Mathematica 11.3 Integration Test Results

Test results for the 46 problems in "1.1.3.6 (g x)^m (a+b x^n)^p (c+d x^n)^q (e+f x^n)^r.m"

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

$$\int \frac{(e x)^m \left(A+B x^n\right) \left(c+d x^n\right)}{\left(a+b x^n\right)^3} \, dx$$

Optimal (type 5, 228 leaves, 3 steps):

$$-\left(\left(\left(A b \left(b c (1+m-2 n)-a d (1+m-n)\right)-a B \left(b c (1+m)-a d (1+m+n)\right)\right) (e x)^{1+m}\right) \Big/ \left(2 a^2 b^2 e n^2 \left(a+b x^n\right)\right)\right)+\frac{(A b-a B) (e x)^{1+m} \left(c+d x^n\right)}{2 a b e n \left(a+b x^n\right)^2}-$$
$$\left(\left(b c \left(a B (1+m)-A b (1+m-2 n)\right) (1+m-n)+a d (1+m) \left(A b (1+m-n)-a B (1+m+n)\right)\right) (e x)^{1+m} \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]\right) \Big/ \left(2 a^3 b^2 e (1+m) n^2\right)$$

Result (type 5, 1153 leaves):

$$\frac{1}{2 a^3 b^2 (1+m) n^2 \left(a+b x^n\right)^2} x (e x)^m \Big(a^2 A b^2 c (1+m) n-a^3 b B c (1+m) n-a^3 A b d (1+m) n+a^4 B d (1+m) n-$$
$$a A b^2 c (1+m) \left(a+b x^n\right)+a^2 b B c (1+m) \left(a+b x^n\right)+a^2 A b d (1+m) \left(a+b x^n\right)-$$
$$a^3 B d (1+m) \left(a+b x^n\right)-a A b^2 c m (1+m) \left(a+b x^n\right)+a^2 b B c m (1+m) \left(a+b x^n\right)+$$
$$a^2 A b d m (1+m) \left(a+b x^n\right)-a^3 B d m (1+m) \left(a+b x^n\right)+2 a A b^2 c (1+m) n \left(a+b x^n\right)-$$
$$2 a^3 B d (1+m) n \left(a+b x^n\right)+A b^2 c \left(a+b x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$a b B c \left(a+b x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$a A b d \left(a+b x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]+$$
$$a^2 B d \left(a+b x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]+$$
$$2 A b^2 c m \left(a+b x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$2 a b B c m \left(a+b x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$2 a A b d m \left(a+b x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]+$$

$$2\,a^2\,B\,d\,m\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$A\,b^2\,c\,m^2\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]-$$
$$a\,b\,B\,c\,m^2\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]-$$
$$a\,A\,b\,d\,m^2\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a^2\,B\,d\,m^2\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]-$$
$$3\,A\,b^2\,c\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a\,b\,B\,c\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a\,A\,b\,d\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a^2\,B\,d\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]-$$
$$3\,A\,b^2\,c\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a\,b\,B\,c\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a\,A\,b\,d\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a^2\,B\,d\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$2\,A\,b^2\,c\,n^2\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]\Big)\Big)$$

Problem 14: Result more than twice size of optimal antiderivative.

$$\int \frac{(e\,x)^m\,\left(A+B\,x^n\right)\,\left(c+d\,x^n\right)^2}{\left(a+b\,x^n\right)^3}\,dx$$

Optimal (type 5, 322 leaves, 4 steps):

