In[1]:=
```
Expand[(1 + (a1 + a2) * t) * (1 + (a1 + a3) * t) * (1 + (a1 + a4) * t) *
  (1 + (a1 + a5) * t) * (1 + (a1 + a6) * t) * (1 + (a1 + a7) * t) *
  (1 + (a2 + a3) * t) * (1 + (a2 + a4) * t) * (1 + (a2 + a5) * t) * (1 + (a2 + a6) * t) *
  (1 + (a2 + a7) * t) * (1 + (a3 + a4) * t) * (1 + (a3 + a5) * t) * (1 + (a3 + a6) * t) *
  (1 + (a3 + a7) * t) * (1 + (a4 + a5) * t) * (1 + (a4 + a6) * t) * (1 + (a4 + a7) * t) *
  (1 + (a5 + a6) * t) * (1 + (a5 + a7) * t) * (1 + (a6 + a7) * t)]
```

Out[1]=

$$1 + 6\,a1\,t + 6\,a2\,t + 6\,a3\,t + 6\,a4\,t + 6\,a5\,t + \cdots 383\,404 \cdots + a1^2\,a3\,a4^3\,a5^4\,a6^5\,a7^6\,t^{21} + 2\,a1\,a2\,a3\,a4^3\,a5^4\,a6^5\,a7^6\,t^{21} + a2^2\,a3\,a4^3\,a5^4\,a6^5\,a7^6\,t^{21} + a1\,a3^2\,a4^3\,a5^4\,a6^5\,a7^6\,t^{21} + a2\,a3^2\,a4^3\,a5^4\,a6^5\,a7^6\,t^{21}$$

Size in memory: 194.8 MB | + Show more | Show all | Iconize | Store full expression in notebook

In[2]:=
```
G8 = SeriesCoefficient[%1, {t, 0, 8}]
```

Out[2]=

$$10\,a1^6\,a2^2 + 70\,a1^5\,a2^3 + 125\,a1^4\,a2^4 + 70\,a1^3\,a2^5 + 10\,a1^2\,a2^6 + 24\,a1^6\,a2\,a3 + 310\,a1^5\,a2^2\,a3 + 950\,a1^4\,a2^3\,a3 + \cdots 2939 \cdots + 10\,a5^2\,a7^6 + 24\,a1\,a6\,a7^6 + 24\,a2\,a6\,a7^6 + 24\,a3\,a6\,a7^6 + 24\,a4\,a6\,a7^6 + 24\,a5\,a6\,a7^6 + 10\,a6^2\,a7^6$$

Size in memory: 0.8 MB | + Show more | Show all | Iconize | Store full expression in notebook

In[3]:=
```
G7 = SeriesCoefficient[%1, {t, 0, 7}]
```

Out[3]=

$$5\,a1^6\,a2 + 65\,a1^5\,a2^2 + 200\,a1^4\,a2^3 + 200\,a1^3\,a2^4 + 65\,a1^2\,a2^5 + 5\,a1\,a2^6 + 5\,a1^6\,a3 + 154\,a1^5\,a2\,a3 + \cdots 1693 \cdots + 154\,a5\,a6\,a7^5 + 65\,a6^2\,a7^5 + 5\,a1\,a7^6 + 5\,a2\,a7^6 + 5\,a3\,a7^6 + 5\,a4\,a7^6 + 5\,a5\,a7^6 + 5\,a6\,a7^6$$

Size in memory: 407.2 kB | + Show more | Show all | Iconize | Store full expression in notebook

In[4]:=
```
G6 = SeriesCoefficient[%1, {t, 0, 6}]
```

Out[4]=

$$a1^6 + 31\,a1^5\,a2 + 175\,a1^4\,a2^2 + 300\,a1^3\,a2^3 + 175\,a1^2\,a2^4 + 31\,a1\,a2^5 + a2^6 + 31\,a1^5\,a3 + 411\,a1^4\,a2\,a3 + 1280\,a1^3\,a2^2\,a3 + 1280\,a1^2\,a2^3\,a3 + 411\,a1\,a2^4\,a3 + 31\,a2^5\,a3 + 175\,a1^4\,a3^2 + 1280\,a1^3\,a2\,a3^2 + 2324\,a1^2\,a2^2\,a3^2 + 1280\,a1\,a2^3\,a3^2 + 175\,a2^4\,a3^2 + 300\,a1^3\,a3^3 + 1280\,a1^2\,a2\,a3^3 + 1280\,a1\,a2^2\,a3^3 + 300\,a2^3\,a3^3 + 175\,a1^2\,a3^4 + 411\,a1\,a2\,a3^4 + 175\,a2^2\,a3^4 + 31\,a1\,a3^5 + 31\,a2\,a3^5 + a3^6 + 31\,a1^5\,a4 + 411\,a1^4\,a2\,a4 + 1280\,a1^3\,a2^2\,a4 + 1280\,a1^2\,a2^3\,a4 + 411\,a1\,a2^4\,a4 + 31\,a2^5\,a4 + 411\,a1^4\,a3\,a4 + 2981\,a1^3\,a2\,a3\,a4 + 5398\,a1^2\,a2^2\,a3\,a4 + 2981\,a1\,a2^3\,a3\,a4 + 411\,a2^4\,a3\,a4 + 1280\,a1^3\,a3^2\,a4 + 5398\,a1^2\,a2\,a3^2\,a4 + 5398\,a1\,a2^2\,a3^2\,a4 + 1280\,a2^3\,a3^2\,a4 + 1280\,a1^2\,a3^3\,a4 + 2981\,a1\,a2\,a3^3\,a4 + 1280\,a2^2\,a3^3\,a4 + 411\,a1\,a3^4\,a4 + 411\,a2\,a3^4\,a4 + 31\,a3^5\,a4 + 175\,a1^4\,a4^2 + 1280\,a1^3\,a2\,a4^2 + 2324\,a1^2\,a2^2\,a4^2 + 1280\,a1\,a2^3\,a4^2 + 175\,a2^4\,a4^2 + 1280\,a1^3\,a3\,a4^2 + 5398\,a1^2\,a2\,a3\,a4^2 + 5398\,a1\,a2^2\,a3\,a4^2 + 1280\,a2^3\,a3\,a4^2 + 2324\,a1^2\,a3^2\,a4^2 + 5398\,a1\,a2\,a3^2\,a4^2 + 2324\,a2^2\,a3^2\,a4^2 + 1280\,a1\,a3^3\,a4^2 + 1280\,a2\,a3^3\,a4^2 + 175\,a3^4\,a4^2 + 300\,a1^3\,a4^3 + 1280\,a1^2\,a2\,a4^3 + 1280\,a1\,a2^2\,a4^3 + 300\,a2^3\,a4^3 + 1280\,a1^2\,a3\,a4^3 + 2981\,a1\,a2\,a3\,a4^3 + 1280\,a2^2\,a3\,a4^3 + 1280\,a1\,a3^2\,a4^3 + 1280\,a2\,a3^2\,a4^3 + 300\,a3^3\,a4^3 + 175\,a1^2\,a4^4 + 411\,a1\,a2\,a4^4 + 175\,a2^2\,a4^4 +$$

$411\, a1\, a3\, a4^4 + 411\, a2\, a3\, a4^4 + 175\, a3^2\, a4^4 + 31\, a1\, a4^5 + 31\, a2\, a4^5 + 31\, a3\, a4^5 +$
$a4^6 + 31\, a1^5\, a5 + 411\, a1^4\, a2\, a5 + 1280\, a1^3\, a2^2\, a5 + 1280\, a1^2\, a2^3\, a5 + 411\, a1\, a2^4\, a5 +$
$31\, a2^5\, a5 + 411\, a1^4\, a3\, a5 + 2981\, a1^3\, a2\, a3\, a5 + 5398\, a1^2\, a2^2\, a3\, a5 + 2981\, a1\, a2^3\, a3\, a5 +$
$411\, a2^4\, a3\, a5 + 1280\, a1^3\, a3^2\, a5 + 5398\, a1^2\, a2\, a3^2\, a5 + 5398\, a1\, a2^2\, a3^2\, a5 + 1280\, a2^3\, a3^2\, a5 +$
$1280\, a1^2\, a3^3\, a5 + 2981\, a1\, a2\, a3^3\, a5 + 1280\, a2^2\, a3^3\, a5 + 411\, a1\, a3^4\, a5 + 411\, a2\, a3^4\, a5 +$
$31\, a3^5\, a5 + 411\, a1^4\, a4\, a5 + 2981\, a1^3\, a2\, a4\, a5 + 5398\, a1^2\, a2^2\, a4\, a5 + 2981\, a1\, a2^3\, a4\, a5 +$
$411\, a2^4\, a4\, a5 + 2981\, a1^3\, a3\, a4\, a5 + 12\,495\, a1^2\, a2\, a3\, a4\, a5 + 12\,495\, a1\, a2^2\, a3\, a4\, a5 +$
$2981\, a2^3\, a3\, a4\, a5 + 5398\, a1^2\, a3^2\, a4\, a5 + 12\,495\, a1\, a2\, a3^2\, a4\, a5 + 5398\, a2^2\, a3^2\, a4\, a5 +$
$2981\, a1\, a3^3\, a4\, a5 + 2981\, a2\, a3^3\, a4\, a5 + 411\, a3^4\, a4\, a5 + 1280\, a1^3\, a4^2\, a5 + 5398\, a1^2\, a2\, a4^2\, a5 +$
$5398\, a1\, a2^2\, a4^2\, a5 + 1280\, a2^3\, a4^2\, a5 + 5398\, a1^2\, a3\, a4^2\, a5 + 12\,495\, a1\, a2\, a3\, a4^2\, a5 +$
$5398\, a2^2\, a3\, a4^2\, a5 + 5398\, a1\, a3^2\, a4^2\, a5 + 5398\, a2\, a3^2\, a4^2\, a5 + 1280\, a3^3\, a4^2\, a5 +$
$1280\, a1^2\, a4^3\, a5 + 2981\, a1\, a2\, a4^3\, a5 + 1280\, a2^2\, a4^3\, a5 + 2981\, a1\, a3\, a4^3\, a5 + 2981\, a2\, a3\, a4^3\, a5 +$
$1280\, a3^2\, a4^3\, a5 + 411\, a1\, a4^4\, a5 + 411\, a2\, a4^4\, a5 + 411\, a3\, a4^4\, a5 + 31\, a4^5\, a5 + 175\, a1^4\, a5^2 +$
$1280\, a1^3\, a2\, a5^2 + 2324\, a1^2\, a2^2\, a5^2 + 1280\, a1\, a2^3\, a5^2 + 175\, a2^4\, a5^2 + 1280\, a1^3\, a3\, a5^2 +$
$5398\, a1^2\, a2\, a3\, a5^2 + 5398\, a1\, a2^2\, a3\, a5^2 + 1280\, a2^3\, a3\, a5^2 + 2324\, a1^2\, a3^2\, a5^2 +$
$5398\, a1\, a2\, a3^2\, a5^2 + 2324\, a2^2\, a3^2\, a5^2 + 1280\, a1\, a3^3\, a5^2 + 1280\, a2\, a3^3\, a5^2 + 175\, a3^4\, a5^2 +$
$1280\, a1^3\, a4\, a5^2 + 5398\, a1^2\, a2\, a4\, a5^2 + 5398\, a1\, a2^2\, a4\, a5^2 + 1280\, a2^3\, a4\, a5^2 +$
$5398\, a1^2\, a3\, a4\, a5^2 + 12\,495\, a1\, a2\, a3\, a4\, a5^2 + 5398\, a2^2\, a3\, a4\, a5^2 + 5398\, a1\, a3^2\, a4\, a5^2 +$
$5398\, a2\, a3^2\, a4\, a5^2 + 1280\, a3^3\, a4\, a5^2 + 2324\, a1^2\, a4^2\, a5^2 + 5398\, a1\, a2\, a4^2\, a5^2 +$
$2324\, a2^2\, a4^2\, a5^2 + 5398\, a1\, a3\, a4^2\, a5^2 + 5398\, a2\, a3\, a4^2\, a5^2 + 2324\, a3^2\, a4^2\, a5^2 +$
$1280\, a1\, a4^3\, a5^2 + 1280\, a2\, a4^3\, a5^2 + 1280\, a3\, a4^3\, a5^2 + 175\, a4^4\, a5^2 + 300\, a1^3\, a5^3 +$
$1280\, a1^2\, a2\, a5^3 + 1280\, a1\, a2^2\, a5^3 + 300\, a2^3\, a5^3 + 1280\, a1^2\, a3\, a5^3 + 2981\, a1\, a2\, a3\, a5^3 +$
$1280\, a2^2\, a3\, a5^3 + 1280\, a1\, a3^2\, a5^3 + 1280\, a2\, a3^2\, a5^3 + 300\, a3^3\, a5^3 + 1280\, a1^2\, a4\, a5^3 +$
$2981\, a1\, a2\, a4\, a5^3 + 1280\, a2^2\, a4\, a5^3 + 2981\, a1\, a3\, a4\, a5^3 + 2981\, a2\, a3\, a4\, a5^3 + 1280\, a3^2\, a4\, a5^3 +$
$1280\, a1\, a4^2\, a5^3 + 1280\, a2\, a4^2\, a5^3 + 1280\, a3\, a4^2\, a5^3 + 300\, a4^3\, a5^3 + 175\, a1^2\, a5^4 +$
$411\, a1\, a2\, a5^4 + 175\, a2^2\, a5^4 + 411\, a1\, a3\, a5^4 + 411\, a2\, a3\, a5^4 + 175\, a3^2\, a5^4 + 411\, a1\, a4\, a5^4 +$
$411\, a2\, a4\, a5^4 + 411\, a3\, a4\, a5^4 + 175\, a4^2\, a5^4 + 31\, a1\, a5^5 + 31\, a2\, a5^5 + 31\, a3\, a5^5 + 31\, a4\, a5^5 +$
$a5^6 + 31\, a1^5\, a6 + 411\, a1^4\, a2\, a6 + 1280\, a1^3\, a2^2\, a6 + 1280\, a1^2\, a2^3\, a6 + 411\, a1\, a2^4\, a6 +$
$31\, a2^5\, a6 + 411\, a1^4\, a3\, a6 + 2981\, a1^3\, a2\, a3\, a6 + 5398\, a1^2\, a2^2\, a3\, a6 + 2981\, a1\, a2^3\, a3\, a6 +$
$411\, a2^4\, a3\, a6 + 1280\, a1^3\, a3^2\, a6 + 5398\, a1^2\, a2\, a3^2\, a6 + 5398\, a1\, a2^2\, a3^2\, a6 + 1280\, a2^3\, a3^2\, a6 +$
$1280\, a1^2\, a3^3\, a6 + 2981\, a1\, a2\, a3^3\, a6 + 1280\, a2^2\, a3^3\, a6 + 411\, a1\, a3^4\, a6 + 411\, a2\, a3^4\, a6 +$
$31\, a3^5\, a6 + 411\, a1^4\, a4\, a6 + 2981\, a1^3\, a2\, a4\, a6 + 5398\, a1^2\, a2^2\, a4\, a6 + 2981\, a1\, a2^3\, a4\, a6 +$
$411\, a2^4\, a4\, a6 + 2981\, a1^3\, a3\, a4\, a6 + 12\,495\, a1^2\, a2\, a3\, a4\, a6 + 12\,495\, a1\, a2^2\, a3\, a4\, a6 +$
$2981\, a2^3\, a3\, a4\, a6 + 5398\, a1^2\, a3^2\, a4\, a6 + 12\,495\, a1\, a2\, a3^2\, a4\, a6 + 5398\, a2^2\, a3^2\, a4\, a6 +$
$2981\, a1\, a3^3\, a4\, a6 + 2981\, a2\, a3^3\, a4\, a6 + 411\, a3^4\, a4\, a6 + 1280\, a1^3\, a4^2\, a6 + 5398\, a1^2\, a2\, a4^2\, a6 +$
$5398\, a1\, a2^2\, a4^2\, a6 + 1280\, a2^3\, a4^2\, a6 + 5398\, a1^2\, a3\, a4^2\, a6 + 12\,495\, a1\, a2\, a3\, a4^2\, a6 +$
$5398\, a2^2\, a3\, a4^2\, a6 + 5398\, a1\, a3^2\, a4^2\, a6 + 5398\, a2\, a3^2\, a4^2\, a6 + 1280\, a3^3\, a4^2\, a6 +$
$1280\, a1^2\, a4^3\, a6 + 2981\, a1\, a2\, a4^3\, a6 + 1280\, a2^2\, a4^3\, a6 + 2981\, a1\, a3\, a4^3\, a6 + 2981\, a2\, a3\, a4^3\, a6 +$
$1280\, a3^2\, a4^3\, a6 + 411\, a1\, a4^4\, a6 + 411\, a2\, a4^4\, a6 + 411\, a3\, a4^4\, a6 + 31\, a4^5\, a6 + 411\, a1^4\, a5\, a6 +$
$2981\, a1^3\, a2\, a5\, a6 + 5398\, a1^2\, a2^2\, a5\, a6 + 2981\, a1\, a2^3\, a5\, a6 + 411\, a2^4\, a5\, a6 + 2981\, a1^3\, a3\, a5\, a6 +$
$12\,495\, a1^2\, a2\, a3\, a5\, a6 + 12\,495\, a1\, a2^2\, a3\, a5\, a6 + 2981\, a2^3\, a3\, a5\, a6 + 5398\, a1^2\, a3^2\, a5\, a6 +$
$12\,495\, a1\, a2\, a3^2\, a5\, a6 + 5398\, a2^2\, a3^2\, a5\, a6 + 2981\, a1\, a3^3\, a5\, a6 + 2981\, a2\, a3^3\, a5\, a6 +$
$411\, a3^4\, a5\, a6 + 2981\, a1^3\, a4\, a5\, a6 + 12\,495\, a1^2\, a2\, a4\, a5\, a6 + 12\,495\, a1\, a2^2\, a4\, a5\, a6 +$
$2981\, a2^3\, a4\, a5\, a6 + 12\,495\, a1^2\, a3\, a4\, a5\, a6 + 28\,821\, a1\, a2\, a3\, a4\, a5\, a6 + 12\,495\, a2^2\, a3\, a4\, a5\, a6 +$
$12\,495\, a1\, a3^2\, a4\, a5\, a6 + 12\,495\, a2\, a3^2\, a4\, a5\, a6 + 2981\, a3^3\, a4\, a5\, a6 + 5398\, a1^2\, a4^2\, a5\, a6 +$
$12\,495\, a1\, a2\, a4^2\, a5\, a6 + 5398\, a2^2\, a4^2\, a5\, a6 + 12\,495\, a1\, a3\, a4^2\, a5\, a6 + 12\,495\, a2\, a3\, a4^2\, a5\, a6 +$
$5398\, a3^2\, a4^2\, a5\, a6 + 2981\, a1\, a4^3\, a5\, a6 + 2981\, a2\, a4^3\, a5\, a6 + 2981\, a3\, a4^3\, a5\, a6 +$

$411\, a4^4\, a5\, a6 + 1280\, a1^3\, a5^2\, a6 + 5398\, a1^2\, a2\, a5^2\, a6 + 5398\, a1\, a2^2\, a5^2\, a6 + 1280\, a2^3\, a5^2\, a6 +$
$5398\, a1^2\, a3\, a5^2\, a6 + 12\,495\, a1\, a2\, a3\, a5^2\, a6 + 5398\, a2^2\, a3\, a5^2\, a6 + 5398\, a1\, a3^2\, a5^2\, a6 +$
$5398\, a2\, a3^2\, a5^2\, a6 + 1280\, a3^3\, a5^2\, a6 + 5398\, a1^2\, a4\, a5^2\, a6 + 12\,495\, a1\, a2\, a4\, a5^2\, a6 +$
$5398\, a2^2\, a4\, a5^2\, a6 + 12\,495\, a1\, a3\, a4\, a5^2\, a6 + 12\,495\, a2\, a3\, a4\, a5^2\, a6 + 5398\, a3^2\, a4\, a5^2\, a6 +$
$5398\, a1\, a4^2\, a5^2\, a6 + 5398\, a2\, a4^2\, a5^2\, a6 + 5398\, a3\, a4^2\, a5^2\, a6 + 1280\, a4^3\, a5^2\, a6 +$
$1280\, a1^2\, a5^3\, a6 + 2981\, a1\, a2\, a5^3\, a6 + 1280\, a2^2\, a5^3\, a6 + 2981\, a1\, a3\, a5^3\, a6 +$
$2981\, a2\, a3\, a5^3\, a6 + 1280\, a3^2\, a5^3\, a6 + 2981\, a1\, a4\, a5^3\, a6 + 2981\, a2\, a4\, a5^3\, a6 +$
$2981\, a3\, a4\, a5^3\, a6 + 1280\, a4^2\, a5^3\, a6 + 411\, a1\, a5^4\, a6 + 411\, a2\, a5^4\, a6 + 411\, a3\, a5^4\, a6 +$
$411\, a4\, a5^4\, a6 + 31\, a5^5\, a6 + 175\, a1^4\, a6^2 + 1280\, a1^3\, a2\, a6^2 + 2324\, a1^2\, a2^2\, a6^2 +$
$1280\, a1\, a2^3\, a6^2 + 175\, a2^4\, a6^2 + 1280\, a1^3\, a3\, a6^2 + 5398\, a1^2\, a2\, a3\, a6^2 + 5398\, a1\, a2^2\, a3\, a6^2 +$
$1280\, a2^3\, a3\, a6^2 + 2324\, a1^2\, a3^2\, a6^2 + 5398\, a1\, a2\, a3^2\, a6^2 + 2324\, a2^2\, a3^2\, a6^2 + 1280\, a1\, a3^3\, a6^2 +$
$1280\, a2\, a3^3\, a6^2 + 175\, a3^4\, a6^2 + 1280\, a1^3\, a4\, a6^2 + 5398\, a1^2\, a2\, a4\, a6^2 + 5398\, a1\, a2^2\, a4\, a6^2 +$
$1280\, a2^3\, a4\, a6^2 + 5398\, a1^2\, a3\, a4\, a6^2 + 12\,495\, a1\, a2\, a3\, a4\, a6^2 + 5398\, a2^2\, a3\, a4\, a6^2 +$
$5398\, a1\, a3^2\, a4\, a6^2 + 5398\, a2\, a3^2\, a4\, a6^2 + 1280\, a3^3\, a4\, a6^2 + 2324\, a1^2\, a4^2\, a6^2 +$
$5398\, a1\, a2\, a4^2\, a6^2 + 2324\, a2^2\, a4^2\, a6^2 + 5398\, a1\, a3\, a4^2\, a6^2 + 5398\, a2\, a3\, a4^2\, a6^2 +$
$2324\, a3^2\, a4^2\, a6^2 + 1280\, a1\, a4^3\, a6^2 + 1280\, a2\, a4^3\, a6^2 + 1280\, a3\, a4^3\, a6^2 + 175\, a4^4\, a6^2 +$
$1280\, a1^3\, a5\, a6^2 + 5398\, a1^2\, a2\, a5\, a6^2 + 5398\, a1\, a2^2\, a5\, a6^2 + 1280\, a2^3\, a5\, a6^2 +$
$5398\, a1^2\, a3\, a5\, a6^2 + 12\,495\, a1\, a2\, a3\, a5\, a6^2 + 5398\, a2^2\, a3\, a5\, a6^2 + 5398\, a1\, a3^2\, a5\, a6^2 +$
$5398\, a2\, a3^2\, a5\, a6^2 + 1280\, a3^3\, a5\, a6^2 + 5398\, a1^2\, a4\, a5\, a6^2 + 12\,495\, a1\, a2\, a4\, a5\, a6^2 +$
$5398\, a2^2\, a4\, a5\, a6^2 + 12\,495\, a1\, a3\, a4\, a5\, a6^2 + 12\,495\, a2\, a3\, a4\, a5\, a6^2 + 5398\, a3^2\, a4\, a5\, a6^2 +$
$5398\, a1\, a4^2\, a5\, a6^2 + 5398\, a2\, a4^2\, a5\, a6^2 + 5398\, a3\, a4^2\, a5\, a6^2 + 1280\, a4^3\, a5\, a6^2 +$
$2324\, a1^2\, a5^2\, a6^2 + 5398\, a1\, a2\, a5^2\, a6^2 + 2324\, a2^2\, a5^2\, a6^2 + 5398\, a1\, a3\, a5^2\, a6^2 +$
$5398\, a2\, a3\, a5^2\, a6^2 + 2324\, a3^2\, a5^2\, a6^2 + 5398\, a1\, a4\, a5^2\, a6^2 + 5398\, a2\, a4\, a5^2\, a6^2 +$
$5398\, a3\, a4\, a5^2\, a6^2 + 2324\, a4^2\, a5^2\, a6^2 + 1280\, a1\, a5^3\, a6^2 + 1280\, a2\, a5^3\, a6^2 + 1280\, a3\, a5^3\, a6^2 +$
$1280\, a4\, a5^3\, a6^2 + 175\, a5^4\, a6^2 + 300\, a1^3\, a6^3 + 1280\, a1^2\, a2\, a6^3 + 1280\, a1\, a2^2\, a6^3 +$
$300\, a2^3\, a6^3 + 1280\, a1^2\, a3\, a6^3 + 2981\, a1\, a2\, a3\, a6^3 + 1280\, a2^2\, a3\, a6^3 + 1280\, a1\, a3^2\, a6^3 +$
$1280\, a2\, a3^2\, a6^3 + 300\, a3^3\, a6^3 + 1280\, a1^2\, a4\, a6^3 + 2981\, a1\, a2\, a4\, a6^3 + 1280\, a2^2\, a4\, a6^3 +$
$2981\, a1\, a3\, a4\, a6^3 + 2981\, a2\, a3\, a4\, a6^3 + 1280\, a3^2\, a4\, a6^3 + 1280\, a1\, a4^2\, a6^3 + 1280\, a2\, a4^2\, a6^3 +$
$1280\, a3\, a4^2\, a6^3 + 300\, a4^3\, a6^3 + 1280\, a1^2\, a5\, a6^3 + 2981\, a1\, a2\, a5\, a6^3 + 1280\, a2^2\, a5\, a6^3 +$
$2981\, a1\, a3\, a5\, a6^3 + 2981\, a2\, a3\, a5\, a6^3 + 1280\, a3^2\, a5\, a6^3 + 2981\, a1\, a4\, a5\, a6^3 +$
$2981\, a2\, a4\, a5\, a6^3 + 2981\, a3\, a4\, a5\, a6^3 + 1280\, a4^2\, a5\, a6^3 + 1280\, a1\, a5^2\, a6^3 +$
$1280\, a2\, a5^2\, a6^3 + 1280\, a3\, a5^2\, a6^3 + 1280\, a4\, a5^2\, a6^3 + 300\, a5^3\, a6^3 + 175\, a1^2\, a6^4 +$
$411\, a1\, a2\, a6^4 + 175\, a2^2\, a6^4 + 411\, a1\, a3\, a6^4 + 411\, a2\, a3\, a6^4 + 175\, a3^2\, a6^4 + 411\, a1\, a4\, a6^4 +$
$411\, a2\, a4\, a6^4 + 411\, a3\, a4\, a6^4 + 175\, a4^2\, a6^4 + 411\, a1\, a5\, a6^4 + 411\, a2\, a5\, a6^4 + 411\, a3\, a5\, a6^4 +$
$411\, a4\, a5\, a6^4 + 175\, a5^2\, a6^4 + 31\, a1\, a6^5 + 31\, a2\, a6^5 + 31\, a3\, a6^5 + 31\, a4\, a6^5 + 31\, a5\, a6^5 +$
$a6^6 + 31\, a1^5\, a7 + 411\, a1^4\, a2\, a7 + 1280\, a1^3\, a2^2\, a7 + 1280\, a1^2\, a2^3\, a7 + 411\, a1\, a2^4\, a7 +$
$31\, a2^5\, a7 + 411\, a1^4\, a3\, a7 + 2981\, a1^3\, a2\, a3\, a7 + 5398\, a1^2\, a2^2\, a3\, a7 + 2981\, a1\, a2^3\, a3\, a7 +$
$411\, a2^4\, a3\, a7 + 1280\, a1^3\, a3^2\, a7 + 5398\, a1^2\, a2\, a3^2\, a7 + 5398\, a1\, a2^2\, a3^2\, a7 + 1280\, a2^3\, a3^2\, a7 +$
$1280\, a1^2\, a3^3\, a7 + 2981\, a1\, a2\, a3^3\, a7 + 1280\, a2^2\, a3^3\, a7 + 411\, a1\, a3^4\, a7 + 411\, a2\, a3^4\, a7 +$
$31\, a3^5\, a7 + 411\, a1^4\, a4\, a7 + 2981\, a1^3\, a2\, a4\, a7 + 5398\, a1^2\, a2^2\, a4\, a7 + 2981\, a1\, a2^3\, a4\, a7 +$
$411\, a2^4\, a4\, a7 + 2981\, a1^3\, a3\, a4\, a7 + 12\,495\, a1^2\, a2\, a3\, a4\, a7 + 12\,495\, a1\, a2^2\, a3\, a4\, a7 +$
$2981\, a2^3\, a3\, a4\, a7 + 5398\, a1^2\, a3^2\, a4\, a7 + 12\,495\, a1\, a2\, a3^2\, a4\, a7 + 5398\, a2^2\, a3^2\, a4\, a7 +$
$2981\, a1\, a3^3\, a4\, a7 + 2981\, a2\, a3^3\, a4\, a7 + 411\, a3^4\, a4\, a7 + 1280\, a1^3\, a4^2\, a7 + 5398\, a1^2\, a2\, a4^2\, a7 +$
$5398\, a1\, a2^2\, a4^2\, a7 + 1280\, a2^3\, a4^2\, a7 + 5398\, a1^2\, a3\, a4^2\, a7 + 12\,495\, a1\, a2\, a3\, a4^2\, a7 +$
$5398\, a2^2\, a3\, a4^2\, a7 + 5398\, a1\, a3^2\, a4^2\, a7 + 5398\, a2\, a3^2\, a4^2\, a7 + 1280\, a3^3\, a4^2\, a7 +$
$1280\, a1^2\, a4^3\, a7 + 2981\, a1\, a2\, a4^3\, a7 + 1280\, a2^2\, a4^3\, a7 + 2981\, a1\, a3\, a4^3\, a7 + 2981\, a2\, a3\, a4^3\, a7 +$
$1280\, a3^2\, a4^3\, a7 + 411\, a1\, a4^4\, a7 + 411\, a2\, a4^4\, a7 + 411\, a3\, a4^4\, a7 + 31\, a4^5\, a7 + 411\, a1^4\, a5\, a7 +$

