[d+e\,x])}{\sqrt{a+\mathrm{i}\,b-c}}-2\,\mathrm{i}\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\right)}{\mathrm{i}+\mathrm{Tan}[d+e\,x]}\Big]-$$

$$\sqrt{a+\mathrm{i}\,b-c}\,\mathrm{Log}\Big[\frac{2\left(-\frac{b(\mathrm{i}+\mathrm{Tan}[d+e\,x])+2(c+\mathrm{i}\,a\,\mathrm{Tan}[d+e\,x])}{\sqrt{a-\mathrm{i}\,b-c}}+2\,\mathrm{i}\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\right)}{-\mathrm{i}+\mathrm{Tan}[d+e\,x]}\Big]\Bigg)$$

$$\mathrm{Tan}[d+e\,x]\,\left(b\,\mathrm{Csc}[d+e\,x]^2-2\,\mathrm{Cot}[d+e\,x]\,\mathrm{Csc}[d+e\,x]^2\,(c+b\,\mathrm{Tan}[d+e\,x])\right)\Bigg)\Big/$$

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

$$\frac{1}{2\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{a+\mathrm{i}\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}}\,\mathrm{Tan}[d+e\,x]\,\sqrt{a+\mathrm{Cot}[d+e\,x]^2\,(c+b\,\mathrm{Tan}[d+e\,x])}$$

$$\Bigg(\Bigg(\sqrt{a-\mathrm{i}\,b-c}\,(\mathrm{i}+\mathrm{Tan}[d+e\,x])\left(\frac{2\left(\frac{-2\,\mathrm{i}\,a\,\mathrm{Sec}[d+e\,x]^2+b\,\mathrm{Sec}[d+e\,x]^2}{\sqrt{a+\mathrm{i}\,b-c}}-\frac{\mathrm{i}\left(a\,\mathrm{Sec}[d+e\,x]^2\,\mathrm{Tan}[d+e\,x]+\mathrm{Sec}[d+e\,x]^2\,(b+a\,\mathrm{Tan}[d+e\,x])\right)}{\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}}\right)}{\mathrm{i}+\mathrm{Tan}[d+e\,x]}-\frac{1}{(\mathrm{i}+\mathrm{Tan}[d+e\,x])^2}\right.$$

$$\left.2\,\mathrm{Sec}[d+e\,x]^2\left(\frac{b(-\mathrm{i}+\mathrm{Tan}[d+e\,x])+2(c-\mathrm{i}\,a\,\mathrm{Tan}[d+e\,x])}{\sqrt{a+\mathrm{i}\,b-c}}-2\,\mathrm{i}\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\right)\right)\Bigg)\Big/$$

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

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

$$\left.\left.2 \text{Sec}[d+e x]^2\left(-\frac{b\left(i+\text{Tan}[d+e x]\right)+2\left(c+i a \text{Tan}[d+e x]\right)}{\sqrt{a-i b-c}}+2 i \sqrt{c+\text{Tan}[d+e x]\,\left(b+a \text{Tan}[d+e x]\right)}\right)\right)\right)\Big/$$

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

Problem 4: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 349 leaves, 10 steps):

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

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

Result (type 4, 64 621 leaves): Display of huge result suppressed!

Problem 5: Humongous result has more than 200000 leaves.

$$\int \frac{\text{Tan}[d+e x]^3}{\sqrt{a+b \text{Cot}[d+e x]+c \text{Cot}[d+e x]^2}}\,dx$$

Optimal (type 3, 501 leaves, 14 steps):

$$-\frac{\text{ArcTanh}\left[\frac{2a+b\text{Cot}[d+ex]}{2\sqrt{a}\sqrt{a+b\text{Cot}[d+ex]+c\text{Cot}[d+ex]^2}}\right]}{\sqrt{a}\,e}+\frac{\left(3b^2-4ac\right)\text{ArcTanh}\left[\frac{2a+b\text{Cot}[d+ex]}{2\sqrt{a}\sqrt{a+b\text{Cot}[d+ex]+c\text{Cot}[d+ex]^2}}\right]}{8a^{5/2}e}-$$

$$\frac{\sqrt{a-c-\sqrt{a^2+b^2-2ac+c^2}}\,\text{ArcTanh}\left[\frac{a-c-\sqrt{a^2+b^2-2ac+c^2}+b\text{Cot}[d+ex]}{\sqrt{2}\sqrt{a-c-\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a+b\text{Cot}[d+ex]+c\text{Cot}[d+ex]^2}}\right]}{\sqrt{2}\sqrt{a^2+b^2-2ac+c^2}\,e}+$$

$$\frac{\sqrt{a-c+\sqrt{a^2+b^2-2ac+c^2}}\,\text{ArcTanh}\left[\frac{a-c+\sqrt{a^2+b^2-2ac+c^2}+b\text{Cot}[d+ex]}{\sqrt{2}\sqrt{a-c+\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a+b\text{Cot}[d+ex]+c\text{Cot}[d+ex]^2}}\right]}{\sqrt{2}\sqrt{a^2+b^2-2ac+c^2}\,e}-$$

$$\frac{3b\sqrt{a+b\text{Cot}[d+ex]+c\text{Cot}[d+ex]^2}\,\text{Tan}[d+ex]}{4a^2e}+\frac{\sqrt{a+b\text{Cot}[d+ex]+c\text{Cot}[d+ex]^2}\,\text{Tan}[d+ex]^2}{2ae}$$

Result (type ?, 325 525 leaves) : Display of huge result suppressed!

Problem 6: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \text{Cot}[d+ex]^5\sqrt{a+b\text{Cot}[d+ex]+c\text{Cot}[d+ex]^2}\,dx$$

Optimal (type 3, 976 leaves, 21 steps) :

$$-\left(\left(\sqrt{a^2+b^2+c\left(c+\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c+\sqrt{a^2+b^2-2ac+c^2}\right)}\right.\right.$$

$$\text{ArcTan}\left[\left(b^2+(a-c)\left(a-c-\sqrt{a^2+b^2-2ac+c^2}\right)-b\sqrt{a^2+b^2-2ac+c^2}\,\text{Cot}[d+ex]\right)\Big/\right.$$

$$\left.\left.\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}\sqrt{a^2+b^2+c\left(c+\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c+\sqrt{a^2+b^2-2ac+c^2}\right)}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\right)\right]\right)\Big/$$

$$\left.\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}e\right)\right)-\frac{b\,\text{ArcTanh}\left[\frac{b+2c\,\text{Cot}[d+ex]}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}\right]}{2\sqrt{c}\,e}+\frac{b\left(b^2-4ac\right)\text{ArcTanh}\left[\frac{b+2c\,\text{Cot}[d+ex]}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}\right]}{16c^{5/2}e}-$$

$$\frac{b\left(7b^2-12ac\right)\left(b^2-4ac\right)\text{ArcTanh}\left[\frac{b+2c\,\text{Cot}[d+ex]}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}\right]}{256c^{9/2}e}+$$

$$\left(\sqrt{a^2+b^2+c\left(c-\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c-\sqrt{a^2+b^2-2ac+c^2}\right)}\right.$$

$$\text{ArcTanh}\left[\left(b^2+(a-c)\left(a-c+\sqrt{a^2+b^2-2ac+c^2}\right)+b\sqrt{a^2+b^2-2ac+c^2}\,\text{Cot}[d+ex]\right)\Big/\right.$$

$$\left.\left.\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}\sqrt{a^2+b^2+c\left(c-\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c-\sqrt{a^2+b^2-2ac+c^2}\right)}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\right)\right]\right)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}e\right)-\frac{\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}{e}-\frac{b\left(b+2c\,\text{Cot}[d+ex]\right)\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}{8c^2e}+$$

$$\frac{b\left(7b^2-12ac\right)\left(b+2c\,\text{Cot}[d+ex]\right)\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}{128c^4e}+$$

$$\frac{\left(a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2\right)^{3/2}}{3ce}-$$

$$\frac{\text{Cot}[d+ex]^2\left(a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2\right)^{3/2}}{5ce}-$$

$$\frac{\left(35b^2-32ac-42bc\,\text{Cot}[d+ex]\right)\left(a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2\right)^{3/2}}{240c^3e}$$

Result (type 3, 4237 leaves) :

$$\frac{1}{e}\left(-\frac{-105b^4+460ab^2c-256a^2c^2+296b^2c^2-768ac^3+2944c^4}{1920c^4}+\frac{\left(-35b^3\,\text{Cos}[d+ex]+116abc\,\text{Cos}[d+ex]+104bc^2\,\text{Cos}[d+ex]\right)\text{Csc}[d+ex]}{960c^3}+\right.$$

$$\left.\frac{\left(7b^2-16ac+176c^2\right)\text{Csc}[d+ex]^2}{240c^2}-\frac{b\,\text{Cot}[d+ex]\,\text{Csc}[d+ex]^2}{40c}-\frac{1}{5}\text{Csc}[d+ex]^4\right)$$

$$\sqrt{\frac{-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}\;+$$

$$\Bigg(\Big(b\,\big(7\,b^4-8\,b^2\,c\,(5\,a+2\,c)+16\,c^2\,(3\,a^2+4\,a\,c+8\,c^2)\big)\,\text{Log}[\text{Tan}[d+e\,x]]-128\,\sqrt{a-\mathbb{i}\,b-c}\;c^{9/2}\,\text{Log}\Big[\Big(-2\,c-2\,\mathbb{i}\,a\,\text{Tan}[d+e\,x]-$$

$$b\,(\mathbb{i}+\text{Tan}[d+e\,x])+2\,\mathbb{i}\,\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big/\Big(128\,(a-\mathbb{i}\,b-c)^{3/2}\,c^4\,(-\mathbb{i}+\text{Tan}[d+e\,x])\Big)\Big]-$$

$$b\,\big(7\,b^4-8\,b^2\,c\,(5\,a+2\,c)+16\,c^2\,(3\,a^2+4\,a\,c+8\,c^2)\big)\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big]+$$

$$128\,\sqrt{a+\mathbb{i}\,b-c}\;c^{9/2}\,\text{Log}\Big[\Big(2\,c+b\,(-\mathbb{i}+\text{Tan}[d+e\,x])-2\,\mathbb{i}\,\Big(a\,\text{Tan}[d+e\,x]+\sqrt{a+\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big)\Big/$$

$$\Big(128\,(a+\mathbb{i}\,b-c)^{3/2}\,c^4\,(\mathbb{i}+\text{Tan}[d+e\,x])\Big)\Big]\Big)\Bigg(\frac{7\,b^5\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{128\,c^4\,\big(a+c-a\,\text{Cos}[2\,(d+e\,x)]+c\,\text{Cos}[2\,(d+e\,x)]+b\,\text{Sin}[2\,(d+e\,x)]\big)}\;-$$

$$\frac{5\,a\,b^3\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{16\,c^3\,\big(a+c-a\,\text{Cos}[2\,(d+e\,x)]+c\,\text{Cos}[2\,(d+e\,x)]+b\,\text{Sin}[2\,(d+e\,x)]\big)}\;+$$

$$\frac{3\,a^2\,b\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{8\,c^2\,\big(a+c-a\,\text{Cos}[2\,(d+e\,x)]+c\,\text{Cos}[2\,(d+e\,x)]+b\,\text{Sin}[2\,(d+e\,x)]\big)}\;-$$

$$\frac{b^3\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{8\,c^2\,\big(a+c-a\,\text{Cos}[2\,(d+e\,x)]+c\,\text{Cos}[2\,(d+e\,x)]+b\,\text{Sin}[2\,(d+e\,x)]\big)}\;+$$

$$\frac{a\,b\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{2\,c\,\big(a+c-a\,\text{Cos}[2\,(d+e\,x)]+c\,\text{Cos}[2\,(d+e\,x)]+b\,\text{Sin}[2\,(d+e\,x)]\big)}\;+$$

$$\frac{b\,\text{Cos}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{a+c-a\,\text{Cos}[2\,(d+e\,x)]+c\,\text{Cos}[2\,(d+e\,x)]+b\,\text{Sin}[2\,(d+e\,x)]}\;+$$

$$\frac{a\,\mathrm{Sin}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{a+c-a\,\mathrm{Cos}[2\,(d+e\,x)]+c\,\mathrm{Cos}[2\,(d+e\,x)]+b\,\mathrm{Sin}[2\,(d+e\,x)]}-$$

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

$$\left.\mathrm{Tan}[d+e\,x]\,\sqrt{a+\mathrm{Cot}[d+e\,x]^2\,(c+b\,\mathrm{Tan}[d+e\,x])}\right)\Big/\left(256\,c^{9/2}\,e\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\right.$$

$$\left(-\frac{1}{512\,c^{9/2}\,(c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x]))^{3/2}}\left(b\,(7\,b^4-8\,b^2\,c\,(5\,a+2\,c)+16\,c^2\,(3\,a^2+4\,a\,c+8\,c^2))\,\mathrm{Log}[\mathrm{Tan}[d+e\,x]]-\right.\right.$$

$$128\,\sqrt{a-i\,b-c}\;c^{9/2}\,\mathrm{Log}\Big[\Big(-2\,c-2\,i\,a\,\mathrm{Tan}[d+e\,x]-b\,(i+\mathrm{Tan}[d+e\,x])+2\,i\,\sqrt{a-i\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\Big)\Big/$$

$$\Big(128\,(a-i\,b-c)^{3/2}\,c^4\,(-i+\mathrm{Tan}[d+e\,x])\Big)\Big]-b\,(7\,b^4-8\,b^2\,c\,(5\,a+2\,c)+16\,c^2\,(3\,a^2+4\,a\,c+8\,c^2))$$

$$\mathrm{Log}\Big[2\,c+b\,\mathrm{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\Big]+128\,\sqrt{a+i\,b-c}\;c^{9/2}\,\mathrm{Log}\Big[\Big(2\,c+b\,(-i+\mathrm{Tan}[d+e\,x])-$$

$$2\,i\,\Big(a\,\mathrm{Tan}[d+e\,x]+\sqrt{a+i\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\Big)\Big)\Big/\Big(128\,(a+i\,b-c)^{3/2}\,c^4\,(i+\mathrm{Tan}[d+e\,x])\Big)\Big]\Big)$$

$$\mathrm{Tan}[d+e\,x]\,(a\,\mathrm{Sec}[d+e\,x]^2\,\mathrm{Tan}[d+e\,x]+\mathrm{Sec}[d+e\,x]^2\,(b+a\,\mathrm{Tan}[d+e\,x]))\,\sqrt{a+\mathrm{Cot}[d+e\,x]^2\,(c+b\,\mathrm{Tan}[d+e\,x])}\;+$$

$$\frac{1}{256\,c^{9/2}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}}\Big(b\,(7\,b^4-8\,b^2\,c\,(5\,a+2\,c)+16\,c^2\,(3\,a^2+4\,a\,c+8\,c^2))\,\mathrm{Log}[\mathrm{Tan}[d+e\,x]]-$$

$$128\,\sqrt{a-i\,b-c}\;c^{9/2}\,\mathrm{Log}\Big[\Big(-2\,c-2\,i\,a\,\mathrm{Tan}[d+e\,x]-b\,(i+\mathrm{Tan}[d+e\,x])+2\,i\,\sqrt{a-i\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\Big)\Big/$$

$$\Big(128\,(a-i\,b-c)^{3/2}\,c^4\,(-i+\mathrm{Tan}[d+e\,x])\Big)\Big]-$$

$$b\,(7\,b^4-8\,b^2\,c\,(5\,a+2\,c)+16\,c^2\,(3\,a^2+4\,a\,c+8\,c^2))\,\mathrm{Log}\Big[2\,c+b\,\mathrm{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\Big]+$$

$$128\,\sqrt{a+i\,b-c}\;c^{9/2}\,\mathrm{Log}\Big[\Big(2\,c+b\,(-i+\mathrm{Tan}[d+e\,x])-2\,i\,\Big(a\,\mathrm{Tan}[d+e\,x]+\sqrt{a+i\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\Big)\Big)\Big/$$

$$\Big(128\,(a+i\,b-c)^{3/2}\,c^4\,(i+\mathrm{Tan}[d+e\,x])\Big)\Big]\Big)\,\mathrm{Sec}[d+e\,x]^2\,\sqrt{a+\mathrm{Cot}[d+e\,x]^2\,(c+b\,\mathrm{Tan}[d+e\,x])}\;+$$

$$\Big(\Big(b\,(7\,b^4-8\,b^2\,c\,(5\,a+2\,c)+16\,c^2\,(3\,a^2+4\,a\,c+8\,c^2))\,\mathrm{Log}[\mathrm{Tan}[d+e\,x]]-128\,\sqrt{a-i\,b-c}\;c^{9/2}\,\mathrm{Log}\Big[\Big(-2\,c-2\,i\,a\,\mathrm{Tan}[d+e\,x]-$$

$$b\left(i+\text{Tan}[d+e x]\right)+2 i\sqrt{a-i b-c}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\Bigg)\Bigg/\left(128\left(a-i b-c\right)^{3/2}c^4\left(-i+\text{Tan}[d+e x]\right)\right)\Bigg]-$$

$$b\left(7 b^4-8 b^2 c\left(5 a+2 c\right)+16 c^2\left(3 a^2+4 a c+8 c^2\right)\right)\text{Log}\left[2 c+b\,\text{Tan}[d+e x]+2\sqrt{c}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\right]+$$

$$128\sqrt{a+i b-c}\;c^{9/2}\,\text{Log}\Bigg[\Bigg(2 c+b\left(-i+\text{Tan}[d+e x]\right)-2 i\left(a\,\text{Tan}[d+e x]+\sqrt{a+i b-c}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\right)\Bigg)\Bigg/$$

$$\left(128\left(a+i b-c\right)^{3/2}c^4\left(i+\text{Tan}[d+e x]\right)\right)\Bigg]\Bigg)\text{Tan}[d+e x]\left(b\,\text{Csc}[d+e x]^2-2\,\text{Cot}[d+e x]\,\text{Csc}[d+e x]^2\left(c+b\,\text{Tan}[d+e x]\right)\right)\Bigg)\Bigg/$$

$$\left(512\,c^{9/2}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\sqrt{a+\text{Cot}[d+e x]^2\left(c+b\,\text{Tan}[d+e x]\right)}\right)+$$

$$\frac{1}{256\,c^{9/2}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}}\text{Tan}[d+e x]\sqrt{a+\text{Cot}[d+e x]^2\left(c+b\,\text{Tan}[d+e x]\right)}$$

$$\Bigg(b\left(7 b^4-8 b^2 c\left(5 a+2 c\right)+16 c^2\left(3 a^2+4 a c+8 c^2\right)\right)\text{Csc}[d+e x]\,\text{Sec}[d+e x]-\Bigg(b\left(7 b^4-8 b^2 c\left(5 a+2 c\right)+16 c^2\left(3 a^2+4 a c+8 c^2\right)\right)$$

$$\left(b\,\text{Sec}[d+e x]^2+\frac{\sqrt{c}\left(a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+\text{Sec}[d+e x]^2\left(b+a\,\text{Tan}[d+e x]\right)\right)}{\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}}\right)\Bigg)\Bigg/$$

$$\left(2 c+b\,\text{Tan}[d+e x]+2\sqrt{c}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\right)-\Bigg(16384\left(a-i b-c\right)^2 c^{17/2}\left(-i+\text{Tan}[d+e x]\right)$$

$$\Bigg(\frac{-2 i a\,\text{Sec}[d+e x]^2-b\,\text{Sec}[d+e x]^2+\frac{i\sqrt{a-i b-c}\left(a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+\text{Sec}[d+e x]^2\left(b+a\,\text{Tan}[d+e x]\right)\right)}{\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}}}{128\left(a-i b-c\right)^{3/2}c^4\left(-i+\text{Tan}[d+e x]\right)}-$$

$$\left(\text{Sec}[d+e x]^2\left(-2 c-2 i a\,\text{Tan}[d+e x]-b\left(i+\text{Tan}[d+e x]\right)+2 i\sqrt{a-i b-c}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\right)\right)\Bigg/$$

$$\left(128\left(a-i b-c\right)^{3/2}c^4\left(-i+\text{Tan}[d+e x]\right)^2\right)\Bigg)\Bigg)\Bigg/$$

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

$$\left(16384\,(a+i\,b-c)^2\,c^{17/2}\,(i+\text{Tan}[d+e\,x])\left(\frac{b\,\text{Sec}[d+e\,x]^2-2\,i\left(a\,\text{Sec}[d+e\,x]^2+\frac{\sqrt{a+i\,b-c}\,\left(a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\text{Sec}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x])\right)}{2\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}\right)}{128\,(a+i\,b-c)^{3/2}\,c^4\,(i+\text{Tan}[d+e\,x])}-\right.\right.$$

$$\left(\text{Sec}[d+e\,x]^2\left(2\,c+b\,(-i+\text{Tan}[d+e\,x])-2\,i\left(a\,\text{Tan}[d+e\,x]+\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)\right)\right)\Big/$$

$$\left.\left.\left(128\,(a+i\,b-c)^{3/2}\,c^4\,(i+\text{Tan}[d+e\,x])^2\right)\right)\right)\Big/$$