$$\left(d\,\left(b\,c\,(1+m)-a\,d\,(1+m+n)\right)\,\left(A\,b\,(1+m)-a\,B\,(1+m+2\,n)\right)\,(e\,x)^{1+m}\right)\Big/\left(2\,a^2\,b^3\,e\,(1+m)\,n^2\right)+$$
$$\frac{(A\,b-a\,B)\,(e\,x)^{1+m}\,\left(c+d\,x^n\right)^2}{2\,a\,b\,e\,n\,\left(a+b\,x^n\right)^2}+$$
$$\left((b\,c-a\,d)\,(e\,x)^{1+m}\,\left(c\,\left(a\,B\,(1+m)-A\,b\,(1+m-2\,n)\right)-d\,\left(A\,b\,(1+m)-a\,B\,(1+m+2\,n)\right)\,x^n\right)\right)\Big/$$
$$\left(2\,a^2\,b^2\,e\,n^2\,\left(a+b\,x^n\right)\right)+\Big(\Big(b\,c\,\left(a\,B\,(1+m)-A\,b\,(1+m-2\,n)\right)\,\left(a\,d\,(1+m)-b\,c\,(1+m-n)\right)-$$
$$a\,d\,\left(b\,c\,(1+m)-a\,d\,(1+m+n)\right)\,\left(A\,b\,(1+m)-a\,B\,(1+m+2\,n)\right)\Big)$$
$$(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]\Big)\Big/\left(2\,a^3\,b^3\,e\,(1+m)\,n^2\right)$$

Result (type 5, 1924 leaves):

$$\frac{1}{2\,a^3\,b^3\,(1+m)\,n^2\,(a+b\,x^n)^2}$$
$$x\,(e\,x)^m \Big(a^2\,A\,b^3\,c^2\,(1+m)\,n - a^3\,b^2\,B\,c^2\,(1+m)\,n - 2\,a^3\,A\,b^2\,c\,d\,(1+m)\,n + 2\,a^4\,b\,B\,c\,d\,(1+m)\,n +$$
$$a^4\,A\,b\,d^2\,(1+m)\,n - a^5\,B\,d^2\,(1+m)\,n - a\,A\,b^3\,c^2\,(1+m)\,(a+b\,x^n) + a^2\,b^2\,B\,c^2\,(1+m)\,(a+b\,x^n) +$$
$$2\,a^2\,A\,b^2\,c\,d\,(1+m)\,(a+b\,x^n) - 2\,a^3\,b\,B\,c\,d\,(1+m)\,(a+b\,x^n) - a^3\,A\,b\,d^2\,(1+m)\,(a+b\,x^n) +$$
$$a^4\,B\,d^2\,(1+m)\,(a+b\,x^n) - a\,A\,b^3\,c^2\,m\,(1+m)\,(a+b\,x^n) + a^2\,b^2\,B\,c^2\,m\,(1+m)\,(a+b\,x^n) +$$
$$2\,a^2\,A\,b^2\,c\,d\,m\,(1+m)\,(a+b\,x^n) - 2\,a^3\,b\,B\,c\,d\,m\,(1+m)\,(a+b\,x^n) - a^3\,A\,b\,d^2\,m\,(1+m)\,(a+b\,x^n) +$$
$$a^4\,B\,d^2\,m\,(1+m)\,(a+b\,x^n) + 2\,a\,A\,b^3\,c^2\,(1+m)\,n\,(a+b\,x^n) - 4\,a^3\,b\,B\,c\,d\,(1+m)\,n\,(a+b\,x^n) -$$
$$2\,a^3\,A\,b\,d^2\,(1+m)\,n\,(a+b\,x^n) + 4\,a^4\,B\,d^2\,(1+m)\,n\,(a+b\,x^n) + 2\,a^3\,B\,d^2\,n^2\,(a+b\,x^n)^2 +$$
$$A\,b^3\,c^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$
$$a\,b^2\,B\,c^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$
$$2\,a\,A\,b^2\,c\,d\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] +$$
$$2\,a^2\,b\,B\,c\,d\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] +$$
$$a^2\,A\,b\,d^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$
$$a^3\,B\,d^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] +$$
$$2\,A\,b^3\,c^2\,m\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$
$$2\,a\,b^2\,B\,c^2\,m\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$
$$4\,a\,A\,b^2\,c\,d\,m\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] +$$
$$4\,a^2\,b\,B\,c\,d\,m\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] +$$
$$2\,a^2\,A\,b\,d^2\,m\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$
$$2\,a^3\,B\,d^2\,m\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] +$$
$$A\,b^3\,c^2\,m^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$
$$a\,b^2\,B\,c^2\,m^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$
$$2\,a\,A\,b^2\,c\,d\,m^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] +$$
$$2\,a^2\,b\,B\,c\,d\,m^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] +$$
$$a^2\,A\,b\,d^2\,m^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$
$$a^3\,B\,d^2\,m^2\,(a+b\,x^n)^2\,\text{Hypergeometric2F1}\Big[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,x^n}{a}\Big] -$$