$2981\, a1^3\, a2\, a5\, a7 + 5398\, a1^2\, a2^2\, a5\, a7 + 2981\, a1\, a2^3\, a5\, a7 + 411\, a2^4\, a5\, a7 + 2981\, a1^3\, a3\, a5\, a7 +$
$12\,495\, a1^2\, a2\, a3\, a5\, a7 + 12\,495\, a1\, a2^2\, a3\, a5\, a7 + 2981\, a2^3\, a3\, a5\, a7 + 5398\, a1^2\, a3^2\, a5\, a7 +$
$12\,495\, a1\, a2\, a3^2\, a5\, a7 + 5398\, a2^2\, a3^2\, a5\, a7 + 2981\, a1\, a3^3\, a5\, a7 + 2981\, a2\, a3^3\, a5\, a7 +$
$411\, a3^4\, a5\, a7 + 2981\, a1^3\, a4\, a5\, a7 + 12\,495\, a1^2\, a2\, a4\, a5\, a7 + 12\,495\, a1\, a2^2\, a4\, a5\, a7 +$
$2981\, a2^3\, a4\, a5\, a7 + 12\,495\, a1^2\, a3\, a4\, a5\, a7 + 28\,821\, a1\, a2\, a3\, a4\, a5\, a7 + 12\,495\, a2^2\, a3\, a4\, a5\, a7 +$
$12\,495\, a1\, a3^2\, a4\, a5\, a7 + 12\,495\, a2\, a3^2\, a4\, a5\, a7 + 2981\, a3^3\, a4\, a5\, a7 + 5398\, a1^2\, a4^2\, a5\, a7 +$
$12\,495\, a1\, a2\, a4^2\, a5\, a7 + 5398\, a2^2\, a4^2\, a5\, a7 + 12\,495\, a1\, a3\, a4^2\, a5\, a7 + 12\,495\, a2\, a3\, a4^2\, a5\, a7 +$
$5398\, a3^2\, a4^2\, a5\, a7 + 2981\, a1\, a4^3\, a5\, a7 + 2981\, a2\, a4^3\, a5\, a7 + 2981\, a3\, a4^3\, a5\, a7 +$
$411\, a4^4\, a5\, a7 + 1280\, a1^3\, a5^2\, a7 + 5398\, a1^2\, a2\, a5^2\, a7 + 5398\, a1\, a2^2\, a5^2\, a7 + 1280\, a2^3\, a5^2\, a7 +$
$5398\, a1^2\, a3\, a5^2\, a7 + 12\,495\, a1\, a2\, a3\, a5^2\, a7 + 5398\, a2^2\, a3\, a5^2\, a7 + 5398\, a1\, a3^2\, a5^2\, a7 +$
$5398\, a2\, a3^2\, a5^2\, a7 + 1280\, a3^3\, a5^2\, a7 + 5398\, a1^2\, a4\, a5^2\, a7 + 12\,495\, a1\, a2\, a4\, a5^2\, a7 +$
$5398\, a2^2\, a4\, a5^2\, a7 + 12\,495\, a1\, a3\, a4\, a5^2\, a7 + 12\,495\, a2\, a3\, a4\, a5^2\, a7 + 5398\, a3^2\, a4\, a5^2\, a7 +$
$5398\, a1\, a4^2\, a5^2\, a7 + 5398\, a2\, a4^2\, a5^2\, a7 + 5398\, a3\, a4^2\, a5^2\, a7 + 1280\, a4^3\, a5^2\, a7 +$
$1280\, a1^2\, a5^3\, a7 + 2981\, a1\, a2\, a5^3\, a7 + 1280\, a2^2\, a5^3\, a7 + 2981\, a1\, a3\, a5^3\, a7 + 2981\, a2\, a3\, a5^3\, a7 +$
$1280\, a3^2\, a5^3\, a7 + 2981\, a1\, a4\, a5^3\, a7 + 2981\, a2\, a4\, a5^3\, a7 + 2981\, a3\, a4\, a5^3\, a7 +$
$1280\, a4^2\, a5^3\, a7 + 411\, a1\, a5^4\, a7 + 411\, a2\, a5^4\, a7 + 411\, a3\, a5^4\, a7 + 411\, a4\, a5^4\, a7 + 31\, a5^5\, a7 +$
$411\, a1^4\, a6\, a7 + 2981\, a1^3\, a2\, a6\, a7 + 5398\, a1^2\, a2^2\, a6\, a7 + 2981\, a1\, a2^3\, a6\, a7 + 411\, a2^4\, a6\, a7 +$
$2981\, a1^3\, a3\, a6\, a7 + 12\,495\, a1^2\, a2\, a3\, a6\, a7 + 12\,495\, a1\, a2^2\, a3\, a6\, a7 + 2981\, a2^3\, a3\, a6\, a7 +$
$5398\, a1^2\, a3^2\, a6\, a7 + 12\,495\, a1\, a2\, a3^2\, a6\, a7 + 5398\, a2^2\, a3^2\, a6\, a7 + 2981\, a1\, a3^3\, a6\, a7 +$
$2981\, a2\, a3^3\, a6\, a7 + 411\, a3^4\, a6\, a7 + 2981\, a1^3\, a4\, a6\, a7 + 12\,495\, a1^2\, a2\, a4\, a6\, a7 +$
$12\,495\, a1\, a2^2\, a4\, a6\, a7 + 2981\, a2^3\, a4\, a6\, a7 + 12\,495\, a1^2\, a3\, a4\, a6\, a7 + 28\,821\, a1\, a2\, a3\, a4\, a6\, a7 +$
$12\,495\, a2^2\, a3\, a4\, a6\, a7 + 12\,495\, a1\, a3^2\, a4\, a6\, a7 + 12\,495\, a2\, a3^2\, a4\, a6\, a7 + 2981\, a3^3\, a4\, a6\, a7 +$
$5398\, a1^2\, a4^2\, a6\, a7 + 12\,495\, a1\, a2\, a4^2\, a6\, a7 + 5398\, a2^2\, a4^2\, a6\, a7 + 12\,495\, a1\, a3\, a4^2\, a6\, a7 +$
$12\,495\, a2\, a3\, a4^2\, a6\, a7 + 5398\, a3^2\, a4^2\, a6\, a7 + 2981\, a1\, a4^3\, a6\, a7 + 2981\, a2\, a4^3\, a6\, a7 +$
$2981\, a3\, a4^3\, a6\, a7 + 411\, a4^4\, a6\, a7 + 2981\, a1^3\, a5\, a6\, a7 + 12\,495\, a1^2\, a2\, a5\, a6\, a7 +$
$12\,495\, a1\, a2^2\, a5\, a6\, a7 + 2981\, a2^3\, a5\, a6\, a7 + 12\,495\, a1^2\, a3\, a5\, a6\, a7 + 28\,821\, a1\, a2\, a3\, a5\, a6\, a7 +$
$12\,495\, a2^2\, a3\, a5\, a6\, a7 + 12\,495\, a1\, a3^2\, a5\, a6\, a7 + 12\,495\, a2\, a3^2\, a5\, a6\, a7 + 2981\, a3^3\, a5\, a6\, a7 +$
$12\,495\, a1^2\, a4\, a5\, a6\, a7 + 28\,821\, a1\, a2\, a4\, a5\, a6\, a7 + 12\,495\, a2^2\, a4\, a5\, a6\, a7 +$
$28\,821\, a1\, a3\, a4\, a5\, a6\, a7 + 28\,821\, a2\, a3\, a4\, a5\, a6\, a7 + 12\,495\, a3^2\, a4\, a5\, a6\, a7 +$
$12\,495\, a1\, a4^2\, a5\, a6\, a7 + 12\,495\, a2\, a4^2\, a5\, a6\, a7 + 12\,495\, a3\, a4^2\, a5\, a6\, a7 + 2981\, a4^3\, a5\, a6\, a7 +$
$5398\, a1^2\, a5^2\, a6\, a7 + 12\,495\, a1\, a2\, a5^2\, a6\, a7 + 5398\, a2^2\, a5^2\, a6\, a7 + 12\,495\, a1\, a3\, a5^2\, a6\, a7 +$
$12\,495\, a2\, a3\, a5^2\, a6\, a7 + 5398\, a3^2\, a5^2\, a6\, a7 + 12\,495\, a1\, a4\, a5^2\, a6\, a7 + 12\,495\, a2\, a4\, a5^2\, a6\, a7 +$
$12\,495\, a3\, a4\, a5^2\, a6\, a7 + 5398\, a4^2\, a5^2\, a6\, a7 + 2981\, a1\, a5^3\, a6\, a7 + 2981\, a2\, a5^3\, a6\, a7 +$
$2981\, a3\, a5^3\, a6\, a7 + 2981\, a4\, a5^3\, a6\, a7 + 411\, a5^4\, a6\, a7 + 1280\, a1^3\, a6^2\, a7 + 5398\, a1^2\, a2\, a6^2\, a7 +$
$5398\, a1\, a2^2\, a6^2\, a7 + 1280\, a2^3\, a6^2\, a7 + 5398\, a1^2\, a3\, a6^2\, a7 + 12\,495\, a1\, a2\, a3\, a6^2\, a7 +$
$5398\, a2^2\, a3\, a6^2\, a7 + 5398\, a1\, a3^2\, a6^2\, a7 + 5398\, a2\, a3^2\, a6^2\, a7 + 1280\, a3^3\, a6^2\, a7 +$
$5398\, a1^2\, a4\, a6^2\, a7 + 12\,495\, a1\, a2\, a4\, a6^2\, a7 + 5398\, a2^2\, a4\, a6^2\, a7 + 12\,495\, a1\, a3\, a4\, a6^2\, a7 +$
$12\,495\, a2\, a3\, a4\, a6^2\, a7 + 5398\, a3^2\, a4\, a6^2\, a7 + 5398\, a1\, a4^2\, a6^2\, a7 + 5398\, a2\, a4^2\, a6^2\, a7 +$
$5398\, a3\, a4^2\, a6^2\, a7 + 1280\, a4^3\, a6^2\, a7 + 5398\, a1^2\, a5\, a6^2\, a7 + 12\,495\, a1\, a2\, a5\, a6^2\, a7 +$
$5398\, a2^2\, a5\, a6^2\, a7 + 12\,495\, a1\, a3\, a5\, a6^2\, a7 + 12\,495\, a2\, a3\, a5\, a6^2\, a7 + 5398\, a3^2\, a5\, a6^2\, a7 +$
$12\,495\, a1\, a4\, a5\, a6^2\, a7 + 12\,495\, a2\, a4\, a5\, a6^2\, a7 + 12\,495\, a3\, a4\, a5\, a6^2\, a7 + 5398\, a4^2\, a5\, a6^2\, a7 +$
$5398\, a1\, a5^2\, a6^2\, a7 + 5398\, a2\, a5^2\, a6^2\, a7 + 5398\, a3\, a5^2\, a6^2\, a7 + 5398\, a4\, a5^2\, a6^2\, a7 +$
$1280\, a5^3\, a6^2\, a7 + 1280\, a1^2\, a6^3\, a7 + 2981\, a1\, a2\, a6^3\, a7 + 1280\, a2^2\, a6^3\, a7 + 2981\, a1\, a3\, a6^3\, a7 +$
$2981\, a2\, a3\, a6^3\, a7 + 1280\, a3^2\, a6^3\, a7 + 2981\, a1\, a4\, a6^3\, a7 + 2981\, a2\, a4\, a6^3\, a7 +$
$2981\, a3\, a4\, a6^3\, a7 + 1280\, a4^2\, a6^3\, a7 + 2981\, a1\, a5\, a6^3\, a7 + 2981\, a2\, a5\, a6^3\, a7 +$
$2981\, a3\, a5\, a6^3\, a7 + 2981\, a4\, a5\, a6^3\, a7 + 1280\, a5^2\, a6^3\, a7 + 411\, a1\, a6^4\, a7 + 411\, a2\, a6^4\, a7 +$
$411\, a3\, a6^4\, a7 + 411\, a4\, a6^4\, a7 + 411\, a5\, a6^4\, a7 + 31\, a6^5\, a7 + 175\, a1^4\, a7^2 + 1280\, a1^3\, a2\, a7^2 +$

$2324\, a1^2\, a2^2\, a7^2 + 1280\, a1\, a2^3\, a7^2 + 175\, a2^4\, a7^2 + 1280\, a1^3\, a3\, a7^2 + 5398\, a1^2\, a2\, a3\, a7^2 +$
$5398\, a1\, a2^2\, a3\, a7^2 + 1280\, a2^3\, a3\, a7^2 + 2324\, a1^2\, a3^2\, a7^2 + 5398\, a1\, a2\, a3^2\, a7^2 +$
$2324\, a2^2\, a3^2\, a7^2 + 1280\, a1\, a3^3\, a7^2 + 1280\, a2\, a3^3\, a7^2 + 175\, a3^4\, a7^2 + 1280\, a1^3\, a4\, a7^2 +$
$5398\, a1^2\, a2\, a4\, a7^2 + 5398\, a1\, a2^2\, a4\, a7^2 + 1280\, a2^3\, a4\, a7^2 + 5398\, a1^2\, a3\, a4\, a7^2 +$
$12\,495\, a1\, a2\, a3\, a4\, a7^2 + 5398\, a2^2\, a3\, a4\, a7^2 + 5398\, a1\, a3^2\, a4\, a7^2 + 5398\, a2\, a3^2\, a4\, a7^2 +$
$1280\, a3^3\, a4\, a7^2 + 2324\, a1^2\, a4^2\, a7^2 + 5398\, a1\, a2\, a4^2\, a7^2 + 2324\, a2^2\, a4^2\, a7^2 +$
$5398\, a1\, a3\, a4^2\, a7^2 + 5398\, a2\, a3\, a4^2\, a7^2 + 2324\, a3^2\, a4^2\, a7^2 + 1280\, a1\, a4^3\, a7^2 +$
$1280\, a2\, a4^3\, a7^2 + 1280\, a3\, a4^3\, a7^2 + 175\, a4^4\, a7^2 + 1280\, a1^3\, a5\, a7^2 + 5398\, a1^2\, a2\, a5\, a7^2 +$
$5398\, a1\, a2^2\, a5\, a7^2 + 1280\, a2^3\, a5\, a7^2 + 5398\, a1^2\, a3\, a5\, a7^2 + 12\,495\, a1\, a2\, a3\, a5\, a7^2 +$
$5398\, a2^2\, a3\, a5\, a7^2 + 5398\, a1\, a3^2\, a5\, a7^2 + 5398\, a2\, a3^2\, a5\, a7^2 + 1280\, a3^3\, a5\, a7^2 +$
$5398\, a1^2\, a4\, a5\, a7^2 + 12\,495\, a1\, a2\, a4\, a5\, a7^2 + 5398\, a2^2\, a4\, a5\, a7^2 + 12\,495\, a1\, a3\, a4\, a5\, a7^2 +$
$12\,495\, a2\, a3\, a4\, a5\, a7^2 + 5398\, a3^2\, a4\, a5\, a7^2 + 5398\, a1\, a4^2\, a5\, a7^2 + 5398\, a2\, a4^2\, a5\, a7^2 +$
$5398\, a3\, a4^2\, a5\, a7^2 + 1280\, a4^3\, a5\, a7^2 + 2324\, a1^2\, a5^2\, a7^2 + 5398\, a1\, a2\, a5^2\, a7^2 +$
$2324\, a2^2\, a5^2\, a7^2 + 5398\, a1\, a3\, a5^2\, a7^2 + 5398\, a2\, a3\, a5^2\, a7^2 + 2324\, a3^2\, a5^2\, a7^2 +$
$5398\, a1\, a4\, a5^2\, a7^2 + 5398\, a2\, a4\, a5^2\, a7^2 + 5398\, a3\, a4\, a5^2\, a7^2 + 2324\, a4^2\, a5^2\, a7^2 +$
$1280\, a1\, a5^3\, a7^2 + 1280\, a2\, a5^3\, a7^2 + 1280\, a3\, a5^3\, a7^2 + 1280\, a4\, a5^3\, a7^2 + 175\, a5^4\, a7^2 +$
$1280\, a1^3\, a6\, a7^2 + 5398\, a1^2\, a2\, a6\, a7^2 + 5398\, a1\, a2^2\, a6\, a7^2 + 1280\, a2^3\, a6\, a7^2 +$
$5398\, a1^2\, a3\, a6\, a7^2 + 12\,495\, a1\, a2\, a3\, a6\, a7^2 + 5398\, a2^2\, a3\, a6\, a7^2 + 5398\, a1\, a3^2\, a6\, a7^2 +$
$5398\, a2\, a3^2\, a6\, a7^2 + 1280\, a3^3\, a6\, a7^2 + 5398\, a1^2\, a4\, a6\, a7^2 + 12\,495\, a1\, a2\, a4\, a6\, a7^2 +$
$5398\, a2^2\, a4\, a6\, a7^2 + 12\,495\, a1\, a3\, a4\, a6\, a7^2 + 12\,495\, a2\, a3\, a4\, a6\, a7^2 + 5398\, a3^2\, a4\, a6\, a7^2 +$
$5398\, a1\, a4^2\, a6\, a7^2 + 5398\, a2\, a4^2\, a6\, a7^2 + 5398\, a3\, a4^2\, a6\, a7^2 + 1280\, a4^3\, a6\, a7^2 +$
$5398\, a1^2\, a5\, a6\, a7^2 + 12\,495\, a1\, a2\, a5\, a6\, a7^2 + 5398\, a2^2\, a5\, a6\, a7^2 + 12\,495\, a1\, a3\, a5\, a6\, a7^2 +$
$12\,495\, a2\, a3\, a5\, a6\, a7^2 + 5398\, a3^2\, a5\, a6\, a7^2 + 12\,495\, a1\, a4\, a5\, a6\, a7^2 + 12\,495\, a2\, a4\, a5\, a6\, a7^2 +$
$12\,495\, a3\, a4\, a5\, a6\, a7^2 + 5398\, a4^2\, a5\, a6\, a7^2 + 5398\, a1\, a5^2\, a6\, a7^2 + 5398\, a2\, a5^2\, a6\, a7^2 +$
$5398\, a3\, a5^2\, a6\, a7^2 + 5398\, a4\, a5^2\, a6\, a7^2 + 1280\, a5^3\, a6\, a7^2 + 2324\, a1^2\, a6^2\, a7^2 +$
$5398\, a1\, a2\, a6^2\, a7^2 + 2324\, a2^2\, a6^2\, a7^2 + 5398\, a1\, a3\, a6^2\, a7^2 + 5398\, a2\, a3\, a6^2\, a7^2 +$
$2324\, a3^2\, a6^2\, a7^2 + 5398\, a1\, a4\, a6^2\, a7^2 + 5398\, a2\, a4\, a6^2\, a7^2 + 5398\, a3\, a4\, a6^2\, a7^2 +$
$2324\, a4^2\, a6^2\, a7^2 + 5398\, a1\, a5\, a6^2\, a7^2 + 5398\, a2\, a5\, a6^2\, a7^2 + 5398\, a3\, a5\, a6^2\, a7^2 +$
$5398\, a4\, a5\, a6^2\, a7^2 + 2324\, a5^2\, a6^2\, a7^2 + 1280\, a1\, a6^3\, a7^2 + 1280\, a2\, a6^3\, a7^2 + 1280\, a3\, a6^3\, a7^2 +$
$1280\, a4\, a6^3\, a7^2 + 1280\, a5\, a6^3\, a7^2 + 175\, a6^4\, a7^2 + 300\, a1^3\, a7^3 + 1280\, a1^2\, a2\, a7^3 +$
$1280\, a1\, a2^2\, a7^3 + 300\, a2^3\, a7^3 + 1280\, a1^2\, a3\, a7^3 + 2981\, a1\, a2\, a3\, a7^3 + 1280\, a2^2\, a3\, a7^3 +$
$1280\, a1\, a3^2\, a7^3 + 1280\, a2\, a3^2\, a7^3 + 300\, a3^3\, a7^3 + 1280\, a1^2\, a4\, a7^3 + 2981\, a1\, a2\, a4\, a7^3 +$
$1280\, a2^2\, a4\, a7^3 + 2981\, a1\, a3\, a4\, a7^3 + 2981\, a2\, a3\, a4\, a7^3 + 1280\, a3^2\, a4\, a7^3 + 1280\, a1\, a4^2\, a7^3 +$
$1280\, a2\, a4^2\, a7^3 + 1280\, a3\, a4^2\, a7^3 + 300\, a4^3\, a7^3 + 1280\, a1^2\, a5\, a7^3 + 2981\, a1\, a2\, a5\, a7^3 +$
$1280\, a2^2\, a5\, a7^3 + 2981\, a1\, a3\, a5\, a7^3 + 2981\, a2\, a3\, a5\, a7^3 + 1280\, a3^2\, a5\, a7^3 + 2981\, a1\, a4\, a5\, a7^3 +$
$2981\, a2\, a4\, a5\, a7^3 + 2981\, a3\, a4\, a5\, a7^3 + 1280\, a4^2\, a5\, a7^3 + 1280\, a1\, a5^2\, a7^3 + 1280\, a2\, a5^2\, a7^3 +$
$1280\, a3\, a5^2\, a7^3 + 1280\, a4\, a5^2\, a7^3 + 300\, a5^3\, a7^3 + 1280\, a1^2\, a6\, a7^3 + 2981\, a1\, a2\, a6\, a7^3 +$
$1280\, a2^2\, a6\, a7^3 + 2981\, a1\, a3\, a6\, a7^3 + 2981\, a2\, a3\, a6\, a7^3 + 1280\, a3^2\, a6\, a7^3 +$
$2981\, a1\, a4\, a6\, a7^3 + 2981\, a2\, a4\, a6\, a7^3 + 2981\, a3\, a4\, a6\, a7^3 + 1280\, a4^2\, a6\, a7^3 +$
$2981\, a1\, a5\, a6\, a7^3 + 2981\, a2\, a5\, a6\, a7^3 + 2981\, a3\, a5\, a6\, a7^3 + 2981\, a4\, a5\, a6\, a7^3 +$
$1280\, a5^2\, a6\, a7^3 + 1280\, a1\, a6^2\, a7^3 + 1280\, a2\, a6^2\, a7^3 + 1280\, a3\, a6^2\, a7^3 + 1280\, a4\, a6^2\, a7^3 +$
$1280\, a5\, a6^2\, a7^3 + 300\, a6^3\, a7^3 + 175\, a1^2\, a7^4 + 411\, a1\, a2\, a7^4 + 175\, a2^2\, a7^4 + 411\, a1\, a3\, a7^4 +$
$411\, a2\, a3\, a7^4 + 175\, a3^2\, a7^4 + 411\, a1\, a4\, a7^4 + 411\, a2\, a4\, a7^4 + 411\, a3\, a4\, a7^4 + 175\, a4^2\, a7^4 +$
$411\, a1\, a5\, a7^4 + 411\, a2\, a5\, a7^4 + 411\, a3\, a5\, a7^4 + 411\, a4\, a5\, a7^4 + 175\, a5^2\, a7^4 +$
$411\, a1\, a6\, a7^4 + 411\, a2\, a6\, a7^4 + 411\, a3\, a6\, a7^4 + 411\, a4\, a6\, a7^4 + 411\, a5\, a6\, a7^4 +$
$175\, a6^2\, a7^4 + 31\, a1\, a7^5 + 31\, a2\, a7^5 + 31\, a3\, a7^5 + 31\, a4\, a7^5 + 31\, a5\, a7^5 + 31\, a6\, a7^5 + a7^6$

In[5]:=
```
G5 = SeriesCoefficient[%1, {t, 0, 5}]
```

Out[5]=

$$
\begin{aligned}
&6\,a1^5 + 80\,a1^4\,a2 + 250\,a1^3\,a2^2 + 250\,a1^2\,a2^3 + 80\,a1\,a2^4 + 6\,a2^5 + 80\,a1^4\,a3 + 584\,a1^3\,a2\,a3 + \\
&1060\,a1^2\,a2^2\,a3 + 584\,a1\,a2^3\,a3 + 80\,a2^4\,a3 + 250\,a1^3\,a3^2 + 1060\,a1^2\,a2\,a3^2 + 1060\,a1\,a2^2\,a3^2 + \\
&250\,a2^3\,a3^2 + 250\,a1^2\,a3^3 + 584\,a1\,a2\,a3^3 + 250\,a2^2\,a3^3 + 80\,a1\,a3^4 + 80\,a2\,a3^4 + 6\,a3^5 + \\
&80\,a1^4\,a4 + 584\,a1^3\,a2\,a4 + 1060\,a1^2\,a2^2\,a4 + 584\,a1\,a2^3\,a4 + 80\,a2^4\,a4 + 584\,a1^3\,a3\,a4 + \\
&2463\,a1^2\,a2\,a3\,a4 + 2463\,a1\,a2^2\,a3\,a4 + 584\,a2^3\,a3\,a4 + 1060\,a1^2\,a3^2\,a4 + 2463\,a1\,a2\,a3^2\,a4 + \\
&1060\,a2^2\,a3^2\,a4 + 584\,a1\,a3^3\,a4 + 584\,a2\,a3^3\,a4 + 80\,a3^4\,a4 + 250\,a1^3\,a4^2 + 1060\,a1^2\,a2\,a4^2 + \\
&1060\,a1\,a2^2\,a4^2 + 250\,a2^3\,a4^2 + 1060\,a1^2\,a3\,a4^2 + 2463\,a1\,a2\,a3\,a4^2 + 1060\,a2^2\,a3\,a4^2 + \\
&1060\,a1\,a3^2\,a4^2 + 1060\,a2\,a3^2\,a4^2 + 250\,a3^3\,a4^2 + 250\,a1^2\,a4^3 + 584\,a1\,a2\,a4^3 + \\
&250\,a2^2\,a4^3 + 584\,a1\,a3\,a4^3 + 584\,a2\,a3\,a4^3 + 250\,a3^2\,a4^3 + 80\,a1\,a4^4 + 80\,a2\,a4^4 + \\
&80\,a3\,a4^4 + 6\,a4^5 + 80\,a1^4\,a5 + 584\,a1^3\,a2\,a5 + 1060\,a1^2\,a2^2\,a5 + 584\,a1\,a2^3\,a5 + 80\,a2^4\,a5 + \\
&584\,a1^3\,a3\,a5 + 2463\,a1^2\,a2\,a3\,a5 + 2463\,a1\,a2^2\,a3\,a5 + 584\,a2^3\,a3\,a5 + 1060\,a1^2\,a3^2\,a5 + \\
&2463\,a1\,a2\,a3^2\,a5 + 1060\,a2^2\,a3^2\,a5 + 584\,a1\,a3^3\,a5 + 584\,a2\,a3^3\,a5 + 80\,a3^4\,a5 + \\
&584\,a1^3\,a4\,a5 + 2463\,a1^2\,a2\,a4\,a5 + 2463\,a1\,a2^2\,a4\,a5 + 584\,a2^3\,a4\,a5 + 2463\,a1^2\,a3\,a4\,a5 + \\
&5706\,a1\,a2\,a3\,a4\,a5 + 2463\,a2^2\,a3\,a4\,a5 + 2463\,a1\,a3^2\,a4\,a5 + 2463\,a2\,a3^2\,a4\,a5 + \\
&584\,a3^3\,a4\,a5 + 1060\,a1^2\,a4^2\,a5 + 2463\,a1\,a2\,a4^2\,a5 + 1060\,a2^2\,a4^2\,a5 + 2463\,a1\,a3\,a4^2\,a5 + \\
&2463\,a2\,a3\,a4^2\,a5 + 1060\,a3^2\,a4^2\,a5 + 584\,a1\,a4^3\,a5 + 584\,a2\,a4^3\,a5 + 584\,a3\,a4^3\,a5 + \\
&80\,a4^4\,a5 + 250\,a1^3\,a5^2 + 1060\,a1^2\,a2\,a5^2 + 1060\,a1\,a2^2\,a5^2 + 250\,a2^3\,a5^2 + 1060\,a1^2\,a3\,a5^2 + \\
&2463\,a1\,a2\,a3\,a5^2 + 1060\,a2^2\,a3\,a5^2 + 1060\,a1\,a3^2\,a5^2 + 1060\,a2\,a3^2\,a5^2 + 250\,a3^3\,a5^2 + \\
&1060\,a1^2\,a4\,a5^2 + 2463\,a1\,a2\,a4\,a5^2 + 1060\,a2^2\,a4\,a5^2 + 2463\,a1\,a3\,a4\,a5^2 + 2463\,a2\,a3\,a4\,a5^2 + \\
&1060\,a3^2\,a4\,a5^2 + 1060\,a1\,a4^2\,a5^2 + 1060\,a2\,a4^2\,a5^2 + 1060\,a3\,a4^2\,a5^2 + 250\,a4^3\,a5^2 + \\
&250\,a1^2\,a5^3 + 584\,a1\,a2\,a5^3 + 250\,a2^2\,a5^3 + 584\,a1\,a3\,a5^3 + 584\,a2\,a3\,a5^3 + 250\,a3^2\,a5^3 + \\
&584\,a1\,a4\,a5^3 + 584\,a2\,a4\,a5^3 + 584\,a3\,a4\,a5^3 + 250\,a4^2\,a5^3 + 80\,a1\,a5^4 + 80\,a2\,a5^4 + 80\,a3\,a5^4 + \\
&80\,a4\,a5^4 + 6\,a5^5 + 80\,a1^4\,a6 + 584\,a1^3\,a2\,a6 + 1060\,a1^2\,a2^2\,a6 + 584\,a1\,a2^3\,a6 + 80\,a2^4\,a6 + \\
&584\,a1^3\,a3\,a6 + 2463\,a1^2\,a2\,a3\,a6 + 2463\,a1\,a2^2\,a3\,a6 + 584\,a2^3\,a3\,a6 + 1060\,a1^2\,a3^2\,a6 + \\
&2463\,a1\,a2\,a3^2\,a6 + 1060\,a2^2\,a3^2\,a6 + 584\,a1\,a3^3\,a6 + 584\,a2\,a3^3\,a6 + 80\,a3^4\,a6 + \\
&584\,a1^3\,a4\,a6 + 2463\,a1^2\,a2\,a4\,a6 + 2463\,a1\,a2^2\,a4\,a6 + 584\,a2^3\,a4\,a6 + 2463\,a1^2\,a3\,a4\,a6 + \\
&5706\,a1\,a2\,a3\,a4\,a6 + 2463\,a2^2\,a3\,a4\,a6 + 2463\,a1\,a3^2\,a4\,a6 + 2463\,a2\,a3^2\,a4\,a6 + \\
&584\,a3^3\,a4\,a6 + 1060\,a1^2\,a4^2\,a6 + 2463\,a1\,a2\,a4^2\,a6 + 1060\,a2^2\,a4^2\,a6 + 2463\,a1\,a3\,a4^2\,a6 + \\
&2463\,a2\,a3\,a4^2\,a6 + 1060\,a3^2\,a4^2\,a6 + 584\,a1\,a4^3\,a6 + 584\,a2\,a4^3\,a6 + 584\,a3\,a4^3\,a6 + \\
&80\,a4^4\,a6 + 584\,a1^3\,a5\,a6 + 2463\,a1^2\,a2\,a5\,a6 + 2463\,a1\,a2^2\,a5\,a6 + 584\,a2^3\,a5\,a6 + \\
&2463\,a1^2\,a3\,a5\,a6 + 5706\,a1\,a2\,a3\,a5\,a6 + 2463\,a2^2\,a3\,a5\,a6 + 2463\,a1\,a3^2\,a5\,a6 + \\
&2463\,a2\,a3^2\,a5\,a6 + 584\,a3^3\,a5\,a6 + 2463\,a1^2\,a4\,a5\,a6 + 5706\,a1\,a2\,a4\,a5\,a6 + \\
&2463\,a2^2\,a4\,a5\,a6 + 5706\,a1\,a3\,a4\,a5\,a6 + 5706\,a2\,a3\,a4\,a5\,a6 + 2463\,a3^2\,a4\,a5\,a6 + \\
&2463\,a1\,a4^2\,a5\,a6 + 2463\,a2\,a4^2\,a5\,a6 + 2463\,a3\,a4^2\,a5\,a6 + 584\,a4^3\,a5\,a6 + 1060\,a1^2\,a5^2\,a6 + \\
&2463\,a1\,a2\,a5^2\,a6 + 1060\,a2^2\,a5^2\,a6 + 2463\,a1\,a3\,a5^2\,a6 + 2463\,a2\,a3\,a5^2\,a6 + 1060\,a3^2\,a5^2\,a6 + \\
&2463\,a1\,a4\,a5^2\,a6 + 2463\,a2\,a4\,a5^2\,a6 + 2463\,a3\,a4\,a5^2\,a6 + 1060\,a4^2\,a5^2\,a6 + 584\,a1\,a5^3\,a6 + \\
&584\,a2\,a5^3\,a6 + 584\,a3\,a5^3\,a6 + 584\,a4\,a5^3\,a6 + 80\,a5^4\,a6 + 250\,a1^3\,a6^2 + 1060\,a1^2\,a2\,a6^2 + \\
&1060\,a1\,a2^2\,a6^2 + 250\,a2^3\,a6^2 + 1060\,a1^2\,a3\,a6^2 + 2463\,a1\,a2\,a3\,a6^2 + 1060\,a2^2\,a3\,a6^2 + \\
&1060\,a1\,a3^2\,a6^2 + 1060\,a2\,a3^2\,a6^2 + 250\,a3^3\,a6^2 + 1060\,a1^2\,a4\,a6^2 + 2463\,a1\,a2\,a4\,a6^2 + \\
&1060\,a2^2\,a4\,a6^2 + 2463\,a1\,a3\,a4\,a6^2 + 2463\,a2\,a3\,a4\,a6^2 + 1060\,a3^2\,a4\,a6^2 + 1060\,a1\,a4^2\,a6^2 + \\
&1060\,a2\,a4^2\,a6^2 + 1060\,a3\,a4^2\,a6^2 + 250\,a4^3\,a6^2 + 1060\,a1^2\,a5\,a6^2 + 2463\,a1\,a2\,a5\,a6^2 + \\
&1060\,a2^2\,a5\,a6^2 + 2463\,a1\,a3\,a5\,a6^2 + 2463\,a2\,a3\,a5\,a6^2 + 1060\,a3^2\,a5\,a6^2 + \\
&2463\,a1\,a4\,a5\,a6^2 + 2463\,a2\,a4\,a5\,a6^2 + 2463\,a3\,a4\,a5\,a6^2 + 1060\,a4^2\,a5\,a6^2 + \\
&1060\,a1\,a5^2\,a6^2 + 1060\,a2\,a5^2\,a6^2 + 1060\,a3\,a5^2\,a6^2 + 1060\,a4\,a5^2\,a6^2 + 250\,a5^3\,a6^2 + \\
&250\,a1^2\,a6^3 + 584\,a1\,a2\,a6^3 + 250\,a2^2\,a6^3 + 584\,a1\,a3\,a6^3 + 584\,a2\,a3\,a6^3 + 250\,a3^2\,a6^3 +
\end{aligned}
$$