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

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

$$\int \text{Cot}[d+e\,x]^3\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\,dx$$

Optimal (type 3, 747 leaves, 16 steps):

$$\left(\sqrt{a^2+b^2+c\left(c+\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c+\sqrt{a^2+b^2-2ac+c^2}\right)}\right.$$

$$\text{ArcTan}\Big[\Big(b^2+(a-c)\left(a-c-\sqrt{a^2+b^2-2ac+c^2}\right)-b\sqrt{a^2+b^2-2ac+c^2}\ \text{Cot}[d+ex]\Big)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}\sqrt{a^2+b^2+c\left(c+\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c+\sqrt{a^2+b^2-2ac+c^2}\right)}\ \sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\right)\Big]\Big)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}e\right)+\frac{b\,\text{ArcTanh}\left[\frac{b+2c\,\text{Cot}[d+ex]}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}\right]}{2\sqrt{c}\,e}-\frac{b\left(b^2-4ac\right)\text{ArcTanh}\left[\frac{b+2c\,\text{Cot}[d+ex]}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}\right]}{16c^{5/2}e}-$$

$$\left(\sqrt{a^2+b^2+c\left(c-\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c-\sqrt{a^2+b^2-2ac+c^2}\right)}\right.$$

$$\text{ArcTanh}\Big[\Big(b^2+(a-c)\left(a-c+\sqrt{a^2+b^2-2ac+c^2}\right)+b\sqrt{a^2+b^2-2ac+c^2}\ \text{Cot}[d+ex]\Big)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}\sqrt{a^2+b^2+c\left(c-\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c-\sqrt{a^2+b^2-2ac+c^2}\right)}\ \sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\right)\Big]\Big)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}e\right)+\frac{\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}{e}+\frac{b\left(b+2c\,\text{Cot}[d+ex]\right)\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}{8c^2e}-$$

$$\frac{\left(a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2\right)^{3/2}}{3ce}$$

Result (type 3, 3416 leaves) :

$$\frac{\left(\frac{3b^2-8ac+32c^2}{24c^2}-\frac{b\,\text{Cot}[d+ex]}{12c}-\frac{1}{3}\text{Csc}[d+ex]^2\right)\sqrt{\frac{-a-c+a\,\text{Cos}[2(d+ex)]-c\,\text{Cos}[2(d+ex)]-b\,\text{Sin}[2(d+ex)]}{-1+\text{Cos}[2(d+ex)]}}}{e}+$$

$$\Bigg(\Big(b\left(b^2-4c(a+2c)\right)\text{Log}[\text{Tan}[d+ex]]-8\sqrt{a+ib-c}\ c^{5/2}$$

$$\text{Log}\Big[\Big(i\left(b+2ic+2a\,\text{Tan}[d+ex]+ib\,\text{Tan}[d+ex]+2\sqrt{a+ib-c}\sqrt{c+\text{Tan}[d+ex]\left(b+a\,\text{Tan}[d+ex]\right)}\right)\Big)\Big/$$

$$\left(8(a+ib-c)^{3/2}c^2\left(i+\text{Tan}[d+ex]\right)\right)\Big]-b\left(b^2-4c(a+2c)\right)\text{Log}\left[2c+b\,\text{Tan}[d+ex]+2\sqrt{c}\sqrt{c+\text{Tan}[d+ex]\left(b+a\,\text{Tan}[d+ex]\right)}\right]+$$

$$8\sqrt{a-ib-c}\ c^{5/2}\,\text{Log}\Big[\Big(b\left(i+\text{Tan}[d+ex]\right)+2\left(c+ia\,\text{Tan}[d+ex]-i\sqrt{a-ib-c}\sqrt{c+\text{Tan}[d+ex]\left(b+a\,\text{Tan}[d+ex]\right)}\right)\Big)\Big/$$

$$\left(8\left(a-\mathrm{i}\,b-c\right)^{3/2}c^{2}\left(-\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)\right)\Big]\Big)\left(\frac{b^{3}\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{8\,c^{2}\left(a+c-a\,\mathrm{Cos}\left[2\left(d+e\,x\right)\right]+c\,\mathrm{Cos}\left[2\left(d+e\,x\right)\right]+b\,\mathrm{Sin}\left[2\left(d+e\,x\right)\right]\right)}-\right.$$

$$\frac{a\,b\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{2\,c\left(a+c-a\,\mathrm{Cos}\left[2\left(d+e\,x\right)\right]+c\,\mathrm{Cos}\left[2\left(d+e\,x\right)\right]+b\,\mathrm{Sin}\left[2\left(d+e\,x\right)\right]\right)}-$$

$$\frac{b\,\mathrm{Cos}\left[2\left(d+e\,x\right)\right]\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{a+c-a\,\mathrm{Cos}\left[2\left(d+e\,x\right)\right]+c\,\mathrm{Cos}\left[2\left(d+e\,x\right)\right]+b\,\mathrm{Sin}\left[2\left(d+e\,x\right)\right]}-$$

$$\frac{a\,\mathrm{Sin}\left[2\left(d+e\,x\right)\right]\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{a+c-a\,\mathrm{Cos}\left[2\left(d+e\,x\right)\right]+c\,\mathrm{Cos}\left[2\left(d+e\,x\right)\right]+b\,\mathrm{Sin}\left[2\left(d+e\,x\right)\right]}+$$

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

$$\left.\mathrm{Tan}[d+e\,x]\sqrt{a+\mathrm{Cot}[d+e\,x]^{2}\left(c+b\,\mathrm{Tan}[d+e\,x]\right)}\right)\Big/$$

$$\left(16\,c^{5/2}\,e\sqrt{c+\mathrm{Tan}[d+e\,x]\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}\right)\left(-\frac{1}{32\,c^{5/2}\left(c+\mathrm{Tan}[d+e\,x]\left(b+a\,\mathrm{Tan}[d+e\,x]\right)\right)^{3/2}}\right.$$

$$\left(b\left(b^{2}-4\,c\left(a+2\,c\right)\right)\mathrm{Log}[\mathrm{Tan}[d+e\,x]]-8\sqrt{a+\mathrm{i}\,b-c}\;c^{5/2}\,\mathrm{Log}\Big[\Big(\mathrm{i}\left(b+2\,\mathrm{i}\,c+2\,a\,\mathrm{Tan}[d+e\,x]+\mathrm{i}\,b\,\mathrm{Tan}[d+e\,x]+\right.\right.$$

$$\left.\left.2\sqrt{a+\mathrm{i}\,b-c}\sqrt{c+\mathrm{Tan}[d+e\,x]\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}\right)\Big)\Big/\left(8\left(a+\mathrm{i}\,b-c\right)^{3/2}c^{2}\left(\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)\right)\Big]-b\left(b^{2}-4\,c\left(a+2\,c\right)\right)$$

$$\mathrm{Log}\left[2\,c+b\,\mathrm{Tan}[d+e\,x]+2\sqrt{c}\sqrt{c+\mathrm{Tan}[d+e\,x]\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}\right]+8\sqrt{a-\mathrm{i}\,b-c}\;c^{5/2}\,\mathrm{Log}\Big[\Big(b\left(\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)+$$

$$\left.2\left(c+\mathrm{i}\,a\,\mathrm{Tan}[d+e\,x]-\mathrm{i}\sqrt{a-\mathrm{i}\,b-c}\sqrt{c+\mathrm{Tan}[d+e\,x]\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}\right)\Big)\Big/\left(8\left(a-\mathrm{i}\,b-c\right)^{3/2}c^{2}\left(-\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)\right)\Big]\right)$$

$$\text{Tan}[d+e x]\ \left(a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+\text{Sec}[d+e x]^2\left(b+a\,\text{Tan}[d+e x]\right)\right)\sqrt{a+\text{Cot}[d+e x]^2\left(c+b\,\text{Tan}[d+e x]\right)}\ +$$

$$\frac{1}{16\,c^{5/2}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}}\Bigg(b\left(b^2-4\,c\left(a+2\,c\right)\right)\text{Log}[\text{Tan}[d+e x]]-8\sqrt{a+\mathrm{i}\,b-c}\ c^{5/2}$$

$$\text{Log}\Big[\Big(\mathrm{i}\left(b+2\,\mathrm{i}\,c+2\,a\,\text{Tan}[d+e x]+\mathrm{i}\,b\,\text{Tan}[d+e x]+2\sqrt{a+\mathrm{i}\,b-c}\ \sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\right)\Big)\Big/\Big(8\left(a+\mathrm{i}\,b-c\right)^{3/2}$$

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

$$8\sqrt{a-\mathrm{i}\,b-c}\ c^{5/2}\,\text{Log}\Big[\Big(b\left(\mathrm{i}+\text{Tan}[d+e x]\right)+2\left(c+\mathrm{i}\,a\,\text{Tan}[d+e x]-\mathrm{i}\sqrt{a-\mathrm{i}\,b-c}\ \sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\right)\Big)\Big/$$

$$\Big(8\left(a-\mathrm{i}\,b-c\right)^{3/2}c^2\left(-\mathrm{i}+\text{Tan}[d+e x]\right)\Big)\Big]\Bigg)\,\text{Sec}[d+e x]^2\sqrt{a+\text{Cot}[d+e x]^2\left(c+b\,\text{Tan}[d+e x]\right)}\ +$$

$$\Bigg(\bigg(b\left(b^2-4\,c\left(a+2\,c\right)\right)\text{Log}[\text{Tan}[d+e x]]-8\sqrt{a+\mathrm{i}\,b-c}\ c^{5/2}\,\text{Log}\Big[\Big(\mathrm{i}\left(b+2\,\mathrm{i}\,c+2\,a\,\text{Tan}[d+e x]+\mathrm{i}\,b\,\text{Tan}[d+e x]+\right.$$

$$\left.2\sqrt{a+\mathrm{i}\,b-c}\ \sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\right)\Big)\Big/\Big(8\left(a+\mathrm{i}\,b-c\right)^{3/2}c^2\left(\mathrm{i}+\text{Tan}[d+e x]\right)\Big)\Big]-$$

$$b\left(b^2-4\,c\left(a+2\,c\right)\right)\text{Log}\Big[2\,c+b\,\text{Tan}[d+e x]+2\sqrt{c}\ \sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\Big]+8\sqrt{a-\mathrm{i}\,b-c}\ c^{5/2}$$

$$\text{Log}\Big[\Big(b\left(\mathrm{i}+\text{Tan}[d+e x]\right)+2\left(c+\mathrm{i}\,a\,\text{Tan}[d+e x]-\mathrm{i}\sqrt{a-\mathrm{i}\,b-c}\ \sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\right)\Big)\Big/$$

$$\Big(8\left(a-\mathrm{i}\,b-c\right)^{3/2}c^2\left(-\mathrm{i}+\text{Tan}[d+e x]\right)\Big)\Big]\bigg)\,\text{Tan}[d+e x]\left(b\,\text{Csc}[d+e x]^2-2\,\text{Cot}[d+e x]\,\text{Csc}[d+e x]^2\left(c+b\,\text{Tan}[d+e x]\right)\right)\Bigg)\Big/$$

$$\left(32\,c^{5/2}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\ \sqrt{a+\text{Cot}[d+e x]^2\left(c+b\,\text{Tan}[d+e x]\right)}\right)+\frac{1}{16\,c^{5/2}\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}}$$

$$\text{Tan}[d+e x]\sqrt{a+\text{Cot}[d+e x]^2\left(c+b\,\text{Tan}[d+e x]\right)}\ \Bigg(b\left(b^2-4\,c\left(a+2\,c\right)\right)\text{Csc}[d+e x]\,\text{Sec}[d+e x]\ -$$

$$\frac{b\left(b^2-4\,c\left(a+2\,c\right)\right)\left(b\,\text{Sec}[d+e x]^2+\frac{\sqrt{c}\ \left(a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+\text{Sec}[d+e x]^2\left(b+a\,\text{Tan}[d+e x]\right)\right)}{\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}}\right)}{2\,c+b\,\text{Tan}[d+e x]+2\sqrt{c}\ \sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}}+\bigg(64\,\mathrm{i}\left(a+\mathrm{i}\,b-c\right)^2c^{9/2}\left(\mathrm{i}+\text{Tan}[d+e x]\right)$$

$$\left(\left(\mathrm{i}\left(2\,a\,\text{Sec}[d+e x]^2+\mathrm{i}\,b\,\text{Sec}[d+e x]^2+\frac{\sqrt{a+\mathrm{i}\,b-c}\ \left(a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+\text{Sec}[d+e x]^2\left(b+a\,\text{Tan}[d+e x]\right)\right)}{\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}}\right)\right)\right.\Big/$$

$$\left(8\left(a+\mathrm{i}\,b-c\right)^{3/2}c^2\left(\mathrm{i}+\text{Tan}[d+e x]\right)\right)-\left(\mathrm{i}\,\text{Sec}[d+e x]^2\left(b+2\,\mathrm{i}\,c+2\,a\,\text{Tan}[d+e x]+\mathrm{i}\,b\,\text{Tan}[d+e x]+2\sqrt{a+\mathrm{i}\,b-c}\right.\right.$$

$$\left.\left.\left.\sqrt{c+\text{Tan}[d+e x]\left(b+a\,\text{Tan}[d+e x]\right)}\right)\right)\Big/\left(8\left(a+\mathrm{i}\,b-c\right)^{3/2}c^2\left(\mathrm{i}+\text{Tan}[d+e x]\right)^2\right)\right)\Big/\Big(b+2\,\mathrm{i}\,c+2\,a\,\text{Tan}[d+e x]\ +$$

$$\mathrm{i}\, b \,\mathrm{Tan}[d+e x]+2 \sqrt{a+\mathrm{i}\, b-c} \sqrt{c+\mathrm{Tan}[d+e x]\,(b+a \,\mathrm{Tan}[d+e x])}\Bigg)+\Bigg(64\,(a-\mathrm{i}\, b-c)^2 c^{9/2}\,(-\mathrm{i}+\mathrm{Tan}[d+e x])$$

$$\left(\left(\left(b \,\mathrm{Sec}[d+e x]^2+2\left(\mathrm{i}\, a \,\mathrm{Sec}[d+e x]^2-\frac{\mathrm{i} \sqrt{a-\mathrm{i}\, b-c}\,\left(a \,\mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x]+\mathrm{Sec}[d+e x]^2\,(b+a \,\mathrm{Tan}[d+e x])\right)}{2 \sqrt{c+\mathrm{Tan}[d+e x]\,(b+a \,\mathrm{Tan}[d+e x])}}\right)\right)\right/\right.$$

$$\left(8\,(a-\mathrm{i}\, b-c)^{3/2} c^2\,(-\mathrm{i}+\mathrm{Tan}[d+e x])\right)-\Bigg(\mathrm{Sec}[d+e x]^2\,\Bigg(b\,(\mathrm{i}+\mathrm{Tan}[d+e x])+2\,\Bigg(c+\mathrm{i}\, a \,\mathrm{Tan}[d+e x]-$$

$$\mathrm{i} \sqrt{a-\mathrm{i}\, b-c} \sqrt{c+\mathrm{Tan}[d+e x]\,(b+a \,\mathrm{Tan}[d+e x])}\Bigg)\Bigg)\Bigg)\Bigg/\left(8\,(a-\mathrm{i}\, b-c)^{3/2} c^2\,(-\mathrm{i}+\mathrm{Tan}[d+e x])^2\right)\Bigg)\Bigg/$$

$$\left(b\,(\mathrm{i}+\mathrm{Tan}[d+e x])+2\left(c+\mathrm{i}\, a \,\mathrm{Tan}[d+e x]-\mathrm{i} \sqrt{a-\mathrm{i}\, b-c} \sqrt{c+\mathrm{Tan}[d+e x]\,(b+a \,\mathrm{Tan}[d+e x])}\right)\right)\Bigg)\Bigg)\Bigg)$$

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

$$\int \mathrm{Cot}[d+e x] \sqrt{a+b \,\mathrm{Cot}[d+e x]+c \,\mathrm{Cot}[d+e x]^2}\, dx$$

Optimal (type 3, 602 leaves, 10 steps) :

$$-\left(\left(\sqrt{a^2+b^2+c\left(c+\sqrt{a^2+b^2-2\,a\,c+c^2}\right)-a\left(2\,c+\sqrt{a^2+b^2-2\,a\,c+c^2}\right)}\right.\right.$$

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

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

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

$$\left(\sqrt{a^2+b^2+c\left(c-\sqrt{a^2+b^2-2\,a\,c+c^2}\right)-a\left(2\,c-\sqrt{a^2+b^2-2\,a\,c+c^2}\right)}\right.$$

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

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

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

Result (type 3, 2871 leaves) :

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

$$\sqrt{a+i\,b-c}\,\text{Log}\Big[\left(i\left(b+2\,i\,c+2\,a\,\text{Tan}[d+e\,x]+i\,b\,\text{Tan}[d+e\,x]+2\,\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]}\,\left(b+a\,\text{Tan}[d+e\,x]\right)\right)\right)\Big/$$

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

$$\sqrt{a-i\,b-c}\,\text{Log}\Big[\left(b\left(i+\text{Tan}[d+e\,x]\right)+2\left(c+i\,a\,\text{Tan}[d+e\,x]-i\,\sqrt{a-i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]}\,\left(b+a\,\text{Tan}[d+e\,x]\right)\right)\right)\Big/$$

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

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

$$\left.\left.\left.\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}\right)\right)\Big/\left(-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)]\right)\right)-$$

$$\frac{a\,\text{Sin}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)]}+$$

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

$$\left.\text{Tan}[d+e\,x]\,\sqrt{a+\text{Cot}[d+e\,x]^2\,(c+b\,\text{Tan}[d+e\,x])}\right)\Big/\left(2\,e\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right.$$

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

$$\sqrt{a+i\,b-c}\,\text{Log}\left[\left(i\,\left(b+2\,i\,c+2\,a\,\text{Tan}[d+e\,x]+i\,b\,\text{Tan}[d+e\,x]+2\,\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)\right)\Big/\right.$$

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

$$\sqrt{a-i\,b-c}\,\text{Log}\left[\left(b\,(i+\text{Tan}[d+e\,x])+2\,\left(c+i\,a\,\text{Tan}[d+e\,x]-i\,\sqrt{a-i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)\right)\Big/\right.$$

$$\left.\left.\left((a-i\,b-c)^{3/2}\,(-i+\text{Tan}[d+e\,x])\right)\right]\right)\,\text{Tan}[d+e\,x]\,\left(a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\text{Sec}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x])\right)\Big)$$

$$\sqrt{a+\text{Cot}[d+e x]^2\,(c+b\,\text{Tan}[d+e x])}-\frac{1}{2\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}}\Bigg(-\frac{b\,\text{Log}[\text{Tan}[d+e x]]}{\sqrt{c}}-$$

$$\sqrt{a+i b-c}\,\text{Log}\Big[\Big(i\,\Big(b+2 i c+2 a\,\text{Tan}[d+e x]+i b\,\text{Tan}[d+e x]+2\sqrt{a+i b-c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\Big)\Big)\Big/$$

$$\Big((a+i b-c)^{3/2}\,(i+\text{Tan}[d+e x])\Big)\Big]+\frac{b\,\text{Log}\Big[2 c+b\,\text{Tan}[d+e x]+2\sqrt{c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\Big]}{\sqrt{c}}+$$

$$\sqrt{a-i b-c}\,\text{Log}\Big[\Big(b\,(i+\text{Tan}[d+e x])+2\Big(c+i a\,\text{Tan}[d+e x]-i\sqrt{a-i b-c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\Big)\Big)\Big/$$

$$\Big((a-i b-c)^{3/2}\,(-i+\text{Tan}[d+e x])\Big)\Big]\Bigg)\,\text{Sec}[d+e x]^2\sqrt{a+\text{Cot}[d+e x]^2\,(c+b\,\text{Tan}[d+e x])}-\Bigg(\Bigg(-\frac{b\,\text{Log}[\text{Tan}[d+e x]]}{\sqrt{c}}-$$

$$\sqrt{a+i b-c}\,\text{Log}\Big[\Big(i\,\Big(b+2 i c+2 a\,\text{Tan}[d+e x]+i b\,\text{Tan}[d+e x]+2\sqrt{a+i b-c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\Big)\Big)\Big/$$

$$\Big((a+i b-c)^{3/2}\,(i+\text{Tan}[d+e x])\Big)\Big]+\frac{b\,\text{Log}\Big[2 c+b\,\text{Tan}[d+e x]+2\sqrt{c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\Big]}{\sqrt{c}}+$$

$$\sqrt{a-i b-c}\,\text{Log}\Big[\Big(b\,(i+\text{Tan}[d+e x])+2\Big(c+i a\,\text{Tan}[d+e x]-i\sqrt{a-i b-c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\Big)\Big)\Big/$$

$$\Big((a-i b-c)^{3/2}\,(-i+\text{Tan}[d+e x])\Big)\Big]\Bigg)\,\text{Tan}[d+e x]\,\Big(b\,\text{Csc}[d+e x]^2-2\,\text{Cot}[d+e x]\,\text{Csc}[d+e x]^2\,(c+b\,\text{Tan}[d+e x])\Big)\Bigg)\Bigg/$$