$$3\,A\,b^3\,c^2\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a\,b^2\,B\,c^2\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$2\,a\,A\,b^2\,c\,d\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$2\,a^2\,b\,B\,c\,d\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a^2\,A\,b\,d^2\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]-$$
$$3\,a^3\,B\,d^2\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]-$$
$$3\,A\,b^3\,c^2\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a\,b^2\,B\,c^2\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$2\,a\,A\,b^2\,c\,d\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$2\,a^2\,b\,B\,c\,d\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$a^2\,A\,b\,d^2\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]-$$
$$3\,a^3\,B\,d^2\,m\,n\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]+$$
$$2\,A\,b^3\,c^2\,n^2\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]-$$
$$2\,a^3\,B\,d^2\,n^2\,\left(a+b\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a}\right]\Bigg)$$

Problem 35: Result more than twice size of optimal antiderivative.

$$\int\frac{(e\,x)^m\,\left(A+B\,x^n\right)}{\left(a+b\,x^n\right)^3\,\left(c+d\,x^n\right)^2}\,dx$$

Optimal (type 5, 567 leaves, 7 steps):

$$\left(d\left(a B c\left(b c(1+m)-a d(1+m-6 n)\right)+A\left(a b c d(1+m-6 n)-b^2 c^2(1+m-2 n)-2 a^2 d^2 n\right)\right)(e x)^{1+m}\right) \Big/ \left(2 a^2 c(b c-a d)^3 e n^2\left(c+d x^n\right)\right)+\frac{(A b-a B)(e x)^{1+m}}{2 a(b c-a d) e n\left(a+b x^n\right)^2\left(c+d x^n\right)}+$$
$$\left(\left(a B\left(b c(1+m)-a d(1+m-3 n)\right)+A b\left(a d(1+m-5 n)-b c(1+m-2 n)\right)\right)(e x)^{1+m}\right) \Big/ \left(2 a^2(b c-a d)^2 e n^2\left(a+b x^n\right)\left(c+d x^n\right)\right)+$$
$$\Big(b\Big(a B\left(2 a b c d(1+m)(1+m-3 n)-b^2 c^2(1+m)(1+m-n)-a^2 d^2\left(1+m^2+m(2-5 n)-5 n+6 n^2\right)\right)+A b\left(b^2 c^2\left(1+m^2+m(2-3 n)-3 n+2 n^2\right)-2 a b c d\left(1+m^2+m(2-5 n)-5 n+4 n^2\right)+a^2 d^2\left(1+m^2+m(2-7 n)-7 n+12 n^2\right)\right)\Big)(e x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]\Big) \Big/ \left(2 a^3(b c-a d)^4 e(1+m) n^2\right)+$$
$$\Big(d^2\left(b c\left(A d(1+m-4 n)-B c(1+m-3 n)\right)+a d\left(B c(1+m)-A d(1+m-n)\right)\right)(e x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]\Big) \Big/ \left(c^2(b c-a d)^4 e(1+m) n\right)$$

Result (type 5, 2176 leaves):

$$\frac{1}{2 a^3 c^2(b c-a d)^4(1+m) n^2\left(a+b x^n\right)^2\left(c+d x^n\right)} x(e x)^m \Big(2 a^3 c d^2(b c-a d)(B c-A d)(1+m) n\left(a+b x^n\right)^2+$$
$$a^2 b(A b-a B) c^2(b c-a d)^2(1+m) n\left(c+d x^n\right)+a b c^2(-b c+a d)(1+m)\left(a B(-b c(1+m)+a d(1+m-4 n))+A b(-a d(1+m-6 n)+b c(1+m-2 n))\right)\left(a+b x^n\right)\left(c+d x^n\right)+A b^4 c^4\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$a b^3 B c^4\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$2 a A b^3 c^3 d\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]+$$
$$2 a^2 b^2 B c^3 d\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]+$$
$$a^2 A b^2 c^2 d^2\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$a^3 b B c^2 d^2\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]+$$
$$2 A b^4 c^4 m\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$2 a b^3 B c^4 m\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$4 a A b^3 c^3 d m\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]+$$
$$4 a^2 b^2 B c^3 d m\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]+$$
$$2 a^2 A b^2 c^2 d^2 m\left(a+b x^n\right)^2\left(c+d x^n\right) \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$