$584\, a1\, a4\, a6^3 + 584\, a2\, a4\, a6^3 + 584\, a3\, a4\, a6^3 + 250\, a4^2\, a6^3 + 584\, a1\, a5\, a6^3 + 584\, a2\, a5\, a6^3 +$
$584\, a3\, a5\, a6^3 + 584\, a4\, a5\, a6^3 + 250\, a5^2\, a6^3 + 80\, a1\, a6^4 + 80\, a2\, a6^4 + 80\, a3\, a6^4 + 80\, a4\, a6^4 +$
$80\, a5\, a6^4 + 6\, a6^5 + 80\, a1^4\, a7 + 584\, a1^3\, a2\, a7 + 1060\, a1^2\, a2^2\, a7 + 584\, a1\, a2^3\, a7 + 80\, a2^4\, a7 +$
$584\, a1^3\, a3\, a7 + 2463\, a1^2\, a2\, a3\, a7 + 2463\, a1\, a2^2\, a3\, a7 + 584\, a2^3\, a3\, a7 + 1060\, a1^2\, a3^2\, a7 +$
$2463\, a1\, a2\, a3^2\, a7 + 1060\, a2^2\, a3^2\, a7 + 584\, a1\, a3^3\, a7 + 584\, a2\, a3^3\, a7 + 80\, a3^4\, a7 +$
$584\, a1^3\, a4\, a7 + 2463\, a1^2\, a2\, a4\, a7 + 2463\, a1\, a2^2\, a4\, a7 + 584\, a2^3\, a4\, a7 + 2463\, a1^2\, a3\, a4\, a7 +$
$5706\, a1\, a2\, a3\, a4\, a7 + 2463\, a2^2\, a3\, a4\, a7 + 2463\, a1\, a3^2\, a4\, a7 + 2463\, a2\, a3^2\, a4\, a7 +$
$584\, a3^3\, a4\, a7 + 1060\, a1^2\, a4^2\, a7 + 2463\, a1\, a2\, a4^2\, a7 + 1060\, a2^2\, a4^2\, a7 + 2463\, a1\, a3\, a4^2\, a7 +$
$2463\, a2\, a3\, a4^2\, a7 + 1060\, a3^2\, a4^2\, a7 + 584\, a1\, a4^3\, a7 + 584\, a2\, a4^3\, a7 + 584\, a3\, a4^3\, a7 +$
$80\, a4^4\, a7 + 584\, a1^3\, a5\, a7 + 2463\, a1^2\, a2\, a5\, a7 + 2463\, a1\, a2^2\, a5\, a7 + 584\, a2^3\, a5\, a7 +$
$2463\, a1^2\, a3\, a5\, a7 + 5706\, a1\, a2\, a3\, a5\, a7 + 2463\, a2^2\, a3\, a5\, a7 + 2463\, a1\, a3^2\, a5\, a7 +$
$2463\, a2\, a3^2\, a5\, a7 + 584\, a3^3\, a5\, a7 + 2463\, a1^2\, a4\, a5\, a7 + 5706\, a1\, a2\, a4\, a5\, a7 +$
$2463\, a2^2\, a4\, a5\, a7 + 5706\, a1\, a3\, a4\, a5\, a7 + 5706\, a2\, a3\, a4\, a5\, a7 + 2463\, a3^2\, a4\, a5\, a7 +$
$2463\, a1\, a4^2\, a5\, a7 + 2463\, a2\, a4^2\, a5\, a7 + 2463\, a3\, a4^2\, a5\, a7 + 584\, a4^3\, a5\, a7 + 1060\, a1^2\, a5^2\, a7 +$
$2463\, a1\, a2\, a5^2\, a7 + 1060\, a2^2\, a5^2\, a7 + 2463\, a1\, a3\, a5^2\, a7 + 2463\, a2\, a3\, a5^2\, a7 + 1060\, a3^2\, a5^2\, a7 +$
$2463\, a1\, a4\, a5^2\, a7 + 2463\, a2\, a4\, a5^2\, a7 + 2463\, a3\, a4\, a5^2\, a7 + 1060\, a4^2\, a5^2\, a7 + 584\, a1\, a5^3\, a7 +$
$584\, a2\, a5^3\, a7 + 584\, a3\, a5^3\, a7 + 584\, a4\, a5^3\, a7 + 80\, a5^4\, a7 + 584\, a1^3\, a6\, a7 + 2463\, a1^2\, a2\, a6\, a7 +$
$2463\, a1\, a2^2\, a6\, a7 + 584\, a2^3\, a6\, a7 + 2463\, a1^2\, a3\, a6\, a7 + 5706\, a1\, a2\, a3\, a6\, a7 +$
$2463\, a2^2\, a3\, a6\, a7 + 2463\, a1\, a3^2\, a6\, a7 + 2463\, a2\, a3^2\, a6\, a7 + 584\, a3^3\, a6\, a7 + 2463\, a1^2\, a4\, a6\, a7 +$
$5706\, a1\, a2\, a4\, a6\, a7 + 2463\, a2^2\, a4\, a6\, a7 + 5706\, a1\, a3\, a4\, a6\, a7 + 5706\, a2\, a3\, a4\, a6\, a7 +$
$2463\, a3^2\, a4\, a6\, a7 + 2463\, a1\, a4^2\, a6\, a7 + 2463\, a2\, a4^2\, a6\, a7 + 2463\, a3\, a4^2\, a6\, a7 + 584\, a4^3\, a6\, a7 +$
$2463\, a1^2\, a5\, a6\, a7 + 5706\, a1\, a2\, a5\, a6\, a7 + 2463\, a2^2\, a5\, a6\, a7 + 5706\, a1\, a3\, a5\, a6\, a7 +$
$5706\, a2\, a3\, a5\, a6\, a7 + 2463\, a3^2\, a5\, a6\, a7 + 5706\, a1\, a4\, a5\, a6\, a7 + 5706\, a2\, a4\, a5\, a6\, a7 +$
$5706\, a3\, a4\, a5\, a6\, a7 + 2463\, a4^2\, a5\, a6\, a7 + 2463\, a1\, a5^2\, a6\, a7 + 2463\, a2\, a5^2\, a6\, a7 +$
$2463\, a3\, a5^2\, a6\, a7 + 2463\, a4\, a5^2\, a6\, a7 + 584\, a5^3\, a6\, a7 + 1060\, a1^2\, a6^2\, a7 + 2463\, a1\, a2\, a6^2\, a7 +$
$1060\, a2^2\, a6^2\, a7 + 2463\, a1\, a3\, a6^2\, a7 + 2463\, a2\, a3\, a6^2\, a7 + 1060\, a3^2\, a6^2\, a7 + 2463\, a1\, a4\, a6^2\, a7 +$
$2463\, a2\, a4\, a6^2\, a7 + 2463\, a3\, a4\, a6^2\, a7 + 1060\, a4^2\, a6^2\, a7 + 2463\, a1\, a5\, a6^2\, a7 +$
$2463\, a2\, a5\, a6^2\, a7 + 2463\, a3\, a5\, a6^2\, a7 + 2463\, a4\, a5\, a6^2\, a7 + 1060\, a5^2\, a6^2\, a7 + 584\, a1\, a6^3\, a7 +$
$584\, a2\, a6^3\, a7 + 584\, a3\, a6^3\, a7 + 584\, a4\, a6^3\, a7 + 584\, a5\, a6^3\, a7 + 80\, a6^4\, a7 + 250\, a1^3\, a7^2 +$
$1060\, a1^2\, a2\, a7^2 + 1060\, a1\, a2^2\, a7^2 + 250\, a2^3\, a7^2 + 1060\, a1^2\, a3\, a7^2 + 2463\, a1\, a2\, a3\, a7^2 +$
$1060\, a2^2\, a3\, a7^2 + 1060\, a1\, a3^2\, a7^2 + 1060\, a2\, a3^2\, a7^2 + 250\, a3^3\, a7^2 + 1060\, a1^2\, a4\, a7^2 +$
$2463\, a1\, a2\, a4\, a7^2 + 1060\, a2^2\, a4\, a7^2 + 2463\, a1\, a3\, a4\, a7^2 + 2463\, a2\, a3\, a4\, a7^2 + 1060\, a3^2\, a4\, a7^2 +$
$1060\, a1\, a4^2\, a7^2 + 1060\, a2\, a4^2\, a7^2 + 1060\, a3\, a4^2\, a7^2 + 250\, a4^3\, a7^2 + 1060\, a1^2\, a5\, a7^2 +$
$2463\, a1\, a2\, a5\, a7^2 + 1060\, a2^2\, a5\, a7^2 + 2463\, a1\, a3\, a5\, a7^2 + 2463\, a2\, a3\, a5\, a7^2 + 1060\, a3^2\, a5\, a7^2 +$
$2463\, a1\, a4\, a5\, a7^2 + 2463\, a2\, a4\, a5\, a7^2 + 2463\, a3\, a4\, a5\, a7^2 + 1060\, a4^2\, a5\, a7^2 + 1060\, a1\, a5^2\, a7^2 +$
$1060\, a2\, a5^2\, a7^2 + 1060\, a3\, a5^2\, a7^2 + 1060\, a4\, a5^2\, a7^2 + 250\, a5^3\, a7^2 + 1060\, a1^2\, a6\, a7^2 +$
$2463\, a1\, a2\, a6\, a7^2 + 1060\, a2^2\, a6\, a7^2 + 2463\, a1\, a3\, a6\, a7^2 + 2463\, a2\, a3\, a6\, a7^2 +$
$1060\, a3^2\, a6\, a7^2 + 2463\, a1\, a4\, a6\, a7^2 + 2463\, a2\, a4\, a6\, a7^2 + 2463\, a3\, a4\, a6\, a7^2 +$
$1060\, a4^2\, a6\, a7^2 + 2463\, a1\, a5\, a6\, a7^2 + 2463\, a2\, a5\, a6\, a7^2 + 2463\, a3\, a5\, a6\, a7^2 +$
$2463\, a4\, a5\, a6\, a7^2 + 1060\, a5^2\, a6\, a7^2 + 1060\, a1\, a6^2\, a7^2 + 1060\, a2\, a6^2\, a7^2 + 1060\, a3\, a6^2\, a7^2 +$
$1060\, a4\, a6^2\, a7^2 + 1060\, a5\, a6^2\, a7^2 + 250\, a6^3\, a7^2 + 250\, a1^2\, a7^3 + 584\, a1\, a2\, a7^3 +$
$250\, a2^2\, a7^3 + 584\, a1\, a3\, a7^3 + 584\, a2\, a3\, a7^3 + 250\, a3^2\, a7^3 + 584\, a1\, a4\, a7^3 + 584\, a2\, a4\, a7^3 +$
$584\, a3\, a4\, a7^3 + 250\, a4^2\, a7^3 + 584\, a1\, a5\, a7^3 + 584\, a2\, a5\, a7^3 + 584\, a3\, a5\, a7^3 + 584\, a4\, a5\, a7^3 +$
$250\, a5^2\, a7^3 + 584\, a1\, a6\, a7^3 + 584\, a2\, a6\, a7^3 + 584\, a3\, a6\, a7^3 + 584\, a4\, a6\, a7^3 + 584\, a5\, a6\, a7^3 +$
$250\, a6^2\, a7^3 + 80\, a1\, a7^4 + 80\, a2\, a7^4 + 80\, a3\, a7^4 + 80\, a4\, a7^4 + 80\, a5\, a7^4 + 80\, a6\, a7^4 + 6\, a7^5$

In[6]:=
```
G4 = SeriesCoefficient[%1, {t, 0, 4}]
```

Out[6]=

$$
\begin{aligned}
&15\,a1^4 + 110\,a1^3\,a2 + 200\,a1^2\,a2^2 + 110\,a1\,a2^3 + 15\,a2^4 + 110\,a1^3\,a3 + 466\,a1^2\,a2\,a3 + \\
&466\,a1\,a2^2\,a3 + 110\,a2^3\,a3 + 200\,a1^2\,a3^2 + 466\,a1\,a2\,a3^2 + 200\,a2^2\,a3^2 + 110\,a1\,a3^3 + \\
&110\,a2\,a3^3 + 15\,a3^4 + 110\,a1^3\,a4 + 466\,a1^2\,a2\,a4 + 466\,a1\,a2^2\,a4 + 110\,a2^3\,a4 + 466\,a1^2\,a3\,a4 + \\
&1083\,a1\,a2\,a3\,a4 + 466\,a2^2\,a3\,a4 + 466\,a1\,a3^2\,a4 + 466\,a2\,a3^2\,a4 + 110\,a3^3\,a4 + 200\,a1^2\,a4^2 + \\
&466\,a1\,a2\,a4^2 + 200\,a2^2\,a4^2 + 466\,a1\,a3\,a4^2 + 466\,a2\,a3\,a4^2 + 200\,a3^2\,a4^2 + 110\,a1\,a4^3 + \\
&110\,a2\,a4^3 + 110\,a3\,a4^3 + 15\,a4^4 + 110\,a1^3\,a5 + 466\,a1^2\,a2\,a5 + 466\,a1\,a2^2\,a5 + 110\,a2^3\,a5 + \\
&466\,a1^2\,a3\,a5 + 1083\,a1\,a2\,a3\,a5 + 466\,a2^2\,a3\,a5 + 466\,a1\,a3^2\,a5 + 466\,a2\,a3^2\,a5 + \\
&110\,a3^3\,a5 + 466\,a1^2\,a4\,a5 + 1083\,a1\,a2\,a4\,a5 + 466\,a2^2\,a4\,a5 + 1083\,a1\,a3\,a4\,a5 + \\
&1083\,a2\,a3\,a4\,a5 + 466\,a3^2\,a4\,a5 + 466\,a1\,a4^2\,a5 + 466\,a2\,a4^2\,a5 + 466\,a3\,a4^2\,a5 + \\
&110\,a4^3\,a5 + 200\,a1^2\,a5^2 + 466\,a1\,a2\,a5^2 + 200\,a2^2\,a5^2 + 466\,a1\,a3\,a5^2 + 466\,a2\,a3\,a5^2 + \\
&200\,a3^2\,a5^2 + 466\,a1\,a4\,a5^2 + 466\,a2\,a4\,a5^2 + 466\,a3\,a4\,a5^2 + 200\,a4^2\,a5^2 + 110\,a1\,a5^3 + \\
&110\,a2\,a5^3 + 110\,a3\,a5^3 + 110\,a4\,a5^3 + 15\,a5^4 + 110\,a1^3\,a6 + 466\,a1^2\,a2\,a6 + 466\,a1\,a2^2\,a6 + \\
&110\,a2^3\,a6 + 466\,a1^2\,a3\,a6 + 1083\,a1\,a2\,a3\,a6 + 466\,a2^2\,a3\,a6 + 466\,a1\,a3^2\,a6 + \\
&466\,a2\,a3^2\,a6 + 110\,a3^3\,a6 + 466\,a1^2\,a4\,a6 + 1083\,a1\,a2\,a4\,a6 + 466\,a2^2\,a4\,a6 + \\
&1083\,a1\,a3\,a4\,a6 + 1083\,a2\,a3\,a4\,a6 + 466\,a3^2\,a4\,a6 + 466\,a1\,a4^2\,a6 + 466\,a2\,a4^2\,a6 + \\
&466\,a3\,a4^2\,a6 + 110\,a4^3\,a6 + 466\,a1^2\,a5\,a6 + 1083\,a1\,a2\,a5\,a6 + 466\,a2^2\,a5\,a6 + \\
&1083\,a1\,a3\,a5\,a6 + 1083\,a2\,a3\,a5\,a6 + 466\,a3^2\,a5\,a6 + 1083\,a1\,a4\,a5\,a6 + 1083\,a2\,a4\,a5\,a6 + \\
&1083\,a3\,a4\,a5\,a6 + 466\,a4^2\,a5\,a6 + 466\,a1\,a5^2\,a6 + 466\,a2\,a5^2\,a6 + 466\,a3\,a5^2\,a6 + \\
&466\,a4\,a5^2\,a6 + 110\,a5^3\,a6 + 200\,a1^2\,a6^2 + 466\,a1\,a2\,a6^2 + 200\,a2^2\,a6^2 + 466\,a1\,a3\,a6^2 + \\
&466\,a2\,a3\,a6^2 + 200\,a3^2\,a6^2 + 466\,a1\,a4\,a6^2 + 466\,a2\,a4\,a6^2 + 466\,a3\,a4\,a6^2 + 200\,a4^2\,a6^2 + \\
&466\,a1\,a5\,a6^2 + 466\,a2\,a5\,a6^2 + 466\,a3\,a5\,a6^2 + 466\,a4\,a5\,a6^2 + 200\,a5^2\,a6^2 + 110\,a1\,a6^3 + \\
&110\,a2\,a6^3 + 110\,a3\,a6^3 + 110\,a4\,a6^3 + 110\,a5\,a6^3 + 15\,a6^4 + 110\,a1^3\,a7 + 466\,a1^2\,a2\,a7 + \\
&466\,a1\,a2^2\,a7 + 110\,a2^3\,a7 + 466\,a1^2\,a3\,a7 + 1083\,a1\,a2\,a3\,a7 + 466\,a2^2\,a3\,a7 + \\
&466\,a1\,a3^2\,a7 + 466\,a2\,a3^2\,a7 + 110\,a3^3\,a7 + 466\,a1^2\,a4\,a7 + 1083\,a1\,a2\,a4\,a7 + \\
&466\,a2^2\,a4\,a7 + 1083\,a1\,a3\,a4\,a7 + 1083\,a2\,a3\,a4\,a7 + 466\,a3^2\,a4\,a7 + 466\,a1\,a4^2\,a7 + \\
&466\,a2\,a4^2\,a7 + 466\,a3\,a4^2\,a7 + 110\,a4^3\,a7 + 466\,a1^2\,a5\,a7 + 1083\,a1\,a2\,a5\,a7 + \\
&466\,a2^2\,a5\,a7 + 1083\,a1\,a3\,a5\,a7 + 1083\,a2\,a3\,a5\,a7 + 466\,a3^2\,a5\,a7 + 1083\,a1\,a4\,a5\,a7 + \\
&1083\,a2\,a4\,a5\,a7 + 1083\,a3\,a4\,a5\,a7 + 466\,a4^2\,a5\,a7 + 466\,a1\,a5^2\,a7 + 466\,a2\,a5^2\,a7 + \\
&466\,a3\,a5^2\,a7 + 466\,a4\,a5^2\,a7 + 110\,a5^3\,a7 + 466\,a1^2\,a6\,a7 + 1083\,a1\,a2\,a6\,a7 + 466\,a2^2\,a6\,a7 + \\
&1083\,a1\,a3\,a6\,a7 + 1083\,a2\,a3\,a6\,a7 + 466\,a3^2\,a6\,a7 + 1083\,a1\,a4\,a6\,a7 + 1083\,a2\,a4\,a6\,a7 + \\
&1083\,a3\,a4\,a6\,a7 + 466\,a4^2\,a6\,a7 + 1083\,a1\,a5\,a6\,a7 + 1083\,a2\,a5\,a6\,a7 + 1083\,a3\,a5\,a6\,a7 + \\
&1083\,a4\,a5\,a6\,a7 + 466\,a5^2\,a6\,a7 + 466\,a1\,a6^2\,a7 + 466\,a2\,a6^2\,a7 + 466\,a3\,a6^2\,a7 + \\
&466\,a4\,a6^2\,a7 + 466\,a5\,a6^2\,a7 + 110\,a6^3\,a7 + 200\,a1^2\,a7^2 + 466\,a1\,a2\,a7^2 + 200\,a2^2\,a7^2 + \\
&466\,a1\,a3\,a7^2 + 466\,a2\,a3\,a7^2 + 200\,a3^2\,a7^2 + 466\,a1\,a4\,a7^2 + 466\,a2\,a4\,a7^2 + 466\,a3\,a4\,a7^2 + \\
&200\,a4^2\,a7^2 + 466\,a1\,a5\,a7^2 + 466\,a2\,a5\,a7^2 + 466\,a3\,a5\,a7^2 + 466\,a4\,a5\,a7^2 + 200\,a5^2\,a7^2 + \\
&466\,a1\,a6\,a7^2 + 466\,a2\,a6\,a7^2 + 466\,a3\,a6\,a7^2 + 466\,a4\,a6\,a7^2 + 466\,a5\,a6\,a7^2 + 200\,a6^2\,a7^2 + \\
&110\,a1\,a7^3 + 110\,a2\,a7^3 + 110\,a3\,a7^3 + 110\,a4\,a7^3 + 110\,a5\,a7^3 + 110\,a6\,a7^3 + 15\,a7^4
\end{aligned}
$$

In[7]:=
```
G3 = SeriesCoefficient[%1, {t, 0, 3}]
```

Out[7]= $20\,a1^3 + 85\,a1^2\,a2 + 85\,a1\,a2^2 + 20\,a2^3 + 85\,a1^2\,a3 + 198\,a1\,a2\,a3 + 85\,a2^2\,a3 + 85\,a1\,a3^2 + 85\,a2\,a3^2 + 20\,a3^3 + 85\,a1^2\,a4 + 198\,a1\,a2\,a4 + 85\,a2^2\,a4 + 198\,a1\,a3\,a4 + 198\,a2\,a3\,a4 + 85\,a3^2\,a4 + 85\,a1\,a4^2 + 85\,a2\,a4^2 + 85\,a3\,a4^2 + 20\,a4^3 + 85\,a1^2\,a5 + 198\,a1\,a2\,a5 + 85\,a2^2\,a5 + 198\,a1\,a3\,a5 + 198\,a2\,a3\,a5 + 85\,a3^2\,a5 + 198\,a1\,a4\,a5 + 198\,a2\,a4\,a5 + 198\,a3\,a4\,a5 + 85\,a4^2\,a5 + 85\,a1\,a5^2 + 85\,a2\,a5^2 + 85\,a3\,a5^2 + 85\,a4\,a5^2 + 20\,a5^3 + 85\,a1^2\,a6 + 198\,a1\,a2\,a6 + 85\,a2^2\,a6 + 198\,a1\,a3\,a6 + 198\,a2\,a3\,a6 + 85\,a3^2\,a6 + 198\,a1\,a4\,a6 + 198\,a2\,a4\,a6 + 198\,a3\,a4\,a6 + 85\,a4^2\,a6 + 198\,a1\,a5\,a6 + 198\,a2\,a5\,a6 + 198\,a3\,a5\,a6 + 198\,a4\,a5\,a6 + 85\,a5^2\,a6 + 85\,a1\,a6^2 + 85\,a2\,a6^2 + 85\,a3\,a6^2 + 85\,a4\,a6^2 + 85\,a5\,a6^2 + 20\,a6^3 + 85\,a1^2\,a7 + 198\,a1\,a2\,a7 + 85\,a2^2\,a7 + 198\,a1\,a3\,a7 + 198\,a2\,a3\,a7 + 85\,a3^2\,a7 + 198\,a1\,a4\,a7 + 198\,a2\,a4\,a7 + 198\,a3\,a4\,a7 + 85\,a4^2\,a7 + 198\,a1\,a5\,a7 + 198\,a2\,a5\,a7 + 198\,a3\,a5\,a7 + 198\,a4\,a5\,a7 + 85\,a5^2\,a7 + 198\,a1\,a6\,a7 + 198\,a2\,a6\,a7 + 198\,a3\,a6\,a7 + 198\,a4\,a6\,a7 + 198\,a5\,a6\,a7 + 85\,a6^2\,a7 + 85\,a1\,a7^2 + 85\,a2\,a7^2 + 85\,a3\,a7^2 + 85\,a4\,a7^2 + 85\,a5\,a7^2 + 85\,a6\,a7^2 + 20\,a7^3$

In[8]:=
```
G2 = SeriesCoefficient[%1, {t, 0, 2}]
```

Out[8]= $15\,a1^2 + 35\,a1\,a2 + 15\,a2^2 + 35\,a1\,a3 + 35\,a2\,a3 + 15\,a3^2 + 35\,a1\,a4 + 35\,a2\,a4 + 35\,a3\,a4 + 15\,a4^2 + 35\,a1\,a5 + 35\,a2\,a5 + 35\,a3\,a5 + 35\,a4\,a5 + 15\,a5^2 + 35\,a1\,a6 + 35\,a2\,a6 + 35\,a3\,a6 + 35\,a4\,a6 + 35\,a5\,a6 + 15\,a6^2 + 35\,a1\,a7 + 35\,a2\,a7 + 35\,a3\,a7 + 35\,a4\,a7 + 35\,a5\,a7 + 35\,a6\,a7 + 15\,a7^2$

In[9]:=
```
G1 = SeriesCoefficient[%1, {t, 0, 1}]
```

Out[9]= $6\,(a1 + a2 + a3 + a4 + a5 + a6 + a7)$

In[10]:=
```
SymmetricReduction[G8, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```

Out[10]= $\{10\,f1^4\,f2^2 + 30\,f1^2\,f2^3 + 5\,f2^4 + 4\,f1^5\,f3 + 60\,f1^3\,f2\,f3 + 60\,f1\,f2^2\,f3 + 24\,f1^2\,f3^2 + 6\,f2\,f3^2 + 8\,f1^4\,f4 + 33\,f1^2\,f2\,f4 + 6\,f2^2\,f4 - 9\,f1\,f3\,f4 - 9\,f4^2 - 38\,f1^3\,f5 - 51\,f1\,f2\,f5 - 11\,f3\,f5 - 162\,f1^2\,f6 - 46\,f2\,f6 - 228\,f1\,f7,\ 0\}$

In[11]:=
```
k8 = First[%10]
```

Out[11]= $10\,f1^4\,f2^2 + 30\,f1^2\,f2^3 + 5\,f2^4 + 4\,f1^5\,f3 + 60\,f1^3\,f2\,f3 + 60\,f1\,f2^2\,f3 + 24\,f1^2\,f3^2 + 6\,f2\,f3^2 + 8\,f1^4\,f4 + 33\,f1^2\,f2\,f4 + 6\,f2^2\,f4 - 9\,f1\,f3\,f4 - 9\,f4^2 - 38\,f1^3\,f5 - 51\,f1\,f2\,f5 - 11\,f3\,f5 - 162\,f1^2\,f6 - 46\,f2\,f6 - 228\,f1\,f7$

In[12]:=
```
SymmetricReduction[G7, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```

Out[12]= $\{5\,f1^5\,f2 + 40\,f1^3\,f2^2 + 30\,f1\,f2^3 + 19\,f1^4\,f3 + 84\,f1^2\,f2\,f3 + 18\,f2^2\,f3 + 12\,f1\,f3^2 + 11\,f1^3\,f4 + 12\,f1\,f2\,f4 - 6\,f3\,f4 - 51\,f1^2\,f5 - 18\,f2\,f5 - 99\,f1\,f6 - 57\,f7,\ 0\}$

In[13]:=
```
k7 = First[%12]
```

Out[13]= $5\,f1^5\,f2 + 40\,f1^3\,f2^2 + 30\,f1\,f2^3 + 19\,f1^4\,f3 + 84\,f1^2\,f2\,f3 + 18\,f2^2\,f3 + 12\,f1\,f3^2 + 11\,f1^3\,f4 + 12\,f1\,f2\,f4 - 6\,f3\,f4 - 51\,f1^2\,f5 - 18\,f2\,f5 - 99\,f1\,f6 - 57\,f7$

In[14]:=
```
SymmetricReduction[G6, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[14]=

$$\{f1^6 + 25\, f1^4\, f2 + 60\, f1^2\, f2^2 + 10\, f2^3 + 36\, f1^3\, f3 + 52\, f1\, f2\, f3 + 2\, f3^2 + 5\, f1^2\, f4 - 34\, f1\, f5 - 25\, f6,\ 0\}$$

In[15]:=
```
k6 = First[%14]
```
Out[15]=

$$f1^6 + 25\, f1^4\, f2 + 60\, f1^2\, f2^2 + 10\, f2^3 + 36\, f1^3\, f3 + 52\, f1\, f2\, f3 + 2\, f3^2 + 5\, f1^2\, f4 - 34\, f1\, f5 - 25\, f6$$

In[16]:=
```
SymmetricReduction[G5, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[16]=

$$\{6\, f1^5 + 50\, f1^3\, f2 + 40\, f1\, f2^2 + 34\, f1^2\, f3 + 12\, f2\, f3 - f1\, f4 - 9\, f5,\ 0\}$$

In[17]:=
```
k5 = First[%16]
```
Out[17]=

$$6\, f1^5 + 50\, f1^3\, f2 + 40\, f1\, f2^2 + 34\, f1^2\, f3 + 12\, f2\, f3 - f1\, f4 - 9\, f5$$

In[18]:=
```
SymmetricReduction[G4, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[18]=

$$\{15\, f1^4 + 50\, f1^2\, f2 + 10\, f2^2 + 16\, f1\, f3 - f4,\ 0\}$$

In[19]:=
```
k4 = First[%18]
```
Out[19]=

$$15\, f1^4 + 50\, f1^2\, f2 + 10\, f2^2 + 16\, f1\, f3 - f4$$

In[20]:=
```
SymmetricReduction[G3, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[20]=

$$\{20\, f1^3 + 25\, f1\, f2 + 3\, f3,\ 0\}$$

In[21]:=
```
k3 = First[%20]
```
Out[21]=

$$20\, f1^3 + 25\, f1\, f2 + 3\, f3$$

In[22]:=
```
SymmetricReduction[G2, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[22]=

$$\{15\, f1^2 + 5\, f2,\ 0\}$$

In[23]:=
```
k2 = First[%22]
```
Out[23]=

$$15\, f1^2 + 5\, f2$$

In[24]:=
```
SymmetricReduction[G1, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[24]=

$$\{6\, f1,\ 0\}$$

In[25]:=
```
k1 = First[%24]
```
Out[25]=

$$6\, f1$$

In[26]:=
```
alpha = {(a1 + a2 + a3), (a1 + a2 + a4), (a1 + a2 + a5), (a1 + a2 + a6), (a1 + a3 + a4),
  (a1 + a3 + a5), (a1 + a3 + a6), (a1 + a4 + a5), (a1 + a4 + a6), (a1 + a5 + a6),
  (a2 + a3 + a4), (a2 + a3 + a5), (a2 + a3 + a6), (a2 + a4 + a5), (a2 + a4 + a6),
  (a2 + a5 + a6), (a3 + a4 + a5), (a3 + a4 + a6), (a3 + a5 + a6), (a4 + a5 + a6),
  (a1 + a2 + a7), (a1 + a3 + a7), (a1 + a4 + a7), (a1 + a5 + a7), (a1 + a6 + a7),
  (a2 + a3 + a7), (a2 + a4 + a7), (a2 + a5 + a7), (a2 + a6 + a7), (a3 + a4 + a7),
  (a3 + a5 + a7), (a3 + a6 + a7), (a4 + a5 + a7), (a4 + a6 + a7), (a5 + a6 + a7)}
```

Out[26]=
```
{a1 + a2 + a3, a1 + a2 + a4, a1 + a2 + a5, a1 + a2 + a6, a1 + a3 + a4,
 a1 + a3 + a5, a1 + a3 + a6, a1 + a4 + a5, a1 + a4 + a6, a1 + a5 + a6, a2 + a3 + a4,
 a2 + a3 + a5, a2 + a3 + a6, a2 + a4 + a5, a2 + a4 + a6, a2 + a5 + a6, a3 + a4 + a5,
 a3 + a4 + a6, a3 + a5 + a6, a4 + a5 + a6, a1 + a2 + a7, a1 + a3 + a7, a1 + a4 + a7,
 a1 + a5 + a7, a1 + a6 + a7, a2 + a3 + a7, a2 + a4 + a7, a2 + a5 + a7, a2 + a6 + a7,
 a3 + a4 + a7, a3 + a5 + a7, a3 + a6 + a7, a4 + a5 + a7, a4 + a6 + a7, a5 + a6 + a7}
```

In[27]:=
```
Multiply[alist_] :=
 Join[ParallelMap[Collect[Expand[#[[1]] × #[[2]]], t] &, Partition[alist, 2]],
  If[Mod[Length@alist, 2] == 0, {}, {alist[[-1]]}]]
```

In[28]:=
```
Monomials[alist_] := Map[1 + # t &, alist]
```

In[29]:=
```
alpha2 = Multiply[Monomials[alpha]]
```

Out[29]=

$$\{1 + (2\,a1 + 2\,a2 + a3 + a4)\,t + (a1^2 + 2\,a1\,a2 + a2^2 + a1\,a3 + a2\,a3 + a1\,a4 + a2\,a4 + a3\,a4)\,t^2,$$
$$1 + (2\,a1 + 2\,a2 + a5 + a6)\,t + (a1^2 + 2\,a1\,a2 + a2^2 + a1\,a5 + a2\,a5 + a1\,a6 + a2\,a6 + a5\,a6)\,t^2,$$
$$1 + (2\,a1 + 2\,a3 + a4 + a5)\,t + (a1^2 + 2\,a1\,a3 + a3^2 + a1\,a4 + a3\,a4 + a1\,a5 + a3\,a5 + a4\,a5)\,t^2,$$
$$1 + (2\,a1 + a3 + a4 + a5 + a6)\,t + (a1^2 + a1\,a3 + a1\,a4 + a3\,a4 + a1\,a5 + a3\,a5 + a1\,a6 + a4\,a6 + a5\,a6)\,t^2,$$
$$1 + (2\,a1 + a4 + a5 + 2\,a6)\,t + (a1^2 + a1\,a4 + a1\,a5 + a4\,a5 + 2\,a1\,a6 + a4\,a6 + a5\,a6 + a6^2)\,t^2,$$
$$1 + (2\,a2 + 2\,a3 + a4 + a5)\,t + (a2^2 + 2\,a2\,a3 + a3^2 + a2\,a4 + a3\,a4 + a2\,a5 + a3\,a5 + a4\,a5)\,t^2,$$
$$1 + (2\,a2 + a3 + a4 + a5 + a6)\,t + (a2^2 + a2\,a3 + a2\,a4 + a3\,a4 + a2\,a5 + a3\,a5 + a2\,a6 + a4\,a6 + a5\,a6)\,t^2,$$
$$1 + (2\,a2 + a4 + a5 + 2\,a6)\,t + (a2^2 + a2\,a4 + a2\,a5 + a4\,a5 + 2\,a2\,a6 + a4\,a6 + a5\,a6 + a6^2)\,t^2,$$
$$1 + (2\,a3 + 2\,a4 + a5 + a6)\,t + (a3^2 + 2\,a3\,a4 + a4^2 + a3\,a5 + a4\,a5 + a3\,a6 + a4\,a6 + a5\,a6)\,t^2,$$
$$1 + (a3 + a4 + 2\,a5 + 2\,a6)\,t + (a3\,a4 + a3\,a5 + a4\,a5 + a5^2 + a3\,a6 + a4\,a6 + 2\,a5\,a6 + a6^2)\,t^2,$$
$$1 + (2\,a1 + a2 + a3 + 2\,a7)\,t + (a1^2 + a1\,a2 + a1\,a3 + a2\,a3 + 2\,a1\,a7 + a2\,a7 + a3\,a7 + a7^2)\,t^2,$$
$$1 + (2\,a1 + a4 + a5 + 2\,a7)\,t + (a1^2 + a1\,a4 + a1\,a5 + a4\,a5 + 2\,a1\,a7 + a4\,a7 + a5\,a7 + a7^2)\,t^2,$$
$$1 + (a1 + a2 + a3 + a6 + 2\,a7)\,t + (a1\,a2 + a1\,a3 + a2\,a6 + a3\,a6 + a1\,a7 + a2\,a7 + a3\,a7 + a6\,a7 + a7^2)\,t^2,$$
$$1 + (2\,a2 + a4 + a5 + 2\,a7)\,t + (a2^2 + a2\,a4 + a2\,a5 + a4\,a5 + 2\,a2\,a7 + a4\,a7 + a5\,a7 + a7^2)\,t^2,$$
$$1 + (a2 + a3 + a4 + a6 + 2\,a7)\,t + (a2\,a3 + a2\,a4 + a3\,a6 + a4\,a6 + a2\,a7 + a3\,a7 + a4\,a7 + a6\,a7 + a7^2)\,t^2,$$
$$1 + (2\,a3 + a5 + a6 + 2\,a7)\,t + (a3^2 + a3\,a5 + a3\,a6 + a5\,a6 + 2\,a3\,a7 + a5\,a7 + a6\,a7 + a7^2)\,t^2,$$
$$1 + (2\,a4 + a5 + a6 + 2\,a7)\,t + (a4^2 + a4\,a5 + a4\,a6 + a5\,a6 + 2\,a4\,a7 + a5\,a7 + a6\,a7 + a7^2)\,t^2,$$
$$1 + (a5 + a6 + a7)\,t\}$$