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

$$\text{Tan}[d+e x]\,\sqrt{a+\text{Cot}[d+e x]^2\,(c+b\,\text{Tan}[d+e x])}$$

$$\Bigg(-\frac{b\,\text{Csc}[d+e x]\,\text{Sec}[d+e x]}{\sqrt{c}}+\frac{b\left(b\,\text{Sec}[d+e x]^2+\frac{\sqrt{c}\,(a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+\text{Sec}[d+e x]^2\,(b+a\,\text{Tan}[d+e x]))}{\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}}\right)}{\sqrt{c}\,\Big(2 c+b\,\text{Tan}[d+e x]+2\sqrt{c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\Big)}+\Bigg(i\,(a+i b-c)^2\,(i+\text{Tan}[d+e x])$$

$$\Bigg(\Bigg(i\,\Bigg(2 a\,\text{Sec}[d+e x]^2+i b\,\text{Sec}[d+e x]^2+\frac{\sqrt{a+i b-c}\,\big(a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+\text{Sec}[d+e x]^2\,(b+a\,\text{Tan}[d+e x])\big)}{\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}}\Bigg)\Bigg)\Bigg/$$

$$\Big((a+i b-c)^{3/2}\,(i+\text{Tan}[d+e x])\Big)-\Big(i\,\text{Sec}[d+e x]^2\,\Big(b+2 i c+2 a\,\text{Tan}[d+e x]+i b\,\text{Tan}[d+e x]+$$

$$2\sqrt{a+i b-c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\Big)\Big)\Big/\Big((a+i b-c)^{3/2}\,(i+\text{Tan}[d+e x])^2\Big)\Bigg)\Bigg)\Bigg/$$

$$\left(b+2\,\mathrm{i}\,c+2\,a\,\mathrm{Tan}[d+e\,x]+\mathrm{i}\,b\,\mathrm{Tan}[d+e\,x]+2\,\sqrt{a+\mathrm{i}\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}\right)+\Bigg(\left(a-\mathrm{i}\,b-c\right)^2\,\left(-\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)$$

$$\left(\left(b\,\mathrm{Sec}[d+e\,x]^2+2\,\left(\mathrm{i}\,a\,\mathrm{Sec}[d+e\,x]^2-\frac{\mathrm{i}\,\sqrt{a-\mathrm{i}\,b-c}\,\left(a\,\mathrm{Sec}[d+e\,x]^2\,\mathrm{Tan}[d+e\,x]+\mathrm{Sec}[d+e\,x]^2\,\left(b+a\,\mathrm{Tan}[d+e\,x]\right)\right)}{2\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}}\right)\right)\Big/\right.$$

$$\left(\left(a-\mathrm{i}\,b-c\right)^{3/2}\,\left(-\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)\right)-\Bigg(\mathrm{Sec}[d+e\,x]^2\,\Bigg(b\,\left(\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)+$$

$$\left.2\,\left(c+\mathrm{i}\,a\,\mathrm{Tan}[d+e\,x]-\mathrm{i}\,\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}\right)\Bigg)\Bigg)\Big/\left(\left(a-\mathrm{i}\,b-c\right)^{3/2}\,\left(-\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)^2\right)\right)\Big/$$

$$\left.\left.\left(b\,\left(\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)+2\,\left(c+\mathrm{i}\,a\,\mathrm{Tan}[d+e\,x]-\mathrm{i}\,\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}\right)\right)\right)\right)\Bigg)$$

Problem 9: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{a+b\,\mathrm{Cot}[d+e\,x]+c\,\mathrm{Cot}[d+e\,x]^2}\;\mathrm{Tan}[d+e\,x]\,dx$$

Optimal (type 3, 570 leaves, 18 steps):

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

Result (type 3, 2361 leaves) :

$$\left(\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\ \left(2\sqrt{a}\ \text{Log}\Big[b+2a\,\text{Tan}[d+ex]+2\sqrt{a}\ \sqrt{c+\text{Tan}[d+ex]\,(b+a\,\text{Tan}[d+ex])}\Big]-\right.\right.$$
$$\sqrt{a+ib-c}\ \text{Log}\Big[\Big(2i\left(b+2ic+2a\,\text{Tan}[d+ex]+ib\,\text{Tan}[d+ex]+2\sqrt{a+ib-c}\ \sqrt{c+\text{Tan}[d+ex]\,(b+a\,\text{Tan}[d+ex])}\right)\Big)\Big/$$
$$\left((a+ib-c)^{3/2}\,(i+\text{Tan}[d+ex])\right)\Big]+$$
$$\sqrt{a-ib-c}\ \text{Log}\Big[\Big(2b\,(i+\text{Tan}[d+ex])+4\left(c+ia\,\text{Tan}[d+ex]-i\sqrt{a-ib-c}\ \sqrt{c+\text{Tan}[d+ex]\,(b+a\,\text{Tan}[d+ex])}\right)\Big)\Big/$$
$$\left.\left((a-ib-c)^{3/2}\,(-i+\text{Tan}[d+ex])\right)\Big]\right)$$
$$\sqrt{\left(-\frac{a}{-1+\text{Cos}[2(d+ex)]}-\frac{c}{-1+\text{Cos}[2(d+ex)]}+\frac{a\,\text{Cos}[2(d+ex)]}{-1+\text{Cos}[2(d+ex)]}-\frac{c\,\text{Cos}[2(d+ex)]}{-1+\text{Cos}[2(d+ex)]}-\frac{b\,\text{Sin}[2(d+ex)]}{-1+\text{Cos}[2(d+ex)]}\right)}$$
$$\left.\text{Tan}[d+ex]^2\right)\Big/$$

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

$$\sqrt{a+b\,\mathrm{Cot}[d+e x]+c\,\mathrm{Cot}[d+e x]^2}\,\Big(2\sqrt{a}\,\mathrm{Log}\big[b+2 a\,\mathrm{Tan}[d+e x]+2\sqrt{a}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}\big]-$$

$$\sqrt{a+i b-c}\,\mathrm{Log}\Big[\Big(2 i\,\Big(b+2 i c+2 a\,\mathrm{Tan}[d+e x]+i b\,\mathrm{Tan}[d+e x]+2\sqrt{a+i b-c}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}\Big)\Big)\Big/$$

$$\Big((a+i b-c)^{3/2}\,(i+\mathrm{Tan}[d+e x])\Big)\Big]+\sqrt{a-i b-c}\,\mathrm{Log}\Big[\Big(2 b\,(i+\mathrm{Tan}[d+e x])+4$$

$$\Big(c+i a\,\mathrm{Tan}[d+e x]-i\sqrt{a-i b-c}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}\Big)\Big)\Big/\Big((a-i b-c)^{3/2}\,(-i+\mathrm{Tan}[d+e x])\Big)\Big]\Big)$$

$$\mathrm{Tan}[d+e x]\,\left(a\,\mathrm{Sec}[d+e x]^2\,\mathrm{Tan}[d+e x]+\mathrm{Sec}[d+e x]^2\,(b+a\,\mathrm{Tan}[d+e x])\right)+\frac{1}{2\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}}$$

$$\sqrt{a+b\,\mathrm{Cot}[d+e x]+c\,\mathrm{Cot}[d+e x]^2}\,\Big(2\sqrt{a}\,\mathrm{Log}\big[b+2 a\,\mathrm{Tan}[d+e x]+2\sqrt{a}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}\big]-$$

$$\sqrt{a+i b-c}\,\mathrm{Log}\Big[\Big(2 i\,\Big(b+2 i c+2 a\,\mathrm{Tan}[d+e x]+i b\,\mathrm{Tan}[d+e x]+2\sqrt{a+i b-c}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}\Big)\Big)\Big/$$

$$\Big((a+i b-c)^{3/2}\,(i+\mathrm{Tan}[d+e x])\Big)\Big]+\sqrt{a-i b-c}\,\mathrm{Log}\Big[\Big(2 b\,(i+\mathrm{Tan}[d+e x])+4\Big(c+i a\,\mathrm{Tan}[d+e x]-$$

$$i\sqrt{a-i b-c}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}\Big)\Big)\Big/\Big((a-i b-c)^{3/2}\,(-i+\mathrm{Tan}[d+e x])\Big)\Big]\Big)\,\mathrm{Sec}[d+e x]^2+$$

$$\Big(\Big(-b\,\mathrm{Csc}[d+e x]^2-2 c\,\mathrm{Cot}[d+e x]\,\mathrm{Csc}[d+e x]^2\Big)\,\Big(2\sqrt{a}\,\mathrm{Log}\big[b+2 a\,\mathrm{Tan}[d+e x]+2\sqrt{a}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}\big]-$$

$$\sqrt{a+i b-c}\,\mathrm{Log}\Big[\Big(2 i\,\Big(b+2 i c+2 a\,\mathrm{Tan}[d+e x]+i b\,\mathrm{Tan}[d+e x]+2\sqrt{a+i b-c}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}\Big)\Big)\Big/$$

$$\Big((a+i b-c)^{3/2}\,(i+\mathrm{Tan}[d+e x])\Big)\Big]+\sqrt{a-i b-c}\,\mathrm{Log}\Big[\Big(2 b\,(i+\mathrm{Tan}[d+e x])+4\Big(c+i a\,\mathrm{Tan}[d+e x]-$$

$$i\sqrt{a-i b-c}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}\Big)\Big)\Big/\Big((a-i b-c)^{3/2}\,(-i+\mathrm{Tan}[d+e x])\Big)\Big]\Big)\,\mathrm{Tan}[d+e x]\Big)\Big/$$

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

$$\sqrt{a+b\,\mathrm{Cot}[d+e x]+c\,\mathrm{Cot}[d+e x]^2}\,\mathrm{Tan}[d+e x]$$

$$\left(\frac{2\sqrt{a}\left(2 a\,\mathrm{Sec}[d+e x]^2+\frac{\sqrt{a}\,\left(a\,\mathrm{Sec}[d+e x]^2\,\mathrm{Tan}[d+e x]+\mathrm{Sec}[d+e x]^2\,(b+a\,\mathrm{Tan}[d+e x])\right)}{\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}}\right)}{b+2 a\,\mathrm{Tan}[d+e x]+2\sqrt{a}\sqrt{c+\mathrm{Tan}[d+e x]\,(b+a\,\mathrm{Tan}[d+e x])}}+\left(i\,(a+i b-c)^2\,(i+\mathrm{Tan}[d+e x])\right)\right.$$

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

$$\left((a+i\,b-c)^{3/2}\,(i+\text{Tan}[d+e\,x])\right)-\left(2\,i\,\text{Sec}[d+e\,x]^2\,\left(b+2\,i\,c+2\,a\,\text{Tan}[d+e\,x]+i\,b\,\text{Tan}[d+e\,x]+2\,\sqrt{a+i\,b-c}\right.\right.$$

$$\left.\left.\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)\right)\Big/\left((a+i\,b-c)^{3/2}\,(i+\text{Tan}[d+e\,x])^2\right)\Bigg)\Bigg/\Big(2\,\Big(b+2\,i\,c+2\,a\,\text{Tan}[d+e\,x]+$$

$$i\,b\,\text{Tan}[d+e\,x]+2\,\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Big)+\Bigg((a-i\,b-c)^2\,(-i+\text{Tan}[d+e\,x])$$

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

$$\left((a-i\,b-c)^{3/2}\,(-i+\text{Tan}[d+e\,x])\right)-\Big(\text{Sec}[d+e\,x]^2\,\Big(2\,b\,(i+\text{Tan}[d+e\,x])+$$

$$4\left(c+i\,a\,\text{Tan}[d+e\,x]-i\,\sqrt{a-i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)\Big)\Big)\Big/\left((a-i\,b-c)^{3/2}\,(-i+\text{Tan}[d+e\,x])^2\right)\Bigg)\Bigg/$$

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

Problem 10: Humongous result has more than 200000 leaves.

$$\int\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\,\text{Tan}[d+e\,x]^3\,dx$$

Optimal (type 3, 691 leaves, 21 steps):

$$-\left(\left(\sqrt{a^2+b^2+c\left(c+\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c+\sqrt{a^2+b^2-2ac+c^2}\right)}\right.\right.$$
$$\text{ArcTan}\Big[\Big(b^2+(a-c)\left(a-c-\sqrt{a^2+b^2-2ac+c^2}\right)-b\sqrt{a^2+b^2-2ac+c^2}\,\text{Cot}[d+ex]\Big)\Big/$$
$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}\sqrt{a^2+b^2+c\left(c+\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c+\sqrt{a^2+b^2-2ac+c^2}\right)}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\right)\Big]\Big)\Big/$$
$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}e\right)\Big)-\frac{\sqrt{a}\,\text{ArcTanh}\Big[\frac{2a+b\,\text{Cot}[d+ex]}{2\sqrt{a}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}\Big]}{e}-\frac{\left(b^2-4ac\right)\text{ArcTanh}\Big[\frac{2a+b\,\text{Cot}[d+ex]}{2\sqrt{a}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}\Big]}{8a^{3/2}e}+$$
$$\left(\sqrt{a^2+b^2+c\left(c-\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c-\sqrt{a^2+b^2-2ac+c^2}\right)}\right.$$
$$\text{ArcTanh}\Big[\Big(b^2+(a-c)\left(a-c+\sqrt{a^2+b^2-2ac+c^2}\right)+b\sqrt{a^2+b^2-2ac+c^2}\,\text{Cot}[d+ex]\Big)\Big/$$
$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}\sqrt{a^2+b^2+c\left(c-\sqrt{a^2+b^2-2ac+c^2}\right)-a\left(2c-\sqrt{a^2+b^2-2ac+c^2}\right)}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\right)\Big]\Big)\Big/$$
$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{1/4}e\right)+\frac{\left(2a+b\,\text{Cot}[d+ex]\right)\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\,\text{Tan}[d+ex]^2}{4ae}$$

Result (type ?, 465 721 leaves) : Display of huge result suppressed!

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

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

Optimal (type 3, 1189 leaves, 20 steps) :

$$-\frac{3b\,\text{ArcTanh}\Big[\frac{b+2c\,\text{Cot}[d+ex]}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}\Big]}{2c^{5/2}e}+\frac{5b\left(7b^2-12ac\right)\text{ArcTanh}\Big[\frac{b+2c\,\text{Cot}[d+ex]}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}\Big]}{16c^{9/2}e}+$$
$$\left(\sqrt{2a-2c-\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a^2-b^2-2ac+c^2+(a-c)\sqrt{a^2+b^2-2ac+c^2}}\right.$$
$$\text{ArcTanh}\Big[\Big(b^2-(a-c)\left(a-c+\sqrt{a^2+b^2-2ac+c^2}\right)-b\left(2a-2c-\sqrt{a^2+b^2-2ac+c^2}\right)\text{Cot}[d+ex]\Big)\Big/$$

$$\left(\sqrt{2}\sqrt{2a-2c-\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a^2-b^2-2ac+c^2+(a-c)\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a+b\,\mathrm{Cot}[d+e\,x]+c\,\mathrm{Cot}[d+e\,x]^2}\right)\Big]\Big)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{3/2}e\right)-\left(\sqrt{2a-2c+\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a^2-b^2-2ac+c^2-(a-c)\sqrt{a^2+b^2-2ac+c^2}}\right.$$

$$\mathrm{ArcTanh}\Big[\left(b^2-(a-c)\left(a-c-\sqrt{a^2+b^2-2ac+c^2}\right)-b\left(2a-2c+\sqrt{a^2+b^2-2ac+c^2}\right)\mathrm{Cot}[d+e\,x]\right)\Big/$$

$$\left(\sqrt{2}\sqrt{2a-2c+\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a^2-b^2-2ac+c^2-(a-c)\sqrt{a^2+b^2-2ac+c^2}}\sqrt{a+b\,\mathrm{Cot}[d+e\,x]+c\,\mathrm{Cot}[d+e\,x]^2}\right)\Big]\Big)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{3/2}e\right)-\frac{2\left(2a+b\,\mathrm{Cot}[d+e\,x]\right)}{\left(b^2-4ac\right)e\sqrt{a+b\,\mathrm{Cot}[d+e\,x]+c\,\mathrm{Cot}[d+e\,x]^2}}+$$

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

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

$$\frac{\left(7b^2-16ac\right)\mathrm{Cot}[d+e\,x]^2\sqrt{a+b\,\mathrm{Cot}[d+e\,x]+c\,\mathrm{Cot}[d+e\,x]^2}}{3c^2\left(b^2-4ac\right)e}+$$

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

$$\frac{\left(3b^2-8ac-2bc\,\mathrm{Cot}[d+e\,x]\right)\sqrt{a+b\,\mathrm{Cot}[d+e\,x]+c\,\mathrm{Cot}[d+e\,x]^2}}{c^2\left(b^2-4ac\right)e}-$$

$$\frac{\left(105b^4-460ab^2c+256a^2c^2-2bc\left(35b^2-116ac\right)\mathrm{Cot}[d+e\,x]\right)\sqrt{a+b\,\mathrm{Cot}[d+e\,x]+c\,\mathrm{Cot}[d+e\,x]^2}}{24c^4\left(b^2-4ac\right)e}$$

Result (type 3, 5618 leaves) :

$$\frac{1}{e}\sqrt{\frac{-a-c+a\,\mathrm{Cos}[2(d+e\,x)]-c\,\mathrm{Cos}[2(d+e\,x)]-b\,\mathrm{Sin}[2(d+e\,x)]}{-1+\mathrm{Cos}[2(d+e\,x)]}}$$

$$\Big(\big(105a^3b^4+105ab^6-460a^4b^2c-727a^2b^4c-57b^6c+256a^5c^2+1364a^3b^2c^2+407ab^4c^2-448a^4c^3-740a^2b^2c^3-$$

$$25 b^4 c^3+96 a^3 c^4+44 a b^2 c^4+224 a^2 c^5+32 b^2 c^5-128 a c^6\Big)\Big/\Big(24 (a-c) (a-i b-c) (a+i b-c) c^4 \left(-b^2+4 a c\right)\Big)+$$

$$\frac{11 b \operatorname{Cot}[d+e x]}{12 c^3}-\frac{\operatorname{Csc}[d+e x]^2}{3 c^2}+\Big(2 \Big(2 a^3 b^4+2 a b^6-8 a^4 b^2 c-12 a^2 b^4 c+4 a^5 c^2+18 a^3 b^2 c^2-4 a^4 c^3+a^4 b^3 \operatorname{Sin}[2 (d+e x)]+$$

$$2 a^2 b^5 \operatorname{Sin}[2 (d+e x)]+b^7 \operatorname{Sin}[2 (d+e x)]-3 a^5 b c \operatorname{Sin}[2 (d+e x)]-10 a^3 b^3 c \operatorname{Sin}[2 (d+e x)]-$$

$$7 a b^5 c \operatorname{Sin}[2 (d+e x)]+10 a^4 b c^2 \operatorname{Sin}[2 (d+e x)]+14 a^2 b^3 c^2 \operatorname{Sin}[2 (d+e x)]-7 a^3 b c^3 \operatorname{Sin}[2 (d+e x)]\Big)\Big)\Big/$$

$$\Big((a-c) (a-i b-c) (a+i b-c) c^3 \left(-b^2+4 a c\right) \left(-a-c+a \operatorname{Cos}[2 (d+e x)]-c \operatorname{Cos}[2 (d+e x)]-b \operatorname{Sin}[2 (d+e x)]\right)\Big)\Bigg)+$$

$$\Bigg(\sqrt{a+b \operatorname{Cot}[d+e x]+c \operatorname{Cot}[d+e x]^2}\ \Bigg(-b (i a+b-i c) (-i a+b+i c) \left(35 b^2-12 c (5 a+2 c)\right) \operatorname{Log}[\operatorname{Tan}[d+e x]]+$$

$$\frac{8 (a+i b-c) c^{9/2} \operatorname{Log}\left[\frac{i b+2 c+(2 i a+b) \operatorname{Tan}[d+e x]-2 i \sqrt{a-i b-c} \sqrt{c+b \operatorname{Tan}[d+e x]+a \operatorname{Tan}[d+e x]^2}}{8 \sqrt{a-i b-c} (a+i b-c) c^4 (-i+\operatorname{Tan}[d+e x])}\right]}{\sqrt{a-i b-c}}+$$

$$\frac{8 c^{9/2} (-a+i b+c) \operatorname{Log}\left[\frac{i \left(b+2 i c+2 a \operatorname{Tan}[d+e x]+i b \operatorname{Tan}[d+e x]+2 \sqrt{a+i b-c} \sqrt{c+\operatorname{Tan}[d+e x] (b+a \operatorname{Tan}[d+e x])}\right)}{8 (a-i b-c) \sqrt{a+i b-c} c^4 (i+\operatorname{Tan}[d+e x])}\right]}{\sqrt{a+i b-c}}+$$

$$b (i a+b-i c) (-i a+b+i c) \left(35 b^2-12 c (5 a+2 c)\right) \operatorname{Log}\left[2 c+b \operatorname{Tan}[d+e x]+2 \sqrt{c} \sqrt{c+\operatorname{Tan}[d+e x] (b+a \operatorname{Tan}[d+e x])}\right]\Bigg)$$