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

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

$a b^3 B c^4 m^2 \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] -$

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

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

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

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

$3 A b^4 c^4 n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] +$

$a b^3 B c^4 n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] +$

$10 a A b^3 c^3 d n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] -$

$6 a^2 b^2 B c^3 d n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] -$

$7 a^2 A b^2 c^2 d^2 n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] +$

$5 a^3 b B c^2 d^2 n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] -$

$3 A b^4 c^4 m n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] +$

$a b^3 B c^4 m n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] +$

$10 a A b^3 c^3 d m n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] -$

$6 a^2 b^2 B c^3 d m n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] -$

$7 a^2 A b^2 c^2 d^2 m n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] +$

$5 a^3 b B c^2 d^2 m n \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] +$

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

$8 a A b^3 c^3 d n^2 \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] +$

$12 a^2 A b^2 c^2 d^2 n^2 \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] -$

$6 a^3 b B c^2 d^2 n^2 \left(a + b x^n\right)^2 \left(c + d x^n\right) \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{b x^n}{a}\right] +$

$$2 a^3 d^2 n \left(b c \left(A d (1+m-4 n) - B c (1+m-3 n)\right) + a d \left(B c (1+m) + A d (-1-m+n)\right)\right) (a+b x^n)^2 (c+d x^n)\,\text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right]\Bigg)$$

Problem 36: Result more than twice size of optimal antiderivative.

$$\int \frac{(e x)^m (a+b x^n)^2 (A+B x^n)}{(c+d x^n)^3}\,dx$$

Optimal (type 5, 322 leaves, 4 steps):

$$\frac{b \left(a d (1+m) - b c (1+m+n)\right) \left(A d (1+m) - B c (1+m+2 n)\right) (e x)^{1+m}}{2 c^2 d^3 e (1+m) n^2} - \frac{(B c - A d) (e x)^{1+m} (a+b x^n)^2}{2 c d e n (c+d x^n)^2} - \left((b c - a d) (e x)^{1+m} \left(a \left(B c (1+m) - A d (1+m-2 n)\right) - b \left(A d (1+m) - B c (1+m+2 n)\right) x^n\right)\right) \Big/ \left(2 c^2 d^2 e n^2 (c+d x^n)\right) + \Bigg(\left(a d \left(B c (1+m) - A d (1+m-2 n)\right) \left(b c (1+m) - a d (1+m-n)\right) - b c \left(a d (1+m) - b c (1+m+n)\right) \left(A d (1+m) - B c (1+m+2 n)\right)\right) (e x)^{1+m}\,\text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right]\Bigg) \Big/ \left(2 c^3 d^3 e (1+m) n^2\right)$$

Result (type 5, 1924 leaves):

$$\frac{1}{2 c^3 d^3 (1+m) n^2 (c+d x^n)^2} x (e x)^m \Bigg(-b^2 B c^5 (1+m) n + A b^2 c^4 d (1+m) n + 2 a b B c^4 d (1+m) n - 2 a A b c^3 d^2 (1+m) n - a^2 B c^3 d^2 (1+m) n + a^2 A c^2 d^3 (1+m) n + b^2 B c^4 (1+m) (c+d x^n) - A b^2 c^3 d (1+m) (c+d x^n) - 2 a b B c^3 d (1+m) (c+d x^n) + 2 a A b c^2 d^2 (1+m) (c+d x^n) + a^2 B c^2 d^2 (1+m) (c+d x^n) - a^2 A c d^3 (1+m) (c+d x^n) + b^2 B c^4 m (1+m) (c+d x^n) - A b^2 c^3 d m (1+m) (c+d x^n) - 2 a b B c^3 d m (1+m) (c+d x^n) + 2 a A b c^2 d^2 m (1+m) (c+d x^n) + a^2 B c^2 d^2 m (1+m) (c+d x^n) - a^2 A c d^3 m (1+m) (c+d x^n) + 4 b^2 B c^4 (1+m) n (c+d x^n) - 2 A b^2 c^3 d (1+m) n (c+d x^n) - 4 a b B c^3 d (1+m) n (c+d x^n) + 2 a^2 A c d^3 (1+m) n (c+d x^n) + 2 b^2 B c^3 n^2 (c+d x^n)^2 - b^2 B c^3 (c+d x^n)^2\,\text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] + A b^2 c^2 d (c+d x^n)^2\,\text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] + 2 a b B c^2 d (c+d x^n)^2\,\text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] - 2 a A b c d^2 (c+d x^n)^2\,\text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] - a^2 B c d^2 (c+d x^n)^2\,\text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] + a^2 A d^3 (c+d x^n)^2\,\text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$