In[30]:=
```
alpha4 = Multiply[alpha2]
```

Out[30]=

$$\{1 + (4\,a1 + 4\,a2 + a3 + a4 + a5 + a6)\,t +$$

$$\left(6\,a1^2 + 12\,a1\,a2 + 6\,a2^2 + 3\,a1\,a3 + 3\,a2\,a3 + 3\,a1\,a4 + 3\,a2\,a4 + a3\,a4 + 3\,a1\,a5 + 3\,a2\,a5 + a3\,a5 + a4\,a5 + 3\,a1\,a6 + 3\,a2\,a6 + a3\,a6 + a4\,a6 + a5\,a6\right) t^2 +$$
$$\left(4\,a1^3 + 12\,a1^2\,a2 + 12\,a1\,a2^2 + 4\,a2^3 + 3\,a1^2\,a3 + 6\,a1\,a2\,a3 + 3\,a2^2\,a3 + 3\,a1^2\,a4 + 6\,a1\,a2\,a4 + 3\,a2^2\,a4 + 2\,a1\,a3\,a4 + 2\,a2\,a3\,a4 + 3\,a1^2\,a5 + 6\,a1\,a2\,a5 + 3\,a2^2\,a5 + 2\,a1\,a3\,a5 + 2\,a2\,a3\,a5 + 2\,a1\,a4\,a5 + 2\,a2\,a4\,a5 + a3\,a4\,a5 + 3\,a1^2\,a6 + 6\,a1\,a2\,a6 + 3\,a2^2\,a6 + 2\,a1\,a3\,a6 + 2\,a2\,a3\,a6 + 2\,a1\,a4\,a6 + 2\,a2\,a4\,a6 + a3\,a4\,a6 + 2\,a1\,a5\,a6 + 2\,a2\,a5\,a6 + a3\,a5\,a6 + a4\,a5\,a6\right) t^3 +$$
$$\left(a1^4 + 4\,a1^3\,a2 + 6\,a1^2\,a2^2 + 4\,a1\,a2^3 + a2^4 + a1^3\,a3 + 3\,a1^2\,a2\,a3 + 3\,a1\,a2^2\,a3 + a2^3\,a3 + a1^3\,a4 + 3\,a1^2\,a2\,a4 + 3\,a1\,a2^2\,a4 + a2^3\,a4 + a1^2\,a3\,a4 + 2\,a1\,a2\,a3\,a4 + a2^2\,a3\,a4 + a1^3\,a5 + 3\,a1^2\,a2\,a5 + 3\,a1\,a2^2\,a5 + a2^3\,a5 + a1^2\,a3\,a5 + 2\,a1\,a2\,a3\,a5 + a2^2\,a3\,a5 + a1^2\,a4\,a5 + 2\,a1\,a2\,a4\,a5 + a2^2\,a4\,a5 + a1\,a3\,a4\,a5 + a2\,a3\,a4\,a5 + a1^3\,a6 + 3\,a1^2\,a2\,a6 + 3\,a1\,a2^2\,a6 + a2^3\,a6 + a1^2\,a3\,a6 + 2\,a1\,a2\,a3\,a6 + a2^2\,a3\,a6 + a1^2\,a4\,a6 + 2\,a1\,a2\,a4\,a6 + a2^2\,a4\,a6 + a1\,a3\,a4\,a6 + a2\,a3\,a4\,a6 + a1^2\,a5\,a6 + 2\,a1\,a2\,a5\,a6 + a2^2\,a5\,a6 + a1\,a3\,a5\,a6 + a2\,a3\,a5\,a6 + a1\,a4\,a5\,a6 + a2\,a4\,a5\,a6 + a3\,a4\,a5\,a6\right) t^4,$$

$$1 + (4\,a1 + 3\,a3 + 2\,a4 + 2\,a5 + a6)\,t + \left(6\,a1^2 + 9\,a1\,a3 + 3\,a3^2 + 6\,a1\,a4 + 5\,a3\,a4 + a4^2 + 6\,a1\,a5 + 5\,a3\,a5 + 3\,a4\,a5 + a5^2 + 3\,a1\,a6 + 2\,a3\,a6 + 2\,a4\,a6 + 2\,a5\,a6\right) t^2 +$$
$$\left(4\,a1^3 + 9\,a1^2\,a3 + 6\,a1\,a3^2 + a3^3 + 6\,a1^2\,a4 + 10\,a1\,a3\,a4 + 4\,a3^2\,a4 + 2\,a1\,a4^2 + 2\,a3\,a4^2 + 6\,a1^2\,a5 + 10\,a1\,a3\,a5 + 4\,a3^2\,a5 + 6\,a1\,a4\,a5 + 5\,a3\,a4\,a5 + a4^2\,a5 + 2\,a1\,a5^2 + 2\,a3\,a5^2 + a4\,a5^2 + 3\,a1^2\,a6 + 4\,a1\,a3\,a6 + a3^2\,a6 + 4\,a1\,a4\,a6 + 3\,a3\,a4\,a6 + a4^2\,a6 + 4\,a1\,a5\,a6 + 3\,a3\,a5\,a6 + 3\,a4\,a5\,a6 + a5^2\,a6\right) t^3 +$$
$$\left(a1^4 + 3\,a1^3\,a3 + 3\,a1^2\,a3^2 + a1\,a3^3 + 2\,a1^3\,a4 + 5\,a1^2\,a3\,a4 + 4\,a1\,a3^2\,a4 + a3^3\,a4 + a1^2\,a4^2 + 2\,a1\,a3\,a4^2 + a3^2\,a4^2 + 2\,a1^3\,a5 + 5\,a1^2\,a3\,a5 + 4\,a1\,a3^2\,a5 + a3^3\,a5 + 3\,a1^2\,a4\,a5 + 5\,a1\,a3\,a4\,a5 + 2\,a3^2\,a4\,a5 + a1\,a4^2\,a5 + a3\,a4^2\,a5 + a1^2\,a5^2 + 2\,a1\,a3\,a5^2 + a3^2\,a5^2 + a1\,a4\,a5^2 + a3\,a4\,a5^2 + a1^3\,a6 + 2\,a1^2\,a3\,a6 + a1\,a3^2\,a6 + 2\,a1^2\,a4\,a6 + 3\,a1\,a3\,a4\,a6 + a3^2\,a4\,a6 + a1\,a4^2\,a6 + a3\,a4^2\,a6 + 2\,a1^2\,a5\,a6 + 3\,a1\,a3\,a5\,a6 + a3^2\,a5\,a6 + 3\,a1\,a4\,a5\,a6 + 2\,a3\,a4\,a5\,a6 + a4^2\,a5\,a6 + a1\,a5^2\,a6 + a3\,a5^2\,a6 + a4\,a5^2\,a6\right) t^4,$$

$$1 + (2\,a1 + 2\,a2 + 2\,a3 + 2\,a4 + 2\,a5 + 2\,a6)\,t +$$
$$\left(a1^2 + 4\,a1\,a2 + a2^2 + 4\,a1\,a3 + 2\,a2\,a3 + a3^2 + 3\,a1\,a4 + 3\,a2\,a4 + 3\,a3\,a4 + a4^2 + 3\,a1\,a5 + 3\,a2\,a5 + 3\,a3\,a5 + 4\,a4\,a5 + a5^2 + 2\,a1\,a6 + 4\,a2\,a6 + 4\,a3\,a6 + 3\,a4\,a6 + 3\,a5\,a6 + a6^2\right) t^2 +$$
$$\left(2\,a1^2\,a2 + 2\,a1\,a2^2 + 2\,a1^2\,a3 + 4\,a1\,a2\,a3 + 2\,a1\,a3^2 + a1^2\,a4 + 4\,a1\,a2\,a4 + a2^2\,a4 + 4\,a1\,a3\,a4 + 2\,a2\,a3\,a4 + a3^2\,a4 + a1\,a4^2 + a2\,a4^2 + a3\,a4^2 + a1^2\,a5 + 4\,a1\,a2\,a5 + a2^2\,a5 + 4\,a1\,a3\,a5 + 2\,a2\,a3\,a5 + a3^2\,a5 + 4\,a1\,a4\,a5 + 4\,a2\,a4\,a5 + 4\,a3\,a4\,a5 + 2\,a4^2\,a5 + a1\,a5^2 + a2\,a5^2 + a3\,a5^2 + 2\,a4\,a5^2 + 4\,a1\,a2\,a6 + 2\,a2^2\,a6 + 4\,a1\,a3\,a6 + 4\,a2\,a3\,a6 + 2\,a3^2\,a6 + 2\,a1\,a4\,a6 + 4\,a2\,a4\,a6 + 4\,a3\,a4\,a6 + a4^2\,a6 + 2\,a1\,a5\,a6 + 4\,a2\,a5\,a6 + 4\,a3\,a5\,a6 + 4\,a4\,a5\,a6 + a5^2\,a6 + 2\,a2\,a6^2 + 2\,a3\,a6^2 + a4\,a6^2 + a5\,a6^2\right) t^3 +$$
$$\left(a1^2\,a2^2 + 2\,a1^2\,a2\,a3 + a1^2\,a3^2 + a1^2\,a2\,a4 + a1\,a2^2\,a4 + a1^2\,a3\,a4 + 2\,a1\,a2\,a3\,a4 + a1\,a3^2\,a4 + a1\,a2\,a4^2 + a1\,a3\,a4^2 + a1^2\,a2\,a5 + a1\,a2^2\,a5 + a1^2\,a3\,a5 + 2\,a1\,a2\,a3\,a5 + a1\,a3^2\,a5 + a1^2\,a4\,a5 + 2\,a1\,a2\,a4\,a5 + a2^2\,a4\,a5 + 2\,a1\,a3\,a4\,a5 + 2\,a2\,a3\,a4\,a5 + a3^2\,a4\,a5 + a1\,a4^2\,a5 + a2\,a4^2\,a5 + a3\,a4^2\,a5 + a1\,a2\,a5^2 + a1\,a3\,a5^2 + a1\,a4\,a5^2 + a2\,a4\,a5^2 + a3\,a4\,a5^2 + a4^2\,a5^2 + 2\,a1\,a2^2\,a6 + 4\,a1\,a2\,a3\,a6 + 2\,a1\,a3^2\,a6 + 2\,a1\,a2\,a4\,a6 + a2^2\,a4\,a6 + 2\,a1\,a3\,a4\,a6 + 2\,a2\,a3\,a4\,a6 + a3^2\,a4\,a6 + a2\,a4^2\,a6 + a3\,a4^2\,a6 + 2\,a1\,a2\,a5\,a6 + a2^2\,a5\,a6 + 2\,a1\,a3\,a5\,a6 + 2\,a2\,a3\,a5\,a6 + a3^2\,a5\,a6 + 2\,a1\,a4\,a5\,a6 + 2\,a2\,a4\,a5\,a6 + 2\,a3\,a4\,a5\,a6 + a4^2\,a5\,a6 + a2\,a5^2\,a6 + a3\,a5^2\,a6 + a4\,a5^2\,a6 + a2^2\,a6^2 + 2\,a2\,a3\,a6^2 + a3^2\,a6^2 + a2\,a4\,a6^2 + a3\,a4\,a6^2 + a2\,a5\,a6^2 + a3\,a5\,a6^2 + a4\,a5\,a6^2\right) t^4,$$

$$1 + (4\,a2 + a3 + 2\,a4 + 2\,a5 + 3\,a6)\,t + \left(6\,a2^2 + 3\,a2\,a3 + 6\,a2\,a4 + 2\,a3\,a4 + a4^2 +\right.$$

$$6\,a2\,a5 + 2\,a3\,a5 + 3\,a4\,a5 + a5^2 + 9\,a2\,a6 + 2\,a3\,a6 + 5\,a4\,a6 + 5\,a5\,a6 + 3\,a6^2)\,t^2 +$$
$$(4\,a2^3 + 3\,a2^2\,a3 + 6\,a2^2\,a4 + 4\,a2\,a3\,a4 + 2\,a2\,a4^2 + a3\,a4^2 + 6\,a2^2\,a5 + 4\,a2\,a3\,a5 +$$
$$6\,a2\,a4\,a5 + 3\,a3\,a4\,a5 + a4^2\,a5 + 2\,a2\,a5^2 + a3\,a5^2 + a4\,a5^2 + 9\,a2^2\,a6 +$$
$$4\,a2\,a3\,a6 + 10\,a2\,a4\,a6 + 3\,a3\,a4\,a6 + 2\,a4^2\,a6 + 10\,a2\,a5\,a6 + 3\,a3\,a5\,a6 +$$
$$5\,a4\,a5\,a6 + 2\,a5^2\,a6 + 6\,a2\,a6^2 + a3\,a6^2 + 4\,a4\,a6^2 + 4\,a5\,a6^2 + a6^3)\,t^3 +$$
$$(a2^4 + a2^3\,a3 + 2\,a2^3\,a4 + 2\,a2^2\,a3\,a4 + a2^2\,a4^2 + a2\,a3\,a4^2 + 2\,a2^3\,a5 + 2\,a2^2\,a3\,a5 +$$
$$3\,a2^2\,a4\,a5 + 3\,a2\,a3\,a4\,a5 + a2\,a4^2\,a5 + a3\,a4^2\,a5 + a2^2\,a5^2 + a2\,a3\,a5^2 + a2\,a4\,a5^2 +$$
$$a3\,a4\,a5^2 + 3\,a2^3\,a6 + 2\,a2^2\,a3\,a6 + 5\,a2^2\,a4\,a6 + 3\,a2\,a3\,a4\,a6 + 2\,a2\,a4^2\,a6 +$$
$$a3\,a4^2\,a6 + 5\,a2^2\,a5\,a6 + 3\,a2\,a3\,a5\,a6 + 5\,a2\,a4\,a5\,a6 + 2\,a3\,a4\,a5\,a6 + a4^2\,a5\,a6 +$$
$$2\,a2\,a5^2\,a6 + a3\,a5^2\,a6 + a4\,a5^2\,a6 + 3\,a2^2\,a6^2 + a2\,a3\,a6^2 + 4\,a2\,a4\,a6^2 + a3\,a4\,a6^2 +$$
$$a4^2\,a6^2 + 4\,a2\,a5\,a6^2 + a3\,a5\,a6^2 + 2\,a4\,a5\,a6^2 + a5^2\,a6^2 + a2\,a6^3 + a4\,a6^3 + a5\,a6^3)\,t^4,$$
$$1 + (3\,a3 + 3\,a4 + 3\,a5 + 3\,a6)\,t + (3\,a3^2 + 7\,a3\,a4 + 3\,a4^2 + 7\,a3\,a5 +$$
$$7\,a4\,a5 + 3\,a5^2 + 7\,a3\,a6 + 7\,a4\,a6 + 7\,a5\,a6 + 3\,a6^2)\,t^2 +$$
$$(a3^3 + 5\,a3^2\,a4 + 5\,a3\,a4^2 + a4^3 + 5\,a3^2\,a5 + 11\,a3\,a4\,a5 + 5\,a4^2\,a5 + 5\,a3\,a5^2 +$$
$$5\,a4\,a5^2 + a5^3 + 5\,a3^2\,a6 + 11\,a3\,a4\,a6 + 5\,a4^2\,a6 + 11\,a3\,a5\,a6 +$$
$$11\,a4\,a5\,a6 + 5\,a5^2\,a6 + 5\,a3\,a6^2 + 5\,a4\,a6^2 + 5\,a5\,a6^2 + a6^3)\,t^3 +$$
$$(a3^3\,a4 + 2\,a3^2\,a4^2 + a3\,a4^3 + a3^3\,a5 + 4\,a3^2\,a4\,a5 + 4\,a3\,a4^2\,a5 + a4^3\,a5 + 2\,a3^2\,a5^2 +$$
$$4\,a3\,a4\,a5^2 + 2\,a4^2\,a5^2 + a3\,a5^3 + a4\,a5^3 + a3^3\,a6 + 4\,a3^2\,a4\,a6 + 4\,a3\,a4^2\,a6 + a4^3\,a6 +$$
$$4\,a3^2\,a5\,a6 + 9\,a3\,a4\,a5\,a6 + 4\,a4^2\,a5\,a6 + 4\,a3\,a5^2\,a6 + 4\,a4\,a5^2\,a6 + a5^3\,a6 + 2\,a3^2\,a6^2 +$$
$$4\,a3\,a4\,a6^2 + 2\,a4^2\,a6^2 + 4\,a3\,a5\,a6^2 + 4\,a4\,a5\,a6^2 + 2\,a5^2\,a6^2 + a3\,a6^3 + a4\,a6^3 + a5\,a6^3)$$
$$t^4,\ 1 + (4\,a1 + a2 + a3 + a4 + a5 + 4\,a7)\,t +$$
$$(6\,a1^2 + 3\,a1\,a2 + 3\,a1\,a3 + a2\,a3 + 3\,a1\,a4 + a2\,a4 + a3\,a4 + 3\,a1\,a5 + a2\,a5 +$$
$$a3\,a5 + a4\,a5 + 12\,a1\,a7 + 3\,a2\,a7 + 3\,a3\,a7 + 3\,a4\,a7 + 3\,a5\,a7 + 6\,a7^2)\,t^2 +$$
$$(4\,a1^3 + 3\,a1^2\,a2 + 3\,a1^2\,a3 + 2\,a1\,a2\,a3 + 3\,a1^2\,a4 + 2\,a1\,a2\,a4 + 2\,a1\,a3\,a4 +$$
$$a2\,a3\,a4 + 3\,a1^2\,a5 + 2\,a1\,a2\,a5 + 2\,a1\,a3\,a5 + a2\,a3\,a5 + 2\,a1\,a4\,a5 +$$
$$a2\,a4\,a5 + a3\,a4\,a5 + 12\,a1^2\,a7 + 6\,a1\,a2\,a7 + 6\,a1\,a3\,a7 + 2\,a2\,a3\,a7 +$$
$$6\,a1\,a4\,a7 + 2\,a2\,a4\,a7 + 2\,a3\,a4\,a7 + 6\,a1\,a5\,a7 + 2\,a2\,a5\,a7 + 2\,a3\,a5\,a7 +$$
$$2\,a4\,a5\,a7 + 12\,a1\,a7^2 + 3\,a2\,a7^2 + 3\,a3\,a7^2 + 3\,a4\,a7^2 + 3\,a5\,a7^2 + 4\,a7^3)\,t^3 +$$
$$(a1^4 + a1^3\,a2 + a1^3\,a3 + a1^2\,a2\,a3 + a1^3\,a4 + a1^2\,a2\,a4 + a1^2\,a3\,a4 + a1\,a2\,a3\,a4 +$$
$$a1^3\,a5 + a1^2\,a2\,a5 + a1^2\,a3\,a5 + a1\,a2\,a3\,a5 + a1^2\,a4\,a5 + a1\,a2\,a4\,a5 + a1\,a3\,a4\,a5 +$$
$$a2\,a3\,a4\,a5 + 4\,a1^3\,a7 + 3\,a1^2\,a2\,a7 + 3\,a1^2\,a3\,a7 + 2\,a1\,a2\,a3\,a7 + 3\,a1^2\,a4\,a7 +$$
$$2\,a1\,a2\,a4\,a7 + 2\,a1\,a3\,a4\,a7 + a2\,a3\,a4\,a7 + 3\,a1^2\,a5\,a7 + 2\,a1\,a2\,a5\,a7 + 2\,a1\,a3\,a5\,a7 +$$
$$a2\,a3\,a5\,a7 + 2\,a1\,a4\,a5\,a7 + a2\,a4\,a5\,a7 + a3\,a4\,a5\,a7 + 6\,a1^2\,a7^2 + 3\,a1\,a2\,a7^2 +$$
$$3\,a1\,a3\,a7^2 + a2\,a3\,a7^2 + 3\,a1\,a4\,a7^2 + a2\,a4\,a7^2 + a3\,a4\,a7^2 + 3\,a1\,a5\,a7^2 + a2\,a5\,a7^2 +$$
$$a3\,a5\,a7^2 + a4\,a5\,a7^2 + 4\,a1\,a7^3 + a2\,a7^3 + a3\,a7^3 + a4\,a7^3 + a5\,a7^3 + a7^4)\,t^4,$$
$$1 + (a1 + 3\,a2 + a3 + a4 + a5 + a6 + 4\,a7)\,t + (3\,a1\,a2 + 3\,a2^2 + a1\,a3 + 2\,a2\,a3 + a1\,a4 +$$
$$2\,a2\,a4 + a3\,a4 + a1\,a5 + 2\,a2\,a5 + a3\,a5 + a4\,a5 + 3\,a2\,a6 + a3\,a6 + a4\,a6 +$$
$$a5\,a6 + 3\,a1\,a7 + 9\,a2\,a7 + 3\,a3\,a7 + 3\,a4\,a7 + 3\,a5\,a7 + 3\,a6\,a7 + 6\,a7^2)\,t^2 +$$
$$(3\,a1\,a2^2 + a2^3 + 2\,a1\,a2\,a3 + a2^2\,a3 + 2\,a1\,a2\,a4 + a2^2\,a4 + a1\,a3\,a4 + a2\,a3\,a4 +$$
$$2\,a1\,a2\,a5 + a2^2\,a5 + a1\,a3\,a5 + a2\,a3\,a5 + a1\,a4\,a5 + a2\,a4\,a5 + a3\,a4\,a5 + 3\,a2^2\,a6 +$$
$$2\,a2\,a3\,a6 + 2\,a2\,a4\,a6 + a3\,a4\,a6 + 2\,a2\,a5\,a6 + a3\,a5\,a6 + a4\,a5\,a6 + 6\,a1\,a2\,a7 +$$
$$6\,a2^2\,a7 + 2\,a1\,a3\,a7 + 4\,a2\,a3\,a7 + 2\,a1\,a4\,a7 + 4\,a2\,a4\,a7 + 2\,a3\,a4\,a7 + 2\,a1\,a5\,a7 +$$
$$4\,a2\,a5\,a7 + 2\,a3\,a5\,a7 + 2\,a4\,a5\,a7 + 6\,a2\,a6\,a7 + 2\,a3\,a6\,a7 + 2\,a4\,a6\,a7 +$$
$$2\,a5\,a6\,a7 + 3\,a1\,a7^2 + 9\,a2\,a7^2 + 3\,a3\,a7^2 + 3\,a4\,a7^2 + 3\,a5\,a7^2 + 3\,a6\,a7^2 + 4\,a7^3)\,t^3 +$$
$$(a1\,a2^3 + a1\,a2^2\,a3 + a1\,a2^2\,a4 + a1\,a2\,a3\,a4 + a1\,a2^2\,a5 + a1\,a2\,a3\,a5 + a1\,a2\,a4\,a5 +$$

$$a1\,a3\,a4\,a5 + a2^3\,a6 + a2^2\,a3\,a6 + a2^2\,a4\,a6 + a2\,a3\,a4\,a6 + a2^2\,a5\,a6 + a2\,a3\,a5\,a6 + a2\,a4\,a5\,a6 + a3\,a4\,a5\,a6 + 3\,a1\,a2^2\,a7 + a2^3\,a7 + 2\,a1\,a2\,a3\,a7 + a2^2\,a3\,a7 + 2\,a1\,a2\,a4\,a7 + a2^2\,a4\,a7 + a1\,a3\,a4\,a7 + a2\,a3\,a4\,a7 + 2\,a1\,a2\,a5\,a7 + a2^2\,a5\,a7 + a1\,a3\,a5\,a7 + a2\,a3\,a5\,a7 + a1\,a4\,a5\,a7 + a2\,a4\,a5\,a7 + a3\,a4\,a5\,a7 + 3\,a2^2\,a6\,a7 + 2\,a2\,a3\,a6\,a7 + 2\,a2\,a4\,a6\,a7 + a3\,a4\,a6\,a7 + 2\,a2\,a5\,a6\,a7 + a3\,a5\,a6\,a7 + a4\,a5\,a6\,a7 + 3\,a1\,a2\,a7^2 + 3\,a2^2\,a7^2 + a1\,a3\,a7^2 + 2\,a2\,a3\,a7^2 + a1\,a4\,a7^2 + 2\,a2\,a4\,a7^2 + a3\,a4\,a7^2 + a1\,a5\,a7^2 + 2\,a2\,a5\,a7^2 + a3\,a5\,a7^2 + a4\,a5\,a7^2 + 3\,a2\,a6\,a7^2 + a3\,a6\,a7^2 + a4\,a6\,a7^2 + a5\,a6\,a7^2 + a1\,a7^3 + 3\,a2\,a7^3 + a3\,a7^3 + a4\,a7^3 + a5\,a7^3 + a6\,a7^3 + a7^4)\,t^4,$$

$$1 + (a2 + 3\,a3 + a4 + a5 + 2\,a6 + 4\,a7)\,t + (3\,a2\,a3 + 3\,a3^2 + a2\,a4 + 2\,a3\,a4 + a2\,a5 + 2\,a3\,a5 + a4\,a5 + a2\,a6 + 5\,a3\,a6 + 2\,a4\,a6 + 2\,a5\,a6 + a6^2 + 3\,a2\,a7 + 9\,a3\,a7 + 3\,a4\,a7 + 3\,a5\,a7 + 6\,a6\,a7 + 6\,a7^2)\,t^2 + (3\,a2\,a3^2 + a3^3 + 2\,a2\,a3\,a4 + a3^2\,a4 + 2\,a2\,a3\,a5 + a3^2\,a5 + a2\,a4\,a5 + a3\,a4\,a5 + 2\,a2\,a3\,a6 + 4\,a3^2\,a6 + a2\,a4\,a6 + 3\,a3\,a4\,a6 + a2\,a5\,a6 + 3\,a3\,a5\,a6 + 2\,a4\,a5\,a6 + 2\,a3\,a6^2 + a4\,a6^2 + a5\,a6^2 + 6\,a2\,a3\,a7 + 6\,a3^2\,a7 + 2\,a2\,a4\,a7 + 4\,a3\,a4\,a7 + 2\,a2\,a5\,a7 + 4\,a3\,a5\,a7 + 2\,a4\,a5\,a7 + 2\,a2\,a6\,a7 + 10\,a3\,a6\,a7 + 4\,a4\,a6\,a7 + 4\,a5\,a6\,a7 + 2\,a6^2\,a7 + 3\,a2\,a7^2 + 9\,a3\,a7^2 + 3\,a4\,a7^2 + 3\,a5\,a7^2 + 6\,a6\,a7^2 + 4\,a7^3)\,t^3 + (a2\,a3^3 + a2\,a3^2\,a4 + a2\,a3^2\,a5 + a2\,a3\,a4\,a5 + a2\,a3^2\,a6 + a3^3\,a6 + a2\,a3\,a4\,a6 + a3^2\,a4\,a6 + a2\,a3\,a5\,a6 + a3^2\,a5\,a6 + a2\,a4\,a5\,a6 + a3\,a4\,a5\,a6 + a3^2\,a6^2 + a3\,a4\,a6^2 + a3\,a5\,a6^2 + a4\,a5\,a6^2 + 3\,a2\,a3^2\,a7 + a3^3\,a7 + 2\,a2\,a3\,a4\,a7 + a3^2\,a4\,a7 + 2\,a2\,a3\,a5\,a7 + a3^2\,a5\,a7 + a2\,a4\,a5\,a7 + a3\,a4\,a5\,a7 + 2\,a2\,a3\,a6\,a7 + 4\,a3^2\,a6\,a7 + a2\,a4\,a6\,a7 + 3\,a3\,a4\,a6\,a7 + a2\,a5\,a6\,a7 + 3\,a3\,a5\,a6\,a7 + 2\,a4\,a5\,a6\,a7 + 2\,a3\,a6^2\,a7 + a4\,a6^2\,a7 + a5\,a6^2\,a7 + 3\,a2\,a3\,a7^2 + 3\,a3^2\,a7^2 + a2\,a4\,a7^2 + 2\,a3\,a4\,a7^2 + a2\,a5\,a7^2 + 2\,a3\,a5\,a7^2 + a4\,a5\,a7^2 + a2\,a6\,a7^2 + 5\,a3\,a6\,a7^2 + 2\,a4\,a6\,a7^2 + 2\,a5\,a6\,a7^2 + a6^2\,a7^2 + a2\,a7^3 + 3\,a3\,a7^3 + a4\,a7^3 + a5\,a7^3 + 2\,a6\,a7^3 + a7^4)\,t^4,\ 1 + (2\,a4 + 2\,a5 + 2\,a6 + 3\,a7)\,t + (a4^2 + 3\,a4\,a5 + a5^2 + 3\,a4\,a6 + 3\,a5\,a6 + a6^2 + 4\,a4\,a7 + 4\,a5\,a7 + 4\,a6\,a7 + 3\,a7^2)\,t^2 + (a4^2\,a5 + a4\,a5^2 + a4^2\,a6 + 2\,a4\,a5\,a6 + a5^2\,a6 + a4\,a6^2 + a5\,a6^2 + a4^2\,a7 + 3\,a4\,a5\,a7 + a5^2\,a7 + 3\,a4\,a6\,a7 + 3\,a5\,a6\,a7 + a6^2\,a7 + 2\,a4\,a7^2 + 2\,a5\,a7^2 + 2\,a6\,a7^2 + a7^3)\,t^3\}$$

In[31]:=
```
alpha8 = Multiply[alpha4]
```

Out[31]=

$$\{1 + \cdots 7 \cdots + (a1^8 + 4\,a1^7\,a2 + 6\,a1^6\,a2^2 + 4\,a1^5\,a2^3 + a1^4\,a2^4 + 4\,a1^7\,a3 + \cdots 614 \cdots + 3\,a1\,a3\,a4\,a5^3\,a6^2 + 2\,a2\,a3\,a4\,a5^3\,a6^2 + a3^2\,a4\,a5^3\,a6^2 + a1\,a4^2\,a5^3\,a6^2 + a2\,a4^2\,a5^3\,a6^2 + a3\,a4^2\,a5^3\,a6^2)\,t^8,\ \cdots 3 \cdots,\ \cdots 1 \cdots\}$$

Size in memory: 2.2 MB | + Show more | Show all | Iconize | Store full expression in notebook

In[32]:=
```
alpha16 = Multiply[alpha8]
```

Out[32]=

$$\{1 + \cdots 15 \cdots + (a1^{10}\,a2^6 + 4\,a1^9\,a2^7 + 6\,a1^8\,a2^8 + 4\,a1^7\,a2^9 + a1^6\,a2^{10} + 3\,a1^{10}\,a2^5\,a3 + \cdots 13\,648 \cdots + 4\,a2\,a3\,a4^2\,a5^5\,a6^7 + 2\,a3^2\,a4^2\,a5^5\,a6^7 + a1\,a4^3\,a5^5\,a6^7 + a2\,a4^3\,a5^5\,a6^7 + a3\,a4^3\,a5^5\,a6^7)\,t^{16},\ \cdots 1 \cdots,\ \cdots 1 \cdots\}$$

Size in memory: 79.4 MB | + Show more | Show all | Iconize | Store full expression in notebook

In[33]:=
```
alpha32 = Multiply[alpha16]
```
Out[33]=

$$\{1 + \cdots 31 \cdots + (a1^{15}\, a2^{10}\, a3^{6}\, a4 + 5\, a1^{14}\, a2^{11}\, a3^{6}\, a4 + 10\, a1^{13}\, a2^{12}\, a3^{6}\, a4 + 10\, a1^{12}\, a2^{13}\, a3^{6}\, a4 + \cdots 1\,798\,508 \cdots + a1\, a4^{3}\, a5^{6}\, a6^{10}\, a7^{12} + a2\, a4^{3}\, a5^{6}\, a6^{10}\, a7^{12} + a3\, a4^{3}\, a5^{6}\, a6^{10}\, a7^{12})\, t^{32},\ 1 + \cdots 2 \cdots + \cdots 1 \cdots\}$$

Size in memory: 5.7 GB | + Show more | Show all | Iconize | Store full expression in notebook

In[34]:=
```
result = Collect[Times @@ alpha32, t]
```
Out[34]=

$$1 + \cdots 34 \cdots + (a4^{2}\, a5 + a4\, a5^{2} + a4^{2}\, a6 + 2\, a4\, a5\, a6 + a5^{2}\, a6 + a4\, a6^{2} + a5\, a6^{2} + a4^{2}\, a7 + 3\, a4\, a5\, a7 + a5^{2}\, a7 + 3\, a4\, a6\, a7 + 3\, a5\, a6\, a7 + a6^{2}\, a7 + 2\, a4\, a7^{2} + 2\, a5\, a7^{2} + 2\, a6\, a7^{2} + a7^{3})\, (a1^{15}\, a2^{10}\, a3^{6}\, a4 + \cdots 1\,798\,513 \cdots + a3 \cdots 3 \cdots a7^{12})\, t^{35}$$

Size in memory: 22.9 GB | + Show more | Show all | Iconize | Store full expression in notebook

In[35]:=
```
HH = Take[List @@ result, {2, 9}]
```
Out[35]=

$$\{(15\, a1 + 15\, a2 + 15\, a3 + 15\, a4 + 15\, a5 + 15\, a6 + 15\, a7)\, t,\ \cdots 6 \cdots,\ (6435\, a1^{8} + 81\,510\, a1^{7}\, a2 + \cdots 3003 \cdots + (2\, a4 + 2\, a5 + 2\, a6 + 3\, a7)\, (6435\, a1^{7} + 65\,065\, a1^{6}\, a2 + 248\,105\, a1^{5}\, a2^{2} + \cdots 1711 \cdots + 10\,626\, a6\, a7^{6} + 792\, a7^{7}))\, t^{8}\}$$

Size in memory: 2.8 MB | + Show more | Show all | Iconize | Store full expression in notebook

In[36]:=
```
{H1, H2, H3, H4, H5, H6, H7, H8} = ParallelMap[Simplify, HH /. t → 1]
```
Out[36]=

$$\{15\, (a1 + a2 + a3 + a4 + a5 + a6 + a7),\ \cdots 6 \cdots,\ 3\, (2145\, a1^{8} + \cdots 509 \cdots + a1\, (27\,170\, a2^{7} + 27\,170\, a3^{7} + \cdots 130 \cdots + \cdots 1 \cdots + a2\, (273\,988\, a3^{6} + \cdots 38 \cdots + a3^{2}\, (6\,445\,715\, a4^{4} + \cdots 11 \cdots + a4\, (\cdots 1 \cdots)))))\}$$