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

$$\frac{35 a^2 b^3 \sqrt{-\frac{a}{-1+\operatorname{Cos}[2 (d+e x)]}-\frac{c}{-1+\operatorname{Cos}[2 (d+e x)]}+\frac{a \operatorname{Cos}[2 (d+e x)]}{-1+\operatorname{Cos}[2 (d+e x)]}-\frac{c \operatorname{Cos}[2 (d+e x)]}{-1+\operatorname{Cos}[2 (d+e x)]}-\frac{b \operatorname{Sin}[2 (d+e x)]}{-1+\operatorname{Cos}[2 (d+e x)]}}}{8 (a-i b-c) (a+i b-c) c^4 \left(-a-c+a \operatorname{Cos}[2 (d+e x)]-c \operatorname{Cos}[2 (d+e x)]-b \operatorname{Sin}[2 (d+e x)]\right)}+$$

$$\frac{35 b^5 \sqrt{-\frac{a}{-1+\operatorname{Cos}[2 (d+e x)]}-\frac{c}{-1+\operatorname{Cos}[2 (d+e x)]}+\frac{a \operatorname{Cos}[2 (d+e x)]}{-1+\operatorname{Cos}[2 (d+e x)]}-\frac{c \operatorname{Cos}[2 (d+e x)]}{-1+\operatorname{Cos}[2 (d+e x)]}-\frac{b \operatorname{Sin}[2 (d+e x)]}{-1+\operatorname{Cos}[2 (d+e x)]}}}{8 (a-i b-c) (a+i b-c) c^4 \left(-a-c+a \operatorname{Cos}[2 (d+e x)]-c \operatorname{Cos}[2 (d+e x)]-b \operatorname{Sin}[2 (d+e x)]\right)}-$$

$$\frac{15\,a^3\,b\,\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{2\,(a-i\,b-c)\,(a+i\,b-c)\,c^3\,(-a-c+a\,\mathrm{Cos}[2\,(d+e\,x)]-c\,\mathrm{Cos}[2\,(d+e\,x)]-b\,\mathrm{Sin}[2\,(d+e\,x)])}-$$

$$\frac{65\,a\,b^3\,\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{4\,(a-i\,b-c)\,(a+i\,b-c)\,c^3\,(-a-c+a\,\mathrm{Cos}[2\,(d+e\,x)]-c\,\mathrm{Cos}[2\,(d+e\,x)]-b\,\mathrm{Sin}[2\,(d+e\,x)])}+$$

$$\frac{12\,a^2\,b\,\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{(a-i\,b-c)\,(a+i\,b-c)\,c^2\,(-a-c+a\,\mathrm{Cos}[2\,(d+e\,x)]-c\,\mathrm{Cos}[2\,(d+e\,x)]-b\,\mathrm{Sin}[2\,(d+e\,x)])}+$$

$$\frac{11\,b^3\,\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{8\,(a-i\,b-c)\,(a+i\,b-c)\,c^2\,(-a-c+a\,\mathrm{Cos}[2\,(d+e\,x)]-c\,\mathrm{Cos}[2\,(d+e\,x)]-b\,\mathrm{Sin}[2\,(d+e\,x)])}-$$

$$\frac{3\,a\,b\,\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{2\,(a-i\,b-c)\,(a+i\,b-c)\,c\,(-a-c+a\,\mathrm{Cos}[2\,(d+e\,x)]-c\,\mathrm{Cos}[2\,(d+e\,x)]-b\,\mathrm{Sin}[2\,(d+e\,x)])}-$$

$$\frac{b\,\mathrm{Cos}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{(a-i\,b-c)\,(a+i\,b-c)\,(-a-c+a\,\mathrm{Cos}[2\,(d+e\,x)]-c\,\mathrm{Cos}[2\,(d+e\,x)]-b\,\mathrm{Sin}[2\,(d+e\,x)])}+$$

$$\frac{a\,\mathrm{Sin}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{(a-i\,b-c)\,(a+i\,b-c)\,(-a-c+a\,\mathrm{Cos}[2\,(d+e\,x)]-c\,\mathrm{Cos}[2\,(d+e\,x)]-b\,\mathrm{Sin}[2\,(d+e\,x)])}-$$

$$\left.\left.\frac{c\,\mathrm{Sin}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\mathrm{Cos}[2\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{c\,\mathrm{Cos}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}-\frac{b\,\mathrm{Sin}[2\,(d+e\,x)]}{-1+\mathrm{Cos}[2\,(d+e\,x)]}}}{(a-i\,b-c)\,(a+i\,b-c)\,(-a-c+a\,\mathrm{Cos}[2\,(d+e\,x)]-c\,\mathrm{Cos}[2\,(d+e\,x)]-b\,\mathrm{Sin}[2\,(d+e\,x)])}\right)\mathrm{Tan}[d+e\,x]\right)\Big/$$

$$\left(16\,c^{9/2}\,(a^2+b^2-2\,a\,c+c^2)\,e\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,(b+a\,\mathrm{Tan}[d+e\,x])}\right.$$

$$\left(-\frac{1}{32\, c^{9/2} \left(a^2+b^2-2\, a\, c+c^2\right) \left(c+\mathrm{Tan}[d+e\, x] \left(b+a\, \mathrm{Tan}[d+e\, x]\right)\right)^{3/2}} \sqrt{a+b\, \mathrm{Cot}[d+e\, x]+c\, \mathrm{Cot}[d+e\, x]^2} \left(-b \left(\mathrm{i}\, a+b-\mathrm{i}\, c\right) \left(-\mathrm{i}\, a+b+\mathrm{i}\, c\right)\right.\right.$$

$$\left(35\, b^2-12\, c \left(5\, a+2\, c\right)\right) \mathrm{Log}[\mathrm{Tan}[d+e\, x]]+\frac{8 \left(a+\mathrm{i}\, b-c\right) c^{9/2}\, \mathrm{Log}\left[\frac{\mathrm{i}\, b+2\, c+(2\, \mathrm{i}\, a+b)\, \mathrm{Tan}[d+e\, x]-2\, \mathrm{i} \sqrt{a-\mathrm{i}\, b-c} \sqrt{c+b\, \mathrm{Tan}[d+e\, x]+a\, \mathrm{Tan}[d+e\, x]^2}}{8 \sqrt{a-\mathrm{i}\, b-c}\, (a+\mathrm{i}\, b-c)\, c^4\, (-\mathrm{i}+\mathrm{Tan}[d+e\, x])}\right]}{\sqrt{a-\mathrm{i}\, b-c}}+$$

$$\frac{8\, c^{9/2} \left(-a+\mathrm{i}\, b+c\right) \mathrm{Log}\left[\frac{\mathrm{i} \left(b+2\, \mathrm{i}\, c+2\, a\, \mathrm{Tan}[d+e\, x]+\mathrm{i}\, b\, \mathrm{Tan}[d+e\, x]+2 \sqrt{a+\mathrm{i}\, b-c} \sqrt{c+\mathrm{Tan}[d+e\, x]\, (b+a\, \mathrm{Tan}[d+e\, x])}\right)}{8\, (a-\mathrm{i}\, b-c) \sqrt{a+\mathrm{i}\, b-c}\, c^4\, (\mathrm{i}+\mathrm{Tan}[d+e\, x])}\right]}{\sqrt{a+\mathrm{i}\, b-c}}+b \left(\mathrm{i}\, a+b-\mathrm{i}\, c\right)$$

$$\left.\left(-\mathrm{i}\, a+b+\mathrm{i}\, c\right) \left(35\, b^2-12\, c \left(5\, a+2\, c\right)\right) \mathrm{Log}\left[2\, c+b\, \mathrm{Tan}[d+e\, x]+2 \sqrt{c} \sqrt{c+\mathrm{Tan}[d+e\, x] \left(b+a\, \mathrm{Tan}[d+e\, x]\right)}\right]\right) \mathrm{Tan}[d+e\, x]$$

$$\left.\left(a\, \mathrm{Sec}[d+e\, x]^2\, \mathrm{Tan}[d+e\, x]+\mathrm{Sec}[d+e\, x]^2 \left(b+a\, \mathrm{Tan}[d+e\, x]\right)\right)\right)+\frac{1}{16\, c^{9/2} \left(a^2+b^2-2\, a\, c+c^2\right) \sqrt{c+\mathrm{Tan}[d+e\, x] \left(b+a\, \mathrm{Tan}[d+e\, x]\right)}}$$

$$\sqrt{a+b\, \mathrm{Cot}[d+e\, x]+c\, \mathrm{Cot}[d+e\, x]^2} \left(-b \left(\mathrm{i}\, a+b-\mathrm{i}\, c\right) \left(-\mathrm{i}\, a+b+\mathrm{i}\, c\right) \left(35\, b^2-12\, c \left(5\, a+2\, c\right)\right) \mathrm{Log}[\mathrm{Tan}[d+e\, x]]+\right.$$

$$\frac{8 \left(a+\mathrm{i}\, b-c\right) c^{9/2}\, \mathrm{Log}\left[\frac{\mathrm{i}\, b+2\, c+(2\, \mathrm{i}\, a+b)\, \mathrm{Tan}[d+e\, x]-2\, \mathrm{i} \sqrt{a-\mathrm{i}\, b-c} \sqrt{c+b\, \mathrm{Tan}[d+e\, x]+a\, \mathrm{Tan}[d+e\, x]^2}}{8 \sqrt{a-\mathrm{i}\, b-c}\, (a+\mathrm{i}\, b-c)\, c^4\, (-\mathrm{i}+\mathrm{Tan}[d+e\, x])}\right]}{\sqrt{a-\mathrm{i}\, b-c}}+$$

$$\frac{8\, c^{9/2} \left(-a+\mathrm{i}\, b+c\right) \mathrm{Log}\left[\frac{\mathrm{i} \left(b+2\, \mathrm{i}\, c+2\, a\, \mathrm{Tan}[d+e\, x]+\mathrm{i}\, b\, \mathrm{Tan}[d+e\, x]+2 \sqrt{a+\mathrm{i}\, b-c} \sqrt{c+\mathrm{Tan}[d+e\, x]\, (b+a\, \mathrm{Tan}[d+e\, x])}\right)}{8\, (a-\mathrm{i}\, b-c) \sqrt{a+\mathrm{i}\, b-c}\, c^4\, (\mathrm{i}+\mathrm{Tan}[d+e\, x])}\right]}{\sqrt{a+\mathrm{i}\, b-c}}+b \left(\mathrm{i}\, a+b-\mathrm{i}\, c\right) \left(-\mathrm{i}\, a+b+\mathrm{i}\, c\right)$$

$$\left.\left(35\, b^2-12\, c \left(5\, a+2\, c\right)\right) \mathrm{Log}\left[2\, c+b\, \mathrm{Tan}[d+e\, x]+2 \sqrt{c} \sqrt{c+\mathrm{Tan}[d+e\, x] \left(b+a\, \mathrm{Tan}[d+e\, x]\right)}\right]\right) \mathrm{Sec}[d+e\, x]^2+$$

$$\left(\left(-b\,\text{Csc}[d+e\,x]^2-2\,c\,\text{Cot}[d+e\,x]\,\text{Csc}[d+e\,x]^2\right)\left(-b\,(\mathbb{i}\,a+b-\mathbb{i}\,c)\,(-\mathbb{i}\,a+b+\mathbb{i}\,c)\,\left(35\,b^2-12\,c\,(5\,a+2\,c)\right)\text{Log}[\text{Tan}[d+e\,x]]+\right.\right.$$

$$\frac{8\,(a+\mathbb{i}\,b-c)\,c^{9/2}\,\text{Log}\left[\frac{\mathbb{i}\,b+2\,c+(2\,\mathbb{i}\,a+b)\,\text{Tan}[d+e\,x]-2\,\mathbb{i}\,\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}}{8\,\sqrt{a-\mathbb{i}\,b-c}\,(a+\mathbb{i}\,b-c)\,c^4\,(-\mathbb{i}+\text{Tan}[d+e\,x])}\right]}{\sqrt{a-\mathbb{i}\,b-c}}+$$

$$\frac{8\,c^{9/2}\,(-a+\mathbb{i}\,b+c)\,\text{Log}\left[\frac{\mathbb{i}\left(b+2\,\mathbb{i}\,c+2\,a\,\text{Tan}[d+e\,x]+\mathbb{i}\,b\,\text{Tan}[d+e\,x]+2\,\sqrt{a+\mathbb{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)}{8\,(a-\mathbb{i}\,b-c)\,\sqrt{a+\mathbb{i}\,b-c}\,c^4\,(\mathbb{i}+\text{Tan}[d+e\,x])}\right]}{\sqrt{a+\mathbb{i}\,b-c}}+b\,(\mathbb{i}\,a+b-\mathbb{i}\,c)\,(-\mathbb{i}\,a+b+\mathbb{i}\,c)$$

$$\left.\left.\left(35\,b^2-12\,c\,(5\,a+2\,c)\right)\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right]\right)\text{Tan}[d+e\,x]\right)\Big/$$

$$\left(32\,c^{9/2}\,(a^2+b^2-2\,a\,c+c^2)\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)+$$

$$\frac{1}{16\,c^{9/2}\,(a^2+b^2-2\,a\,c+c^2)\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\,\text{Tan}[d+e\,x]$$

$$\left(-b\,(\mathbb{i}\,a+b-\mathbb{i}\,c)\,(-\mathbb{i}\,a+b+\mathbb{i}\,c)\,\left(35\,b^2-12\,c\,(5\,a+2\,c)\right)\text{Csc}[d+e\,x]\,\text{Sec}[d+e\,x]+\left(b\,(\mathbb{i}\,a+b-\mathbb{i}\,c)\,(-\mathbb{i}\,a+b+\mathbb{i}\,c)\right.\right.$$

$$\left.\left(35\,b^2-12\,c\,(5\,a+2\,c)\right)\left(b\,\text{Sec}[d+e\,x]^2+\frac{\sqrt{c}\,\left(a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\text{Sec}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x])\right)}{\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}\right)\right)\Big/$$

$$\left(2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)+$$

$$\left(64\,(a+\mathbb{i}\,b-c)^2\,c^{17/2}\,(-\mathbb{i}+\text{Tan}[d+e\,x])\left(\frac{(2\,\mathbb{i}\,a+b)\,\text{Sec}[d+e\,x]^2-\frac{\mathbb{i}\,\sqrt{a-\mathbb{i}\,b-c}\,\left(b\,\text{Sec}[d+e\,x]^2+2\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]\right)}{\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}}}{8\,\sqrt{a-\mathbb{i}\,b-c}\,(a+\mathbb{i}\,b-c)\,c^4\,(-\mathbb{i}+\text{Tan}[d+e\,x])}-\right.\right.$$

$$\left.\left.\left(\text{Sec}[d+e\,x]^2\,\left(\mathbb{i}\,b+2\,c+(2\,\mathbb{i}\,a+b)\,\text{Tan}[d+e\,x]-2\,\mathbb{i}\,\sqrt{a-\mathbb{i}\,b-c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}\right)\right)\right)\Big/$$

$$\left.\left.\left(8\sqrt{a-\mathrm{i}\,b-c}\,\left(a+\mathrm{i}\,b-c\right)c^4\left(-\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)^2\right)\right)\right)\Big/\left(\mathrm{i}\,b+2\,c+\left(2\,\mathrm{i}\,a+b\right)\mathrm{Tan}[d+e\,x]-\right.$$

$$\left.2\,\mathrm{i}\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{c+b\,\mathrm{Tan}[d+e\,x]+a\,\mathrm{Tan}[d+e\,x]^2}\right)-\left(64\,\mathrm{i}\,\left(a-\mathrm{i}\,b-c\right)c^{17/2}\left(-a+\mathrm{i}\,b+c\right)\left(\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)\right.$$

$$\left(\left(\mathrm{i}\left(2\,a\,\mathrm{Sec}[d+e\,x]^2+\mathrm{i}\,b\,\mathrm{Sec}[d+e\,x]^2+\frac{\sqrt{a+\mathrm{i}\,b-c}\,\left(a\,\mathrm{Sec}[d+e\,x]^2\,\mathrm{Tan}[d+e\,x]+\mathrm{Sec}[d+e\,x]^2\left(b+a\,\mathrm{Tan}[d+e\,x]\right)\right)}{\sqrt{c+\mathrm{Tan}[d+e\,x]\,\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}}\right)\right)\Big/\right.\right.$$

$$\left(8\left(a-\mathrm{i}\,b-c\right)\sqrt{a+\mathrm{i}\,b-c}\,c^4\left(\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)\right)\Big)-\left(\mathrm{i}\,\mathrm{Sec}[d+e\,x]^2\left(b+2\,\mathrm{i}\,c+2\,a\,\mathrm{Tan}[d+e\,x]+\mathrm{i}\,b\,\mathrm{Tan}[d+e\,x]+\right.\right.$$

$$\left.\left.\left.2\sqrt{a+\mathrm{i}\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}\right)\right)\Big/\left(8\left(a-\mathrm{i}\,b-c\right)\sqrt{a+\mathrm{i}\,b-c}\,c^4\left(\mathrm{i}+\mathrm{Tan}[d+e\,x]\right)^2\right)\right)\Big/$$

$$\left.\left.\left.\left(b+2\,\mathrm{i}\,c+2\,a\,\mathrm{Tan}[d+e\,x]+\mathrm{i}\,b\,\mathrm{Tan}[d+e\,x]+2\sqrt{a+\mathrm{i}\,b-c}\,\sqrt{c+\mathrm{Tan}[d+e\,x]\,\left(b+a\,\mathrm{Tan}[d+e\,x]\right)}\right)\right)\right)\right)$$

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

$$\int\frac{\mathrm{Cot}[d+e\,x]^5}{\left(a+b\,\mathrm{Cot}[d+e\,x]+c\,\mathrm{Cot}[d+e\,x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 865 leaves, 14 steps):

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

Result (type 3, 4537 leaves) :

$$\frac{1}{e}\sqrt{\frac{-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}$$
$$\left(-\frac{-3\,a^3\,b^2-3\,a\,b^4+8\,a^4\,c+15\,a^2\,b^2\,c+b^4\,c-16\,a^3\,c^2-7\,a\,b^2\,c^2+12\,a^2\,c^3+b^2\,c^3-4\,a\,c^4}{(a-c)\,(a-\mathrm{i}\,b-c)\,(a+\mathrm{i}\,b-c)\,c^2\,\left(-b^2+4\,a\,c\right)}-\right.$$
$$\Big(2\,\Big(-2\,a^3\,b^2-2\,a\,b^4+4\,a^4\,c+8\,a^2\,b^2\,c-4\,a^3\,c^2-a^4\,b\,\text{Sin}[2\,(d+e\,x)]-2\,a^2\,b^3\,\text{Sin}[2\,(d+e\,x)]-$$
$$b^5\,\text{Sin}[2\,(d+e\,x)]+6\,a^3\,b\,c\,\text{Sin}[2\,(d+e\,x)]+5\,a\,b^3\,c\,\text{Sin}[2\,(d+e\,x)]-5\,a^2\,b\,c^2\,\text{Sin}[2\,(d+e\,x)]\Big)\Big)\Big/$$

$$\left(\left(a-c\right)\left(a-i b-c\right)\left(a+i b-c\right) c\left(-b^2+4 a c\right)\left(-a-c+a \text{Cos}[2(d+e x)]-c \text{Cos}[2(d+e x)]-b \text{Sin}[2(d+e x)]\right)\right)\right)-$$

$$\left(\sqrt{a+b \text{Cot}[d+e x]+c \text{Cot}[d+e x]^2}\left(3 b\left(i a+b-i c\right)\left(-i a+b+i c\right) \text{Log}[\text{Tan}[d+e x]]+\right.\right.$$

$$\frac{\left(a+i b-c\right) c^{5/2} \text{Log}\left[\frac{i b+2 c+(2 i a+b) \text{Tan}[d+e x]-2 i \sqrt{a-i b-c} \sqrt{c+b \text{Tan}[d+e x]+a \text{Tan}[d+e x]^2}}{\sqrt{a-i b-c}\,(a+i b-c)\, c^2\,(-i+\text{Tan}[d+e x])}\right]}{\sqrt{a-i b-c}}+$$

$$\frac{c^{5/2}\left(-a+i b+c\right) \text{Log}\left[\frac{i\left(b+2 i c+2 a \text{Tan}[d+e x]+i b \text{Tan}[d+e x]+2 \sqrt{a+i b-c} \sqrt{c+\text{Tan}[d+e x]\,(b+a \text{Tan}[d+e x])}\right)}{(a-i b-c) \sqrt{a+i b-c}\, c^2\,(i+\text{Tan}[d+e x])}\right]}{\sqrt{a+i b-c}}-$$

$$\left.3 b\left(i a+b-i c\right)\left(-i a+b+i c\right) \text{Log}\left[2 c+b \text{Tan}[d+e x]+2 \sqrt{c} \sqrt{c+\text{Tan}[d+e x]\left(b+a \text{Tan}[d+e x]\right)}\right]\right)$$