$$2 b^2 B c^3 m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$2 A b^2 c^2 d m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$4 a b B c^2 d m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$4 a A b c d^2 m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$2 a^2 B c d^2 m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$2 a^2 A d^3 m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$b^2 B c^3 m^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$A b^2 c^2 d m^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$2 a b B c^2 d m^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$2 a A b c d^2 m^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$a^2 B c d^2 m^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$a^2 A d^3 m^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$3 b^2 B c^3 n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$A b^2 c^2 d n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$2 a b B c^2 d n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$2 a A b c d^2 n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$a^2 B c d^2 n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$3 a^2 A d^3 n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$3 b^2 B c^3 m n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$A b^2 c^2 d m n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$2 a b B c^2 d m n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$2 a A b c d^2 m n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$a^2 B c d^2 m n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$

$$3 a^2 A d^3 m n \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$
$$2 b^2 B c^3 n^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$
$$2 a^2 A d^3 n^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]\Bigg)$$

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

$$\int \frac{(e x)^m \left(a+b x^n\right) \left(A+B x^n\right)}{\left(c+d x^n\right)^3} \, dx$$

Optimal (type 5, 228 leaves, 3 steps):

$$-\frac{(b c-a d) (e x)^{1+m} \left(A+B x^n\right)}{2 c d e n \left(c+d x^n\right)^2}-$$
$$\left((a d (A d (1+m-2 n)-B c (1+m-n))-b c (A d (1+m)-B c (1+m+n))) (e x)^{1+m}\right)\Big/$$
$$\left(2 c^2 d^2 e n^2 \left(c+d x^n\right)\right)-$$
$$\Bigg((A d (b c (1+m)-a d (1+m-2 n)) (1+m-n)+B c (1+m) (a d (1+m-n)-b c (1+m+n)))$$
$$(e x)^{1+m} \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]\Bigg)\Big/\left(2 c^3 d^2 e (1+m) n^2\right)$$

Result (type 5, 1153 leaves):

$$\frac{1}{2 c^3 d^2 (1+m) n^2 \left(c+d x^n\right)^2}$$
$$x (e x)^m \Bigg(b B c^4 (1+m) n-A b c^3 d (1+m) n-a B c^3 d (1+m) n+a A c^2 d^2 (1+m) n-$$
$$b B c^3 (1+m) \left(c+d x^n\right)+A b c^2 d (1+m) \left(c+d x^n\right)+a B c^2 d (1+m) \left(c+d x^n\right)-$$
$$a A c d^2 (1+m) \left(c+d x^n\right)-b B c^3 m (1+m) \left(c+d x^n\right)+A b c^2 d m (1+m) \left(c+d x^n\right)+$$
$$a B c^2 d m (1+m) \left(c+d x^n\right)-a A c d^2 m (1+m) \left(c+d x^n\right)-2 b B c^3 (1+m) n \left(c+d x^n\right)+$$
$$2 a A c d^2 (1+m) n \left(c+d x^n\right)+b B c^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$
$$A b c d \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$
$$a B c d \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$
$$a A d^2 \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$
$$2 b B c^2 m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$
$$2 A b c d m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$
$$2 a B c d m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$
$$2 a A d^2 m \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$