Size in memory: 1.1 MB | + Show more | Show all | Iconize | Store full expression in notebook

In[37]:=
```
SymmetricReduction[H8, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[37]=

$$\{6435\, f1^{8} + 30\,030\, f1^{6}\, f2 + 32\,175\, f1^{4}\, f2^{2} + 7920\, f1^{2}\, f2^{3} + 210\, f2^{4} + 6864\, f1^{5}\, f3 + 7524\, f1^{3}\, f2\, f3 + 1008\, f1\, f2^{2}\, f3 - 84\, f1^{2}\, f3^{2} - 24\, f2\, f3^{2} - 5280\, f1^{4}\, f4 - 3759\, f1^{2}\, f2\, f4 - 192\, f2^{2}\, f4 - 237\, f1\, f3\, f4 + 6\, f4^{2} - 3570\, f1^{3}\, f5 - 951\, f1\, f2\, f5 + 33\, f3\, f5 + 2370\, f1^{2}\, f6 + 222\, f2\, f6 + 3624\, f1\, f7,\ 0\}$$

In[38]:=
```
m8 = First[%37]
```
Out[38]=

$$6435\, f1^{8} + 30\,030\, f1^{6}\, f2 + 32\,175\, f1^{4}\, f2^{2} + 7920\, f1^{2}\, f2^{3} + 210\, f2^{4} + 6864\, f1^{5}\, f3 + 7524\, f1^{3}\, f2\, f3 + 1008\, f1\, f2^{2}\, f3 - 84\, f1^{2}\, f3^{2} - 24\, f2\, f3^{2} - 5280\, f1^{4}\, f4 - 3759\, f1^{2}\, f2\, f4 - 192\, f2^{2}\, f4 - 237\, f1\, f3\, f4 + 6\, f4^{2} - 3570\, f1^{3}\, f5 - 951\, f1\, f2\, f5 + 33\, f3\, f5 + 2370\, f1^{2}\, f6 + 222\, f2\, f6 + 3624\, f1\, f7$$

In[39]:=
```
SymmetricReduction[H7, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[39]=

$$\{6435\, f1^{7} + 20\,020\, f1^{5}\, f2 + 12\,870\, f1^{3}\, f2^{2} + 1440\, f1\, f2^{3} + 3146\, f1^{4}\, f3 + 1836\, f1^{2}\, f2\, f3 + 72\, f2^{2}\, f3 - 27\, f1\, f3^{2} - 2156\, f1^{3}\, f4 - 702\, f1\, f2\, f4 - 18\, f3\, f4 - 904\, f1^{2}\, f5 - 72\, f2\, f5 + 454\, f1\, f6 + 302\, f7,\ 0\}$$

In[40]:=
```
m7 = First[%39]
```
Out[40]=

$$6435\, f1^7 + 20\,020\, f1^5\, f2 + 12\,870\, f1^3\, f2^2 + 1440\, f1\, f2^3 + 3146\, f1^4\, f3 + 1836\, f1^2\, f2\, f3 + 72\, f2^2\, f3 - 27\, f1\, f3^2 - 2156\, f1^3\, f4 - 702\, f1\, f2\, f4 - 18\, f3\, f4 - 904\, f1^2\, f5 - 72\, f2\, f5 + 454\, f1\, f6 + 302\, f7$$

In[41]:=
```
SymmetricReduction[H6, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[41]=

$$\{5005\, f1^6 + 10\,010\, f1^4\, f2 + 3510\, f1^2\, f2^2 + 120\, f2^3 + 1040\, f1^3\, f3 + 270\, f1\, f2\, f3 - 3\, f3^2 - 600\, f1^2\, f4 - 60\, f2\, f4 - 140\, f1\, f5 + 40\, f6,\ 0\}$$

In[42]:=
```
m6 = First[%41]
```
Out[42]=

$$5005\, f1^6 + 10\,010\, f1^4\, f2 + 3510\, f1^2\, f2^2 + 120\, f2^3 + 1040\, f1^3\, f3 + 270\, f1\, f2\, f3 - 3\, f3^2 - 600\, f1^2\, f4 - 60\, f2\, f4 - 140\, f1\, f5 + 40\, f6$$

In[43]:=
```
SymmetricReduction[H5, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[43]=

$$\{3003\, f1^5 + 3640\, f1^3\, f2 + 585\, f1\, f2^2 + 234\, f1^2\, f3 + 18\, f2\, f3 - 102\, f1\, f4 - 10\, f5,\ 0\}$$

In[44]:=
```
m5 = First[%43]
```
Out[44]=

$$3003\, f1^5 + 3640\, f1^3\, f2 + 585\, f1\, f2^2 + 234\, f1^2\, f3 + 18\, f2\, f3 - 102\, f1\, f4 - 10\, f5$$

In[45]:=
```
SymmetricReduction[H4, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[45]=

$$\{1365\, f1^4 + 910\, f1^2\, f2 + 45\, f2^2 + 32\, f1\, f3 - 8\, f4,\ 0\}$$

In[46]:=
```
m4 = First[%45]
```
Out[46]=

$$1365\, f1^4 + 910\, f1^2\, f2 + 45\, f2^2 + 32\, f1\, f3 - 8\, f4$$

In[47]:=
```
SymmetricReduction[H3, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[47]=