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

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

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

$$\frac{6 a b \sqrt{-\frac{a}{-1+\text{Cos}[2(d+e x)]}-\frac{c}{-1+\text{Cos}[2(d+e x)]}+\frac{a \text{Cos}[2(d+e x)]}{-1+\text{Cos}[2(d+e x)]}-\frac{c \text{Cos}[2(d+e x)]}{-1+\text{Cos}[2(d+e x)]}-\frac{b \text{Sin}[2(d+e x)]}{-1+\text{Cos}[2(d+e x)]}}}{\left(a-i b-c\right)\left(a+i b-c\right) c\left(-a-c+a \text{Cos}[2(d+e x)]-c \text{Cos}[2(d+e x)]-b \text{Sin}[2(d+e x)]\right)}+$$

$$\frac{b\,\text{Cos}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{(a-\mathrm{i}\,b-c)\,(a+\mathrm{i}\,b-c)\,(-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)])}-$$

$$\frac{a\,\text{Sin}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{(a-\mathrm{i}\,b-c)\,(a+\mathrm{i}\,b-c)\,(-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)])}+$$

$$\left.\left.\frac{c\,\text{Sin}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{(a-\mathrm{i}\,b-c)\,(a+\mathrm{i}\,b-c)\,(-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)])}\right)\text{Tan}[d+e\,x]\right)\Big/$$

$$\left(2\,c^{5/2}\,(a^2+b^2-2\,a\,c+c^2)\,e\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right.$$

$$\left(\frac{1}{4\,c^{5/2}\,(a^2+b^2-2\,a\,c+c^2)\,(c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x]))^{3/2}}\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\right.$$

$$\left(3\,b\,(\mathrm{i}\,a+b-\mathrm{i}\,c)\,(-\mathrm{i}\,a+b+\mathrm{i}\,c)\,\text{Log}[\text{Tan}[d+e\,x]]+\frac{(a+\mathrm{i}\,b-c)\,c^{5/2}\,\text{Log}\left[\frac{\mathrm{i}\,b+2\,c+(2\,\mathrm{i}\,a+b)\,\text{Tan}[d+e\,x]-2\,\mathrm{i}\,\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}}{\sqrt{a-\mathrm{i}\,b-c}\,(a+\mathrm{i}\,b-c)\,c^2\,(-\mathrm{i}+\text{Tan}[d+e\,x])}\right]}{\sqrt{a-\mathrm{i}\,b-c}}+\right.$$

$$\frac{c^{5/2}\,(-a+\mathrm{i}\,b+c)\,\text{Log}\left[\frac{\mathrm{i}\,\left(b+2\,\mathrm{i}\,c+2\,a\,\text{Tan}[d+e\,x]+\mathrm{i}\,b\,\text{Tan}[d+e\,x]+2\,\sqrt{a+\mathrm{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)}{(a-\mathrm{i}\,b-c)\,\sqrt{a+\mathrm{i}\,b-c}\,c^2\,(\mathrm{i}+\text{Tan}[d+e\,x])}\right]}{\sqrt{a+\mathrm{i}\,b-c}}-$$

$$\left.3\,b\,(\mathrm{i}\,a+b-\mathrm{i}\,c)\,(-\mathrm{i}\,a+b+\mathrm{i}\,c)\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right]\right)$$

$$\text{Tan}[d+e\,x]\,\left(a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\text{Sec}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x])\right)\Big)-$$

$$\frac{1}{2\,c^{5/2}\left(a^2+b^2-2\,a\,c+c^2\right)\sqrt{c+\text{Tan}[d+e\,x]\,\left(b+a\,\text{Tan}[d+e\,x]\right)}}\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}$$

$$\left(3\,b\,(\mathrm{i}\,a+b-\mathrm{i}\,c)\,(-\mathrm{i}\,a+b+\mathrm{i}\,c)\,\text{Log}[\text{Tan}[d+e\,x]]+\frac{(a+\mathrm{i}\,b-c)\,c^{5/2}\,\text{Log}\left[\frac{\mathrm{i}\,b+2\,c+(2\,\mathrm{i}\,a+b)\,\text{Tan}[d+e\,x]-2\,\mathrm{i}\,\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}}{\sqrt{a-\mathrm{i}\,b-c}\,(a+\mathrm{i}\,b-c)\,c^2\,(-\mathrm{i}+\text{Tan}[d+e\,x])}\right]}{\sqrt{a-\mathrm{i}\,b-c}}+\right.$$

$$\frac{c^{5/2}\,(-a+\mathrm{i}\,b+c)\,\text{Log}\left[\frac{\mathrm{i}\,\left(b+2\,\mathrm{i}\,c+2\,a\,\text{Tan}[d+e\,x]+\mathrm{i}\,b\,\text{Tan}[d+e\,x]+2\,\sqrt{a+\mathrm{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)}{(a-\mathrm{i}\,b-c)\,\sqrt{a+\mathrm{i}\,b-c}\,c^2\,(\mathrm{i}+\text{Tan}[d+e\,x])}\right]}{\sqrt{a+\mathrm{i}\,b-c}}-3\,b\,(\mathrm{i}\,a+b-\mathrm{i}\,c)\,(-\mathrm{i}\,a+b+\mathrm{i}\,c)\,\text{Log}\Big[$$

$$\left.2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\,\Big]\right)\,\text{Sec}[d+e\,x]^2-\left(\left(-b\,\text{Csc}[d+e\,x]^2-2\,c\,\text{Cot}[d+e\,x]\,\text{Csc}[d+e\,x]^2\right)\right.$$

$$\left(3\,b\,(\mathrm{i}\,a+b-\mathrm{i}\,c)\,(-\mathrm{i}\,a+b+\mathrm{i}\,c)\,\text{Log}[\text{Tan}[d+e\,x]]+\frac{(a+\mathrm{i}\,b-c)\,c^{5/2}\,\text{Log}\left[\frac{\mathrm{i}\,b+2\,c+(2\,\mathrm{i}\,a+b)\,\text{Tan}[d+e\,x]-2\,\mathrm{i}\,\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}}{\sqrt{a-\mathrm{i}\,b-c}\,(a+\mathrm{i}\,b-c)\,c^2\,(-\mathrm{i}+\text{Tan}[d+e\,x])}\right]}{\sqrt{a-\mathrm{i}\,b-c}}+\right.$$

$$\frac{c^{5/2}\,(-a+\mathrm{i}\,b+c)\,\text{Log}\left[\frac{\mathrm{i}\,\left(b+2\,\mathrm{i}\,c+2\,a\,\text{Tan}[d+e\,x]+\mathrm{i}\,b\,\text{Tan}[d+e\,x]+2\,\sqrt{a+\mathrm{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)}{(a-\mathrm{i}\,b-c)\,\sqrt{a+\mathrm{i}\,b-c}\,c^2\,(\mathrm{i}+\text{Tan}[d+e\,x])}\right]}{\sqrt{a+\mathrm{i}\,b-c}}-$$

$$\left.\left.3\,b\,(\mathrm{i}\,a+b-\mathrm{i}\,c)\,(-\mathrm{i}\,a+b+\mathrm{i}\,c)\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]+2\,\sqrt{c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\,\Big]\right)\text{Tan}[d+e\,x]\right)\Big/$$

$$\left(4\,c^{5/2}\left(a^2+b^2-2\,a\,c+c^2\right)\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\right)-$$

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

$$\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\,\text{Tan}[d+e\,x]\,\Big(3\,b\,(\mathrm{i}\,a+b-\mathrm{i}\,c)\,(-\mathrm{i}\,a+b+\mathrm{i}\,c)\,\text{Csc}[d+e\,x]\,\text{Sec}[d+e\,x]-$$

$$\left(3\, b\, (i\, a + b - i\, c)\, (-i\, a + b + i\, c)\, \left(b\, \text{Sec}[d + e\, x]^2 + \frac{\sqrt{c}\, \left(a\, \text{Sec}[d + e\, x]^2\, \text{Tan}[d + e\, x] + \text{Sec}[d + e\, x]^2\, (b + a\, \text{Tan}[d + e\, x])\right)}{\sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}}\right)\right) \Big/$$

$$\left(2\, c + b\, \text{Tan}[d + e\, x] + 2\, \sqrt{c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\right) + \Bigg((a + i\, b - c)^2\, c^{9/2}\, (-i + \text{Tan}[d + e\, x])$$

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

$$\left.\left.2\, i\, \sqrt{a - i\, b - c}\, \sqrt{c + b\, \text{Tan}[d + e\, x] + a\, \text{Tan}[d + e\, x]^2}\right)\right) \Big/ \left(\sqrt{a - i\, b - c}\, (a + i\, b - c)\, c^2\, (-i + \text{Tan}[d + e\, x])^2\right)\Bigg) \Big/ \Bigg(i\, b + 2\, c +$$

$$(2\, i\, a + b)\, \text{Tan}[d + e\, x] - 2\, i\, \sqrt{a - i\, b - c}\, \sqrt{c + b\, \text{Tan}[d + e\, x] + a\, \text{Tan}[d + e\, x]^2}\Bigg) - \Bigg(i\, (a - i\, b - c)\, c^{9/2}\, (-a + i\, b + c)\, (i + \text{Tan}[d + e\, x])$$

$$\left(\left(i\, \left(2\, a\, \text{Sec}[d + e\, x]^2 + i\, b\, \text{Sec}[d + e\, x]^2 + \frac{\sqrt{a + i\, b - c}\, \left(a\, \text{Sec}[d + e\, x]^2\, \text{Tan}[d + e\, x] + \text{Sec}[d + e\, x]^2\, (b + a\, \text{Tan}[d + e\, x])\right)}{\sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}}\right)\right) \Big/\right.$$

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

$$\left.\left.2\, \sqrt{a + i\, b - c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\right)\right) \Big/ \left((a - i\, b - c)\, \sqrt{a + i\, b - c}\, c^2\, (i + \text{Tan}[d + e\, x])^2\right)\Bigg) \Big/$$

$$\left(b + 2\, i\, c + 2\, a\, \text{Tan}[d + e\, x] + i\, b\, \text{Tan}[d + e\, x] + 2\, \sqrt{a + i\, b - c}\, \sqrt{c + \text{Tan}[d + e\, x]\, (b + a\, \text{Tan}[d + e\, x])}\right)\Bigg)\Bigg)\Bigg)$$

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

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

Optimal (type 3, 686 leaves, 10 steps):

$$\left(\sqrt{2a-2c-\sqrt{a^2+b^2-2ac+c^2}}\ \sqrt{a^2-b^2-2ac+c^2+(a-c)\sqrt{a^2+b^2-2ac+c^2}}\right.$$

$$\mathrm{ArcTanh}\left[\left(b^2-(a-c)\left(a-c+\sqrt{a^2+b^2-2ac+c^2}\right)-b\left(2a-2c-\sqrt{a^2+b^2-2ac+c^2}\right)\mathrm{Cot}[d+ex]\right)\Big/\right.$$

$$\left.\left.\left(\sqrt{2}\sqrt{2a-2c-\sqrt{a^2+b^2-2ac+c^2}}\ \sqrt{a^2-b^2-2ac+c^2+(a-c)\sqrt{a^2+b^2-2ac+c^2}}\ \sqrt{a+b\,\mathrm{Cot}[d+ex]+c\,\mathrm{Cot}[d+ex]^2}\right)\right]\right)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{3/2}e\right)-\left(\sqrt{2a-2c+\sqrt{a^2+b^2-2ac+c^2}}\ \sqrt{a^2-b^2-2ac+c^2-(a-c)\sqrt{a^2+b^2-2ac+c^2}}\right.$$

$$\mathrm{ArcTanh}\left[\left(b^2-(a-c)\left(a-c-\sqrt{a^2+b^2-2ac+c^2}\right)-b\left(2a-2c+\sqrt{a^2+b^2-2ac+c^2}\right)\mathrm{Cot}[d+ex]\right)\Big/\right.$$

$$\left.\left.\left(\sqrt{2}\sqrt{2a-2c+\sqrt{a^2+b^2-2ac+c^2}}\ \sqrt{a^2-b^2-2ac+c^2-(a-c)\sqrt{a^2+b^2-2ac+c^2}}\ \sqrt{a+b\,\mathrm{Cot}[d+ex]+c\,\mathrm{Cot}[d+ex]^2}\right)\right]\right)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2ac+c^2\right)^{3/2}e\right)-\frac{2\left(2a+b\,\mathrm{Cot}[d+ex]\right)}{\left(b^2-4ac\right)e\sqrt{a+b\,\mathrm{Cot}[d+ex]+c\,\mathrm{Cot}[d+ex]^2}}+$$

$$\frac{2\left(a\left(b^2-2(a-c)c\right)+bc(a+c)\mathrm{Cot}[d+ex]\right)}{\left(b^2+(a-c)^2\right)\left(b^2-4ac\right)e\sqrt{a+b\,\mathrm{Cot}[d+ex]+c\,\mathrm{Cot}[d+ex]^2}}$$

Result (type 3, 3282 leaves):

$$\frac{1}{e}\sqrt{\frac{-a-c+a\,\mathrm{Cos}[2(d+ex)]-c\,\mathrm{Cos}[2(d+ex)]-b\,\mathrm{Sin}[2(d+ex)]}{-1+\mathrm{Cos}[2(d+ex)]}}$$

$$\left(\frac{2a\left(2a^2+b^2-2ac\right)}{(a-c)(a+\mathrm{i}b-c)\left(-ab^2+\mathrm{i}b^3+4a^2c-4\mathrm{i}abc+b^2c-4ac^2\right)}+\left(\left(\mathrm{Cos}[2(d+ex)]-\mathrm{i}\,\mathrm{Sin}[2(d+ex)]\right)\right.\right.$$

$$\left(\mathrm{i}a^3b+2\mathrm{i}a^2bc+\mathrm{i}b^3c-3\mathrm{i}abc^2+8a^3c\,\mathrm{Cos}[2(d+ex)]+4ab^2c\,\mathrm{Cos}[2(d+ex)]-8a^2c^2\,\mathrm{Cos}[2(d+ex)]-\mathrm{i}a^3b\,\mathrm{Cos}[4(d+ex)]-\right.$$

$$2\mathrm{i}a^2bc\,\mathrm{Cos}[4(d+ex)]-\mathrm{i}b^3c\,\mathrm{Cos}[4(d+ex)]+3\mathrm{i}abc^2\,\mathrm{Cos}[4(d+ex)]+8\mathrm{i}a^3c\,\mathrm{Sin}[2(d+ex)]+4\mathrm{i}ab^2c\,\mathrm{Sin}[2(d+ex)]-$$

$$\left.8\mathrm{i}a^2c^2\,\mathrm{Sin}[2(d+ex)]+a^3b\,\mathrm{Sin}[4(d+ex)]+2a^2bc\,\mathrm{Sin}[4(d+ex)]+b^3c\,\mathrm{Sin}[4(d+ex)]-3abc^2\,\mathrm{Sin}[4(d+ex)]\right)\Big)\Big/$$

$$\left.\left((a-c)(a-\mathrm{i}b-c)(a+\mathrm{i}b-c)\left(-b^2+4ac\right)\left(-a-c+a\,\mathrm{Cos}[2(d+ex)]-c\,\mathrm{Cos}[2(d+ex)]-b\,\mathrm{Sin}[2(d+ex)]\right)\right)\right)+$$

$$\left(\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\;\left(\frac{\text{Log}\left[\frac{-4\,c-4\,\mathrm{i}\,a\,\text{Tan}[d+e\,x]-2\,b\,(\mathrm{i}+\text{Tan}[d+e\,x])+4\,\mathrm{i}\,\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}{\sqrt{a-\mathrm{i}\,b-c}\,(a+\mathrm{i}\,b-c)\,(-\mathrm{i}+\text{Tan}[d+e\,x])}\right]}{(a-\mathrm{i}\,b-c)^{3/2}}-\right.\right.$$

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

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

$$\frac{b\,\text{Cos}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{(a-\mathrm{i}\,b-c)\,(a+\mathrm{i}\,b-c)\,(-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)])}+$$

$$\frac{a\,\text{Sin}[2\,(d+e\,x)]\,\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{(a-\mathrm{i}\,b-c)\,(a+\mathrm{i}\,b-c)\,(-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)])}-$$

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

$$\left.\text{Tan}[d+e\,x]\right)\Big/\left(2\,e\,\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}\right.$$

$$\left(-\left(\left(\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\;\left(\frac{\text{Log}\left[\frac{-4\,c-4\,\mathrm{i}\,a\,\text{Tan}[d+e\,x]-2\,b\,(\mathrm{i}+\text{Tan}[d+e\,x])+4\,\mathrm{i}\,\sqrt{a-\mathrm{i}\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}{\sqrt{a-\mathrm{i}\,b-c}\,(a+\mathrm{i}\,b-c)\,(-\mathrm{i}+\text{Tan}[d+e\,x])}\right]}{(a-\mathrm{i}\,b-c)^{3/2}}-\right.\right.\right.\right.$$

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

$$\left.\left.\left(b\,\text{Sec}[d+e x]^2+2a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]\right)\right)\Big/\left(4\left(c+b\,\text{Tan}[d+e x]+a\,\text{Tan}[d+e x]^2\right)^{3/2}\right)\right)+$$

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

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

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

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

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

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

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

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

$$\left.\left.\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\right)\right)\Big/\left(\sqrt{a-i b-c}\,(a+i b-c)\,(-i+\text{Tan}[d+e x])^2\right)\Bigg)\Bigg)\Big/\left((a-i b-c)\left(-4 c-4 i a\right.\right.$$

$$\left.\left.\text{Tan}[d+e x]-2 b\,(i+\text{Tan}[d+e x])+4 i\sqrt{a-i b-c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\right)\right)-\Bigg((a-i b-c)\,(i+\text{Tan}[d+e x])$$

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

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

$$\left.\left.\left.\sqrt{a+i b-c}\,\sqrt{c+\text{Tan}[d+e x]\,(b+a\,\text{Tan}[d+e x])}\right)\right)\right)\Big/\left((a-i b-c)\sqrt{a+i b-c}\,(i+\text{Tan}[d+e x])^2\right)\Bigg)\Big/$$

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

Problem 14: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 635 leaves, 7 steps) :

$$-\left(\left(\sqrt{2a-2c-\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a^2-b^2-2ac+c^2+(a-c)\sqrt{a^2+b^2-2ac+c^2}}\right.\right.$$

$$\text{ArcTanh}\left[\left(b^2-(a-c)\left(a-c+\sqrt{a^2+b^2-2ac+c^2}\right)-b\left(2a-2c-\sqrt{a^2+b^2-2ac+c^2}\right)\text{Cot}[d+ex]\right)\Big/\right.$$

$$\left.\left.\left.\left(\sqrt{2}\,\sqrt{2a-2c-\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a^2-b^2-2ac+c^2+(a-c)\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\right)\right]\right)\Big/\right.$$

$$\left.\left(\sqrt{2}\,\left(a^2+b^2-2ac+c^2\right)^{3/2}e\right)\right)+\left(\sqrt{2a-2c+\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a^2-b^2-2ac+c^2-(a-c)\sqrt{a^2+b^2-2ac+c^2}}\right.$$

$$\text{ArcTanh}\left[\left(b^2-(a-c)\left(a-c-\sqrt{a^2+b^2-2ac+c^2}\right)-b\left(2a-2c+\sqrt{a^2+b^2-2ac+c^2}\right)\text{Cot}[d+ex]\right)\Big/\right.$$

$$\left.\left.\left(\sqrt{2}\,\sqrt{2a-2c+\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a^2-b^2-2ac+c^2-(a-c)\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\right)\right]\right)\Big/$$

$$\left(\sqrt{2}\,\left(a^2+b^2-2ac+c^2\right)^{3/2}e\right)-\frac{2\left(a\left(b^2-2(a-c)c\right)+bc(a+c)\,\text{Cot}[d+ex]\right)}{\left(b^2+(a-c)^2\right)\left(b^2-4ac\right)e\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}}$$