$$b\,B\,c^2\,m^2\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]-$$
$$A\,b\,c\,d\,m^2\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]-$$
$$a\,B\,c\,d\,m^2\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]+$$
$$a\,A\,d^2\,m^2\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]+$$
$$b\,B\,c^2\,n\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]+$$
$$A\,b\,c\,d\,n\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]+$$
$$a\,B\,c\,d\,n\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]-$$
$$3\,a\,A\,d^2\,n\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]+$$
$$b\,B\,c^2\,m\,n\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]+$$
$$A\,b\,c\,d\,m\,n\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]+$$
$$a\,B\,c\,d\,m\,n\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]-$$
$$3\,a\,A\,d^2\,m\,n\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]+$$
$$2\,a\,A\,d^2\,n^2\,\left(c+d\,x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\,\frac{1+m}{n},\,\frac{1+m+n}{n},\,-\frac{d\,x^n}{c}\right]\Bigg)$$

Problem 40: Result more than twice size of optimal antiderivative.

$$\int\frac{(e\,x)^m\,\left(A+B\,x^n\right)}{\left(a+b\,x^n\right)^2\,\left(c+d\,x^n\right)^3}\,dx$$

Optimal (type 5, 482 leaves, 7 steps):

$$\frac{d\left(2 A b c-3 a B c+a A d\right)(e x)^{1+m}}{2 a c\left(b c-a d\right)^2 e n\left(c+d x^n\right)^2}+\frac{\left(A b-a B\right)(e x)^{1+m}}{a\left(b c-a d\right) e n\left(a+b x^n\right)\left(c+d x^n\right)^2}-$$
$$\left(d\left(a^2 d\left(B c\left(1+m\right)-A d\left(1+m-2 n\right)\right)-a b c\left(B c-A d\right)\left(1+m-6 n\right)-2 A b^2 c^2 n\right)(e x)^{1+m}\right)\Big/$$
$$\left(2 a c^2\left(b c-a d\right)^3 e n^2\left(c+d x^n\right)\right)+$$
$$\Big(b^2\left(a B\left(b c\left(1+m\right)-a d\left(1+m-3 n\right)\right)+A b\left(a d\left(1+m-4 n\right)-b c\left(1+m-n\right)\right)\right)(e x)^{1+m}$$
$$\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]\Big)\Big/\left(a^2\left(b c-a d\right)^4 e\left(1+m\right) n\right)+$$
$$\Big(d\left(b^2 c^2\left(A d\left(1+m-4 n\right)-B c\left(1+m-2 n\right)\right)\left(1+m-3 n\right)-a^2 d^2\left(B c\left(1+m\right)-A d\left(1+m-2 n\right)\right)\right.$$
$$\left.\left(1+m-n\right)+2 a b c d\left(B c\left(1+m\right)\left(1+m-3 n\right)-A d\left(1+m^2+m\left(2-5 n\right)-5 n+4 n^2\right)\right)\right)$$
$$(e x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]\Big)\Big/\left(2 c^3\left(b c-a d\right)^4 e\left(1+m\right) n^2\right)$$

Result (type 5, 2178 leaves):

$$\frac{1}{2 a^2 c^3\left(b c-a d\right)^4\left(1+m\right) n^2\left(a+b x^n\right)\left(c+d x^n\right)^2}$$
$$x\,(e x)^m\Big(-a^2 c^2 d\left(b c-a d\right)^2\left(B c-A d\right)\left(1+m\right) n\left(a+b x^n\right)+a^2 c d\left(-b c+a d\right)\left(1+m\right)$$
$$\left(b c\left(A d\left(1+m-6 n\right)-B c\left(1+m-4 n\right)\right)+a d\left(B c\left(1+m\right)-A d\left(1+m-2 n\right)\right)\right)$$
$$\left(a+b x^n\right)\left(c+d x^n\right)+2 a b^2\left(-A b+a B\right) c^3\left(-b c+a d\right)\left(1+m\right) n\left(c+d x^n\right)^2+$$
$$2 b^2 c^3\left(a B\left(b c\left(1+m\right)-a d\left(1+m-3 n\right)\right)+A b\left(a d\left(1+m-4 n\right)-b c\left(1+m-n\right)\right)\right)$$
$$n\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b x^n}{a}\right]-$$
$$a^2 b^2 B c^3 d\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$
$$a^2 A b^2 c^2 d^2\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$
$$2 a^3 b B c^2 d^2\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$
$$2 a^3 A b c d^3\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$
$$a^4 B c d^3\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$
$$a^4 A d^4\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$
$$2 a^2 b^2 B c^3 d m\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$
$$2 a^2 A b^2 c^2 d^2 m\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]+$$
$$4 a^3 b B c^2 d^2 m\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$
$$4 a^3 A b c d^3 m\left(a+b x^n\right)\left(c+d x^n\right)^2\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{d x^n}{c}\right]-$$