$$\{455\, f1^3 + 140\, f1\, f2 + 2\, f3,\ 0\}$$

In[48]:=
```
m3 = First[%47]
```
Out[48]=

$$455\, f1^3 + 140\, f1\, f2 + 2\, f3$$

In[49]:=
```
SymmetricReduction[H2, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[49]=

$$\{105\, f1^2 + 10\, f2,\ 0\}$$

In[50]:=
```
m2 = First[%49]
```
Out[50]=

$$105\, f1^2 + 10\, f2$$

In[51]:=
```
SymmetricReduction[H1, {a1, a2, a3, a4, a5, a6, a7}, {f1, f2, f3, f4, f5, f6, f7}]
```
Out[51]=

$$\{15\, f1,\ 0\}$$

In[52]:=
```
m1 = First[%51]
```

Out[52]=

$15\ f1$

In[53]:=
```
AugmentedSymmetricPolynomial[{8}, {a, b, c, d, e, f, g, h}]
```

Out[53]=

$a^8 + b^8 + c^8 + d^8 + e^8 + f^8 + g^8 + h^8$

In[54]:=
```
SymmetricReduction[%53, {a, b, c, d, e, f, g, h}, {d1, d2, d3, d4, d5, d6, d7, d8}]
```

Out[54]=

$\{d1^8 - 8\,d1^6\,d2 + 20\,d1^4\,d2^2 - 16\,d1^2\,d2^3 + 2\,d2^4 + 8\,d1^5\,d3 - 32\,d1^3\,d2\,d3 + 24\,d1\,d2^2\,d3 + 12\,d1^2\,d3^2 - 8\,d2\,d3^2 - 8\,d1^4\,d4 + 24\,d1^2\,d2\,d4 - 8\,d2^2\,d4 - 16\,d1\,d3\,d4 + 4\,d4^2 + 8\,d1^3\,d5 - 16\,d1\,d2\,d5 + 8\,d3\,d5 - 8\,d1^2\,d6 + 8\,d2\,d6 + 8\,d1\,d7 - 8\,d8,\ 0\}$

In[55]:=
```
s8 = First[%54]
```

Out[55]=

$d1^8 - 8\,d1^6\,d2 + 20\,d1^4\,d2^2 - 16\,d1^2\,d2^3 + 2\,d2^4 + 8\,d1^5\,d3 - 32\,d1^3\,d2\,d3 + 24\,d1\,d2^2\,d3 + 12\,d1^2\,d3^2 - 8\,d2\,d3^2 - 8\,d1^4\,d4 + 24\,d1^2\,d2\,d4 - 8\,d2^2\,d4 - 16\,d1\,d3\,d4 + 4\,d4^2 + 8\,d1^3\,d5 - 16\,d1\,d2\,d5 + 8\,d3\,d5 - 8\,d1^2\,d6 + 8\,d2\,d6 + 8\,d1\,d7 - 8\,d8$

In[56]:=
```
AugmentedSymmetricPolynomial[{7}, {a, b, c, d, e, f, g, h}]
```

Out[56]=

$a^7 + b^7 + c^7 + d^7 + e^7 + f^7 + g^7 + h^7$

In[57]:=
```
SymmetricReduction[%56, {a, b, c, d, e, f, g, h}, {d1, d2, d3, d4, d5, d6, d7, d8}]
```

Out[57]=

$\{d1^7 - 7\,d1^5\,d2 + 14\,d1^3\,d2^2 - 7\,d1\,d2^3 + 7\,d1^4\,d3 - 21\,d1^2\,d2\,d3 + 7\,d2^2\,d3 + 7\,d1\,d3^2 - 7\,d1^3\,d4 + 14\,d1\,d2\,d4 - 7\,d3\,d4 + 7\,d1^2\,d5 - 7\,d2\,d5 - 7\,d1\,d6 + 7\,d7,\ 0\}$

In[58]:=
```
s7 = First[%57]
```

Out[58]=

$d1^7 - 7\,d1^5\,d2 + 14\,d1^3\,d2^2 - 7\,d1\,d2^3 + 7\,d1^4\,d3 - 21\,d1^2\,d2\,d3 + 7\,d2^2\,d3 + 7\,d1\,d3^2 - 7\,d1^3\,d4 + 14\,d1\,d2\,d4 - 7\,d3\,d4 + 7\,d1^2\,d5 - 7\,d2\,d5 - 7\,d1\,d6 + 7\,d7$

In[59]:=
```
AugmentedSymmetricPolynomial[{6}, {a, b, c, d, e, f, g, h}]
```

Out[59]=

$a^6 + b^6 + c^6 + d^6 + e^6 + f^6 + g^6 + h^6$

In[60]:=
```
SymmetricReduction[%59, {a, b, c, d, e, f, g, h}, {d1, d2, d3, d4, d5, d6, d7, d8}]
```

Out[60]=

$\{d1^6 - 6\,d1^4\,d2 + 9\,d1^2\,d2^2 - 2\,d2^3 + 6\,d1^3\,d3 - 12\,d1\,d2\,d3 + 3\,d3^2 - 6\,d1^2\,d4 + 6\,d2\,d4 + 6\,d1\,d5 - 6\,d6,\ 0\}$

In[61]:=
```
s6 = First[%60]
```

Out[61]=

$$d1^6 - 6\,d1^4\,d2 + 9\,d1^2\,d2^2 - 2\,d2^3 + 6\,d1^3\,d3 - 12\,d1\,d2\,d3 + 3\,d3^2 - 6\,d1^2\,d4 + 6\,d2\,d4 + 6\,d1\,d5 - 6\,d6$$

In[62]:=
```
AugmentedSymmetricPolynomial[{5}, {a, b, c, d, e, f, g, h}]
```

Out[62]=

$$a^5 + b^5 + c^5 + d^5 + e^5 + f^5 + g^5 + h^5$$

In[63]:=
```
SymmetricReduction[%62, {a, b, c, d, e, f, g, h}, {d1, d2, d3, d4, d5, d6, d7, d8}]
```

Out[63]=

$$\{d1^5 - 5\,d1^3\,d2 + 5\,d1\,d2^2 + 5\,d1^2\,d3 - 5\,d2\,d3 - 5\,d1\,d4 + 5\,d5,\ 0\}$$

In[64]:=
```
s5 = First[%63]
```

Out[64]=

$$d1^5 - 5\,d1^3\,d2 + 5\,d1\,d2^2 + 5\,d1^2\,d3 - 5\,d2\,d3 - 5\,d1\,d4 + 5\,d5$$

In[65]:=
```
ch21 = 21 + d1 * t + (1 / 2) * (d1 ^ 2 - 2 * d2) * t ^ 2 + (1 / 6) * (d1 ^ 3 - 3 * d1 * d2 + 3 * d3) * t ^ 3 +
  (1 / 24) * (d1 ^ 4 - 4 * d1 ^ 2 * d2 + 4 * d1 * d3 + 2 * d2 ^ 2 - 4 * d4) * t ^ 4 +
  (1 / 120) * s5 * t ^ 5 + (1 / 720) * s6 * t ^ 6 + (1 / 5040) * s7 * t ^ 7 + (1 / 40 320) * s8 * t ^ 8
```

Out[65]=

$$21 + d1\,t + \frac{1}{2}\left(d1^2 - 2\,d2\right) t^2 + \frac{1}{6}\left(d1^3 - 3\,d1\,d2 + 3\,d3\right) t^3 + \frac{1}{24}\left(d1^4 - 4\,d1^2\,d2 + 2\,d2^2 + 4\,d1\,d3 - 4\,d4\right) t^4 + \frac{1}{120}\left(d1^5 - 5\,d1^3\,d2 + 5\,d1\,d2^2 + 5\,d1^2\,d3 - 5\,d2\,d3 - 5\,d1\,d4 + 5\,d5\right) t^5 + \frac{1}{720}\left(d1^6 - 6\,d1^4\,d2 + 9\,d1^2\,d2^2 - 2\,d2^3 + 6\,d1^3\,d3 - 12\,d1\,d2\,d3 + 3\,d3^2 - 6\,d1^2\,d4 + 6\,d2\,d4 + 6\,d1\,d5 - 6\,d6\right) t^6 + \frac{1}{5040}\left(d1^7 - 7\,d1^5\,d2 + 14\,d1^3\,d2^2 - 7\,d1\,d2^3 + 7\,d1^4\,d3 - 21\,d1^2\,d2\,d3 + 7\,d2^2\,d3 + 7\,d1\,d3^2 - 7\,d1^3\,d4 + 14\,d1\,d2\,d4 - 7\,d3\,d4 + 7\,d1^2\,d5 - 7\,d2\,d5 - 7\,d1\,d6 + 7\,d7\right) t^7 + \frac{1}{40\,320}\left(d1^8 - 8\,d1^6\,d2 + 20\,d1^4\,d2^2 - 16\,d1^2\,d2^3 + 2\,d2^4 + 8\,d1^5\,d3 - 32\,d1^3\,d2\,d3 + 24\,d1\,d2^2\,d3 + 12\,d1^2\,d3^2 - 8\,d2\,d3^2 - 8\,d1^4\,d4 + 24\,d1^2\,d2\,d4 - 8\,d2^2\,d4 - 16\,d1\,d3\,d4 + 4\,d4^2 + 8\,d1^3\,d5 - 16\,d1\,d2\,d5 + 8\,d3\,d5 - 8\,d1^2\,d6 + 8\,d2\,d6 + 8\,d1\,d7 - 8\,d8\right) t^8$$

In[66]:=
```
ch35 = 35 + d1 * t + (1 / 2) * (d1 ^ 2 - 2 * d2) * t ^ 2 + (1 / 6) * (d1 ^ 3 - 3 * d1 * d2 + 3 * d3) * t ^ 3 +
  (1 / 24) * (d1 ^ 4 - 4 * d1 ^ 2 * d2 + 4 * d1 * d3 + 2 * d2 ^ 2 - 4 * d4) * t ^ 4 +
  (1 / 120) * s5 * t ^ 5 + (1 / 720) * s6 * t ^ 6 + (1 / 5040) * s7 * t ^ 7 + (1 / 40 320) * s8 * t ^ 8
```

Out[66]=

$$35 + d1\, t + \frac{1}{2}\left(d1^2 - 2\, d2\right) t^2 + \frac{1}{6}\left(d1^3 - 3\, d1\, d2 + 3\, d3\right) t^3 + \frac{1}{24}\left(d1^4 - 4\, d1^2\, d2 + 2\, d2^2 + 4\, d1\, d3 - 4\, d4\right) t^4 + \frac{1}{120}\left(d1^5 - 5\, d1^3\, d2 + 5\, d1\, d2^2 + 5\, d1^2\, d3 - 5\, d2\, d3 - 5\, d1\, d4 + 5\, d5\right) t^5 + \frac{1}{720}\left(d1^6 - 6\, d1^4\, d2 + 9\, d1^2\, d2^2 - 2\, d2^3 + 6\, d1^3\, d3 - 12\, d1\, d2\, d3 + 3\, d3^2 - 6\, d1^2\, d4 + 6\, d2\, d4 + 6\, d1\, d5 - 6\, d6\right) t^6 + \frac{1}{5040}\left(d1^7 - 7\, d1^5\, d2 + 14\, d1^3\, d2^2 - 7\, d1\, d2^3 + 7\, d1^4\, d3 - 21\, d1^2\, d2\, d3 + 7\, d2^2\, d3 + 7\, d1\, d3^2 - 7\, d1^3\, d4 + 14\, d1\, d2\, d4 - 7\, d3\, d4 + 7\, d1^2\, d5 - 7\, d2\, d5 - 7\, d1\, d6 + 7\, d7\right) t^7 + \frac{1}{40\,320}\left(d1^8 - 8\, d1^6\, d2 + 20\, d1^4\, d2^2 - 16\, d1^2\, d2^3 + 2\, d2^4 + 8\, d1^5\, d3 - 32\, d1^3\, d2\, d3 + 24\, d1\, d2^2\, d3 + 12\, d1^2\, d3^2 - 8\, d2\, d3^2 - 8\, d1^4\, d4 + 24\, d1^2\, d2\, d4 - 8\, d2^2\, d4 - 16\, d1\, d3\, d4 + 4\, d4^2 + 8\, d1^3\, d5 - 16\, d1\, d2\, d5 + 8\, d3\, d5 - 8\, d1^2\, d6 + 8\, d2\, d6 + 8\, d1\, d7 - 8\, d8\right) t^8$$

In[67]:=
```
td = 1 + (1 / 2) * c1 * t + (1 / 12) * (c1 ^ 2 + c2) * t ^ 2 + (1 / 24) * c1 * c2 * t ^ 3 -
  (1 / 720) (c1 ^ 4 - 4 * c1 ^ 2 * c2 - 3 * c2 ^ 2 - c1 * c3 + c4) * t ^ 4 -
  (1 / 1440) * (c1 ^ 3 * c2 - 3 * c1 * c2 ^ 2 - c1 ^ 2 * c3 + c1 * c4) * t ^ 5 +
  (1 / 60 480) * (2 * c1 ^ 6 - 12 * c1 ^ 4 * c2 + 11 * c1 ^ 2 * c2 ^ 2 + 10 * c2 ^ 3 + 5 * c1 ^ 3 * c3 +
     11 * c1 * c2 * c3 - c3 ^ 2 - 5 * c1 ^ 2 * c4 - 9 * c2 * c4 - 2 * c1 * c5 + 2 * c6) * t ^ 6 +
  (1 / 60 480) * (c1 ^ 5 * c2 - 5 * c1 ^ 3 * c2 ^ 2 + 5 * c1 * c2 ^ 3 - c1 ^ 4 * c3 + (11 / 2) * c1 ^ 2 * c2 *
      c3 - (1 / 2) * c1 * c3 ^ 2 + c1 ^ 3 * c4 - (9 / 2) * c1 * c2 * c4 - c1 ^ 2 * c5 + c1 * c6) * t ^ 7 -
  (1 / 3 628 800) * (3 * c1 ^ 8 - 24 * c1 ^ 6 * c2 + 50 * c1 ^ 4 * c2 ^ 2 - 8 * c1 ^ 2 * c2 ^ 3 -
     21 * c2 ^ 4 + 14 * c1 ^ 5 * c3 - 26 * c1 ^ 3 * c2 * c3 - 50 * c1 * c2 ^ 2 * c3 -
     3 * c1 ^ 2 * c3 ^ 2 + 8 * c2 * c3 ^ 2 - 14 * c1 ^ 4 * c4 + 19 * c1 ^ 2 * c2 * c4 +
     34 * c2 ^ 2 * c4 + 13 * c1 * c3 * c4 - 5 * c4 ^ 2 + 7 * c1 ^ 3 * c5 + 16 * c1 * c2 * c5 -
     3 * c3 * c5 - 7 * c1 ^ 2 * c6 - 13 * c2 * c6 - 3 * c1 * c7 + 3 * c8) * t ^ 8
```

Out[67]=

$$1 + \frac{c1\, t}{2} + \frac{1}{12}\left(c1^2 + c2\right) t^2 + \frac{1}{24} c1\, c2\, t^3 - \frac{1}{720}\left(c1^4 - 4\, c1^2\, c2 - 3\, c2^2 - c1\, c3 + c4\right) t^4 - \frac{\left(c1^3\, c2 - 3\, c1\, c2^2 - c1^2\, c3 + c1\, c4\right) t^5}{1440} + \frac{1}{60\,480}\left(2\, c1^6 - 12\, c1^4\, c2 + 11\, c1^2\, c2^2 + 10\, c2^3 + 5\, c1^3\, c3 + 11\, c1\, c2\, c3 - c3^2 - 5\, c1^2\, c4 - 9\, c2\, c4 - 2\, c1\, c5 + 2\, c6\right) t^6 + \frac{1}{60\,480}\left(c1^5\, c2 - 5\, c1^3\, c2^2 + 5\, c1\, c2^3 - c1^4\, c3 + \frac{11}{2} c1^2\, c2\, c3 - \frac{c1\, c3^2}{2} + c1^3\, c4 - \frac{9\, c1\, c2\, c4}{2} - c1^2\, c5 + c1\, c6\right) t^7 - \frac{1}{3\,628\,800}\left(3\, c1^8 - 24\, c1^6\, c2 + 50\, c1^4\, c2^2 - 8\, c1^2\, c2^3 - 21\, c2^4 + 14\, c1^5\, c3 - 26\, c1^3\, c2\, c3 - 50\, c1\, c2^2\, c3 - 3\, c1^2\, c3^2 + 8\, c2\, c3^2 - 14\, c1^4\, c4 + 19\, c1^2\, c2\, c4 + 34\, c2^2\, c4 + 13\, c1\, c3\, c4 - 5\, c4^2 + 7\, c1^3\, c5 + 16\, c1\, c2\, c5 - 3\, c3\, c5 - 7\, c1^2\, c6 - 13\, c2\, c6 - 3\, c1\, c7 + 3\, c8\right) t^8$$

In[68]:=
```
Expand[ch21 * td]
```

Out[68]=

$$21 + \frac{21\, c1\, t}{2} + d1\, t + \frac{7\, c1^2\, t^2}{4} + \frac{7\, c2\, t^2}{4} + \frac{1}{2} c1\, d1\, t^2 + \cdots 5681 \cdots + \frac{c8\, d8\, t^{16}}{6\,096\,384\,000}$$

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In[69]:=
```
SeriesCoefficient[%68, {t, 0, 8}]
```

Out[69]=

$$-\frac{c1^8}{57\,600} + \frac{c1^6\, c2}{7200} - \frac{c1^4\, c2^2}{3456} + \frac{c1^2\, c2^3}{21\,600} + \frac{7\, c2^4}{57\,600} - \frac{7\, c1^5\, c3}{86\,400} + \frac{13\, c1^3\, c2\, c3}{86\,400} + \frac{c1\, c2^2\, c3}{3456} + \frac{c1^2\, c3^2}{57\,600} - \frac{c2\, c3^2}{21\,600} + \frac{7\, c1^4\, c4}{86\,400} - \frac{19\, c1^2\, c2\, c4}{172\,800} - \frac{17\, c2^2\, c4}{86\,400} - \frac{13\, c1\, c3\, c4}{172\,800} + \frac{c4^2}{34\,560} - \frac{7\, c1^3\, c5}{172\,800} - \frac{c1\, c2\, c5}{10\,800} + \frac{c3\, c5}{57\,600} + \frac{7\, c1^2\, c6}{172\,800} + \frac{13\, c2\, c6}{172\,800} + \frac{c1\, c7}{57\,600} - \frac{c8}{57\,600} + \frac{c1^5\, c2\, d1}{60\,480} - \frac{c1^3\, c2^2\, d1}{12\,096} + \frac{c1\, c2^3\, d1}{12\,096} - \frac{c1^4\, c3\, d1}{60\,480} + \frac{11\, c1^2\, c2\, c3\, d1}{120\,960} - \frac{c1\, c3^2\, d1}{120\,960} + \frac{c1^3\, c4\, d1}{60\,480} - \frac{c1\, c2\, c4\, d1}{13\,440} -$$

$$\frac{c1^2\,c5\,d1}{60480}+\frac{c1\,c6\,d1}{60480}+\frac{c1^6\,d1^2}{60480}-\frac{c1^4\,c2\,d1^2}{10080}+\frac{11\,c1^2\,c2^2\,d1^2}{120960}+\frac{c2^3\,d1^2}{12096}+\frac{c1^3\,c3\,d1^2}{24192}+$$
$$\frac{11\,c1\,c2\,c3\,d1^2}{120960}-\frac{c3^2\,d1^2}{120960}-\frac{c1^2\,c4\,d1^2}{24192}-\frac{c2\,c4\,d1^2}{13440}-\frac{c1\,c5\,d1^2}{60480}+\frac{c6\,d1^2}{60480}-\frac{c1^3\,c2\,d1^3}{8640}+$$
$$\frac{c1\,c2^2\,d1^3}{2880}+\frac{c1^2\,c3\,d1^3}{8640}-\frac{c1\,c4\,d1^3}{8640}-\frac{c1^4\,d1^4}{17280}+\frac{c1^2\,c2\,d1^4}{4320}+\frac{c2^2\,d1^4}{5760}+\frac{c1\,c3\,d1^4}{17280}-$$
$$\frac{c4\,d1^4}{17280}+\frac{c1\,c2\,d1^5}{2880}+\frac{c1^2\,d1^6}{8640}+\frac{c2\,d1^6}{8640}+\frac{c1\,d1^7}{10080}+\frac{d1^8}{40320}-\frac{c1^6\,d2}{30240}+\frac{c1^4\,c2\,d2}{5040}-$$
$$\frac{11\,c1^2\,c2^2\,d2}{60480}-\frac{c2^3\,d2}{6048}-\frac{c1^3\,c3\,d2}{12096}-\frac{11\,c1\,c2\,c3\,d2}{60480}+\frac{c3^2\,d2}{60480}+\frac{c1^2\,c4\,d2}{12096}+\frac{c2\,c4\,d2}{6720}+$$
$$\frac{c1\,c5\,d2}{30240}-\frac{c6\,d2}{30240}+\frac{c1^3\,c2\,d1\,d2}{2880}-\frac{1}{960}\,c1\,c2^2\,d1\,d2-\frac{c1^2\,c3\,d1\,d2}{2880}+\frac{c1\,c4\,d1\,d2}{2880}+$$
$$\frac{c1^4\,d1^2\,d2}{4320}-\frac{c1^2\,c2\,d1^2\,d2}{1080}-\frac{c2^2\,d1^2\,d2}{1440}-\frac{c1\,c3\,d1^2\,d2}{4320}+\frac{c4\,d1^2\,d2}{4320}-\frac{1}{576}\,c1\,c2\,d1^3\,d2-$$
$$\frac{c1^2\,d1^4\,d2}{1440}-\frac{c2\,d1^4\,d2}{1440}-\frac{c1\,d1^5\,d2}{1440}-\frac{d1^6\,d2}{5040}-\frac{c1^4\,d2^2}{8640}+\frac{c1^2\,c2\,d2^2}{2160}+\frac{c2^2\,d2^2}{2880}+\frac{c1\,c3\,d2^2}{8640}-$$
$$\frac{c4\,d2^2}{8640}+\frac{1}{576}\,c1\,c2\,d1\,d2^2+\frac{1}{960}\,c1^2\,d1^2\,d2^2+\frac{1}{960}\,c2\,d1^2\,d2^2+\frac{1}{720}\,c1\,d1^3\,d2^2+$$
$$\frac{d1^4\,d2^2}{2016}-\frac{c1^2\,d2^3}{4320}-\frac{c2\,d2^3}{4320}-\frac{c1\,d1\,d2^3}{1440}-\frac{d1^2\,d2^3}{2520}+\frac{d2^4}{20160}-\frac{c1^3\,c2\,d3}{2880}+\frac{1}{960}\,c1\,c2^2\,d3+$$
$$\frac{c1^2\,c3\,d3}{2880}-\frac{c1\,c4\,d3}{2880}-\frac{c1^4\,d1\,d3}{4320}+\frac{c1^2\,c2\,d1\,d3}{1080}+\frac{c2^2\,d1\,d3}{1440}+\frac{c1\,c3\,d1\,d3}{4320}-\frac{c4\,d1\,d3}{4320}+$$
$$\frac{1}{576}\,c1\,c2\,d1^2\,d3+\frac{c1^2\,d1^3\,d3}{1440}+\frac{c2\,d1^3\,d3}{1440}+\frac{c1\,d1^4\,d3}{1440}+\frac{d1^5\,d3}{5040}-\frac{1}{576}\,c1\,c2\,d2\,d3-$$
$$\frac{1}{720}\,c1^2\,d1\,d2\,d3-\frac{1}{720}\,c2\,d1\,d2\,d3-\frac{1}{480}\,c1\,d1^2\,d2\,d3-\frac{d1^3\,d2\,d3}{1260}+\frac{c1\,d2^2\,d3}{1440}+$$
$$\frac{d1\,d2^2\,d3}{1680}+\frac{c1^2\,d3^2}{2880}+\frac{c2\,d3^2}{2880}+\frac{c1\,d1\,d3^2}{1440}+\frac{d1^2\,d3^2}{3360}-\frac{d2\,d3^2}{5040}+\frac{c1^4\,d4}{4320}-\frac{c1^2\,c2\,d4}{1080}-$$
$$\frac{c2^2\,d4}{1440}-\frac{c1\,c3\,d4}{4320}+\frac{c4\,d4}{4320}-\frac{1}{576}\,c1\,c2\,d1\,d4-\frac{c1^2\,d1^2\,d4}{1440}-\frac{c2\,d1^2\,d4}{1440}-\frac{c1\,d1^3\,d4}{1440}-$$
$$\frac{d1^4\,d4}{5040}+\frac{c1^2\,d2\,d4}{1440}+\frac{c2\,d2\,d4}{1440}+\frac{1}{720}\,c1\,d1\,d2\,d4+\frac{d1^2\,d2\,d4}{1680}-\frac{d2^2\,d4}{5040}-\frac{c1\,d3\,d4}{1440}-$$
$$\frac{d1\,d3\,d4}{2520}+\frac{d4^2}{10080}+\frac{c1\,c2\,d5}{576}+\frac{c1^2\,d1\,d5}{1440}+\frac{c2\,d1\,d5}{1440}+\frac{c1\,d1^2\,d5}{1440}+\frac{d1^3\,d5}{5040}-\frac{c1\,d2\,d5}{1440}-$$
$$\frac{d1\,d2\,d5}{2520}+\frac{d3\,d5}{5040}-\frac{c1^2\,d6}{1440}-\frac{c2\,d6}{1440}-\frac{c1\,d1\,d6}{1440}-\frac{d1^2\,d6}{5040}+\frac{d2\,d6}{5040}+\frac{c1\,d7}{1440}+\frac{d1\,d7}{5040}-\frac{d8}{5040}$$

In[70]:=
```
Expand[ch35 * td]
```

Out[70]=

$$35+\frac{35\,c1\,t}{2}+d1\,t+\frac{35\,c1^2\,t^2}{12}+\frac{35\,c2\,t^2}{12}+\frac{1}{2}\,c1\,d1\,t^2+\cdots 5681 \cdots+\frac{c8\,d8\,t^{16}}{6096384000}$$

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In[71]:=
```
SeriesCoefficient[%70, {t, 0, 8}]
```

Out[71]=

$$-\frac{c1^8}{34560}+\frac{c1^6\,c2}{4320}-\frac{5\,c1^4\,c2^2}{10368}+\frac{c1^2\,c2^3}{12960}+\frac{7\,c2^4}{34560}-\frac{7\,c1^5\,c3}{51840}+\frac{13\,c1^3\,c2\,c3}{51840}+\frac{5\,c1\,c2^2\,c3}{10368}+$$

$$\frac{c1^2\,c3^2}{34\,560}-\frac{c2\,c3^2}{12\,960}+\frac{7\,c1^4\,c4}{51\,840}-\frac{19\,c1^2\,c2\,c4}{103\,680}-\frac{17\,c2^2\,c4}{51\,840}-\frac{13\,c1\,c3\,c4}{103\,680}+\frac{c4^2}{20\,736}-\frac{7\,c1^3\,c5}{103\,680}-$$
$$\frac{c1\,c2\,c5}{6480}+\frac{c3\,c5}{34\,560}+\frac{7\,c1^2\,c6}{103\,680}+\frac{13\,c2\,c6}{103\,680}+\frac{c1\,c7}{34\,560}-\frac{c8}{34\,560}+\frac{c1^5\,c2\,d1}{60\,480}-\frac{c1^3\,c2^2\,d1}{12\,096}+$$
$$\frac{c1\,c2^3\,d1}{12\,096}-\frac{c1^4\,c3\,d1}{60\,480}+\frac{11\,c1^2\,c2\,c3\,d1}{120\,960}-\frac{c1\,c3^2\,d1}{120\,960}+\frac{c1^3\,c4\,d1}{60\,480}-\frac{c1\,c2\,c4\,d1}{13\,440}-$$
$$\frac{c1^2\,c5\,d1}{60\,480}+\frac{c1\,c6\,d1}{60\,480}+\frac{c1^6\,d1^2}{60\,480}-\frac{c1^4\,c2\,d1^2}{10\,080}+\frac{11\,c1^2\,c2^2\,d1^2}{120\,960}+\frac{c2^3\,d1^2}{12\,096}+\frac{c1^3\,c3\,d1^2}{24\,192}+$$
$$\frac{11\,c1\,c2\,c3\,d1^2}{120\,960}-\frac{c3^2\,d1^2}{120\,960}-\frac{c1^2\,c4\,d1^2}{24\,192}-\frac{c2\,c4\,d1^2}{13\,440}-\frac{c1\,c5\,d1^2}{60\,480}+\frac{c6\,d1^2}{60\,480}-\frac{c1^3\,c2\,d1^3}{8640}+$$
$$\frac{c1\,c2^2\,d1^3}{2880}+\frac{c1^2\,c3\,d1^3}{8640}-\frac{c1\,c4\,d1^3}{8640}-\frac{c1^4\,d1^4}{17\,280}+\frac{c1^2\,c2\,d1^4}{4320}+\frac{c2^2\,d1^4}{5760}+\frac{c1\,c3\,d1^4}{17\,280}-$$
$$\frac{c4\,d1^4}{17\,280}+\frac{c1\,c2\,d1^5}{2880}+\frac{c1^2\,d1^6}{8640}+\frac{c2\,d1^6}{8640}+\frac{c1\,d1^7}{10\,080}+\frac{d1^8}{40\,320}-\frac{c1^6\,d2}{30\,240}+\frac{c1^4\,c2\,d2}{5040}-$$
$$\frac{11\,c1^2\,c2^2\,d2}{60\,480}-\frac{c2^3\,d2}{6048}-\frac{c1^3\,c3\,d2}{12\,096}-\frac{11\,c1\,c2\,c3\,d2}{60\,480}+\frac{c3^2\,d2}{60\,480}+\frac{c1^2\,c4\,d2}{12\,096}+\frac{c2\,c4\,d2}{6720}+$$
$$\frac{c1\,c5\,d2}{30\,240}-\frac{c6\,d2}{30\,240}+\frac{c1^3\,c2\,d1\,d2}{2880}-\frac{1}{960}\,c1\,c2^2\,d1\,d2-\frac{c1^2\,c3\,d1\,d2}{2880}+\frac{c1\,c4\,d1\,d2}{2880}+$$
$$\frac{c1^4\,d1^2\,d2}{4320}-\frac{c1^2\,c2\,d1^2\,d2}{1080}-\frac{c2^2\,d1^2\,d2}{1440}-\frac{c1\,c3\,d1^2\,d2}{4320}+\frac{c4\,d1^2\,d2}{4320}-\frac{1}{576}\,c1\,c2\,d1^3\,d2-$$
$$\frac{c1^2\,d1^4\,d2}{1440}-\frac{c2\,d1^4\,d2}{1440}-\frac{c1\,d1^5\,d2}{1440}-\frac{d1^6\,d2}{5040}-\frac{c1^4\,d2^2}{8640}+\frac{c1^2\,c2\,d2^2}{2160}+\frac{c2^2\,d2^2}{2880}+\frac{c1\,c3\,d2^2}{8640}-$$
$$\frac{c4\,d2^2}{8640}+\frac{1}{576}\,c1\,c2\,d1\,d2^2+\frac{1}{960}\,c1^2\,d1^2\,d2^2+\frac{1}{960}\,c2\,d1^2\,d2^2+\frac{1}{720}\,c1\,d1^3\,d2^2+$$
$$\frac{d1^4\,d2^2}{2016}-\frac{c1^2\,d2^3}{4320}-\frac{c2\,d2^3}{4320}-\frac{c1\,d1\,d2^3}{1440}-\frac{d1^2\,d2^3}{2520}+\frac{d2^4}{20\,160}-\frac{c1^3\,c2\,d3}{2880}+\frac{1}{960}\,c1\,c2^2\,d3+$$
$$\frac{c1^2\,c3\,d3}{2880}-\frac{c1\,c4\,d3}{2880}-\frac{c1^4\,d1\,d3}{4320}+\frac{c1^2\,c2\,d1\,d3}{1080}+\frac{c2^2\,d1\,d3}{1440}+\frac{c1\,c3\,d1\,d3}{4320}-\frac{c4\,d1\,d3}{4320}+$$
$$\frac{1}{576}\,c1\,c2\,d1^2\,d3+\frac{c1^2\,d1^3\,d3}{1440}+\frac{c2\,d1^3\,d3}{1440}+\frac{c1\,d1^4\,d3}{1440}+\frac{d1^5\,d3}{5040}-\frac{1}{576}\,c1\,c2\,d2\,d3-$$
$$\frac{1}{720}\,c1^2\,d1\,d2\,d3-\frac{1}{720}\,c2\,d1\,d2\,d3-\frac{1}{480}\,c1\,d1^2\,d2\,d3-\frac{d1^3\,d2\,d3}{1260}+\frac{c1\,d2^2\,d3}{1440}+$$
$$\frac{d1\,d2^2\,d3}{1680}+\frac{c1^2\,d3^2}{2880}+\frac{c2\,d3^2}{2880}+\frac{c1\,d1\,d3^2}{1440}+\frac{d1^2\,d3^2}{3360}-\frac{d2\,d3^2}{5040}+\frac{c1^4\,d4}{4320}-\frac{c1^2\,c2\,d4}{1080}-$$
$$\frac{c2^2\,d4}{1440}-\frac{c1\,c3\,d4}{4320}+\frac{c4\,d4}{4320}-\frac{1}{576}\,c1\,c2\,d1\,d4-\frac{c1^2\,d1^2\,d4}{1440}-\frac{c2\,d1^2\,d4}{1440}-\frac{c1\,d1^3\,d4}{1440}-$$
$$\frac{d1^4\,d4}{5040}+\frac{c1^2\,d2\,d4}{1440}+\frac{c2\,d2\,d4}{1440}+\frac{1}{720}\,c1\,d1\,d2\,d4+\frac{d1^2\,d2\,d4}{1680}-\frac{d2^2\,d4}{5040}-\frac{c1\,d3\,d4}{1440}-$$
$$\frac{d1\,d3\,d4}{2520}+\frac{d4^2}{10\,080}+\frac{c1\,c2\,d5}{576}+\frac{c1^2\,d1\,d5}{1440}+\frac{c2\,d1\,d5}{1440}+\frac{c1\,d1^2\,d5}{1440}+\frac{d1^3\,d5}{5040}-\frac{c1\,d2\,d5}{1440}-$$
$$\frac{d1\,d2\,d5}{2520}+\frac{d3\,d5}{5040}-\frac{c1^2\,d6}{1440}-\frac{c2\,d6}{1440}-\frac{c1\,d1\,d6}{1440}-\frac{d1^2\,d6}{5040}+\frac{d2\,d6}{5040}+\frac{c1\,d7}{1440}+\frac{d1\,d7}{5040}-\frac{d8}{5040}$$

In[72]:=
```
Expand[%69 /. {d1 → e1 + Binomial[21, 20] * t * H,
   d2 → e2 + Binomial[20, 19] * e1 * t * H + Binomial[21, 19] * t ^ 2 * H ^ 2,
   d3 → e3 + Binomial[19, 18] * e2 * t * H +
     Binomial[20, 18] * e1 * t ^ 2 * H ^ 2 + Binomial[21, 18] * t ^ 3 * H ^ 3,
   d4 → e4 + Binomial[18, 17] * e3 * t * H + Binomial[19, 17] * e2 * t ^ 2 * H ^ 2 +
     Binomial[20, 17] * e1 * t ^ 3 * H ^ 3 + Binomial[21, 17] * t ^ 4 * H ^ 4,
   d5 → e5 + Binomial[17, 16] * e4 * t * H + Binomial[18, 16] * e3 * t ^ 2 * H ^ 2 +
     Binomial[19, 16] * e2 * t ^ 3 * H ^ 3 +
     Binomial[20, 16] * e1 * t ^ 4 * H ^ 4 + Binomial[21, 16] * t ^ 5 * H ^ 5,
   d6 → e6 + Binomial[16, 15] * e5 * t * H + Binomial[17, 15] * e4 * t ^ 2 * H ^ 2 +
     Binomial[18, 15] * e3 * t ^ 3 * H ^ 3 + Binomial[19, 15] * e2 * t ^ 4 * H ^ 4 +
     Binomial[20, 15] * e1 * t ^ 5 * H ^ 5 + Binomial[21, 15] * t ^ 6 * H ^ 6,
   d7 → e7 + Binomial[15, 14] * e6 * t * H + Binomial[16, 14] * e5 * t ^ 2 * H ^ 2 +
     Binomial[17, 14] * e4 * t ^ 3 * H ^ 3 +
     Binomial[18, 14] * e3 * t ^ 4 * H ^ 4 + Binomial[19, 14] * e2 * t ^ 5 * H ^ 5 +
     Binomial[20, 14] * e1 * t ^ 6 * H ^ 6 + Binomial[21, 14] * t ^ 7 * H ^ 7,
   d8 → e8 + Binomial[14, 13] * e7 * t * H + Binomial[15, 13] * e6 * t ^ 2 * H ^ 2 +
     Binomial[16, 13] * e5 * t ^ 3 * H ^ 3 + Binomial[17, 13] * e4 * t ^ 4 * H ^ 4 +
     Binomial[18, 13] * e3 * t ^ 5 * H ^ 5 + Binomial[19, 13] * e2 * t ^ 6 * H ^ 6 +
     Binomial[20, 13] * e1 * t ^ 7 * H ^ 7 + Binomial[21, 13] * t ^ 8 * H ^ 8}]
```

Out[72]=

$$
\begin{aligned}
&-\frac{c1^8}{57600}+\frac{c1^6\,c2}{7200}-\frac{c1^4\,c2^2}{3456}+\frac{c1^2\,c2^3}{21600}+\frac{7\,c2^4}{57600}-\frac{7\,c1^5\,c3}{86400}+\frac{13\,c1^3\,c2\,c3}{86400}+\frac{c1\,c2^2\,c3}{3456}+\\
&\frac{c1^2\,c3^2}{57600}-\frac{c2\,c3^2}{21600}+\frac{7\,c1^4\,c4}{86400}-\frac{19\,c1^2\,c2\,c4}{172800}-\frac{17\,c2^2\,c4}{86400}-\frac{13\,c1\,c3\,c4}{172800}+\frac{c4^2}{34560}-\frac{7\,c1^3\,c5}{172800}-\\
&\frac{c1\,c2\,c5}{10800}+\frac{c3\,c5}{57600}+\frac{7\,c1^2\,c6}{172800}+\frac{13\,c2\,c6}{172800}+\frac{c1\,c7}{57600}-\frac{c8}{57600}+\frac{c1^5\,c2\,e1}{60480}-\frac{c1^3\,c2^2\,e1}{12096}+\\
&\frac{c1\,c2^3\,e1}{12096}-\frac{c1^4\,c3\,e1}{60480}+\frac{11\,c1^2\,c2\,c3\,e1}{120960}-\frac{c1\,c3^2\,e1}{120960}+\frac{c1^3\,c4\,e1}{60480}-\frac{c1\,c2\,c4\,e1}{13440}-\\
&\frac{c1^2\,c5\,e1}{60480}+\frac{c1\,c6\,e1}{60480}+\frac{c1^6\,e1^2}{60480}-\frac{c1^4\,c2\,e1^2}{10080}+\frac{11\,c1^2\,c2^2\,e1^2}{120960}+\frac{c2^3\,e1^2}{12096}+\frac{c1^3\,c3\,e1^2}{24192}+\\
&\frac{11\,c1\,c2\,c3\,e1^2}{120960}-\frac{c3^2\,e1^2}{120960}-\frac{c1^2\,c4\,e1^2}{24192}-\frac{c2\,c4\,e1^2}{13440}-\frac{c1\,c5\,e1^2}{60480}+\frac{c6\,e1^2}{60480}-\frac{c1^3\,c2\,e1^3}{8640}+\\
&\frac{c1\,c2^2\,e1^3}{2880}+\frac{c1^2\,c3\,e1^3}{8640}-\frac{c1\,c4\,e1^3}{8640}-\frac{c1^4\,e1^4}{17280}+\frac{c1^2\,c2\,e1^4}{4320}+\frac{c2^2\,e1^4}{5760}+\frac{c1\,c3\,e1^4}{17280}-\\
&\frac{c4\,e1^4}{17280}+\frac{c1\,c2\,e1^5}{2880}+\frac{c1^2\,e1^6}{8640}+\frac{c2\,e1^6}{8640}+\frac{c1\,e1^7}{10080}+\frac{e1^8}{40320}-\frac{c1^6\,e2}{30240}+\frac{c1^4\,c2\,e2}{5040}-\\
&\frac{11\,c1^2\,c2^2\,e2}{60480}-\frac{c2^3\,e2}{6048}-\frac{c1^3\,c3\,e2}{12096}-\frac{11\,c1\,c2\,c3\,e2}{60480}+\frac{c3^2\,e2}{60480}+\frac{c1^2\,c4\,e2}{12096}+\frac{c2\,c4\,e2}{6720}+\\
&\frac{c1\,c5\,e2}{30240}-\frac{c6\,e2}{30240}+\frac{c1^3\,c2\,e1\,e2}{2880}-\frac{1}{960}\,c1\,c2^2\,e1\,e2-\frac{c1^2\,c3\,e1\,e2}{2880}+\frac{c1\,c4\,e1\,e2}{2880}+\\
&\frac{c1^4\,e1^2\,e2}{4320}-\frac{c1^2\,c2\,e1^2\,e2}{1080}-\frac{c2^2\,e1^2\,e2}{1440}-\frac{c1\,c3\,e1^2\,e2}{4320}+\frac{c4\,e1^2\,e2}{4320}-\frac{1}{576}\,c1\,c2\,e1^3\,e2-
\end{aligned}
$$

$$\frac{c1^2\,e1^4\,e2}{1440}-\frac{c2\,e1^4\,e2}{1440}-\frac{c1\,e1^5\,e2}{1440}-\frac{e1^6\,e2}{5040}-\frac{c1^4\,e2^2}{8640}+\frac{c1^2\,c2\,e2^2}{2160}+\frac{c2^2\,e2^2}{2880}+\frac{c1\,c3\,e2^2}{8640}-$$
$$\frac{c4\,e2^2}{8640}+\frac{1}{576}\,c1\,c2\,e1\,e2^2+\frac{1}{960}\,c1^2\,e1^2\,e2^2+\frac{1}{960}\,c2\,e1^2\,e2^2+\frac{1}{720}\,c1\,e1^3\,e2^2+$$
$$\frac{e1^4\,e2^2}{2016}-\frac{c1^2\,e2^3}{4320}-\frac{c2\,e2^3}{4320}-\frac{c1\,e1\,e2^3}{1440}-\frac{e1^2\,e2^3}{2520}+\frac{e2^4}{20\,160}-\frac{c1^3\,c2\,e3}{2880}+\frac{1}{960}\,c1\,c2^2\,e3+$$
$$\frac{c1^2\,c3\,e3}{2880}-\frac{c1\,c4\,e3}{2880}-\frac{c1^4\,e1\,e3}{4320}+\frac{c1^2\,c2\,e1\,e3}{1080}+\frac{c2^2\,e1\,e3}{1440}+\frac{c1\,c3\,e1\,e3}{4320}-\frac{c4\,e1\,e3}{4320}+$$
$$\frac{1}{576}\,c1\,c2\,e1^2\,e3+\frac{c1^2\,e1^3\,e3}{1440}+\frac{c2\,e1^3\,e3}{1440}+\frac{c1\,e1^4\,e3}{1440}+\frac{e1^5\,e3}{5040}-\frac{1}{576}\,c1\,c2\,e2\,e3-$$
$$\frac{1}{720}\,c1^2\,e1\,e2\,e3-\frac{1}{720}\,c2\,e1\,e2\,e3-\frac{1}{480}\,c1\,e1^2\,e2\,e3-\frac{e1^3\,e2\,e3}{1260}+\frac{c1\,e2^2\,e3}{1440}+$$
$$\frac{e1\,e2^2\,e3}{1680}+\frac{c1^2\,e3^2}{2880}+\frac{c2\,e3^2}{2880}+\frac{c1\,e1\,e3^2}{1440}+\frac{e1^2\,e3^2}{3360}-\frac{e2\,e3^2}{5040}+\frac{c1^4\,e4}{4320}-\frac{c1^2\,c2\,e4}{1080}-$$
$$\frac{c2^2\,e4}{1440}-\frac{c1\,c3\,e4}{4320}+\frac{c4\,e4}{4320}-\frac{1}{576}\,c1\,c2\,e1\,e4-\frac{c1^2\,e1^2\,e4}{1440}-\frac{c2\,e1^2\,e4}{1440}-\frac{c1\,e1^3\,e4}{1440}-$$
$$\frac{e1^4\,e4}{5040}+\frac{c1^2\,e2\,e4}{1440}+\frac{c2\,e2\,e4}{1440}+\frac{1}{720}\,c1\,e1\,e2\,e4+\frac{e1^2\,e2\,e4}{1680}-\frac{e2^2\,e4}{5040}-\frac{c1\,e3\,e4}{1440}-$$
$$\frac{e1\,e3\,e4}{2520}+\frac{e4^2}{10\,080}+\frac{c1\,c2\,e5}{576}+\frac{c1^2\,e1\,e5}{1440}+\frac{c2\,e1\,e5}{1440}+\frac{c1\,e1^2\,e5}{1440}+\frac{e1^3\,e5}{5040}-\frac{c1\,e2\,e5}{1440}-$$
$$\frac{e1\,e2\,e5}{2520}+\frac{e3\,e5}{5040}-\frac{c1^2\,e6}{1440}-\frac{c2\,e6}{1440}-\frac{c1\,e1\,e6}{1440}-\frac{e1^2\,e6}{5040}+\frac{e2\,e6}{5040}+\frac{c1\,e7}{1440}+\frac{e1\,e7}{5040}-$$
$$\frac{e8}{5040}+\frac{c1^5\,c2\,H\,t}{2880}-\frac{1}{576}\,c1^3\,c2^2\,H\,t+\frac{1}{576}\,c1\,c2^3\,H\,t-\frac{c1^4\,c3\,H\,t}{2880}+\frac{11\,c1^2\,c2\,c3\,H\,t}{5760}-$$
$$\frac{c1\,c3^2\,H\,t}{5760}+\frac{c1^3\,c4\,H\,t}{2880}-\frac{1}{640}\,c1\,c2\,c4\,H\,t-\frac{c1^2\,c5\,H\,t}{2880}+\frac{c1\,c6\,H\,t}{2880}+\frac{c1^6\,e1\,H\,t}{30\,240}-$$
$$\frac{c1^4\,c2\,e1\,H\,t}{5040}+\frac{11\,c1^2\,c2^2\,e1\,H\,t}{60\,480}+\frac{c2^3\,e1\,H\,t}{6048}+\frac{c1^3\,c3\,e1\,H\,t}{12\,096}+\frac{11\,c1\,c2\,c3\,e1\,H\,t}{60\,480}-$$
$$\frac{c3^2\,e1\,H\,t}{60\,480}-\frac{c1^2\,c4\,e1\,H\,t}{12\,096}-\frac{c2\,c4\,e1\,H\,t}{6720}-\frac{c1\,c5\,e1\,H\,t}{30\,240}+\frac{c6\,e1\,H\,t}{30\,240}-\frac{c1^3\,c2\,e1^2\,H\,t}{2880}+$$
$$\frac{1}{960}\,c1\,c2^2\,e1^2\,H\,t+\frac{c1^2\,c3\,e1^2\,H\,t}{2880}-\frac{c1\,c4\,e1^2\,H\,t}{2880}-\frac{c1^4\,e1^3\,H\,t}{4320}+\frac{c1^2\,c2\,e1^3\,H\,t}{1080}+$$
$$\frac{c2^2\,e1^3\,H\,t}{1440}+\frac{c1\,c3\,e1^3\,H\,t}{4320}-\frac{c4\,e1^3\,H\,t}{4320}+\frac{1}{576}\,c1\,c2\,e1^4\,H\,t+\frac{c1^2\,e1^5\,H\,t}{1440}+\frac{c2\,e1^5\,H\,t}{1440}+$$
$$\frac{c1\,e1^6\,H\,t}{1440}+\frac{e1^7\,H\,t}{5040}+\frac{c1^3\,c2\,e2\,H\,t}{1440}-\frac{1}{480}\,c1\,c2^2\,e2\,H\,t-\frac{c1^2\,c3\,e2\,H\,t}{1440}+\frac{c1\,c4\,e2\,H\,t}{1440}+$$
$$\frac{c1^4\,e1\,e2\,H\,t}{1440}-\frac{1}{360}\,c1^2\,c2\,e1\,e2\,H\,t-\frac{1}{480}\,c2^2\,e1\,e2\,H\,t-\frac{c1\,c3\,e1\,e2\,H\,t}{1440}+\frac{c4\,e1\,e2\,H\,t}{1440}-$$
$$\frac{1}{144}\,c1\,c2\,e1^2\,e2\,H\,t-\frac{1}{288}\,c1^2\,e1^3\,e2\,H\,t-\frac{1}{288}\,c2\,e1^3\,e2\,H\,t-\frac{1}{240}\,c1\,e1^4\,e2\,H\,t-$$
$$\frac{1}{720}\,e1^5\,e2\,H\,t+\frac{1}{288}\,c1\,c2\,e2^2\,H\,t+\frac{1}{288}\,c1^2\,e1\,e2^2\,H\,t+\frac{1}{288}\,c2\,e1\,e2^2\,H\,t+$$
$$\frac{1}{160}\,c1\,e1^2\,e2^2\,H\,t+\frac{1}{360}\,e1^3\,e2^2\,H\,t-\frac{1}{720}\,c1\,e2^3\,H\,t-\frac{1}{720}\,e1\,e2^3\,H\,t-\frac{c1^4\,e3\,H\,t}{1440}+$$

$$\frac{1}{360} c1^2 c2 e3 H t + \frac{1}{480} c2^2 e3 H t + \frac{c1 c3 e3 H t}{1440} - \frac{c4 e3 H t}{1440} + \frac{1}{144} c1 c2 e1 e3 H t +$$
$$\frac{1}{288} c1^2 e1^2 e3 H t + \frac{1}{288} c2 e1^2 e3 H t + \frac{1}{240} c1 e1^3 e3 H t + \frac{1}{720} e1^4 e3 H t -$$
$$\frac{1}{288} c1^2 e2 e3 H t - \frac{1}{288} c2 e2 e3 H t - \frac{1}{120} c1 e1 e2 e3 H t - \frac{1}{240} e1^2 e2 e3 H t +$$
$$\frac{1}{720} e2^2 e3 H t + \frac{1}{480} c1 e3^2 H t + \frac{1}{720} e1 e3^2 H t - \frac{1}{144} c1 c2 e4 H t - \frac{1}{288} c1^2 e1 e4 H t -$$
$$\frac{1}{288} c2 e1 e4 H t - \frac{1}{240} c1 e1^2 e4 H t - \frac{1}{720} e1^3 e4 H t + \frac{1}{240} c1 e2 e4 H t +$$
$$\frac{1}{360} e1 e2 e4 H t - \frac{1}{720} e3 e4 H t + \frac{1}{288} c1^2 e5 H t + \frac{1}{288} c2 e5 H t + \frac{1}{240} c1 e1 e5 H t +$$
$$\frac{1}{720} e1^2 e5 H t - \frac{1}{720} e2 e5 H t - \frac{1}{240} c1 e6 H t - \frac{1}{720} e1 e6 H t + \frac{e7 H t}{720} + \frac{c1^6 H^2 t^2}{2880} -$$
$$\frac{1}{480} c1^4 c2 H^2 t^2 + \frac{11 c1^2 c2^2 H^2 t^2}{5760} + \frac{1}{576} c2^3 H^2 t^2 + \frac{c1^3 c3 H^2 t^2}{1152} + \frac{11 c1 c2 c3 H^2 t^2}{5760} -$$
$$\frac{c3^2 H^2 t^2}{5760} - \frac{c1^2 c4 H^2 t^2}{1152} - \frac{1}{640} c2 c4 H^2 t^2 - \frac{c1 c5 H^2 t^2}{2880} + \frac{c6 H^2 t^2}{2880} - \frac{c1^3 c2 e1 H^2 t^2}{2880} +$$
$$\frac{1}{960} c1 c2^2 e1 H^2 t^2 + \frac{c1^2 c3 e1 H^2 t^2}{2880} - \frac{c1 c4 e1 H^2 t^2}{2880} - \frac{c1^4 e1^2 H^2 t^2}{2880} + \frac{1}{720} c1^2 c2 e1^2 H^2 t^2 +$$
$$\frac{1}{960} c2^2 e1^2 H^2 t^2 + \frac{c1 c3 e1^2 H^2 t^2}{2880} - \frac{c4 e1^2 H^2 t^2}{2880} + \frac{1}{288} c1 c2 e1^3 H^2 t^2 + \frac{1}{576} c1^2 e1^4 H^2 t^2 +$$
$$\frac{1}{576} c2 e1^4 H^2 t^2 + \frac{1}{480} c1 e1^5 H^2 t^2 + \frac{e1^6 H^2 t^2}{1440} + \frac{c1^4 e2 H^2 t^2}{1440} - \frac{1}{360} c1^2 c2 e2 H^2 t^2 -$$
$$\frac{1}{480} c2^2 e2 H^2 t^2 - \frac{c1 c3 e2 H^2 t^2}{1440} + \frac{c4 e2 H^2 t^2}{1440} - \frac{1}{96} c1 c2 e1 e2 H^2 t^2 - \frac{1}{144} c1^2 e1^2 e2 H^2 t^2 -$$
$$\frac{1}{144} c2 e1^2 e2 H^2 t^2 - \frac{1}{96} c1 e1^3 e2 H^2 t^2 - \frac{1}{240} e1^4 e2 H^2 t^2 + \frac{1}{288} c1^2 e2^2 H^2 t^2 +$$
$$\frac{1}{288} c2 e2^2 H^2 t^2 + \frac{1}{96} c1 e1 e2^2 H^2 t^2 + \frac{1}{160} e1^2 e2^2 H^2 t^2 - \frac{1}{720} e2^3 H^2 t^2 + \frac{1}{96} c1 c2 e3 H^2 t^2 +$$
$$\frac{1}{144} c1^2 e1 e3 H^2 t^2 + \frac{1}{144} c2 e1 e3 H^2 t^2 + \frac{1}{96} c1 e1^2 e3 H^2 t^2 + \frac{1}{240} e1^3 e3 H^2 t^2 -$$
$$\frac{1}{96} c1 e2 e3 H^2 t^2 - \frac{1}{120} e1 e2 e3 H^2 t^2 + \frac{1}{480} e3^2 H^2 t^2 - \frac{1}{144} c1^2 e4 H^2 t^2 - \frac{1}{144} c2 e4 H^2 t^2 -$$
$$\frac{1}{96} c1 e1 e4 H^2 t^2 - \frac{1}{240} e1^2 e4 H^2 t^2 + \frac{1}{240} e2 e4 H^2 t^2 + \frac{1}{96} c1 e5 H^2 t^2 + \frac{1}{240} e1 e5 H^2 t^2 -$$
$$\frac{1}{240} e6 H^2 t^2 - \frac{7 c1^3 c2 H^3 t^3}{2880} + \frac{7}{960} c1 c2^2 H^3 t^3 + \frac{7 c1^2 c3 H^3 t^3}{2880} - \frac{7 c1 c4 H^3 t^3}{2880} -$$
$$\frac{c1^4 e1 H^3 t^3}{4320} + \frac{c1^2 c2 e1 H^3 t^3}{1080} + \frac{c2^2 e1 H^3 t^3}{1440} + \frac{c1 c3 e1 H^3 t^3}{4320} - \frac{c4 e1 H^3 t^3}{4320} +$$
$$\frac{1}{288} c1 c2 e1^2 H^3 t^3 + \frac{1}{432} c1^2 e1^3 H^3 t^3 + \frac{1}{432} c2 e1^3 H^3 t^3 + \frac{1}{288} c1 e1^4 H^3 t^3 +$$
$$\frac{1}{720} e1^5 H^3 t^3 - \frac{1}{144} c1 c2 e2 H^3 t^3 - \frac{1}{144} c1^2 e1 e2 H^3 t^3 - \frac{1}{144} c2 e1 e2 H^3 t^3 -$$
$$\frac{1}{72} c1 e1^2 e2 H^3 t^3 - \frac{1}{144} e1^3 e2 H^3 t^3 + \frac{1}{144} c1 e2^2 H^3 t^3 + \frac{1}{144} e1 e2^2 H^3 t^3 +$$

$$\frac{1}{144} c1^2 e3 H^3 t^3 + \frac{1}{144} c2 e3 H^3 t^3 + \frac{1}{72} c1 e1 e3 H^3 t^3 + \frac{1}{144} e1^2 e3 H^3 t^3 - \frac{1}{144} e2 e3 H^3 t^3 - \frac{1}{72} c1 e4 H^3 t^3 - \frac{1}{144} e1 e4 H^3 t^3 + \frac{1}{144} e5 H^3 t^3 - \frac{7 c1^4 H^4 t^4}{5760} + \frac{7 c1^2 c2 H^4 t^4}{1440} + \frac{7 c2^2 H^4 t^4}{1920} + \frac{7 c1 c3 H^4 t^4}{5760} - \frac{7 c4 H^4 t^4}{5760} + \frac{1}{576} c1 c2 e1 H^4 t^4 + \frac{1}{576} c1^2 e1^2 H^4 t^4 + \frac{1}{576} c2 e1^2 H^4 t^4 + \frac{1}{288} c1 e1^3 H^4 t^4 + \frac{1}{576} e1^4 H^4 t^4 - \frac{1}{288} c1^2 e2 H^4 t^4 - \frac{1}{288} c2 e2 H^4 t^4 - \frac{1}{96} c1 e1 e2 H^4 t^4 - \frac{1}{144} e1^2 e2 H^4 t^4 + \frac{1}{288} e2^2 H^4 t^4 + \frac{1}{96} c1 e3 H^4 t^4 + \frac{1}{144} e1 e3 H^4 t^4 - \frac{1}{144} e4 H^4 t^4 + \frac{7}{960} c1 c2 H^5 t^5 + \frac{c1^2 e1 H^5 t^5}{1440} + \frac{c2 e1 H^5 t^5}{1440} + \frac{1}{480} c1 e1^2 H^5 t^5 + \frac{1}{720} e1^3 H^5 t^5 - \frac{1}{240} c1 e2 H^5 t^5 - \frac{1}{240} e1 e2 H^5 t^5 + \frac{1}{240} e3 H^5 t^5 + \frac{7 c1^2 H^6 t^6}{2880} + \frac{7 c2 H^6 t^6}{2880} + \frac{c1 e1 H^6 t^6}{1440} + \frac{e1^2 H^6 t^6}{1440} - \frac{1}{720} e2 H^6 t^6 + \frac{1}{480} c1 H^7 t^7 + \frac{e1 H^7 t^7}{5040} + \frac{H^8 t^8}{1920}$$

In[73]:=
```
Expand[%71 /. {d1 → e1 + Binomial[35, 34] * t * H,
  d2 → e2 + Binomial[34, 33] * e1 * t * H + Binomial[35, 33] * t^2 * H^2,
  d3 → e3 + Binomial[33, 32] * e2 * t * H +
    Binomial[34, 32] * e1 * t^2 * H^2 + Binomial[35, 32] * t^3 * H^3,
  d4 → e4 + Binomial[32, 31] * e3 * t * H + Binomial[33, 31] * e2 * t^2 * H^2 +
    Binomial[34, 31] * e1 * t^3 * H^3 + Binomial[35, 31] * t^4 * H^4,
  d5 → e5 + Binomial[31, 30] * e4 * t * H + Binomial[32, 30] * e3 * t^2 * H^2 +
    Binomial[33, 30] * e2 * t^3 * H^3 +
    Binomial[34, 30] * e1 * t^4 * H^4 + Binomial[35, 30] * t^5 * H^5,
  d6 → e6 + Binomial[30, 29] * e5 * t * H + Binomial[31, 29] * e4 * t^2 * H^2 +
    Binomial[32, 29] * e3 * t^3 * H^3 + Binomial[33, 29] * e2 * t^4 * H^4 +
    Binomial[34, 29] * e1 * t^5 * H^5 + Binomial[35, 29] * t^6 * H^6,
  d7 → e7 + Binomial[29, 28] * e6 * t * H + Binomial[30, 28] * e5 * t^2 * H^2 +
    Binomial[31, 28] * e4 * t^3 * H^3 +
    Binomial[32, 28] * e3 * t^4 * H^4 + Binomial[33, 28] * e2 * t^5 * H^5 +
    Binomial[34, 28] * e1 * t^6 * H^6 + Binomial[35, 28] * t^7 * H^7,
  d8 → e8 + Binomial[28, 27] * e7 * t * H + Binomial[29, 27] * e6 * t^2 * H^2 +
    Binomial[30, 27] * e5 * t^3 * H^3 + Binomial[31, 27] * e4 * t^4 * H^4 +
    Binomial[32, 27] * e3 * t^5 * H^5 + Binomial[33, 27] * e2 * t^6 * H^6 +
    Binomial[34, 27] * e1 * t^7 * H^7 + Binomial[35, 27] * t^8 * H^8}]
```

Out[73]=

$$-\frac{c1^8}{34560} + \frac{c1^6 c2}{4320} - \frac{5 c1^4 c2^2}{10368} + \frac{c1^2 c2^3}{12960} + \frac{7 c2^4}{34560} - \frac{7 c1^5 c3}{51840} + \frac{13 c1^3 c2 c3}{51840} + \frac{5 c1 c2^2 c3}{10368} + \frac{c1^2 c3^2}{34560} - \frac{c2 c3^2}{12960} + \frac{7 c1^4 c4}{51840} - \frac{19 c1^2 c2 c4}{103680} - \frac{17 c2^2 c4}{51840} - \frac{13 c1 c3 c4}{103680} + \frac{c4^2}{20736} - \frac{7 c1^3 c5}{103680} - \frac{c1 c2 c5}{6480} + \frac{c3 c5}{34560} + \frac{7 c1^2 c6}{103680} + \frac{13 c2 c6}{103680} + \frac{c1 c7}{34560} - \frac{c8}{34560} + \frac{c1^5 c2 e1}{60480} - \frac{c1^3 c2^2 e1}{12096} + \frac{c1 c2^3 e1}{12096} - \frac{c1^4 c3 e1}{60480} + \frac{11 c1^2 c2 c3 e1}{120960} - \frac{c1 c3^2 e1}{120960} + \frac{c1^3 c4 e1}{60480} - \frac{c1 c2 c4 e1}{13440} -$$

$$\frac{c1^2\,c5\,e1}{60480}+\frac{c1\,c6\,e1}{60480}+\frac{c1^6\,e1^2}{60480}-\frac{c1^4\,c2\,e1^2}{10080}+\frac{11\,c1^2\,c2^2\,e1^2}{120960}+\frac{c2^3\,e1^2}{12096}+\frac{c1^3\,c3\,e1^2}{24192}+$$
$$\frac{11\,c1\,c2\,c3\,e1^2}{120960}-\frac{c3^2\,e1^2}{120960}-\frac{c1^2\,c4\,e1^2}{24192}-\frac{c2\,c4\,e1^2}{13440}-\frac{c1\,c5\,e1^2}{60480}+\frac{c6\,e1^2}{60480}-\frac{c1^3\,c2\,e1^3}{8640}+$$
$$\frac{c1\,c2^2\,e1^3}{2880}+\frac{c1^2\,c3\,e1^3}{8640}-\frac{c1\,c4\,e1^3}{8640}-\frac{c1^4\,e1^4}{17280}+\frac{c1^2\,c2\,e1^4}{4320}+\frac{c2^2\,e1^4}{5760}+\frac{c1\,c3\,e1^4}{17280}-$$
$$\frac{c4\,e1^4}{17280}+\frac{c1\,c2\,e1^5}{2880}+\frac{c1^2\,e1^6}{8640}+\frac{c2\,e1^6}{8640}+\frac{c1\,e1^7}{10080}+\frac{e1^8}{40320}-\frac{c1^6\,e2}{30240}+\frac{c1^4\,c2\,e2}{5040}-$$
$$\frac{11\,c1^2\,c2^2\,e2}{60480}-\frac{c2^3\,e2}{6048}-\frac{c1^3\,c3\,e2}{12096}-\frac{11\,c1\,c2\,c3\,e2}{60480}+\frac{c3^2\,e2}{60480}+\frac{c1^2\,c4\,e2}{12096}+\frac{c2\,c4\,e2}{6720}+$$
$$\frac{c1\,c5\,e2}{30240}-\frac{c6\,e2}{30240}+\frac{c1^3\,c2\,e1\,e2}{2880}-\frac{1}{960}\,c1\,c2^2\,e1\,e2-\frac{c1^2\,c3\,e1\,e2}{2880}+\frac{c1\,c4\,e1\,e2}{2880}+$$
$$\frac{c1^4\,e1^2\,e2}{4320}-\frac{c1^2\,c2\,e1^2\,e2}{1080}-\frac{c2^2\,e1^2\,e2}{1440}-\frac{c1\,c3\,e1^2\,e2}{4320}+\frac{c4\,e1^2\,e2}{4320}-\frac{1}{576}\,c1\,c2\,e1^3\,e2-$$
$$\frac{c1^2\,e1^4\,e2}{1440}-\frac{c2\,e1^4\,e2}{1440}-\frac{c1\,e1^5\,e2}{1440}-\frac{e1^6\,e2}{5040}-\frac{c1^4\,e2^2}{8640}+\frac{c1^2\,c2\,e2^2}{2160}+\frac{c2^2\,e2^2}{2880}+\frac{c1\,c3\,e2^2}{8640}-$$
$$\frac{c4\,e2^2}{8640}+\frac{1}{576}\,c1\,c2\,e1\,e2^2+\frac{1}{960}\,c1^2\,e1^2\,e2^2+\frac{1}{960}\,c2\,e1^2\,e2^2+\frac{1}{720}\,c1\,e1^3\,e2^2+$$
$$\frac{e1^4\,e2^2}{2016}-\frac{c1^2\,e2^3}{4320}-\frac{c2\,e2^3}{4320}-\frac{c1\,e1\,e2^3}{1440}-\frac{e1^2\,e2^3}{2520}+\frac{e2^4}{20160}-\frac{c1^3\,c2\,e3}{2880}+\frac{1}{960}\,c1\,c2^2\,e3+$$
$$\frac{c1^2\,c3\,e3}{2880}-\frac{c1\,c4\,e3}{2880}-\frac{c1^4\,e1\,e3}{4320}+\frac{c1^2\,c2\,e1\,e3}{1080}+\frac{c2^2\,e1\,e3}{1440}+\frac{c1\,c3\,e1\,e3}{4320}-\frac{c4\,e1\,e3}{4320}+$$
$$\frac{1}{576}\,c1\,c2\,e1^2\,e3+\frac{c1^2\,e1^3\,e3}{1440}+\frac{c2\,e1^3\,e3}{1440}+\frac{c1\,e1^4\,e3}{1440}+\frac{e1^5\,e3}{5040}-\frac{1}{576}\,c1\,c2\,e2\,e3-$$
$$\frac{1}{720}\,c1^2\,e1\,e2\,e3-\frac{1}{720}\,c2\,e1\,e2\,e3-\frac{1}{480}\,c1\,e1^2\,e2\,e3-\frac{e1^3\,e2\,e3}{1260}+\frac{c1\,e2^2\,e3}{1440}+$$
$$\frac{e1\,e2^2\,e3}{1680}+\frac{c1^2\,e3^2}{2880}+\frac{c2\,e3^2}{2880}+\frac{c1\,e1\,e3^2}{1440}+\frac{e1^2\,e3^2}{3360}-\frac{e2\,e3^2}{5040}+\frac{c1^4\,e4}{4320}-\frac{c1^2\,c2\,e4}{1080}-$$
$$\frac{c2^2\,e4}{1440}-\frac{c1\,c3\,e4}{4320}+\frac{c4\,e4}{4320}-\frac{1}{576}\,c1\,c2\,e1\,e4-\frac{c1^2\,e1^2\,e4}{1440}-\frac{c2\,e1^2\,e4}{1440}-\frac{c1\,e1^3\,e4}{1440}-$$
$$\frac{e1^4\,e4}{5040}+\frac{c1^2\,e2\,e4}{1440}+\frac{c2\,e2\,e4}{1440}+\frac{1}{720}\,c1\,e1\,e2\,e4+\frac{e1^2\,e2\,e4}{1680}-\frac{e2^2\,e4}{5040}-\frac{c1\,e3\,e4}{1440}-$$
$$\frac{e1\,e3\,e4}{2520}+\frac{e4^2}{10080}+\frac{c1\,c2\,e5}{576}+\frac{c1^2\,e1\,e5}{1440}+\frac{c2\,e1\,e5}{1440}+\frac{c1\,e1^2\,e5}{1440}+\frac{e1^3\,e5}{5040}-\frac{c1\,e2\,e5}{1440}-$$
$$\frac{e1\,e2\,e5}{2520}+\frac{e3\,e5}{5040}-\frac{c1^2\,e6}{1440}-\frac{c2\,e6}{1440}-\frac{c1\,e1\,e6}{1440}-\frac{e1^2\,e6}{5040}+\frac{e2\,e6}{5040}+\frac{c1\,e7}{1440}+\frac{e1\,e7}{5040}-$$
$$\frac{e8}{5040}+\frac{c1^5\,c2\,H\,t}{1728}-\frac{5\,c1^3\,c2^2\,H\,t}{1728}+\frac{5\,c1\,c2^3\,H\,t}{1728}-\frac{c1^4\,c3\,H\,t}{1728}+\frac{11\,c1^2\,c2\,c3\,H\,t}{3456}-$$
$$\frac{c1\,c3^2\,H\,t}{3456}+\frac{c1^3\,c4\,H\,t}{1728}-\frac{1}{384}\,c1\,c2\,c4\,H\,t-\frac{c1^2\,c5\,H\,t}{1728}+\frac{c1\,c6\,H\,t}{1728}+\frac{c1^6\,e1\,H\,t}{30240}-$$
$$\frac{c1^4\,c2\,e1\,H\,t}{5040}+\frac{11\,c1^2\,c2^2\,e1\,H\,t}{60480}+\frac{c2^3\,e1\,H\,t}{6048}+\frac{c1^3\,c3\,e1\,H\,t}{12096}+\frac{11\,c1\,c2\,c3\,e1\,H\,t}{60480}-$$
$$\frac{c3^2\,e1\,H\,t}{60480}-\frac{c1^2\,c4\,e1\,H\,t}{12096}-\frac{c2\,c4\,e1\,H\,t}{6720}-\frac{c1\,c5\,e1\,H\,t}{30240}+\frac{c6\,e1\,H\,t}{30240}-\frac{c1^3\,c2\,e1^2\,H\,t}{2880}+$$

$$\frac{1}{960} c1\, c2^2\, e1^2\, H\, t + \frac{c1^2\, c3\, e1^2\, H\, t}{2880} - \frac{c1\, c4\, e1^2\, H\, t}{2880} - \frac{c1^4\, e1^3\, H\, t}{4320} + \frac{c1^2\, c2\, e1^3\, H\, t}{1080} +$$
$$\frac{c2^2\, e1^3\, H\, t}{1440} + \frac{c1\, c3\, e1^3\, H\, t}{4320} - \frac{c4\, e1^3\, H\, t}{4320} + \frac{1}{576} c1\, c2\, e1^4\, H\, t + \frac{c1^2\, e1^5\, H\, t}{1440} + \frac{c2\, e1^5\, H\, t}{1440} +$$
$$\frac{c1\, e1^6\, H\, t}{1440} + \frac{e1^7\, H\, t}{5040} + \frac{c1^3\, c2\, e2\, H\, t}{1440} - \frac{1}{480} c1\, c2^2\, e2\, H\, t - \frac{c1^2\, c3\, e2\, H\, t}{1440} + \frac{c1\, c4\, e2\, H\, t}{1440} +$$
$$\frac{c1^4\, e1\, e2\, H\, t}{1440} - \frac{1}{360} c1^2\, c2\, e1\, e2\, H\, t - \frac{1}{480} c2^2\, e1\, e2\, H\, t - \frac{c1\, c3\, e1\, e2\, H\, t}{1440} + \frac{c4\, e1\, e2\, H\, t}{1440} -$$
$$\frac{1}{144} c1\, c2\, e1^2\, e2\, H\, t - \frac{1}{288} c1^2\, e1^3\, e2\, H\, t - \frac{1}{288} c2\, e1^3\, e2\, H\, t - \frac{1}{240} c1\, e1^4\, e2\, H\, t -$$
$$\frac{1}{720} e1^5\, e2\, H\, t + \frac{1}{288} c1\, c2\, e2^2\, H\, t + \frac{1}{288} c1^2\, e1\, e2^2\, H\, t + \frac{1}{288} c2\, e1\, e2^2\, H\, t +$$
$$\frac{1}{160} c1\, e1^2\, e2^2\, H\, t + \frac{1}{360} e1^3\, e2^2\, H\, t - \frac{1}{720} c1\, e2^3\, H\, t - \frac{1}{720} e1\, e2^3\, H\, t - \frac{c1^4\, e3\, H\, t}{1440} +$$
$$\frac{1}{360} c1^2\, c2\, e3\, H\, t + \frac{1}{480} c2^2\, e3\, H\, t + \frac{c1\, c3\, e3\, H\, t}{1440} - \frac{c4\, e3\, H\, t}{1440} + \frac{1}{144} c1\, c2\, e1\, e3\, H\, t +$$
$$\frac{1}{288} c1^2\, e1^2\, e3\, H\, t + \frac{1}{288} c2\, e1^2\, e3\, H\, t + \frac{1}{240} c1\, e1^3\, e3\, H\, t + \frac{1}{720} e1^4\, e3\, H\, t -$$
$$\frac{1}{288} c1^2\, e2\, e3\, H\, t - \frac{1}{288} c2\, e2\, e3\, H\, t - \frac{1}{120} c1\, e1\, e2\, e3\, H\, t - \frac{1}{240} e1^2\, e2\, e3\, H\, t +$$
$$\frac{1}{720} e2^2\, e3\, H\, t + \frac{1}{480} c1\, e3^2\, H\, t + \frac{1}{720} e1\, e3^2\, H\, t - \frac{1}{144} c1\, c2\, e4\, H\, t - \frac{1}{288} c1^2\, e1\, e4\, H\, t -$$
$$\frac{1}{288} c2\, e1\, e4\, H\, t - \frac{1}{240} c1\, e1^2\, e4\, H\, t - \frac{1}{720} e1^3\, e4\, H\, t + \frac{1}{240} c1\, e2\, e4\, H\, t +$$
$$\frac{1}{360} e1\, e2\, e4\, H\, t - \frac{1}{720} e3\, e4\, H\, t + \frac{1}{288} c1^2\, e5\, H\, t + \frac{1}{288} c2\, e5\, H\, t + \frac{1}{240} c1\, e1\, e5\, H\, t +$$
$$\frac{1}{720} e1^2\, e5\, H\, t - \frac{1}{720} e2\, e5\, H\, t - \frac{1}{240} c1\, e6\, H\, t - \frac{1}{720} e1\, e6\, H\, t + \frac{e7\, H\, t}{720} + \frac{c1^6\, H^2\, t^2}{1728} -$$
$$\frac{1}{288} c1^4\, c2\, H^2\, t^2 + \frac{11\, c1^2\, c2^2\, H^2\, t^2}{3456} + \frac{5\, c2^3\, H^2\, t^2}{1728} + \frac{5\, c1^3\, c3\, H^2\, t^2}{3456} + \frac{11\, c1\, c2\, c3\, H^2\, t^2}{3456} -$$
$$\frac{c3^2\, H^2\, t^2}{3456} - \frac{5\, c1^2\, c4\, H^2\, t^2}{3456} - \frac{1}{384} c2\, c4\, H^2\, t^2 - \frac{c1\, c5\, H^2\, t^2}{1728} + \frac{c6\, H^2\, t^2}{1728} - \frac{c1^3\, c2\, e1\, H^2\, t^2}{2880} +$$
$$\frac{1}{960} c1\, c2^2\, e1\, H^2\, t^2 + \frac{c1^2\, c3\, e1\, H^2\, t^2}{2880} - \frac{c1\, c4\, e1\, H^2\, t^2}{2880} - \frac{c1^4\, e1^2\, H^2\, t^2}{2880} + \frac{1}{720} c1^2\, c2\, e1^2\, H^2\, t^2 +$$
$$\frac{1}{960} c2^2\, e1^2\, H^2\, t^2 + \frac{c1\, c3\, e1^2\, H^2\, t^2}{2880} - \frac{c4\, e1^2\, H^2\, t^2}{2880} + \frac{1}{288} c1\, c2\, e1^3\, H^2\, t^2 + \frac{1}{576} c1^2\, e1^4\, H^2\, t^2 +$$
$$\frac{1}{576} c2\, e1^4\, H^2\, t^2 + \frac{1}{480} c1\, e1^5\, H^2\, t^2 + \frac{e1^6\, H^2\, t^2}{1440} + \frac{c1^4\, e2\, H^2\, t^2}{1440} - \frac{1}{360} c1^2\, c2\, e2\, H^2\, t^2 -$$
$$\frac{1}{480} c2^2\, e2\, H^2\, t^2 - \frac{c1\, c3\, e2\, H^2\, t^2}{1440} + \frac{c4\, e2\, H^2\, t^2}{1440} - \frac{1}{96} c1\, c2\, e1\, e2\, H^2\, t^2 - \frac{1}{144} c1^2\, e1^2\, e2\, H^2\, t^2 -$$
$$\frac{1}{144} c2\, e1^2\, e2\, H^2\, t^2 - \frac{1}{96} c1\, e1^3\, e2\, H^2\, t^2 - \frac{1}{240} e1^4\, e2\, H^2\, t^2 + \frac{1}{288} c1^2\, e2^2\, H^2\, t^2 +$$
$$\frac{1}{288} c2\, e2^2\, H^2\, t^2 + \frac{1}{96} c1\, e1\, e2^2\, H^2\, t^2 + \frac{1}{160} e1^2\, e2^2\, H^2\, t^2 - \frac{1}{720} e2^3\, H^2\, t^2 + \frac{1}{96} c1\, c2\, e3\, H^2\, t^2 +$$
$$\frac{1}{144} c1^2\, e1\, e3\, H^2\, t^2 + \frac{1}{144} c2\, e1\, e3\, H^2\, t^2 + \frac{1}{96} c1\, e1^2\, e3\, H^2\, t^2 + \frac{1}{240} e1^3\, e3\, H^2\, t^2 -$$

$$\frac{1}{96} c1\, e2\, e3\, H^2 t^2 - \frac{1}{120} e1\, e2\, e3\, H^2 t^2 + \frac{1}{480} e3^2 H^2 t^2 - \frac{1}{144} c1^2 e4\, H^2 t^2 - \frac{1}{144} c2\, e4\, H^2 t^2 -$$
$$\frac{1}{96} c1\, e1\, e4\, H^2 t^2 - \frac{1}{240} e1^2 e4\, H^2 t^2 + \frac{1}{240} e2\, e4\, H^2 t^2 + \frac{1}{96} c1\, e5\, H^2 t^2 + \frac{1}{240} e1\, e5\, H^2 t^2 -$$
$$\frac{1}{240} e6\, H^2 t^2 - \frac{7\, c1^3\, c2\, H^3 t^3}{1728} + \frac{7}{576} c1\, c2^2 H^3 t^3 + \frac{7\, c1^2\, c3\, H^3 t^3}{1728} - \frac{7\, c1\, c4\, H^3 t^3}{1728} -$$
$$\frac{c1^4\, e1\, H^3 t^3}{4320} + \frac{c1^2\, c2\, e1\, H^3 t^3}{1080} + \frac{c2^2\, e1\, H^3 t^3}{1440} + \frac{c1\, c3\, e1\, H^3 t^3}{4320} - \frac{c4\, e1\, H^3 t^3}{4320} +$$
$$\frac{1}{288} c1\, c2\, e1^2 H^3 t^3 + \frac{1}{432} c1^2 e1^3 H^3 t^3 + \frac{1}{432} c2\, e1^3 H^3 t^3 + \frac{1}{288} c1\, e1^4 H^3 t^3 +$$
$$\frac{1}{720} e1^5 H^3 t^3 - \frac{1}{144} c1\, c2\, e2\, H^3 t^3 - \frac{1}{144} c1^2 e1\, e2\, H^3 t^3 - \frac{1}{144} c2\, e1\, e2\, H^3 t^3 -$$
$$\frac{1}{72} c1\, e1^2 e2\, H^3 t^3 - \frac{1}{144} e1^3 e2\, H^3 t^3 + \frac{1}{144} c1\, e2^2 H^3 t^3 + \frac{1}{144} e1\, e2^2 H^3 t^3 +$$
$$\frac{1}{144} c1^2 e3\, H^3 t^3 + \frac{1}{144} c2\, e3\, H^3 t^3 + \frac{1}{72} c1\, e1\, e3\, H^3 t^3 + \frac{1}{144} e1^2 e3\, H^3 t^3 - \frac{1}{144} e2\, e3\, H^3 t^3 -$$
$$\frac{1}{72} c1\, e4\, H^3 t^3 - \frac{1}{144} e1\, e4\, H^3 t^3 + \frac{1}{144} e5\, H^3 t^3 - \frac{7\, c1^4 H^4 t^4}{3456} + \frac{7}{864} c1^2 c2\, H^4 t^4 +$$
$$\frac{7\, c2^2 H^4 t^4}{1152} + \frac{7\, c1\, c3\, H^4 t^4}{3456} - \frac{7\, c4\, H^4 t^4}{3456} + \frac{1}{576} c1\, c2\, e1\, H^4 t^4 + \frac{1}{576} c1^2 e1^2 H^4 t^4 +$$
$$\frac{1}{576} c2\, e1^2 H^4 t^4 + \frac{1}{288} c1\, e1^3 H^4 t^4 + \frac{1}{576} e1^4 H^4 t^4 - \frac{1}{288} c1^2 e2\, H^4 t^4 - \frac{1}{288} c2\, e2\, H^4 t^4 -$$
$$\frac{1}{96} c1\, e1\, e2\, H^4 t^4 - \frac{1}{144} e1^2 e2\, H^4 t^4 + \frac{1}{288} e2^2 H^4 t^4 + \frac{1}{96} c1\, e3\, H^4 t^4 + \frac{1}{144} e1\, e3\, H^4 t^4 -$$
$$\frac{1}{144} e4\, H^4 t^4 + \frac{7}{576} c1\, c2\, H^5 t^5 + \frac{c1^2\, e1\, H^5 t^5}{1440} + \frac{c2\, e1\, H^5 t^5}{1440} + \frac{1}{480} c1\, e1^2 H^5 t^5 +$$
$$\frac{1}{720} e1^3 H^5 t^5 - \frac{1}{240} c1\, e2\, H^5 t^5 - \frac{1}{240} e1\, e2\, H^5 t^5 + \frac{1}{240} e3\, H^5 t^5 + \frac{7\, c1^2 H^6 t^6}{1728} +$$
$$\frac{7\, c2\, H^6 t^6}{1728} + \frac{c1\, e1\, H^6 t^6}{1440} + \frac{e1^2 H^6 t^6}{1440} - \frac{1}{720} e2\, H^6 t^6 + \frac{1}{288} c1\, H^7 t^7 + \frac{e1\, H^7 t^7}{5040} + \frac{H^8 t^8}{1152}$$

In[74]:=
```
p1 =
Expand[%72 /. {e1 → k1, e2 → k2, e3 → k3, e4 → k4, e5 → k5, e6 → k6, e7 → k7, e8 → k8}]
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Out[74]=