Result (type 3, 3075 leaves) :

$$\frac{1}{e}\sqrt{\frac{-a-c+a\,\text{Cos}[2(d+ex)]-c\,\text{Cos}[2(d+ex)]-b\,\text{Sin}[2(d+ex)]}{-1+\text{Cos}[2(d+ex)]}}\left(-\frac{2a\left(-b^2+2ac-2c^2\right)}{(a-c)(a-\mathrm{i}b-c)(a+\mathrm{i}b-c)\left(-b^2+4ac\right)}-\right.$$

$$\left(2\left(-2ab^2c+4a^2c^2-4ac^3-ab^3\,\text{Sin}[2(d+ex)]+3a^2bc\,\text{Sin}[2(d+ex)]-2abc^2\,\text{Sin}[2(d+ex)]-bc^3\,\text{Sin}[2(d+ex)]\right)\right)\Big/$$

$$\left.\left((a-c)(a-\mathrm{i}b-c)(a+\mathrm{i}b-c)\left(-b^2+4ac\right)\left(-a-c+a\,\text{Cos}[2(d+ex)]-c\,\text{Cos}[2(d+ex)]-b\,\text{Sin}[2(d+ex)]\right)\right)\right)+$$

$$\left(\sqrt{a+b\,\text{Cot}[d+ex]+c\,\text{Cot}[d+ex]^2}\left(-\frac{\text{Log}\left[\frac{-4c-4\mathrm{i}a\,\text{Tan}[d+ex]-2b(\mathrm{i}+\text{Tan}[d+ex])+4\mathrm{i}\sqrt{a-\mathrm{i}b-c}\,\sqrt{c+\text{Tan}[d+ex](b+a\,\text{Tan}[d+ex])}}{\sqrt{a-\mathrm{i}b-c}\,(a+\mathrm{i}b-c)(-\mathrm{i}+\text{Tan}[d+ex])}\right]}{(a-\mathrm{i}b-c)^{3/2}}+\right.\right.$$

$$\left.\frac{\text{Log}\left[\frac{4c+2b(-\mathrm{i}+\text{Tan}[d+ex])-4\mathrm{i}\left(a\,\text{Tan}[d+ex]+\sqrt{a+\mathrm{i}b-c}\,\sqrt{c+\text{Tan}[d+ex](b+a\,\text{Tan}[d+ex])}\right)}{(a-\mathrm{i}b-c)\sqrt{a+\mathrm{i}b-c}\,(\mathrm{i}+\text{Tan}[d+ex])}\right]}{(a+\mathrm{i}b-c)^{3/2}}\right)$$

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

$$\frac{b\,\text{Cos}[2\,(d+e\,x)]\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{(a-i\,b-c)\,(a+i\,b-c)\,(-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)])}-$$

$$\frac{a\,\text{Sin}[2\,(d+e\,x)]\sqrt{-\frac{a}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c}{-1+\text{Cos}[2\,(d+e\,x)]}+\frac{a\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{c\,\text{Cos}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}-\frac{b\,\text{Sin}[2\,(d+e\,x)]}{-1+\text{Cos}[2\,(d+e\,x)]}}}{(a-i\,b-c)\,(a+i\,b-c)\,(-a-c+a\,\text{Cos}[2\,(d+e\,x)]-c\,\text{Cos}[2\,(d+e\,x)]-b\,\text{Sin}[2\,(d+e\,x)])}+$$

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

$$\left.\text{Tan}[d+e\,x]\right)\Big/\left(2\,e\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}\right.$$

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

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

$$\left.\left(b\,\text{Sec}[d+e\,x]^2+2\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]\right)\right)\Big/\left(4\,\left(c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2\right)^{3/2}\right)\right)+$$

$$\Bigg(\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\;\Bigg(-\frac{\text{Log}\Big[\frac{-4\,c-4\,i\,a\,\text{Tan}[d+e\,x]-2\,b\,(i+\text{Tan}[d+e\,x])+4\,i\,\sqrt{a-i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}{\sqrt{a-i\,b-c}\,(a+i\,b-c)\,(-i+\text{Tan}[d+e\,x])}\Big]}{(a-i\,b-c)^{3/2}}+$$

$$\frac{\text{Log}\Big[\frac{4\,c+2\,b\,(-i+\text{Tan}[d+e\,x])-4\,i\,\big(a\,\text{Tan}[d+e\,x]+\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\big)}{(a-i\,b-c)\,\sqrt{a+i\,b-c}\,(i+\text{Tan}[d+e\,x])}\Big]}{(a+i\,b-c)^{3/2}}\Bigg)\,\text{Sec}[d+e\,x]^2\Bigg)\Big/\Big(2\,\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}\Big)+$$

$$\Bigg(\big(-b\,\text{Csc}[d+e\,x]^2-2\,c\,\text{Cot}[d+e\,x]\,\text{Csc}[d+e\,x]^2\big)\;\Bigg(-\frac{\text{Log}\Big[\frac{-4\,c-4\,i\,a\,\text{Tan}[d+e\,x]-2\,b\,(i+\text{Tan}[d+e\,x])+4\,i\,\sqrt{a-i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}{\sqrt{a-i\,b-c}\,(a+i\,b-c)\,(-i+\text{Tan}[d+e\,x])}\Big]}{(a-i\,b-c)^{3/2}}+$$

$$\frac{\text{Log}\Big[\frac{4\,c+2\,b\,(-i+\text{Tan}[d+e\,x])-4\,i\,\big(a\,\text{Tan}[d+e\,x]+\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\big)}{(a-i\,b-c)\,\sqrt{a+i\,b-c}\,(i+\text{Tan}[d+e\,x])}\Big]}{(a+i\,b-c)^{3/2}}\Bigg)\,\text{Tan}[d+e\,x]\Bigg)\Big/$$

$$\Big(4\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\,\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}\Big)+\frac{1}{2\,\sqrt{c+b\,\text{Tan}[d+e\,x]+a\,\text{Tan}[d+e\,x]^2}}$$

$$\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\;\text{Tan}[d+e\,x]\;\Bigg(-\Bigg(\Bigg(\Big((a+i\,b-c)\,(-i+\text{Tan}[d+e\,x])$$

$$\Bigg(\Bigg(-4\,i\,a\,\text{Sec}[d+e\,x]^2-2\,b\,\text{Sec}[d+e\,x]^2+\frac{2\,i\,\sqrt{a-i\,b-c}\,\big(a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\text{Sec}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x])\big)}{\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}}\Bigg)\Big/$$

$$\Big(\sqrt{a-i\,b-c}\,(a+i\,b-c)\,(-i+\text{Tan}[d+e\,x])\Big)\Bigg)-\Bigg(\text{Sec}[d+e\,x]^2\,\Big(-4\,c-4\,i\,a\,\text{Tan}[d+e\,x]-2\,b\,(i+\text{Tan}[d+e\,x])+$$

$$4\,i\,\sqrt{a-i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Bigg)\Big/\Big(\sqrt{a-i\,b-c}\,(a+i\,b-c)\,(-i+\text{Tan}[d+e\,x])^2\Big)\Bigg)\Bigg)\Big/$$

$$\Bigg((a-i\,b-c)\,\Big(-4\,c-4\,i\,a\,\text{Tan}[d+e\,x]-2\,b\,(i+\text{Tan}[d+e\,x])+4\,i\,\sqrt{a-i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,(b+a\,\text{Tan}[d+e\,x])}\Big)\Bigg)\Bigg)+$$

$$\Bigg(\left(a-i\,b-c\right)\left(i+\text{Tan}[d+e\,x]\right)\Bigg(\Bigg(2\,b\,\text{Sec}[d+e\,x]^2-4\,i\Bigg(a\,\text{Sec}[d+e\,x]^2+$$

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

$$\Big(\left(a-i\,b-c\right)\sqrt{a+i\,b-c}\,\left(i+\text{Tan}[d+e\,x]\right)\Big)-\Bigg(\text{Sec}[d+e\,x]^2\,\Bigg(4\,c+2\,b\,\left(-i+\text{Tan}[d+e\,x]\right)-4\,i\,\Bigg(a\,\text{Tan}[d+e\,x]+$$

$$\sqrt{a+i\,b-c}\,\sqrt{c+\text{Tan}[d+e\,x]\,\left(b+a\,\text{Tan}[d+e\,x]\right)}\Bigg)\Bigg)\Bigg)\Bigg/\Big(\left(a-i\,b-c\right)\sqrt{a+i\,b-c}\,\left(i+\text{Tan}[d+e\,x]\right)^2\Big)\Bigg)\Bigg/$$

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

Problem 15: Humongous result has more than 200000 leaves.

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

Optimal (type 3, 749 leaves, 13 steps):

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

$$\text{ArcTanh}\left[\left(b^2-(a-c)\left(a-c+\sqrt{a^2+b^2-2ac+c^2}\right)-b\left(2a-2c-\sqrt{a^2+b^2-2ac+c^2}\right)\text{Cot}[d+e\,x]\right)\Big/\right.$$

$$\left.\left.\left(\sqrt{2}\,\sqrt{2a-2c-\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a^2-b^2-2ac+c^2+(a-c)\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\right)\right]\right)\Big/$$

$$\left(\sqrt{2}\,\left(a^2+b^2-2ac+c^2\right)^{3/2}e\right)-\left(\sqrt{2a-2c+\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a^2-b^2-2ac+c^2-(a-c)\sqrt{a^2+b^2-2ac+c^2}}\right.$$

$$\text{ArcTanh}\left[\left(b^2-(a-c)\left(a-c-\sqrt{a^2+b^2-2ac+c^2}\right)-b\left(2a-2c+\sqrt{a^2+b^2-2ac+c^2}\right)\text{Cot}[d+e\,x]\right)\Big/\right.$$

$$\left.\left.\left(\sqrt{2}\,\sqrt{2a-2c+\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a^2-b^2-2ac+c^2-(a-c)\sqrt{a^2+b^2-2ac+c^2}}\,\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\right)\right]\right)\Big/$$

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

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

Result (type ?, 558 961 leaves) : Display of huge result suppressed!

Problem 16: Humongous result has more than 200000 leaves.

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

Optimal (type 3, 1008 leaves, 18 steps) :

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

$$\left(\sqrt{2\,a-2\,c-\sqrt{a^2+b^2-2\,a\,c+c^2}}\sqrt{a^2-b^2-2\,a\,c+c^2+(a-c)\sqrt{a^2+b^2-2\,a\,c+c^2}}\right.$$

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

$$\left.\left.\left(\sqrt{2}\sqrt{2\,a-2\,c-\sqrt{a^2+b^2-2\,a\,c+c^2}}\sqrt{a^2-b^2-2\,a\,c+c^2+(a-c)\sqrt{a^2+b^2-2\,a\,c+c^2}}\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\right)\right]\right)\Big/$$

$$\left(\sqrt{2}\left(a^2+b^2-2\,a\,c+c^2\right)^{3/2}e\right)+\left(\sqrt{2\,a-2\,c+\sqrt{a^2+b^2-2\,a\,c+c^2}}\sqrt{a^2-b^2-2\,a\,c+c^2-(a-c)\sqrt{a^2+b^2-2\,a\,c+c^2}}\right.$$

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

$$\left.\left.\left(\sqrt{2}\sqrt{2\,a-2\,c+\sqrt{a^2+b^2-2\,a\,c+c^2}}\sqrt{a^2-b^2-2\,a\,c+c^2-(a-c)\sqrt{a^2+b^2-2\,a\,c+c^2}}\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\right)\right]\right)\Big/$$

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

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

$$\frac{b\left(15\,b^2-52\,a\,c\right)\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\,\text{Tan}[d+e\,x]}{4\,a^3\left(b^2-4\,a\,c\right)e}-$$

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

$$\frac{\left(5\,b^2-12\,a\,c\right)\sqrt{a+b\,\text{Cot}[d+e\,x]+c\,\text{Cot}[d+e\,x]^2}\,\text{Tan}[d+e\,x]^2}{2\,a^2\left(b^2-4\,a\,c\right)e}$$

Result (type ?, 930 953 leaves) : Display of huge result suppressed!

Problem 17: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 182 leaves, 8 steps):

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

Result (type 3, 2952 leaves):

$$-\frac{\sqrt{\frac{3a+b+3c-4a\,\text{Cos}[2(d+e x)]+4c\,\text{Cos}[2(d+e x)]+a\,\text{Cos}[4(d+e x)]-b\,\text{Cos}[4(d+e x)]+c\,\text{Cos}[4(d+e x)]}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}}}{2c\,e}-$$

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

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

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

$$\Bigg(-\Bigg(\Bigg(2\sqrt{\Bigg(\frac{3a}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}+\frac{b}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}+\frac{3c}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}-}$$

$$\frac{4a\,\text{Cos}[2(d+e x)]}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}+\frac{4c\,\text{Cos}[2(d+e x)]}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}+\frac{a\,\text{Cos}[4(d+e x)]}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}-$$

$$\frac{b\,\text{Cos}[4(d+e x)]}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}+\frac{c\,\text{Cos}[4(d+e x)]}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}\Bigg)\,\text{Sin}[2(d+e x)]\Bigg)\Big/$$

$$\left(3a+b+3c-4a\,\text{Cos}[2(d+e x)]+4c\,\text{Cos}[2(d+e x)]+a\,\text{Cos}[4(d+e x)]-b\,\text{Cos}[4(d+e x)]+c\,\text{Cos}[4(d+e x)]\right)\Bigg)-$$

$$\Bigg(2b\sqrt{\Bigg(\frac{3a}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}+\frac{b}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}+\frac{3c}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}-}$$

$$\frac{4a\,\text{Cos}[2(d+e x)]}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}+\frac{4c\,\text{Cos}[2(d+e x)]}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}+\frac{a\,\text{Cos}[4(d+e x)]}{3-4\,\text{Cos}[2(d+e x)]+\text{Cos}[4(d+e x)]}-$$

$$\frac{b\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}\Bigg)\,\text{Sin}[2\,(d+e\,x)]\Bigg)\Big/$$

$$\Big(c\,\big(3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)]\big)\Big)\Big)-$$

$$\Bigg(\sqrt{\Bigg(\frac{3\,a}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{b}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{3\,c}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-}$$

$$\frac{4\,a\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{a\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\frac{b\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}\Bigg)\,\text{Sin}[4\,(d+e\,x)]\Bigg)\Big/$$

$$\big(3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)]\big)\Bigg)$$

$$\text{Tan}[d+e\,x]^2\,\sqrt{a+\text{Cot}[d+e\,x]^4\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\Bigg)\Big/\Bigg(4$$

$$c^{3/2}$$

$$e$$

$$\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}$$

$$\Bigg(\frac{1}{8\,c^{3/2}\,\left(c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4\right)^{3/2}}$$

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

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

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

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

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

$$2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big]-2\,c\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right]+$$

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

$$\text{Sec}[d+e\, x]^2\, \text{Tan}[d+e\, x]\, \sqrt{a+\text{Cot}[d+e\, x]^4\, \left(c+b\, \text{Tan}[d+e\, x]^2\right)}\; -$$

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

$$2\, c\, \text{Log}\Big[2\, c+b\, \text{Tan}[d+e\, x]^2+2\, \sqrt{c}\, \sqrt{c+b\, \text{Tan}[d+e\, x]^2+a\, \text{Tan}[d+e\, x]^4}\,\Big]+\frac{1}{\sqrt{a-b+c}}$$

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

$$\text{Tan}[d+e\, x]^2\, \left(2\, b\, \text{Cot}[d+e\, x]\, \text{Csc}[d+e\, x]^2-4\, \text{Cot}[d+e\, x]^3\, \text{Csc}[d+e\, x]^2\, \left(c+b\, \text{Tan}[d+e\, x]^2\right)\right)\Bigg)\Big/$$

$$\left(8\, c^{3/2}\, \sqrt{c+b\, \text{Tan}[d+e\, x]^2+a\, \text{Tan}[d+e\, x]^4}\, \sqrt{a+\text{Cot}[d+e\, x]^4\, \left(c+b\, \text{Tan}[d+e\, x]^2\right)}\right)\; -$$

$$\frac{1}{4\, c^{3/2}\, \sqrt{c+b\, \text{Tan}[d+e\, x]^2+a\, \text{Tan}[d+e\, x]^4}}\, \text{Tan}[d+e\, x]^2\, \sqrt{a+\text{Cot}[d+e\, x]^4\, \left(c+b\, \text{Tan}[d+e\, x]^2\right)}\, \Bigg(2\, \left(b+2\, c\right)\, \text{Csc}[d+e\, x]\, \text{Sec}[d+e\, x]\; -$$

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

$$\frac{2\, c\, \left(2\, b\, \text{Sec}[d+e\, x]^2\, \text{Tan}[d+e\, x]+\frac{\sqrt{c}\, \left(2\, b\, \text{Sec}[d+e\, x]^2\, \text{Tan}[d+e\, x]+4\, a\, \text{Sec}[d+e\, x]^2\, \text{Tan}[d+e\, x]^3\right)}{\sqrt{c+b\, \text{Tan}[d+e\, x]^2+a\, \text{Tan}[d+e\, x]^4}}\right)}{2\, c+b\, \text{Tan}[d+e\, x]^2+2\, \sqrt{c}\, \sqrt{c+b\, \text{Tan}[d+e\, x]^2+a\, \text{Tan}[d+e\, x]^4}}+\Bigg(2\, c^{3/2}\, \Bigg(2\, b\, \text{Sec}[d+e\, x]^2\, \text{Tan}[d+e\, x]+2$$

$$\left(-2\, a\, \text{Sec}[d+e\, x]^2\, \text{Tan}[d+e\, x]+\frac{\sqrt{a-b+c}\, \left(2\, b\, \text{Sec}[d+e\, x]^2\, \text{Tan}[d+e\, x]+4\, a\, \text{Sec}[d+e\, x]^2\, \text{Tan}[d+e\, x]^3\right)}{2\, \sqrt{c+b\, \text{Tan}[d+e\, x]^2+a\, \text{Tan}[d+e\, x]^4}}\right)\Bigg)\Bigg)\Big/$$

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

Problem 18: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 141 leaves, 7 steps):

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

Result (type 3, 2161 leaves):

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

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

$$\Bigg(\Bigg(2\,\sqrt{\Bigg(\Bigg(\frac{3\,a}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{b}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{3\,c}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\frac{4\,a\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{a\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\frac{b\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}\Bigg)\,\text{Sin}[2\,(d+e\,x)]\Bigg)\Big/$$

$$(3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)]))+$$

$$\Bigg(\sqrt{\Bigg(\Bigg(\frac{3\,a}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{b}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{3\,c}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\frac{4\,a\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{a\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\frac{b\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}\Bigg)\,\text{Sin}[4\,(d+e\,x)]\Bigg)\Big/$$

$$(3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)]))\Bigg)$$

$$\text{Tan}[d+e\,x]^2\,\sqrt{a+\text{Cot}[d+e\,x]^4\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\,\Bigg)\Big/\Bigg(2$$

$$e$$

$$\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}$$

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

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

$$\text{Tan}[d+e\,x]^2\,\left(2\,b\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+4\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]^3\right)$$

$$\sqrt{a+\text{Cot}[d+e\,x]^4\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\Bigg)\Bigg/\left(4\,\left(c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4\right)^{3/2}\right)\Bigg)+$$

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

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

$$\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]\,\sqrt{a+\text{Cot}[d+e\,x]^4\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\Bigg)\Bigg/\left(\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right)+$$

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

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

$$\text{Tan}[d+e\,x]^2\,\left(2\,b\,\text{Cot}[d+e\,x]\,\text{Csc}[d+e\,x]^2-4\,\text{Cot}[d+e\,x]^3\,\text{Csc}[d+e\,x]^2\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)\right)\Bigg)\Bigg/$$

$$\left(4\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\sqrt{a+\text{Cot}[d+e\,x]^4\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\right)+$$

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

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

$$\Big(2\,b\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+2\,\Big(-2\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\Big(\sqrt{a-b+c}\,\Big(2\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]^3+$$

$$2\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]\,\left(b+a\,\text{Tan}[d+e\,x]^2\right)\Big)\Big)\Big/\left(2\,\sqrt{c+\text{Tan}[d+e\,x]^2\,\left(b+a\,\text{Tan}[d+e\,x]^2\right)}\right)\Big)\Big)\Big/$$

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

Problem 19: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 79 leaves, 4 steps):

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

Result (type 4, 84 039 leaves): Display of huge result suppressed!

Problem 20: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 142 leaves, 8 steps):

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

Result (type 4, 44 361 leaves): Display of huge result suppressed!

Problem 21: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 249 leaves, 11 steps):

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

Result (type 4, 124 484 leaves): Display of huge result suppressed!