$$2 a^4 B c d^3 m \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$2 a^4 A d^4 m \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$a^2 b^2 B c^3 d m^2 \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$a^2 A b^2 c^2 d^2 m^2 \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$2 a^3 b B c^2 d^2 m^2 \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$2 a^3 A b c d^3 m^2 \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$a^4 B c d^3 m^2 \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$a^4 A d^4 m^2 \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$5 a^2 b^2 B c^3 d n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$7 a^2 A b^2 c^2 d^2 n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$6 a^3 b B c^2 d^2 n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$10 a^3 A b c d^3 n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$a^4 B c d^3 n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$3 a^4 A d^4 n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$5 a^2 b^2 B c^3 d m n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$7 a^2 A b^2 c^2 d^2 m n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$6 a^3 b B c^2 d^2 m n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$10 a^3 A b c d^3 m n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$a^4 B c d^3 m n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$3 a^4 A d^4 m n \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$6 a^2 b^2 B c^3 d n^2 \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$
$$12 a^2 A b^2 c^2 d^2 n^2 \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] -$$
$$8 a^3 A b c d^3 n^2 \left(a+b x^n\right) \left(c+d x^n\right)^2 \text{Hypergeometric2F1}\left[1, \frac{1+m}{n}, \frac{1+m+n}{n}, -\frac{d x^n}{c}\right] +$$

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

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

$$\int (e\,x)^m\,\left(a+b\,x^n\right)^p\,\left(A+B\,x^n\right)\,\left(c+d\,x^n\right)^q\,dx$$

Optimal (type 6, 211 leaves, 7 steps):

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

Result (type 6, 458 leaves):

$$\frac{1}{1+m+n}a\,c\,x\,(e\,x)^m\,\left(a+b\,x^n\right)^p\,\left(c+d\,x^n\right)^q\,\left(\left(A\,(1+m+n)^2\,\text{AppellF1}\left[\frac{1+m}{n},\,-p,\,-q,\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a},\,-\frac{d\,x^n}{c}\right]\right)\Big/\left((1+m)\,\left(a\,c\,(1+m+n)\,\text{AppellF1}\left[\frac{1+m}{n},\,-p,\,-q,\,\frac{1+m+n}{n},\,-\frac{b\,x^n}{a},\,-\frac{d\,x^n}{c}\right]+n\,x^n\,\left(b\,c\,p\,\text{AppellF1}\left[\frac{1+m+n}{n},\,1-p,\,-q,\,\frac{1+m+2\,n}{n},\,-\frac{b\,x^n}{a},\,-\frac{d\,x^n}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{1+m+n}{n},\,-p,\,1-q,\,\frac{1+m+2\,n}{n},\,-\frac{b\,x^n}{a},\,-\frac{d\,x^n}{c}\right]\right)\right)\right)+\left(B\,(1+m+2\,n)\,x^n\,\text{AppellF1}\left[\frac{1+m+n}{n},\,-p,\,-q,\,\frac{1+m+2\,n}{n},\,-\frac{b\,x^n}{a},\,-\frac{d\,x^n}{c}\right]\right)\Big/\left(a\,c\,(1+m+2\,n)\,\text{AppellF1}\left[\frac{1+m+n}{n},\,-p,\,-q,\,\frac{1+m+2\,n}{n},\,-\frac{b\,x^n}{a},\,-\frac{d\,x^n}{c}\right]+n\,x^n\,\left(b\,c\,p\,\text{AppellF1}\left[\frac{1+m+2\,n}{n},\,1-p,\,-q,\,\frac{1+m+3\,n}{n},\,-\frac{b\,x^n}{a},\,-\frac{d\,x^n}{c}\right]+a\,d\,q\,\text{AppellF1}\left[\frac{1+m+2\,n}{n},\,-p,\,1-q,\,\frac{1+m+3\,n}{n},\,-\frac{b\,x^n}{a},\,-\frac{d\,x^n}{c}\right]\right)\right)\right)$$