$$-\frac{c1^8}{57600} + \frac{c1^6\, c2}{7200} - \frac{c1^4\, c2^2}{3456} + \frac{c1^2\, c2^3}{21600} + \frac{7\, c2^4}{57600} - \frac{7\, c1^5\, c3}{86400} + \frac{13\, c1^3\, c2\, c3}{86400} + \frac{c1\, c2^2\, c3}{3456} +$$
$$\frac{c1^2\, c3^2}{57600} - \frac{c2\, c3^2}{21600} + \frac{7\, c1^4\, c4}{86400} - \frac{19\, c1^2\, c2\, c4}{172800} - \frac{17\, c2^2\, c4}{86400} - \frac{13\, c1\, c3\, c4}{172800} + \frac{c4^2}{34560} -$$
$$\frac{7\, c1^3\, c5}{172800} - \frac{c1\, c2\, c5}{10800} + \frac{c3\, c5}{57600} + \frac{7\, c1^2\, c6}{172800} + \frac{13\, c2\, c6}{172800} + \frac{c1\, c7}{57600} - \frac{c8}{57600} + \frac{c1^5\, c2\, f1}{10080} -$$
$$\frac{c1^3\, c2^2\, f1}{2016} + \frac{c1\, c2^3\, f1}{2016} - \frac{c1^4\, c3\, f1}{10080} + \frac{11\, c1^2\, c2\, c3\, f1}{20160} - \frac{c1\, c3^2\, f1}{20160} + \frac{c1^3\, c4\, f1}{10080} -$$
$$\frac{c1\, c2\, c4\, f1}{2240} - \frac{c1^2\, c5\, f1}{10080} + \frac{c1\, c6\, f1}{10080} + \frac{c1^6\, f1^2}{10080} - \frac{c1^4\, c2\, f1^2}{1680} + \frac{11\, c1^2\, c2^2\, f1^2}{20160} + \frac{c2^3\, f1^2}{2016} +$$

$$\frac{c1^3\,c3\,f1^2}{4032}+\frac{11\,c1\,c2\,c3\,f1^2}{20\,160}-\frac{c3^2\,f1^2}{20\,160}-\frac{c1^2\,c4\,f1^2}{4032}-\frac{c2\,c4\,f1^2}{2240}-\frac{c1\,c5\,f1^2}{10\,080}+\frac{c6\,f1^2}{10\,080}-$$
$$\frac{c1^3\,c2\,f1^3}{1440}+\frac{1}{480}\,c1\,c2^2\,f1^3+\frac{c1^2\,c3\,f1^3}{1440}-\frac{c1\,c4\,f1^3}{1440}-\frac{c1^4\,f1^4}{2880}+\frac{1}{720}\,c1^2\,c2\,f1^4+$$
$$\frac{c2^2\,f1^4}{960}+\frac{c1\,c3\,f1^4}{2880}-\frac{c4\,f1^4}{2880}+\frac{1}{480}\,c1\,c2\,f1^5+\frac{c1^2\,f1^6}{1440}+\frac{c2\,f1^6}{1440}+\frac{c1\,f1^7}{1680}+\frac{f1^8}{6720}-$$
$$\frac{c1^6\,f2}{6048}+\frac{c1^4\,c2\,f2}{1008}-\frac{11\,c1^2\,c2^2\,f2}{12\,096}-\frac{5\,c2^3\,f2}{6048}-\frac{5\,c1^3\,c3\,f2}{12\,096}-\frac{11\,c1\,c2\,c3\,f2}{12\,096}+\frac{c3^2\,f2}{12\,096}+$$
$$\frac{5\,c1^2\,c4\,f2}{12\,096}+\frac{c2\,c4\,f2}{1344}+\frac{c1\,c5\,f2}{6048}-\frac{c6\,f2}{6048}+\frac{1}{576}\,c1^3\,c2\,f1\,f2-\frac{1}{192}\,c1\,c2^2\,f1\,f2-$$
$$\frac{1}{576}\,c1^2\,c3\,f1\,f2+\frac{1}{576}\,c1\,c4\,f1\,f2+\frac{1}{864}\,c1^4\,f1^2\,f2-\frac{1}{216}\,c1^2\,c2\,f1^2\,f2-\frac{1}{288}\,c2^2\,f1^2\,f2-$$
$$\frac{1}{864}\,c1\,c3\,f1^2\,f2+\frac{1}{864}\,c4\,f1^2\,f2-\frac{5}{576}\,c1\,c2\,f1^3\,f2-\frac{1}{288}\,c1^2\,f1^4\,f2-\frac{1}{288}\,c2\,f1^4\,f2-$$
$$\frac{1}{288}\,c1\,f1^5\,f2-\frac{f1^6\,f2}{1008}-\frac{c1^4\,f2^2}{1728}+\frac{1}{432}\,c1^2\,c2\,f2^2+\frac{c2^2\,f2^2}{576}+\frac{c1\,c3\,f2^2}{1728}-\frac{c4\,f2^2}{1728}+$$
$$\frac{5}{576}\,c1\,c2\,f1\,f2^2+\frac{1}{192}\,c1^2\,f1^2\,f2^2+\frac{1}{192}\,c2\,f1^2\,f2^2+\frac{1}{144}\,c1\,f1^3\,f2^2+\frac{5\,f1^4\,f2^2}{2016}-$$
$$\frac{c1^2\,f2^3}{864}-\frac{c2\,f2^3}{864}-\frac{1}{288}\,c1\,f1\,f2^3-\frac{f1^2\,f2^3}{504}+\frac{f2^4}{4032}-\frac{1}{960}\,c1^3\,c2\,f3+\frac{1}{320}\,c1\,c2^2\,f3+$$
$$\frac{1}{960}\,c1^2\,c3\,f3-\frac{c1\,c4\,f3}{960}-\frac{c1^4\,f1\,f3}{2160}+\frac{1}{540}\,c1^2\,c2\,f1\,f3+\frac{1}{720}\,c2^2\,f1\,f3+\frac{c1\,c3\,f1\,f3}{2160}-$$
$$\frac{c4\,f1\,f3}{2160}+\frac{1}{576}\,c1\,c2\,f1^2\,f3-\frac{c1\,f1^4\,f3}{1440}-\frac{f1^5\,f3}{2520}-\frac{1}{192}\,c1\,c2\,f2\,f3-\frac{1}{288}\,c1^2\,f1\,f2\,f3-$$
$$\frac{1}{288}\,c2\,f1\,f2\,f3-\frac{1}{240}\,c1\,f1^2\,f2\,f3-\frac{1}{840}\,f1^3\,f2\,f3+\frac{1}{480}\,c1\,f2^2\,f3+\frac{1}{630}\,f1\,f2^2\,f3+$$
$$\frac{c1^2\,f3^2}{576}+\frac{c2\,f3^2}{576}+\frac{1}{240}\,c1\,f1\,f3^2+\frac{11\,f1^2\,f3^2}{5040}-\frac{f2\,f3^2}{1008}-\frac{c1^4\,f4}{4320}+\frac{c1^2\,c2\,f4}{1080}+\frac{c2^2\,f4}{1440}+$$
$$\frac{c1\,c3\,f4}{4320}-\frac{c4\,f4}{4320}+\frac{5}{576}\,c1\,c2\,f1\,f4+\frac{1}{144}\,c1^2\,f1^2\,f4+\frac{1}{144}\,c2\,f1^2\,f4+\frac{1}{90}\,c1\,f1^3\,f4+$$
$$\frac{23\,f1^4\,f4}{5040}-\frac{1}{288}\,c1^2\,f2\,f4-\frac{c2\,f2\,f4}{288}-\frac{1}{80}\,c1\,f1\,f2\,f4-\frac{41\,f1^2\,f2\,f4}{5040}+\frac{f2^2\,f4}{560}-\frac{c1\,f3\,f4}{480}-$$
$$\frac{f1\,f3\,f4}{504}+\frac{19\,f4^2}{10\,080}-\frac{c1\,c2\,f5}{64}-\frac{1}{72}\,c1^2\,f1\,f5-\frac{c2\,f1\,f5}{72}-\frac{1}{40}\,c1\,f1^2\,f5-\frac{29\,f1^3\,f5}{2520}+$$
$$\frac{3\,c1\,f2\,f5}{160}+\frac{11\,f1\,f2\,f5}{630}-\frac{f3\,f5}{315}+\frac{5\,c1^2\,f6}{288}+\frac{5\,c2\,f6}{288}+\frac{17\,c1\,f1\,f6}{480}+\frac{31\,f1^2\,f6}{1680}-$$
$$\frac{79\,f2\,f6}{5040}-\frac{19\,c1\,f7}{480}-\frac{19\,f1\,f7}{840}+\frac{c1^5\,c2\,H\,t}{2880}-\frac{1}{576}\,c1^3\,c2^2\,H\,t+\frac{1}{576}\,c1\,c2^3\,H\,t-$$
$$\frac{c1^4\,c3\,H\,t}{2880}+\frac{11\,c1^2\,c2\,c3\,H\,t}{5760}-\frac{c1\,c3^2\,H\,t}{5760}+\frac{c1^3\,c4\,H\,t}{2880}-\frac{1}{640}\,c1\,c2\,c4\,H\,t-\frac{c1^2\,c5\,H\,t}{2880}+$$
$$\frac{c1\,c6\,H\,t}{2880}+\frac{c1^6\,f1\,H\,t}{5040}-\frac{1}{840}\,c1^4\,c2\,f1\,H\,t+\frac{11\,c1^2\,c2^2\,f1\,H\,t}{10\,080}+\frac{c2^3\,f1\,H\,t}{1008}+\frac{c1^3\,c3\,f1\,H\,t}{2016}+$$
$$\frac{11\,c1\,c2\,c3\,f1\,H\,t}{10\,080}-\frac{c3^2\,f1\,H\,t}{10\,080}-\frac{c1^2\,c4\,f1\,H\,t}{2016}-\frac{c2\,c4\,f1\,H\,t}{1120}-\frac{c1\,c5\,f1\,H\,t}{5040}+\frac{c6\,f1\,H\,t}{5040}-$$

$$\frac{1}{480} c1^3 c2 f1^2 H t + \frac{1}{160} c1 c2^2 f1^2 H t + \frac{1}{480} c1^2 c3 f1^2 H t - \frac{1}{480} c1 c4 f1^2 H t -$$
$$\frac{1}{720} c1^4 f1^3 H t + \frac{1}{180} c1^2 c2 f1^3 H t + \frac{1}{240} c2^2 f1^3 H t + \frac{1}{720} c1 c3 f1^3 H t -$$
$$\frac{1}{720} c4 f1^3 H t + \frac{1}{96} c1 c2 f1^4 H t + \frac{1}{240} c1^2 f1^5 H t + \frac{1}{240} c2 f1^5 H t + \frac{1}{240} c1 f1^6 H t +$$
$$\frac{1}{840} f1^7 H t + \frac{1}{288} c1^3 c2 f2 H t - \frac{1}{96} c1 c2^2 f2 H t - \frac{1}{288} c1^2 c3 f2 H t + \frac{1}{288} c1 c4 f2 H t +$$
$$\frac{1}{288} c1^4 f1 f2 H t - \frac{1}{72} c1^2 c2 f1 f2 H t - \frac{1}{96} c2^2 f1 f2 H t - \frac{1}{288} c1 c3 f1 f2 H t +$$
$$\frac{1}{288} c4 f1 f2 H t - \frac{5}{144} c1 c2 f1^2 f2 H t - \frac{5}{288} c1^2 f1^3 f2 H t - \frac{5}{288} c2 f1^3 f2 H t -$$
$$\frac{1}{48} c1 f1^4 f2 H t - \frac{1}{144} f1^5 f2 H t + \frac{5}{288} c1 c2 f2^2 H t + \frac{5}{288} c1^2 f1 f2^2 H t +$$
$$\frac{5}{288} c2 f1 f2^2 H t + \frac{1}{32} c1 f1^2 f2^2 H t + \frac{1}{72} f1^3 f2^2 H t - \frac{1}{144} c1 f2^3 H t - \frac{1}{144} f1 f2^3 H t -$$
$$\frac{1}{480} c1^4 f3 H t + \frac{1}{120} c1^2 c2 f3 H t + \frac{1}{160} c2^2 f3 H t + \frac{1}{480} c1 c3 f3 H t - \frac{1}{480} c4 f3 H t +$$
$$\frac{1}{72} c1 c2 f1 f3 H t + \frac{1}{288} c1^2 f1^2 f3 H t + \frac{1}{288} c2 f1^2 f3 H t - \frac{1}{720} f1^4 f3 H t -$$
$$\frac{1}{96} c1^2 f2 f3 H t - \frac{1}{96} c2 f2 f3 H t - \frac{1}{48} c1 f1 f2 f3 H t - \frac{1}{120} f1^2 f2 f3 H t + \frac{1}{240} f2^2 f3 H t +$$
$$\frac{1}{96} c1 f3^2 H t + \frac{1}{120} f1 f3^2 H t + \frac{1}{144} c1 c2 f4 H t + \frac{5}{288} c1^2 f1 f4 H t + \frac{5}{288} c2 f1 f4 H t +$$
$$\frac{1}{24} c1 f1^2 f4 H t + \frac{1}{45} f1^3 f4 H t - \frac{1}{48} c1 f2 f4 H t - \frac{1}{40} f1 f2 f4 H t - \frac{1}{240} f3 f4 H t -$$
$$\frac{1}{32} c1^2 f5 H t - \frac{1}{32} c2 f5 H t - \frac{1}{12} c1 f1 f5 H t - \frac{1}{20} f1^2 f5 H t + \frac{3}{80} f2 f5 H t +$$
$$\frac{5}{48} c1 f6 H t + \frac{17}{240} f1 f6 H t - \frac{19 f7 H t}{240} + \frac{c1^6 H^2 t^2}{2880} - \frac{1}{480} c1^4 c2 H^2 t^2 + \frac{11 c1^2 c2^2 H^2 t^2}{5760} +$$
$$\frac{1}{576} c2^3 H^2 t^2 + \frac{c1^3 c3 H^2 t^2}{1152} + \frac{11 c1 c2 c3 H^2 t^2}{5760} - \frac{c3^2 H^2 t^2}{5760} - \frac{c1^2 c4 H^2 t^2}{1152} - \frac{1}{640} c2 c4 H^2 t^2 -$$
$$\frac{c1 c5 H^2 t^2}{2880} + \frac{c6 H^2 t^2}{2880} - \frac{1}{480} c1^3 c2 f1 H^2 t^2 + \frac{1}{160} c1 c2^2 f1 H^2 t^2 + \frac{1}{480} c1^2 c3 f1 H^2 t^2 -$$
$$\frac{1}{480} c1 c4 f1 H^2 t^2 - \frac{1}{480} c1^4 f1^2 H^2 t^2 + \frac{1}{120} c1^2 c2 f1^2 H^2 t^2 + \frac{1}{160} c2^2 f1^2 H^2 t^2 +$$
$$\frac{1}{480} c1 c3 f1^2 H^2 t^2 - \frac{1}{480} c4 f1^2 H^2 t^2 + \frac{1}{48} c1 c2 f1^3 H^2 t^2 + \frac{1}{96} c1^2 f1^4 H^2 t^2 +$$
$$\frac{1}{96} c2 f1^4 H^2 t^2 + \frac{1}{80} c1 f1^5 H^2 t^2 + \frac{1}{240} f1^6 H^2 t^2 + \frac{1}{288} c1^4 f2 H^2 t^2 - \frac{1}{72} c1^2 c2 f2 H^2 t^2 -$$
$$\frac{1}{96} c2^2 f2 H^2 t^2 - \frac{1}{288} c1 c3 f2 H^2 t^2 + \frac{1}{288} c4 f2 H^2 t^2 - \frac{5}{96} c1 c2 f1 f2 H^2 t^2 -$$
$$\frac{5}{144} c1^2 f1^2 f2 H^2 t^2 - \frac{5}{144} c2 f1^2 f2 H^2 t^2 - \frac{5}{96} c1 f1^3 f2 H^2 t^2 - \frac{1}{48} f1^4 f2 H^2 t^2 +$$
$$\frac{5}{288} c1^2 f2^2 H^2 t^2 + \frac{5}{288} c2 f2^2 H^2 t^2 + \frac{5}{96} c1 f1 f2^2 H^2 t^2 + \frac{1}{32} f1^2 f2^2 H^2 t^2 - \frac{1}{144} f2^3 H^2 t^2 +$$