Problem 22: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 270 leaves, 9 steps):

$$\frac{\sqrt{a-b+c} \text{ArcTanh}\left[\frac{2 a-b+(b-2 c) \text{Cot}[d+e x]^2}{2 \sqrt{a-b+c} \sqrt{a+b \text{Cot}[d+e x]^2+c \text{Cot}[d+e x]^4}}\right]}{2 e}-\frac{\left(b^3+2 b^2 c-4 b (a-2 c) c-8 c^2 (a+2 c)\right) \text{ArcTanh}\left[\frac{b+2 c \text{Cot}[d+e x]^2}{2 \sqrt{c} \sqrt{a+b \text{Cot}[d+e x]^2+c \text{Cot}[d+e x]^4}}\right]}{32 c^{5/2} e}+$$
$$\frac{\left((b-2 c) (b+4 c)+2 c (b+2 c) \text{Cot}[d+e x]^2\right) \sqrt{a+b \text{Cot}[d+e x]^2+c \text{Cot}[d+e x]^4}}{16 c^2 e}-\frac{\left(a+b \text{Cot}[d+e x]^2+c \text{Cot}[d+e x]^4\right)^{3/2}}{6 c e}$$

Result (type 3, 4238 leaves):

$$\frac{1}{e}\sqrt{\left(\left(3 a+b+3 c-4 a \text{Cos}[2 (d+e x)]+4 c \text{Cos}[2 (d+e x)]+a \text{Cos}[4 (d+e x)]-b \text{Cos}[4 (d+e x)]+c \text{Cos}[4 (d+e x)]\right)\right/}$$
$$\left.\left(3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]\right)\right) \left(-\frac{-3 b^2+8 a c-8 b c+44 c^2}{48 c^2}+\frac{(-b+14 c) \text{Csc}[d+e x]^2}{24 c}-\frac{1}{6} \text{Csc}[d+e x]^4\right)+$$
$$\left(\left(\left(b^3+2 b^2 c-4 b (a-2 c) c-8 c^2 (a+2 c)\right) \text{Log}\left[\text{Tan}[d+e x]^2\right]+16 c^{5/2} \sqrt{a-b+c} \text{Log}\left[1+\text{Tan}[d+e x]^2\right]-\right.\right.$$
$$\left(b^3+2 b^2 c-4 b (a-2 c) c-8 c^2 (a+2 c)\right) \text{Log}\left[2 c+b \text{Tan}[d+e x]^2+2 \sqrt{c} \sqrt{c+\text{Tan}[d+e x]^2 \left(b+a \text{Tan}[d+e x]^2\right)}\right]-$$
$$16 c^{5/2} \sqrt{a-b+c} \text{Log}\left[b \left(-1+\text{Tan}[d+e x]^2\right)+2 \left(c-a \text{Tan}[d+e x]^2+\sqrt{a-b+c} \sqrt{c+\text{Tan}[d+e x]^2 \left(b+a \text{Tan}[d+e x]^2\right)}\right)\right]\Big)$$

$$\Bigg(\Bigg(b^3\sqrt{\Bigg(\Bigg(\frac{3\,a}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{b}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{3\,c}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}-}$$

$$\frac{4\,a\cos[2\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{4\,c\cos[2\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{a\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}-$$

$$\frac{b\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{c\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}\Bigg)\sin[2\,(d+e\,x)]\Bigg)\Bigg/$$

$$\Big(4\,c^2\,\big(3\,a+b+3\,c-4\,a\cos[2\,(d+e\,x)]+4\,c\cos[2\,(d+e\,x)]+a\cos[4\,(d+e\,x)]-b\cos[4\,(d+e\,x)]+c\cos[4\,(d+e\,x)]\big)\Big)\Bigg)-$$

$$\Bigg(a\,b\sqrt{\Bigg(\Bigg(\frac{3\,a}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{b}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{3\,c}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}-}$$

$$\frac{4\,a\cos[2\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{4\,c\cos[2\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{a\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}-$$

$$\frac{b\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{c\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}\Bigg)\sin[2\,(d+e\,x)]\Bigg)\Bigg/$$

$$\Big(c\,\big(3\,a+b+3\,c-4\,a\cos[2\,(d+e\,x)]+4\,c\cos[2\,(d+e\,x)]+a\cos[4\,(d+e\,x)]-b\cos[4\,(d+e\,x)]+c\cos[4\,(d+e\,x)]\big)\Big)\Bigg)+$$

$$\Bigg(b^2\sqrt{\Bigg(\Bigg(\frac{3\,a}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{b}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{3\,c}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}-}$$

$$\frac{4\,a\cos[2\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{4\,c\cos[2\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{a\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}-$$

$$\frac{b\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{c\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}\Bigg)\sin[2\,(d+e\,x)]\Bigg)\Bigg/$$

$$\Big(2\,c\,\big(3\,a+b+3\,c-4\,a\cos[2\,(d+e\,x)]+4\,c\cos[2\,(d+e\,x)]+a\cos[4\,(d+e\,x)]-b\cos[4\,(d+e\,x)]+c\cos[4\,(d+e\,x)]\big)\Big)\Bigg)-$$

$$\Bigg(2\,c\sqrt{\Bigg(\Bigg(\frac{3\,a}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{b}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{3\,c}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}-}$$

$$\frac{4\,a\cos[2\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{4\,c\cos[2\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{a\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}-$$

$$\frac{b\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{c\cos[4\,(d+e\,x)]}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}\Bigg)\sin[2\,(d+e\,x)]\Bigg)\Bigg/$$

$$\big(3\,a+b+3\,c-4\,a\cos[2\,(d+e\,x)]+4\,c\cos[2\,(d+e\,x)]+a\cos[4\,(d+e\,x)]-b\cos[4\,(d+e\,x)]+c\cos[4\,(d+e\,x)]\big)\Bigg)-$$

$$\Bigg(a\sqrt{\Bigg(\Bigg(\frac{3\,a}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{b}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}+\frac{3\,c}{3-4\cos[2\,(d+e\,x)]+\cos[4\,(d+e\,x)]}-}$$

$$\frac{4\,a\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{a\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\left.\left.\frac{b\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}\right)\text{Sin}[4\,(d+e\,x)]\right)\Big/$$

$$(3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)])\Big)+$$

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

$$\frac{4\,a\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{a\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\left.\left.\frac{b\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}\right)\text{Sin}[4\,(d+e\,x)]\right)\Big/$$

$$(3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)])\Big)-$$

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

$$\frac{4\,a\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{a\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\left.\left.\frac{b\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}\right)\text{Sin}[4\,(d+e\,x)]\right)\Big/$$

$$(3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)])\Big)\Big)$$

$$\left.\text{Tan}[d+e\,x]^2\sqrt{a+\text{Cot}[d+e\,x]^4\,(c+b\,\text{Tan}[d+e\,x]^2)}\right)\Big/\Big(32$$

$$c^{5/2}$$

$$e$$

$$\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}$$

$$\left(-\frac{1}{64\,c^{5/2}\,(c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4)^{3/2}}\right.$$

$$\Big((b^3+2\,b^2\,c-4\,b\,(a-2\,c)\,c-8\,c^2\,(a+2\,c))\,\text{Log}[\text{Tan}[d+e\,x]^2]+16\,c^{5/2}\sqrt{a-b+c}\,\text{Log}[1+\text{Tan}[d+e\,x]^2]-$$

$$(b^3+2\,b^2\,c-4\,b\,(a-2\,c)\,c-8\,c^2\,(a+2\,c))\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\sqrt{c+\text{Tan}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x]^2)}\Big]-$$

$$16\,c^{5/2}\sqrt{a-b+c}\,\text{Log}\Big[b\,(-1+\text{Tan}[d+e\,x]^2)+2\left(c-a\,\text{Tan}[d+e\,x]^2+\sqrt{a-b+c}\sqrt{c+\text{Tan}[d+e\,x]^2\,(b+a\,\text{Tan}[d+e\,x]^2)}\right)\Big]\Big)$$

$$\mathrm{Tan}[d+e x]^2 \left(2 b\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x]+4 a\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x]^3\right) \sqrt{a+\mathrm{Cot}[d+e x]^4 \left(c+b\, \mathrm{Tan}[d+e x]^2\right)}\; +$$

$$\frac{1}{16 c^{5/2} \sqrt{c+b\, \mathrm{Tan}[d+e x]^2+a\, \mathrm{Tan}[d+e x]^4}} \Big(\left(b^3+2 b^2 c-4 b (a-2 c) c-8 c^2 (a+2 c)\right) \mathrm{Log}\left[\mathrm{Tan}[d+e x]^2\right]+16 c^{5/2} \sqrt{a-b+c}\, \mathrm{Log}\Big[1+$$

$$\mathrm{Tan}[d+e x]^2\Big]-\left(b^3+2 b^2 c-4 b (a-2 c) c-8 c^2 (a+2 c)\right) \mathrm{Log}\left[2 c+b\, \mathrm{Tan}[d+e x]^2+2 \sqrt{c} \sqrt{c+\mathrm{Tan}[d+e x]^2 \left(b+a\, \mathrm{Tan}[d+e x]^2\right)}\right]-$$

$$16 c^{5/2} \sqrt{a-b+c}\, \mathrm{Log}\left[b \left(-1+\mathrm{Tan}[d+e x]^2\right)+2 \left(c-a\, \mathrm{Tan}[d+e x]^2+\sqrt{a-b+c} \sqrt{c+\mathrm{Tan}[d+e x]^2 \left(b+a\, \mathrm{Tan}[d+e x]^2\right)}\right)\right]\Big)$$

$$\mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x] \sqrt{a+\mathrm{Cot}[d+e x]^4 \left(c+b\, \mathrm{Tan}[d+e x]^2\right)}\; +$$

$$\Bigg(\Big(\left(b^3+2 b^2 c-4 b (a-2 c) c-8 c^2 (a+2 c)\right) \mathrm{Log}\left[\mathrm{Tan}[d+e x]^2\right]+16 c^{5/2} \sqrt{a-b+c}\, \mathrm{Log}\left[1+\mathrm{Tan}[d+e x]^2\right]-$$

$$\left(b^3+2 b^2 c-4 b (a-2 c) c-8 c^2 (a+2 c)\right) \mathrm{Log}\left[2 c+b\, \mathrm{Tan}[d+e x]^2+2 \sqrt{c} \sqrt{c+\mathrm{Tan}[d+e x]^2 \left(b+a\, \mathrm{Tan}[d+e x]^2\right)}\right]-$$

$$16 c^{5/2} \sqrt{a-b+c}\, \mathrm{Log}\left[b \left(-1+\mathrm{Tan}[d+e x]^2\right)+2 \left(c-a\, \mathrm{Tan}[d+e x]^2+\sqrt{a-b+c} \sqrt{c+\mathrm{Tan}[d+e x]^2 \left(b+a\, \mathrm{Tan}[d+e x]^2\right)}\right)\right]\Big)$$

$$\mathrm{Tan}[d+e x]^2 \left(2 b\, \mathrm{Cot}[d+e x]\, \mathrm{Csc}[d+e x]^2-4\, \mathrm{Cot}[d+e x]^3 \mathrm{Csc}[d+e x]^2 \left(c+b\, \mathrm{Tan}[d+e x]^2\right)\right)\Bigg)\Big/$$

$$\left(64 c^{5/2} \sqrt{c+b\, \mathrm{Tan}[d+e x]^2+a\, \mathrm{Tan}[d+e x]^4} \sqrt{a+\mathrm{Cot}[d+e x]^4 \left(c+b\, \mathrm{Tan}[d+e x]^2\right)}\right)+\frac{1}{32 c^{5/2} \sqrt{c+b\, \mathrm{Tan}[d+e x]^2+a\, \mathrm{Tan}[d+e x]^4}}$$

$$\mathrm{Tan}[d+e x]^2 \sqrt{a+\mathrm{Cot}[d+e x]^4 \left(c+b\, \mathrm{Tan}[d+e x]^2\right)} \Bigg(2 \left(b^3+2 b^2 c-4 b (a-2 c) c-8 c^2 (a+2 c)\right) \mathrm{Csc}[d+e x]\, \mathrm{Sec}[d+e x]+$$

$$\frac{32 c^{5/2} \sqrt{a-b+c}\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x]}{1+\mathrm{Tan}[d+e x]^2}-\Bigg(\left(b^3+2 b^2 c-4 b (a-2 c) c-8 c^2 (a+2 c)\right)$$

$$\left(2 b\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x]+\frac{\sqrt{c} \left(2 a\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x]^3+2\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x] \left(b+a\, \mathrm{Tan}[d+e x]^2\right)\right)}{\sqrt{c+\mathrm{Tan}[d+e x]^2 \left(b+a\, \mathrm{Tan}[d+e x]^2\right)}}\right)\Bigg)\Big/$$

$$\left(2 c+b\, \mathrm{Tan}[d+e x]^2+2 \sqrt{c} \sqrt{c+\mathrm{Tan}[d+e x]^2 \left(b+a\, \mathrm{Tan}[d+e x]^2\right)}\right)-$$

$$\Bigg(16 c^{5/2} \sqrt{a-b+c} \Bigg(2 b\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x]+2 \Bigg(-2 a\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x]+\Bigg(\sqrt{a-b+c} \Big(2 a\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x]^3+$$

$$2\, \mathrm{Sec}[d+e x]^2 \mathrm{Tan}[d+e x] \left(b+a\, \mathrm{Tan}[d+e x]^2\right)\Big)\Bigg)\Big/\left(2 \sqrt{c+\mathrm{Tan}[d+e x]^2 \left(b+a\, \mathrm{Tan}[d+e x]^2\right)}\right)\Bigg)\Bigg)\Bigg)\Big/$$

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

Problem 23: Result more than twice size of optimal antiderivative.

$$\int \text{Cot}[d+e\,x]^3\,\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}\;dx$$

Optimal (type 3, 209 leaves, 8 steps):

$$-\frac{\sqrt{a-b+c}\;\text{ArcTanh}\left[\frac{2\,a-b+(b-2\,c)\,\text{Cot}[d+e\,x]^2}{2\,\sqrt{a-b+c}\,\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}}\right]}{2\,e}+\frac{\left(b^2+4\,b\,c-4\,c\,(a+2\,c)\right)\text{ArcTanh}\left[\frac{b+2\,c\,\text{Cot}[d+e\,x]^2}{2\,\sqrt{c}\,\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}}\right]}{16\,c^{3/2}\,e}-\frac{\left(b-4\,c+2\,c\,\text{Cot}[d+e\,x]^2\right)\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}}{8\,c\,e}$$

Result (type 3, 4379 leaves):

$$\frac{\sqrt{\frac{3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}}\left(\frac{-b+6\,c}{8\,c}-\frac{1}{4}\,\text{Csc}[d+e\,x]^2\right)}{e}+$$

$$\Bigg(\Bigg(-\left(b^2+4\,b\,c-4\,c\,(a+2\,c)\right)\text{Log}\left[\text{Tan}[d+e\,x]^2\right]-$$
$$8\,c^{3/2}\sqrt{a-b+c}\;\text{Log}\left[1+\text{Tan}[d+e\,x]^2\right]+b^2\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right]-$$
$$4\,a\,c\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right]+$$
$$4\,b\,c\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right]-$$
$$8\,c^2\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right]+$$
$$8\,c^{3/2}\sqrt{a-b+c}\;\text{Log}\left[b\left(-1+\text{Tan}[d+e\,x]^2\right)+2\left(c-a\,\text{Tan}[d+e\,x]^2+\sqrt{a-b+c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right)\right]\Bigg)\Bigg)$$

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

$$\Bigg(2\,c\sqrt{\Bigg(\frac{3\,a}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{b}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{3\,c}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-}$$

$$\frac{4\,a\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\left.\left.\frac{b\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{c\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}\right)\mathrm{Sin}[2\,(d+e\,x)]\right)\Big/$$

$$(3\,a+b+3\,c-4\,a\,\mathrm{Cos}[2\,(d+e\,x)]+4\,c\,\mathrm{Cos}[2\,(d+e\,x)]+a\,\mathrm{Cos}[4\,(d+e\,x)]-b\,\mathrm{Cos}[4\,(d+e\,x)]+c\,\mathrm{Cos}[4\,(d+e\,x)])\,+$$

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

$$\frac{4\,a\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\left.\left.\frac{b\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{c\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}\right)\mathrm{Sin}[4\,(d+e\,x)]\right)\Big/$$

$$(3\,a+b+3\,c-4\,a\,\mathrm{Cos}[2\,(d+e\,x)]+4\,c\,\mathrm{Cos}[2\,(d+e\,x)]+a\,\mathrm{Cos}[4\,(d+e\,x)]-b\,\mathrm{Cos}[4\,(d+e\,x)]+c\,\mathrm{Cos}[4\,(d+e\,x)])\,-$$

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

$$\frac{4\,a\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\left.\left.\frac{b\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{c\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}\right)\mathrm{Sin}[4\,(d+e\,x)]\right)\Big/$$

$$(3\,a+b+3\,c-4\,a\,\mathrm{Cos}[2\,(d+e\,x)]+4\,c\,\mathrm{Cos}[2\,(d+e\,x)]+a\,\mathrm{Cos}[4\,(d+e\,x)]-b\,\mathrm{Cos}[4\,(d+e\,x)]+c\,\mathrm{Cos}[4\,(d+e\,x)])\,+$$

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

$$\frac{4\,a\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\left.\left.\frac{b\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{c\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}\right)\mathrm{Sin}[4\,(d+e\,x)]\right)\Big/$$

$$\left.(3\,a+b+3\,c-4\,a\,\mathrm{Cos}[2\,(d+e\,x)]+4\,c\,\mathrm{Cos}[2\,(d+e\,x)]+a\,\mathrm{Cos}[4\,(d+e\,x)]-b\,\mathrm{Cos}[4\,(d+e\,x)]+c\,\mathrm{Cos}[4\,(d+e\,x)])\right)$$

$$\left.\mathrm{Tan}[d+e\,x]^2\,\sqrt{a+\mathrm{Cot}[d+e\,x]^4\,\left(c+b\,\mathrm{Tan}[d+e\,x]^2\right)}\right)\Big/\Bigg(16$$

$$c^{3/2}$$

$$\frac{e}{\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}}$$

$$\Bigg(-\frac{1}{32\,c^{3/2}\left(c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4\right)^{3/2}}\Big(-\left(b^2+4\,b\,c-4\,c\,(a+2\,c)\right)\text{Log}\left[\text{Tan}[d+e\,x]^2\right]-$$

$$8\,c^{3/2}\sqrt{a-b+c}\;\text{Log}\left[1+\text{Tan}[d+e\,x]^2\right]+b^2\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]-$$

$$4\,a\,c\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]+4\,b\,c\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+$$

$$2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\Big]-8\,c^2\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]+$$

$$8\,c^{3/2}\sqrt{a-b+c}\;\text{Log}\left[b\left(-1+\text{Tan}[d+e\,x]^2\right)+2\left(c-a\,\text{Tan}[d+e\,x]^2+\sqrt{a-b+c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right)\right]\Big)$$

$$\text{Tan}[d+e\,x]^2\left(2\,b\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+4\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]^3\right)\sqrt{a+\text{Cot}[d+e\,x]^4\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\;+$$

$$\frac{1}{8\,c^{3/2}\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}}\Big(-\left(b^2+4\,b\,c-4\,c\,(a+2\,c)\right)\text{Log}\left[\text{Tan}[d+e\,x]^2\right]-8\,c^{3/2}\sqrt{a-b+c}\;\text{Log}\left[1+\text{Tan}[d+e\,x]^2\right]+$$

$$b^2\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]-$$

$$4\,a\,c\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]+4\,b\,c\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+$$

$$2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\Big]-8\,c^2\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]+$$

$$8\,c^{3/2}\sqrt{a-b+c}\;\text{Log}\left[b\left(-1+\text{Tan}[d+e\,x]^2\right)+2\left(c-a\,\text{Tan}[d+e\,x]^2+\sqrt{a-b+c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right)\right]\Big)$$

$$\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]\,\sqrt{a+\text{Cot}[d+e\,x]^4\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\;+\Big(\Big(-\left(b^2+4\,b\,c-4\,c\,(a+2\,c)\right)\text{Log}\left[\text{Tan}[d+e\,x]^2\right]-$$

$$8\,c^{3/2}\sqrt{a-b+c}\;\text{Log}\left[1+\text{Tan}[d+e\,x]^2\right]+b^2\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]-$$

$$4\,a\,c\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]+4\,b\,c\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+$$

$$2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\Big]-8\,c^2\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]+$$

$$8\,c^{3/2}\sqrt{a-b+c}\;\text{Log}\left[b\left(-1+\text{Tan}[d+e\,x]^2\right)+2\left(c-a\,\text{Tan}[d+e\,x]^2+\sqrt{a-b+c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right)\right]\Big)$$

$$\text{Tan}[d+e\,x]^2\left(2\,b\,\text{Cot}[d+e\,x]\,\text{Csc}[d+e\,x]^2-4\,\text{Cot}[d+e\,x]^3\,\text{Csc}[d+e\,x]^2\left(c+b\,\text{Tan}[d+e\,x]^2\right)\right)\Big)\Big/$$

$$\left(32\,c^{3/2}\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\sqrt{a+\text{Cot}[d+e\,x]^4\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\right)+$$

$$\frac{1}{16\,c^{3/2}\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}}\,\text{Tan}[d+e\,x]^2\sqrt{a+\text{Cot}[d+e\,x]^4\left(c+b\,\text{Tan}[d+e\,x]^2\right)}$$

$$\left(-2\left(b^2+4bc-4c\left(a+2c\right)\right)\text{Csc}[d+e x]\,\text{Sec}[d+e x]-\frac{16\,c^{3/2}\sqrt{a-b+c}\;\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]}{1+\text{Tan}[d+e x]^2}+\right.$$