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

$$\int \frac{(e\,x)^m\,\left(a+b\,x^n\right)^p\,\left(A+B\,x^n\right)}{c+d\,x^n}\,dx$$

Optimal (type 6, 164 leaves, 6 steps):

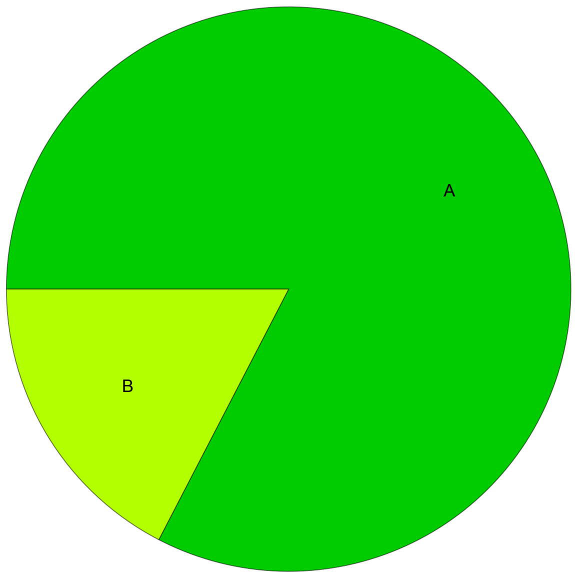
$$-\frac{1}{c\,d\,e\,(1+m)}(B\,c-A\,d)\,(e\,x)^{1+m}\,(a+b\,x^n)^p\,\left(1+\frac{b\,x^n}{a}\right)^{-p}\text{AppellF1}\left[\frac{1+m}{n},-p,1,\frac{1+m+n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]+\frac{1}{d\,e\,(1+m)}B\,(e\,x)^{1+m}\,(a+b\,x^n)^p\,\left(1+\frac{b\,x^n}{a}\right)^{-p}\text{Hypergeometric2F1}\left[\frac{1+m}{n},-p,\frac{1+m+n}{n},-\frac{b\,x^n}{a}\right]$$

Result (type 6, 438 leaves):

$$\left(a\,c\,x\,(e\,x)^m\,(a+b\,x^n)^p\,\left(\left(A\,(1+m+n)^2\,\text{AppellF1}\left[\frac{1+m}{n},-p,1,\frac{1+m+n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\Big/\left((1+m)\,\left(a\,c\,(1+m+n)\,\text{AppellF1}\left[\frac{1+m}{n},-p,1,\frac{1+m+n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]+n\,x^n\,\left(b\,c\,p\,\text{AppellF1}\left[\frac{1+m+n}{n},1-p,1,\frac{1+m+2\,n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]-a\,d\,\text{AppellF1}\left[\frac{1+m+n}{n},-p,2,\frac{1+m+2\,n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\right)\right)+\left(B\,(1+m+2\,n)\,x^n\,\text{AppellF1}\left[\frac{1+m+n}{n},-p,1,\frac{1+m+2\,n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\Big/\left(a\,c\,(1+m+2\,n)\,\text{AppellF1}\left[\frac{1+m+n}{n},-p,1,\frac{1+m+2\,n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]+n\,x^n\,\left(b\,c\,p\,\text{AppellF1}\left[\frac{1+m+2\,n}{n},1-p,1,\frac{1+m+3\,n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]-a\,d\,\text{AppellF1}\left[\frac{1+m+2\,n}{n},-p,2,\frac{1+m+3\,n}{n},-\frac{b\,x^n}{a},-\frac{d\,x^n}{c}\right]\right)\right)\right)\right)\Big/\left((1+m+n)\,(c+d\,x^n)\right)$$

Summary of Integration Test Results

46 integration problems



A - 38 optimal antiderivatives

B - 8 more than twice size of optimal antiderivatives

C - 0 unnecessarily complex antiderivatives

D - 0 unable to integrate problems

E - 0 integration timeouts