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

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

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

$$\frac{8c^2\left(2b\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+\frac{\sqrt{c}\left(2b\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+4a\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]^3\right)}{\sqrt{c+b\,\text{Tan}[d+e x]^2+a\,\text{Tan}[d+e x]^4}}\right)}{2c+b\,\text{Tan}[d+e x]^2+2\sqrt{c}\sqrt{c+b\,\text{Tan}[d+e x]^2+a\,\text{Tan}[d+e x]^4}}+\left(8\,c^{3/2}\sqrt{a-b+c}\left(2b\,\text{Sec}[d+e x]^2\,\text{Tan}[d+e x]+2\right.\right.$$

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

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

Problem 24: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 179 leaves, 8 steps):

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

Result (type 3, 3486 leaves) :

$$-\frac{\sqrt{\frac{3 a+b+3 c-4 a \text{Cos}[2 (d+e x)]+4 c \text{Cos}[2 (d+e x)]+a \text{Cos}[4 (d+e x)]-b \text{Cos}[4 (d+e x)]+c \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}}}{2 e}+\Bigg(\sqrt{a+b \text{Cot}[d+e x]^2+c \text{Cot}[d+e x]^4}$$

$$\Bigg(2 \sqrt{c} \sqrt{a-b+c} \text{Log}\left[\text{Sec}[d+e x]^2\right]+(b-2 c) \text{Log}\left[\text{Tan}[d+e x]^2\right]-b \text{Log}\left[2 c+b \text{Tan}[d+e x]^2+2 \sqrt{c} \sqrt{c+b \text{Tan}[d+e x]^2+a \text{Tan}[d+e x]^4}\right]+$$

$$2 c \text{Log}\left[2 c+b \text{Tan}[d+e x]^2+2 \sqrt{c} \sqrt{c+b \text{Tan}[d+e x]^2+a \text{Tan}[d+e x]^4}\right]-$$

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

$$\Bigg(\Bigg(\Bigg(2 a \sqrt{\Bigg(\frac{3 a}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{b}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{3 c}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}-}$$

$$\frac{4 a \text{Cos}[2 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{4 c \text{Cos}[2 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{a \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}-$$

$$\frac{b \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{c \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}\Bigg) \text{Sin}[2 (d+e x)]\Bigg)\Bigg/$$

$$(3 a+b+3 c-4 a \text{Cos}[2 (d+e x)]+4 c \text{Cos}[2 (d+e x)]+a \text{Cos}[4 (d+e x)]-b \text{Cos}[4 (d+e x)]+c \text{Cos}[4 (d+e x)])-$$

$$\Bigg(2 c \sqrt{\Bigg(\frac{3 a}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{b}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{3 c}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}-}$$

$$\frac{4 a \text{Cos}[2 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{4 c \text{Cos}[2 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{a \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}-$$

$$\frac{b \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{c \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}\Bigg) \text{Sin}[2 (d+e x)]\Bigg)\Bigg/$$

$$(3 a+b+3 c-4 a \text{Cos}[2 (d+e x)]+4 c \text{Cos}[2 (d+e x)]+a \text{Cos}[4 (d+e x)]-b \text{Cos}[4 (d+e x)]+c \text{Cos}[4 (d+e x)])-$$

$$\Bigg(a \sqrt{\Bigg(\frac{3 a}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{b}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{3 c}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}-}$$

$$\frac{4 a \text{Cos}[2 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{4 c \text{Cos}[2 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{a \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}-$$

$$\frac{b \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{c \text{Cos}[4 (d+e x)]}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}\Bigg) \text{Sin}[4 (d+e x)]\Bigg)\Bigg/$$

$$(3 a+b+3 c-4 a \text{Cos}[2 (d+e x)]+4 c \text{Cos}[2 (d+e x)]+a \text{Cos}[4 (d+e x)]-b \text{Cos}[4 (d+e x)]+c \text{Cos}[4 (d+e x)])+$$

$$\Bigg(b \sqrt{\Bigg(\frac{3 a}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{b}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}+\frac{3 c}{3-4 \text{Cos}[2 (d+e x)]+\text{Cos}[4 (d+e x)]}-}$$

$$\frac{4\,a\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{a\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\left.\left.\frac{b\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}\right)\text{Sin}[4\,(d+e\,x)]\right)\Big/$$

$$(3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)])-$$

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

$$\frac{4\,a\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{a\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

$$\left.\left.\frac{b\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{c\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}\right)\text{Sin}[4\,(d+e\,x)]\right)\Big/$$

$$\left.(3\,a+b+3\,c-4\,a\,\text{Cos}[2\,(d+e\,x)]+4\,c\,\text{Cos}[2\,(d+e\,x)]+a\,\text{Cos}[4\,(d+e\,x)]-b\,\text{Cos}[4\,(d+e\,x)]+c\,\text{Cos}[4\,(d+e\,x)])\right)\text{Tan}[d+e\,x]^2\Big)\Big/$$

$$\left(4\sqrt{c}\;e\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\left(-\frac{1}{8\sqrt{c}\,\left(c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4\right)^{3/2}}\right.\right.$$

$$\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}\;\left(2\sqrt{c}\,\sqrt{a-b+c}\;\text{Log}[\text{Sec}[d+e\,x]^2]+(b-2\,c)\,\text{Log}[\text{Tan}[d+e\,x]^2]-b\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+\right.$$

$$2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\Big]+2\,c\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\Big]-$$

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

$$\text{Tan}[d+e\,x]^2\,\left(2\,b\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+4\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]^3\right)+$$

$$\frac{1}{2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}}\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}\;\Big(2\sqrt{c}\,\sqrt{a-b+c}\;\text{Log}[\text{Sec}[d+e\,x]^2]+$$

$$(b-2\,c)\,\text{Log}[\text{Tan}[d+e\,x]^2]-b\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\Big]+$$

$$2\,c\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\Big]-$$

$$\left.2\sqrt{c}\,\sqrt{a-b+c}\;\text{Log}\Big[-b+(-2\,a+b)\,\text{Tan}[d+e\,x]^2+2\left(c+\sqrt{a-b+c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\right)\Big]\right)\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+$$

$$\Big(\left(-2\,b\,\text{Cot}[d+e\,x]\,\text{Csc}[d+e\,x]^2-4\,c\,\text{Cot}[d+e\,x]^3\,\text{Csc}[d+e\,x]^2\right)\Big(2\sqrt{c}\,\sqrt{a-b+c}\;\text{Log}[\text{Sec}[d+e\,x]^2]+$$

$$(b-2\,c)\,\text{Log}[\text{Tan}[d+e\,x]^2]-b\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\Big]+$$

$$2\,c\,\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\Big]-$$

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

$$\left(8\sqrt{c}\,\sqrt{a+b\,\text{Cot}[d+e x]^2+c\,\text{Cot}[d+e x]^4}\,\sqrt{c+b\,\text{Tan}[d+e x]^2+a\,\text{Tan}[d+e x]^4}\right)+\frac{1}{4\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e x]^2+a\,\text{Tan}[d+e x]^4}}$$

$$\sqrt{a+b\,\text{Cot}[d+e x]^2+c\,\text{Cot}[d+e x]^4}\,\text{Tan}[d+e x]^2\,\Bigg(2\,(b-2c)\,\text{Csc}[d+e x]\,\text{Sec}[d+e x]+$$

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

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

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

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

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

$$\int\sqrt{a+b\,\text{Cot}[d+e x]^2+c\,\text{Cot}[d+e x]^4}\,\text{Tan}[d+e x]\,dx$$

Optimal (type 3, 203 leaves, 10 steps):

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

Result (type 3, 1999 leaves):

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

$$\frac{4\,a\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\text{Cos}[2\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}+\frac{a\,\text{Cos}[4\,(d+e\,x)]}{3-4\,\text{Cos}[2\,(d+e\,x)]+\text{Cos}[4\,(d+e\,x)]}-$$

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

$$\Big(-\sqrt{a-b+c}\;\text{Log}\big[\text{Sec}[d+e\,x]^2\big]+\sqrt{c}\;\text{Log}\big[\text{Tan}[d+e\,x]^2\big]+\sqrt{a}\;\text{Log}\Big[b+2\,a\,\text{Tan}[d+e\,x]^2+2\sqrt{a}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big]-$$

$$\sqrt{c}\;\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big]+$$

$$\left.\sqrt{a-b+c}\;\text{Log}\Big[-b+(-2\,a+b)\,\text{Tan}[d+e\,x]^2+2\Big(c+\sqrt{a-b+c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big)\Big]\Big)\,\text{Tan}[d+e\,x]^3\right)\Big/$$

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

$$\Big(-\sqrt{a-b+c}\;\text{Log}\big[\text{Sec}[d+e\,x]^2\big]+\sqrt{c}\;\text{Log}\big[\text{Tan}[d+e\,x]^2\big]+\sqrt{a}\;\text{Log}\Big[b+2\,a\,\text{Tan}[d+e\,x]^2+2\sqrt{a}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big]-$$

$$\sqrt{c}\;\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big]+$$

$$\sqrt{a-b+c}\;\text{Log}\Big[-b+(-2\,a+b)\,\text{Tan}[d+e\,x]^2+2\Big(c+\sqrt{a-b+c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big)\Big]\Big)$$

$$\text{Tan}[d+e\,x]^2\,\big(2\,b\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+4\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]^3\big)+\frac{1}{\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}}$$

$$\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}\;\Big(-\sqrt{a-b+c}\;\text{Log}\big[\text{Sec}[d+e\,x]^2\big]+\sqrt{c}\;\text{Log}\big[\text{Tan}[d+e\,x]^2\big]+\sqrt{a}\;\text{Log}\Big[b+2\,a\,\text{Tan}[d+e\,x]^2+$$

$$2\sqrt{a}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big]-\sqrt{c}\;\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big]+$$

$$\sqrt{a-b+c}\;\text{Log}\Big[-b+(-2\,a+b)\,\text{Tan}[d+e\,x]^2+2\Big(c+\sqrt{a-b+c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big)\Big]\Big)\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+$$

$$\Big(\big(-2\,b\,\text{Cot}[d+e\,x]\,\text{Csc}[d+e\,x]^2-4\,c\,\text{Cot}[d+e\,x]^3\,\text{Csc}[d+e\,x]^2\big)\;\Big(-\sqrt{a-b+c}\;\text{Log}\big[\text{Sec}[d+e\,x]^2\big]+\sqrt{c}\;\text{Log}\big[\text{Tan}[d+e\,x]^2\big]+$$

$$\sqrt{a}\;\text{Log}\Big[b+2\,a\,\text{Tan}[d+e\,x]^2+2\sqrt{a}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big]-$$

$$\sqrt{c}\;\text{Log}\Big[2\,c+b\,\text{Tan}[d+e\,x]^2+2\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big]+$$

$$\sqrt{a-b+c}\;\text{Log}\Big[-b+(-2\,a+b)\,\text{Tan}[d+e\,x]^2+2\Big(c+\sqrt{a-b+c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big)\Big]\Big)\,\text{Tan}[d+e\,x]^2\Big)\Big/$$

$$\Big(4\,\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}\;\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\Big)+\frac{1}{2\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}}$$

$$\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}\ \text{Tan}[d+e\,x]^2\left(2\sqrt{c}\ \text{Csc}[d+e\,x]\ \text{Sec}[d+e\,x]-2\sqrt{a-b+c}\ \text{Tan}[d+e\,x]+\right.$$

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

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

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

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

Problem 26: Humongous result has more than 200000 leaves.

$$\int\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}\ \text{Tan}[d+e\,x]^3\,dx$$

Optimal (type 3, 435 leaves, 22 steps):

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

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

$$\frac{\sqrt{c}\ \text{ArcTanh}\left[\frac{b+2\,c\,\text{Cot}[d+e\,x]^2}{2\sqrt{c}\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}}\right]}{2\,e}+\frac{\sqrt{a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4}\ \text{Tan}[d+e\,x]^2}{2\,e}$$

Result (type ?, 215 131 leaves): Display of huge result suppressed!

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

$$\int \frac{\text{Cot}[d+e x]^7}{\left(a+b\,\text{Cot}[d+e x]^2+c\,\text{Cot}[d+e x]^4\right)^{3/2}}\,dx$$

Optimal (type 3, 236 leaves, 8 steps):

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

Result (type 3, 3921 leaves):

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

$$\frac{b\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{c\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}\Bigg)\,\mathrm{Sin}[2\,(d+e\,x)]\Bigg)\Big/$$

$$\big((a-b+c)\,(3\,a+b+3\,c-4\,a\,\mathrm{Cos}[2\,(d+e\,x)]+4\,c\,\mathrm{Cos}[2\,(d+e\,x)]+a\,\mathrm{Cos}[4\,(d+e\,x)]-b\,\mathrm{Cos}[4\,(d+e\,x)]+c\,\mathrm{Cos}[4\,(d+e\,x)])\big)\big)+$$

$$\Bigg(4\,a\,\surd\Bigg(\frac{3\,a}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{b}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{3\,c}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\frac{4\,a\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\frac{b\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{c\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}\Bigg)\,\mathrm{Sin}[2\,(d+e\,x)]\Bigg)\Big/$$

$$\big(c\,(a-b+c)\,(3\,a+b+3\,c-4\,a\,\mathrm{Cos}[2\,(d+e\,x)]+4\,c\,\mathrm{Cos}[2\,(d+e\,x)]+a\,\mathrm{Cos}[4\,(d+e\,x)]-b\,\mathrm{Cos}[4\,(d+e\,x)]+c\,\mathrm{Cos}[4\,(d+e\,x)])\big)\big)-$$

$$\Bigg(4\,b\,\surd\Bigg(\frac{3\,a}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{b}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{3\,c}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\frac{4\,a\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\frac{b\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{c\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}\Bigg)\,\mathrm{Sin}[2\,(d+e\,x)]\Bigg)\Big/$$

$$\big(c\,(a-b+c)\,(3\,a+b+3\,c-4\,a\,\mathrm{Cos}[2\,(d+e\,x)]+4\,c\,\mathrm{Cos}[2\,(d+e\,x)]+a\,\mathrm{Cos}[4\,(d+e\,x)]-b\,\mathrm{Cos}[4\,(d+e\,x)]+c\,\mathrm{Cos}[4\,(d+e\,x)])\big)\big)+$$

$$\Bigg(\surd\Bigg(\frac{3\,a}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{b}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{3\,c}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\frac{4\,a\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{4\,c\,\mathrm{Cos}[2\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{a\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}-$$

$$\frac{b\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}+\frac{c\,\mathrm{Cos}[4\,(d+e\,x)]}{3-4\,\mathrm{Cos}[2\,(d+e\,x)]+\mathrm{Cos}[4\,(d+e\,x)]}\Bigg)\,\mathrm{Sin}[4\,(d+e\,x)]\Bigg)\Big/$$

$$\big((a-b+c)\,(3\,a+b+3\,c-4\,a\,\mathrm{Cos}[2\,(d+e\,x)]+4\,c\,\mathrm{Cos}[2\,(d+e\,x)]+a\,\mathrm{Cos}[4\,(d+e\,x)]-b\,\mathrm{Cos}[4\,(d+e\,x)]+c\,\mathrm{Cos}[4\,(d+e\,x)])\big)\big)\Bigg)$$

$$\mathrm{Tan}[d+e\,x]^2\,\sqrt{a+\mathrm{Cot}[d+e\,x]^4\,(c+b\,\mathrm{Tan}[d+e\,x]^2)}\Bigg)\Big/\Bigg(2$$

$$c^{3/2}$$

$$(a-b+c)$$

$$e$$

$$\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}$$

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

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

$$b\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]-$$

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

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

$$\text{Tan}[d+e\,x]^2\,\left(2\,b\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+4\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]^3\right)\,\sqrt{a+\text{Cot}[d+e\,x]^4\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\;+$$

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

$$a\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]+b\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+\right.$$

$$\left.2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]-c\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]+$$

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

$$\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]\,\sqrt{a+\text{Cot}[d+e\,x]^4\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\;+$$

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

$$b\,\text{Log}\left[2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}\,\right]-$$

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

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

$$\left.\text{Tan}[d+e\,x]^2\,\left(2\,b\,\text{Cot}[d+e\,x]\,\text{Csc}[d+e\,x]^2-4\,\text{Cot}[d+e\,x]^3\,\text{Csc}[d+e\,x]^2\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)\right)\right)\Big/$$

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

$$\frac{1}{2\, c^{3/2}\, (a-b+c)\, \sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}}\,\text{Tan}[d+e\,x]^2\,\sqrt{a+\text{Cot}[d+e\,x]^4\,\left(c+b\,\text{Tan}[d+e\,x]^2\right)}\,\Bigg(2\,(a-b+c)\,\text{Csc}[d+e\,x]$$

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

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

$$\frac{c\left(2\,b\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+\frac{\sqrt{c}\,\left(2\,b\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+4\,a\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]^3\right)}{\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}}\right)}{2\,c+b\,\text{Tan}[d+e\,x]^2+2\,\sqrt{c}\,\sqrt{c+b\,\text{Tan}[d+e\,x]^2+a\,\text{Tan}[d+e\,x]^4}}+\Bigg(c^{3/2}\,\Bigg(2\,b\,\text{Sec}[d+e\,x]^2\,\text{Tan}[d+e\,x]+2$$

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

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

Problem 28: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cot}[d+e\,x]^5}{\left(a+b\,\text{Cot}[d+e\,x]^2+c\,\text{Cot}[d+e\,x]^4\right)^{3/2}}\,dx$$

Optimal (type 3, 160 leaves, 6 steps):

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

Result (type 4, 78 272 leaves): Display of huge result suppressed!

Problem 29: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 153 leaves, 6 steps):

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

Result (type 4, 78 265 leaves): Display of huge result suppressed!

Problem 30: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 78 291 leaves): Display of huge result suppressed!

Problem 31: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 280 leaves, 12 steps):

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

Result (type 4, 181 078 leaves): Display of huge result suppressed!

Problem 32: Humongous result has more than 200000 leaves.

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

Optimal (type 3, 478 leaves, 16 steps):

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

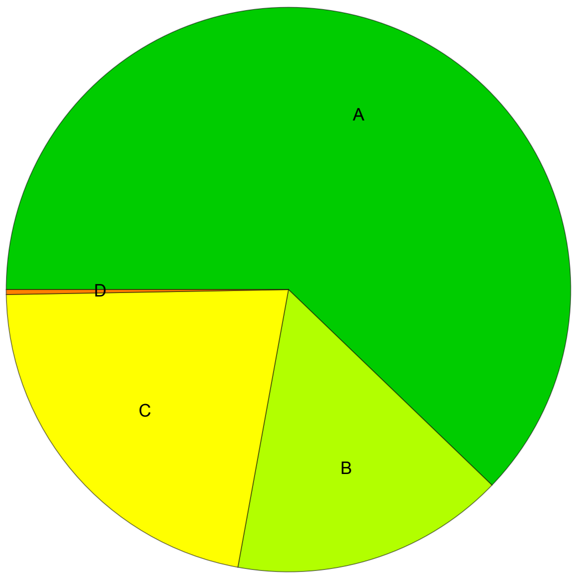
$$\frac{b^2-2 a c+b c\,\text{Cot}[d+e x]^2}{a\left(b^2-4 a c\right) e\sqrt{a+b\,\text{Cot}[d+e x]^2+c\,\text{Cot}[d+e x]^4}}-\frac{b^2-2 a c-b c+(b-2 c)\, c\,\text{Cot}[d+e x]^2}{(a-b+c)\left(b^2-4 a c\right) e\sqrt{a+b\,\text{Cot}[d+e x]^2+c\,\text{Cot}[d+e x]^4}}-$$

$$\frac{\left(b^2-2 a c+b c\,\text{Cot}[d+e x]^2\right)\text{Tan}[d+e x]^2}{a\left(b^2-4 a c\right) e\sqrt{a+b\,\text{Cot}[d+e x]^2+c\,\text{Cot}[d+e x]^4}}+\frac{\left(3 b^2-8 a c\right)\sqrt{a+b\,\text{Cot}[d+e x]^2+c\,\text{Cot}[d+e x]^4}\;\text{Tan}[d+e x]^2}{2 a^2\left(b^2-4 a c\right) e}$$

Result (type ?, 293 889 leaves): Display of huge result suppressed!

Summary of Integration Test Results

357 integration problems



A - 222 optimal antiderivatives

B - 56 more than twice size of optimal antiderivatives

C - 78 unnecessarily complex antiderivatives

D - 1 unable to integrate problems

E - 0 integration timeouts