$$\frac{1}{32}\,c1\,c2\,f3\,H^2\,t^2+\frac{1}{72}\,c1^2\,f1\,f3\,H^2\,t^2+\frac{1}{72}\,c2\,f1\,f3\,H^2\,t^2+\frac{1}{96}\,c1\,f1^2\,f3\,H^2\,t^2-$$
$$\frac{1}{32}\,c1\,f2\,f3\,H^2\,t^2-\frac{1}{48}\,f1\,f2\,f3\,H^2\,t^2+\frac{1}{96}\,f3^2\,H^2\,t^2+\frac{1}{144}\,c1^2\,f4\,H^2\,t^2+\frac{1}{144}\,c2\,f4\,H^2\,t^2+$$
$$\frac{5}{96}\,c1\,f1\,f4\,H^2\,t^2+\frac{1}{24}\,f1^2\,f4\,H^2\,t^2-\frac{1}{48}\,f2\,f4\,H^2\,t^2-\frac{3}{32}\,c1\,f5\,H^2\,t^2-\frac{1}{12}\,f1\,f5\,H^2\,t^2+$$
$$\frac{5}{48}\,f6\,H^2\,t^2-\frac{7\,c1^3\,c2\,H^3\,t^3}{2880}+\frac{7}{960}\,c1\,c2^2\,H^3\,t^3+\frac{7\,c1^2\,c3\,H^3\,t^3}{2880}-\frac{7\,c1\,c4\,H^3\,t^3}{2880}-$$
$$\frac{1}{720}\,c1^4\,f1\,H^3\,t^3+\frac{1}{180}\,c1^2\,c2\,f1\,H^3\,t^3+\frac{1}{240}\,c2^2\,f1\,H^3\,t^3+\frac{1}{720}\,c1\,c3\,f1\,H^3\,t^3-$$
$$\frac{1}{720}\,c4\,f1\,H^3\,t^3+\frac{1}{48}\,c1\,c2\,f1^2\,H^3\,t^3+\frac{1}{72}\,c1^2\,f1^3\,H^3\,t^3+\frac{1}{72}\,c2\,f1^3\,H^3\,t^3+\frac{1}{48}\,c1\,f1^4\,H^3\,t^3+$$
$$\frac{1}{120}\,f1^5\,H^3\,t^3-\frac{5}{144}\,c1\,c2\,f2\,H^3\,t^3-\frac{5}{144}\,c1^2\,f1\,f2\,H^3\,t^3-\frac{5}{144}\,c2\,f1\,f2\,H^3\,t^3-$$
$$\frac{5}{72}\,c1\,f1^2\,f2\,H^3\,t^3-\frac{5}{144}\,f1^3\,f2\,H^3\,t^3+\frac{5}{144}\,c1\,f2^2\,H^3\,t^3+\frac{5}{144}\,f1\,f2^2\,H^3\,t^3+$$
$$\frac{1}{48}\,c1^2\,f3\,H^3\,t^3+\frac{1}{48}\,c2\,f3\,H^3\,t^3+\frac{1}{36}\,c1\,f1\,f3\,H^3\,t^3+\frac{1}{144}\,f1^2\,f3\,H^3\,t^3-\frac{1}{48}\,f2\,f3\,H^3\,t^3+$$
$$\frac{1}{72}\,c1\,f4\,H^3\,t^3+\frac{5}{144}\,f1\,f4\,H^3\,t^3-\frac{1}{16}\,f5\,H^3\,t^3-\frac{7\,c1^4\,H^4\,t^4}{5760}+\frac{7\,c1^2\,c2\,H^4\,t^4}{1440}+$$
$$\frac{7\,c2^2\,H^4\,t^4}{1920}+\frac{7\,c1\,c3\,H^4\,t^4}{5760}-\frac{7\,c4\,H^4\,t^4}{5760}+\frac{1}{96}\,c1\,c2\,f1\,H^4\,t^4+\frac{1}{96}\,c1^2\,f1^2\,H^4\,t^4+$$
$$\frac{1}{96}\,c2\,f1^2\,H^4\,t^4+\frac{1}{48}\,c1\,f1^3\,H^4\,t^4+\frac{1}{96}\,f1^4\,H^4\,t^4-\frac{5}{288}\,c1^2\,f2\,H^4\,t^4-\frac{5}{288}\,c2\,f2\,H^4\,t^4-$$
$$\frac{5}{96}\,c1\,f1\,f2\,H^4\,t^4-\frac{5}{144}\,f1^2\,f2\,H^4\,t^4+\frac{5}{288}\,f2^2\,H^4\,t^4+\frac{1}{32}\,c1\,f3\,H^4\,t^4+\frac{1}{72}\,f1\,f3\,H^4\,t^4+$$
$$\frac{1}{144}\,f4\,H^4\,t^4+\frac{7}{960}\,c1\,c2\,H^5\,t^5+\frac{1}{240}\,c1^2\,f1\,H^5\,t^5+\frac{1}{240}\,c2\,f1\,H^5\,t^5+\frac{1}{80}\,c1\,f1^2\,H^5\,t^5+$$
$$\frac{1}{120}\,f1^3\,H^5\,t^5-\frac{1}{48}\,c1\,f2\,H^5\,t^5-\frac{1}{48}\,f1\,f2\,H^5\,t^5+\frac{1}{80}\,f3\,H^5\,t^5+\frac{7\,c1^2\,H^6\,t^6}{2880}+\frac{7\,c2\,H^6\,t^6}{2880}+$$
$$\frac{1}{240}\,c1\,f1\,H^6\,t^6+\frac{1}{240}\,f1^2\,H^6\,t^6-\frac{1}{144}\,f2\,H^6\,t^6+\frac{1}{480}\,c1\,H^7\,t^7+\frac{1}{840}\,f1\,H^7\,t^7+\frac{H^8\,t^8}{1920}$$

In[75]:=
```
p2 =
Expand[%73 /. {e1 → m1, e2 → m2, e3 → m3, e4 → m4, e5 → m5, e6 → m6, e7 → m7, e8 → m8}]
```

Out[75]=

$$-\frac{c1^8}{34\,560}+\frac{c1^6\,c2}{4320}-\frac{5\,c1^4\,c2^2}{10\,368}+\frac{c1^2\,c2^3}{12\,960}+\frac{7\,c2^4}{34\,560}-\frac{7\,c1^5\,c3}{51\,840}+\frac{13\,c1^3\,c2\,c3}{51\,840}+\frac{5\,c1\,c2^2\,c3}{10\,368}+$$
$$\frac{c1^2\,c3^2}{34\,560}-\frac{c2\,c3^2}{12\,960}+\frac{7\,c1^4\,c4}{51\,840}-\frac{19\,c1^2\,c2\,c4}{103\,680}-\frac{17\,c2^2\,c4}{51\,840}-\frac{13\,c1\,c3\,c4}{103\,680}+\frac{c4^2}{20\,736}-$$
$$\frac{7\,c1^3\,c5}{103\,680}-\frac{c1\,c2\,c5}{6480}+\frac{c3\,c5}{34\,560}+\frac{7\,c1^2\,c6}{103\,680}+\frac{13\,c2\,c6}{103\,680}+\frac{c1\,c7}{34\,560}-\frac{c8}{34\,560}+\frac{c1^5\,c2\,f1}{4032}-$$
$$\frac{5\,c1^3\,c2^2\,f1}{4032}+\frac{5\,c1\,c2^3\,f1}{4032}-\frac{c1^4\,c3\,f1}{4032}+\frac{11\,c1^2\,c2\,c3\,f1}{8064}-\frac{c1\,c3^2\,f1}{8064}+\frac{c1^3\,c4\,f1}{4032}-$$
$$\frac{1}{896}\,c1\,c2\,c4\,f1-\frac{c1^2\,c5\,f1}{4032}+\frac{c1\,c6\,f1}{4032}+\frac{c1^6\,f1^2}{4032}-\frac{1}{672}\,c1^4\,c2\,f1^2+\frac{11\,c1^2\,c2^2\,f1^2}{8064}+$$

$$\frac{5\,c2^3\,f1^2}{4032}+\frac{5\,c1^3\,c3\,f1^2}{8064}+\frac{11\,c1\,c2\,c3\,f1^2}{8064}-\frac{c3^2\,f1^2}{8064}-\frac{5\,c1^2\,c4\,f1^2}{8064}-\frac{1}{896}\,c2\,c4\,f1^2-$$
$$\frac{c1\,c5\,f1^2}{4032}+\frac{c6\,f1^2}{4032}-\frac{1}{576}\,c1^3\,c2\,f1^3+\frac{1}{192}\,c1\,c2^2\,f1^3+\frac{1}{576}\,c1^2\,c3\,f1^3-\frac{1}{576}\,c1\,c4\,f1^3-$$
$$\frac{c1^4\,f1^4}{1152}+\frac{1}{288}\,c1^2\,c2\,f1^4+\frac{c2^2\,f1^4}{384}+\frac{c1\,c3\,f1^4}{1152}-\frac{c4\,f1^4}{1152}+\frac{1}{192}\,c1\,c2\,f1^5+\frac{c1^2\,f1^6}{576}+$$
$$\frac{c2\,f1^6}{576}+\frac{c1\,f1^7}{672}+\frac{f1^8}{2688}-\frac{c1^6\,f2}{3024}+\frac{1}{504}\,c1^4\,c2\,f2-\frac{11\,c1^2\,c2^2\,f2}{6048}-\frac{5\,c2^3\,f2}{3024}-$$
$$\frac{5\,c1^3\,c3\,f2}{6048}-\frac{11\,c1\,c2\,c3\,f2}{6048}+\frac{c3^2\,f2}{6048}+\frac{5\,c1^2\,c4\,f2}{6048}+\frac{c2\,c4\,f2}{672}+\frac{c1\,c5\,f2}{3024}-\frac{c6\,f2}{3024}+$$
$$\frac{1}{288}\,c1^3\,c2\,f1\,f2-\frac{1}{96}\,c1\,c2^2\,f1\,f2-\frac{1}{288}\,c1^2\,c3\,f1\,f2+\frac{1}{288}\,c1\,c4\,f1\,f2+\frac{1}{432}\,c1^4\,f1^2\,f2-$$
$$\frac{1}{108}\,c1^2\,c2\,f1^2\,f2-\frac{1}{144}\,c2^2\,f1^2\,f2-\frac{1}{432}\,c1\,c3\,f1^2\,f2+\frac{1}{432}\,c4\,f1^2\,f2-\frac{5}{288}\,c1\,c2\,f1^3\,f2-$$
$$\frac{1}{144}\,c1^2\,f1^4\,f2-\frac{1}{144}\,c2\,f1^4\,f2-\frac{1}{144}\,c1\,f1^5\,f2-\frac{f1^6\,f2}{504}-\frac{c1^4\,f2^2}{864}+\frac{1}{216}\,c1^2\,c2\,f2^2+$$
$$\frac{c2^2\,f2^2}{288}+\frac{1}{864}\,c1\,c3\,f2^2-\frac{c4\,f2^2}{864}+\frac{5}{288}\,c1\,c2\,f1\,f2^2+\frac{1}{96}\,c1^2\,f1^2\,f2^2+\frac{1}{96}\,c2\,f1^2\,f2^2+$$
$$\frac{1}{72}\,c1\,f1^3\,f2^2+\frac{5\,f1^4\,f2^2}{1008}-\frac{c1^2\,f2^3}{432}-\frac{c2\,f2^3}{432}-\frac{1}{144}\,c1\,f1\,f2^3-\frac{f1^2\,f2^3}{252}+\frac{f2^4}{2016}-$$
$$\frac{c1^3\,c2\,f3}{1440}+\frac{1}{480}\,c1\,c2^2\,f3+\frac{c1^2\,c3\,f3}{1440}-\frac{c1\,c4\,f3}{1440}+\frac{c1^4\,f1\,f3}{2160}-\frac{1}{540}\,c1^2\,c2\,f1\,f3-$$
$$\frac{1}{720}\,c2^2\,f1\,f3-\frac{c1\,c3\,f1\,f3}{2160}+\frac{c4\,f1\,f3}{2160}-\frac{1}{96}\,c1\,c2\,f1^2\,f3-\frac{1}{144}\,c1^2\,f1^3\,f3-\frac{1}{144}\,c2\,f1^3\,f3-$$
$$\frac{7}{720}\,c1\,f1^4\,f3-\frac{f1^5\,f3}{280}-\frac{1}{288}\,c1\,c2\,f2\,f3+\frac{1}{240}\,c1\,f1^2\,f2\,f3+\frac{1}{315}\,f1^3\,f2\,f3+$$
$$\frac{1}{720}\,c1\,f2^2\,f3+\frac{f1\,f2^2\,f3}{2520}+\frac{c1^2\,f3^2}{288}+\frac{c2\,f3^2}{288}+\frac{7}{720}\,c1\,f1\,f3^2+\frac{29\,f1^2\,f3^2}{5040}-\frac{f2\,f3^2}{504}-$$
$$\frac{c1^4\,f4}{540}+\frac{1}{135}\,c1^2\,c2\,f4+\frac{c2^2\,f4}{180}+\frac{c1\,c3\,f4}{540}-\frac{c4\,f4}{540}+\frac{1}{32}\,c1\,c2\,f1\,f4+\frac{1}{48}\,c1^2\,f1^2\,f4+$$
$$\frac{1}{48}\,c2\,f1^2\,f4+\frac{11}{360}\,c1\,f1^3\,f4+\frac{f1^4\,f4}{84}-\frac{1}{72}\,c1^2\,f2\,f4-\frac{c2\,f2\,f4}{72}-\frac{31}{720}\,c1\,f1\,f2\,f4-$$
$$\frac{131\,f1^2\,f2\,f4}{5040}+\frac{2\,f2^2\,f4}{315}-\frac{c1\,f3\,f4}{720}-\frac{13\,f1\,f3\,f4}{5040}+\frac{13\,f4^2}{2520}-\frac{5\,c1\,c2\,f5}{288}-\frac{1}{144}\,c1^2\,f1\,f5-$$
$$\frac{c2\,f1\,f5}{144}-\frac{1}{360}\,c1\,f1^2\,f5+\frac{f1^3\,f5}{504}+\frac{7\,c1\,f2\,f5}{360}+\frac{71\,f1\,f2\,f5}{5040}-\frac{53\,f3\,f5}{5040}-\frac{c1^2\,f6}{36}-\frac{c2\,f6}{36}-$$
$$\frac{73\,c1\,f1\,f6}{720}-\frac{f1^2\,f6}{14}+\frac{89\,f2\,f6}{2520}+\frac{151\,c1\,f7}{720}+\frac{151\,f1\,f7}{840}+\frac{c1^5\,c2\,H\,t}{1728}-\frac{5\,c1^3\,c2^2\,H\,t}{1728}+$$
$$\frac{5\,c1\,c2^3\,H\,t}{1728}-\frac{c1^4\,c3\,H\,t}{1728}+\frac{11\,c1^2\,c2\,c3\,H\,t}{3456}-\frac{c1\,c3^2\,H\,t}{3456}+\frac{c1^3\,c4\,H\,t}{1728}-\frac{1}{384}\,c1\,c2\,c4\,H\,t-$$
$$\frac{c1^2\,c5\,H\,t}{1728}+\frac{c1\,c6\,H\,t}{1728}+\frac{c1^6\,f1\,H\,t}{2016}-\frac{1}{336}\,c1^4\,c2\,f1\,H\,t+\frac{11\,c1^2\,c2^2\,f1\,H\,t}{4032}+\frac{5\,c2^3\,f1\,H\,t}{2016}+$$
$$\frac{5\,c1^3\,c3\,f1\,H\,t}{4032}+\frac{11\,c1\,c2\,c3\,f1\,H\,t}{4032}-\frac{c3^2\,f1\,H\,t}{4032}-\frac{5\,c1^2\,c4\,f1\,H\,t}{4032}-\frac{1}{448}\,c2\,c4\,f1\,H\,t-$$

$$\frac{c1\,c5\,f1\,H\,t}{2016}+\frac{c6\,f1\,H\,t}{2016}-\frac{1}{192}c1^3\,c2\,f1^2\,H\,t+\frac{1}{64}c1\,c2^2\,f1^2\,H\,t+\frac{1}{192}c1^2\,c3\,f1^2\,H\,t-$$
$$\frac{1}{192}c1\,c4\,f1^2\,H\,t-\frac{1}{288}c1^4\,f1^3\,H\,t+\frac{1}{72}c1^2\,c2\,f1^3\,H\,t+\frac{1}{96}c2^2\,f1^3\,H\,t+\frac{1}{288}c1\,c3\,f1^3\,H\,t-$$
$$\frac{1}{288}c4\,f1^3\,H\,t+\frac{5}{192}c1\,c2\,f1^4\,H\,t+\frac{1}{96}c1^2\,f1^5\,H\,t+\frac{1}{96}c2\,f1^5\,H\,t+\frac{1}{96}c1\,f1^6\,H\,t+$$
$$\frac{1}{336}f1^7\,H\,t+\frac{1}{144}c1^3\,c2\,f2\,H\,t-\frac{1}{48}c1\,c2^2\,f2\,H\,t-\frac{1}{144}c1^2\,c3\,f2\,H\,t+\frac{1}{144}c1\,c4\,f2\,H\,t+$$
$$\frac{1}{144}c1^4\,f1\,f2\,H\,t-\frac{1}{36}c1^2\,c2\,f1\,f2\,H\,t-\frac{1}{48}c2^2\,f1\,f2\,H\,t-\frac{1}{144}c1\,c3\,f1\,f2\,H\,t+$$
$$\frac{1}{144}c4\,f1\,f2\,H\,t-\frac{5}{72}c1\,c2\,f1^2\,f2\,H\,t-\frac{5}{144}c1^2\,f1^3\,f2\,H\,t-\frac{5}{144}c2\,f1^3\,f2\,H\,t-$$
$$\frac{1}{24}c1\,f1^4\,f2\,H\,t-\frac{1}{72}f1^5\,f2\,H\,t+\frac{5}{144}c1\,c2\,f2^2\,H\,t+\frac{5}{144}c1^2\,f1\,f2^2\,H\,t+\frac{5}{144}c2\,f1\,f2^2\,H\,t+$$
$$\frac{1}{16}c1\,f1^2\,f2^2\,H\,t+\frac{1}{36}f1^3\,f2^2\,H\,t-\frac{1}{72}c1\,f2^3\,H\,t-\frac{1}{72}f1\,f2^3\,H\,t-\frac{1}{720}c1^4\,f3\,H\,t+$$
$$\frac{1}{180}c1^2\,c2\,f3\,H\,t+\frac{1}{240}c2^2\,f3\,H\,t+\frac{1}{720}c1\,c3\,f3\,H\,t-\frac{1}{720}c4\,f3\,H\,t-\frac{1}{72}c1\,c2\,f1\,f3\,H\,t-$$
$$\frac{1}{48}c1^2\,f1^2\,f3\,H\,t-\frac{1}{48}c2\,f1^2\,f3\,H\,t-\frac{1}{24}c1\,f1^3\,f3\,H\,t-\frac{7}{360}f1^4\,f3\,H\,t-\frac{1}{144}c1^2\,f2\,f3\,H\,t-$$
$$\frac{1}{144}c2\,f2\,f3\,H\,t+\frac{1}{120}f1^2\,f2\,f3\,H\,t+\frac{1}{360}f2^2\,f3\,H\,t+\frac{1}{48}c1\,f3^2\,H\,t+\frac{7}{360}f1\,f3^2\,H\,t+$$
$$\frac{1}{18}c1\,c2\,f4\,H\,t+\frac{1}{16}c1^2\,f1\,f4\,H\,t+\frac{1}{16}c2\,f1\,f4\,H\,t+\frac{1}{8}c1\,f1^2\,f4\,H\,t+\frac{11}{180}f1^3\,f4\,H\,t-$$
$$\frac{1}{12}c1\,f2\,f4\,H\,t-\frac{31}{360}f1\,f2\,f4\,H\,t-\frac{1}{360}f3\,f4\,H\,t-\frac{5}{144}c1^2\,f5\,H\,t-\frac{5}{144}c2\,f5\,H\,t-$$
$$\frac{1}{24}c1\,f1\,f5\,H\,t-\frac{1}{180}f1^2\,f5\,H\,t+\frac{7}{180}f2\,f5\,H\,t-\frac{1}{6}c1\,f6\,H\,t-\frac{73}{360}f1\,f6\,H\,t+$$
$$\frac{151\,f7\,H\,t}{360}+\frac{c1^6\,H^2\,t^2}{1728}-\frac{1}{288}c1^4\,c2\,H^2\,t^2+\frac{11\,c1^2\,c2^2\,H^2\,t^2}{3456}+\frac{5\,c2^3\,H^2\,t^2}{1728}+\frac{5\,c1^3\,c3\,H^2\,t^2}{3456}+$$
$$\frac{11\,c1\,c2\,c3\,H^2\,t^2}{3456}-\frac{c3^2\,H^2\,t^2}{3456}-\frac{5\,c1^2\,c4\,H^2\,t^2}{3456}-\frac{1}{384}c2\,c4\,H^2\,t^2-\frac{c1\,c5\,H^2\,t^2}{1728}+\frac{c6\,H^2\,t^2}{1728}-$$
$$\frac{1}{192}c1^3\,c2\,f1\,H^2\,t^2+\frac{1}{64}c1\,c2^2\,f1\,H^2\,t^2+\frac{1}{192}c1^2\,c3\,f1\,H^2\,t^2-\frac{1}{192}c1\,c4\,f1\,H^2\,t^2-$$
$$\frac{1}{192}c1^4\,f1^2\,H^2\,t^2+\frac{1}{48}c1^2\,c2\,f1^2\,H^2\,t^2+\frac{1}{64}c2^2\,f1^2\,H^2\,t^2+\frac{1}{192}c1\,c3\,f1^2\,H^2\,t^2-$$
$$\frac{1}{192}c4\,f1^2\,H^2\,t^2+\frac{5}{96}c1\,c2\,f1^3\,H^2\,t^2+\frac{5}{192}c1^2\,f1^4\,H^2\,t^2+\frac{5}{192}c2\,f1^4\,H^2\,t^2+\frac{1}{32}c1\,f1^5\,H^2\,t^2+$$
$$\frac{1}{96}f1^6\,H^2\,t^2+\frac{1}{144}c1^4\,f2\,H^2\,t^2-\frac{1}{36}c1^2\,c2\,f2\,H^2\,t^2-\frac{1}{48}c2^2\,f2\,H^2\,t^2-\frac{1}{144}c1\,c3\,f2\,H^2\,t^2+$$
$$\frac{1}{144}c4\,f2\,H^2\,t^2-\frac{5}{48}c1\,c2\,f1\,f2\,H^2\,t^2-\frac{5}{72}c1^2\,f1^2\,f2\,H^2\,t^2-\frac{5}{72}c2\,f1^2\,f2\,H^2\,t^2-$$
$$\frac{5}{48}c1\,f1^3\,f2\,H^2\,t^2-\frac{1}{24}f1^4\,f2\,H^2\,t^2+\frac{5}{144}c1^2\,f2^2\,H^2\,t^2+\frac{5}{144}c2\,f2^2\,H^2\,t^2+$$
$$\frac{5}{48}c1\,f1\,f2^2\,H^2\,t^2+\frac{1}{16}f1^2\,f2^2\,H^2\,t^2-\frac{1}{72}f2^3\,H^2\,t^2+\frac{1}{48}c1\,c2\,f3\,H^2\,t^2-\frac{1}{72}c1^2\,f1\,f3\,H^2\,t^2-$$

$$\frac{1}{72}\,c2\,f1\,f3\,H^2\,t^2-\frac{1}{16}\,c1\,f1^2\,f3\,H^2\,t^2-\frac{1}{24}\,f1^3\,f3\,H^2\,t^2-\frac{1}{48}\,c1\,f2\,f3\,H^2\,t^2+\frac{1}{48}\,f3^2\,H^2\,t^2+$$
$$\frac{1}{18}\,c1^2\,f4\,H^2\,t^2+\frac{1}{18}\,c2\,f4\,H^2\,t^2+\frac{3}{16}\,c1\,f1\,f4\,H^2\,t^2+\frac{1}{8}\,f1^2\,f4\,H^2\,t^2-\frac{1}{12}\,f2\,f4\,H^2\,t^2-$$
$$\frac{5}{48}\,c1\,f5\,H^2\,t^2-\frac{1}{24}\,f1\,f5\,H^2\,t^2-\frac{1}{6}\,f6\,H^2\,t^2-\frac{7\,c1^3\,c2\,H^3\,t^3}{1728}+\frac{7}{576}\,c1\,c2^2\,H^3\,t^3+$$
$$\frac{7\,c1^2\,c3\,H^3\,t^3}{1728}-\frac{7\,c1\,c4\,H^3\,t^3}{1728}-\frac{1}{288}\,c1^4\,f1\,H^3\,t^3+\frac{1}{72}\,c1^2\,c2\,f1\,H^3\,t^3+\frac{1}{96}\,c2^2\,f1\,H^3\,t^3+$$
$$\frac{1}{288}\,c1\,c3\,f1\,H^3\,t^3-\frac{1}{288}\,c4\,f1\,H^3\,t^3+\frac{5}{96}\,c1\,c2\,f1^2\,H^3\,t^3+\frac{5}{144}\,c1^2\,f1^3\,H^3\,t^3+$$
$$\frac{5}{144}\,c2\,f1^3\,H^3\,t^3+\frac{5}{96}\,c1\,f1^4\,H^3\,t^3+\frac{1}{48}\,f1^5\,H^3\,t^3-\frac{5}{72}\,c1\,c2\,f2\,H^3\,t^3-\frac{5}{72}\,c1^2\,f1\,f2\,H^3\,t^3-$$
$$\frac{5}{72}\,c2\,f1\,f2\,H^3\,t^3-\frac{5}{36}\,c1\,f1^2\,f2\,H^3\,t^3-\frac{5}{72}\,f1^3\,f2\,H^3\,t^3+\frac{5}{72}\,c1\,f2^2\,H^3\,t^3+\frac{5}{72}\,f1\,f2^2\,H^3\,t^3+$$
$$\frac{1}{72}\,c1^2\,f3\,H^3\,t^3+\frac{1}{72}\,c2\,f3\,H^3\,t^3-\frac{1}{36}\,c1\,f1\,f3\,H^3\,t^3-\frac{1}{24}\,f1^2\,f3\,H^3\,t^3-\frac{1}{72}\,f2\,f3\,H^3\,t^3+$$
$$\frac{1}{9}\,c1\,f4\,H^3\,t^3+\frac{1}{8}\,f1\,f4\,H^3\,t^3-\frac{5}{72}\,f5\,H^3\,t^3-\frac{7\,c1^4\,H^4\,t^4}{3456}+\frac{7}{864}\,c1^2\,c2\,H^4\,t^4+$$
$$\frac{7\,c2^2\,H^4\,t^4}{1152}+\frac{7\,c1\,c3\,H^4\,t^4}{3456}-\frac{7\,c4\,H^4\,t^4}{3456}+\frac{5}{192}\,c1\,c2\,f1\,H^4\,t^4+\frac{5}{192}\,c1^2\,f1^2\,H^4\,t^4+$$
$$\frac{5}{192}\,c2\,f1^2\,H^4\,t^4+\frac{5}{96}\,c1\,f1^3\,H^4\,t^4+\frac{5}{192}\,f1^4\,H^4\,t^4-\frac{5}{144}\,c1^2\,f2\,H^4\,t^4-\frac{5}{144}\,c2\,f2\,H^4\,t^4-$$
$$\frac{5}{48}\,c1\,f1\,f2\,H^4\,t^4-\frac{5}{72}\,f1^2\,f2\,H^4\,t^4+\frac{5}{144}\,f2^2\,H^4\,t^4+\frac{1}{48}\,c1\,f3\,H^4\,t^4-\frac{1}{72}\,f1\,f3\,H^4\,t^4+$$
$$\frac{1}{18}\,f4\,H^4\,t^4+\frac{7}{576}\,c1\,c2\,H^5\,t^5+\frac{1}{96}\,c1^2\,f1\,H^5\,t^5+\frac{1}{96}\,c2\,f1\,H^5\,t^5+\frac{1}{32}\,c1\,f1^2\,H^5\,t^5+$$
$$\frac{1}{48}\,f1^3\,H^5\,t^5-\frac{1}{24}\,c1\,f2\,H^5\,t^5-\frac{1}{24}\,f1\,f2\,H^5\,t^5+\frac{1}{120}\,f3\,H^5\,t^5+\frac{7\,c1^2\,H^6\,t^6}{1728}+\frac{7\,c2\,H^6\,t^6}{1728}+$$
$$\frac{1}{96}\,c1\,f1\,H^6\,t^6+\frac{1}{96}\,f1^2\,H^6\,t^6-\frac{1}{72}\,f2\,H^6\,t^6+\frac{1}{288}\,c1\,H^7\,t^7+\frac{1}{336}\,f1\,H^7\,t^7+\frac{H^8\,t^8}{1152}$$

In[76]:=
```
FunctionExpand[1 - Binomial[5 - d, 5]]
```

Out[76]=

$$1-\frac{1}{120}\,(1-d)\,(2-d)\,(3-d)\,(4-d)\,(5-d)$$

In[77]:=
```
Expand[(1 / 4) * l1 * l2 * f1 +
  (1 / 4) * (l1 ^ 2 + l2) * (f1 ^ 2 - 2 * f2) + (1 / 2) * l1 * (f1 ^ 3 - 3 * f1 * f2 + 3 * f3) +
  (1 / 4) * (f1 ^ 4 - 4 * f1 ^ 2 * f2 + 4 * f1 * f3 + 2 * f2 ^ 2) - 42 * d + 42 * %76]
```

Out[77]=

$$\frac{539\,d}{10}-\frac{315\,d^2}{4}+\frac{119\,d^3}{4}-\frac{21\,d^4}{4}+\frac{7\,d^5}{20}+\frac{f1^4}{4}-f1^2\,f2+\frac{f2^2}{2}+f1\,f3+$$
$$\frac{f1^3\,l1}{2}-\frac{3\,f1\,f2\,l1}{2}+\frac{3\,f3\,l1}{2}+\frac{f1^2\,l1^2}{4}-\frac{f2\,l1^2}{2}+\frac{f1^2\,l2}{4}-\frac{f2\,l2}{2}+\frac{f1\,l1\,l2}{4}$$

In[78]:=
```
Expand[%77 /. {l1 → (6 - d) * H, l2 → (d ^ 2 - 6 * d + 15) * H ^ 2, f1 → (7 / 2) * (d - 1) * H,
    f2 → (7 / 24) * (d - 1) * (19 * d - 17) * H ^ 2, f3 → (35 / 48) * (d - 1) ^ 2 * (7 * d - 5) * H ^ 3}]
```

Out[78]=

$$\frac{539\,d}{10} - \frac{315\,d^2}{4} + \frac{119\,d^3}{4} - \frac{21\,d^4}{4} + \frac{7\,d^5}{20} - \frac{60\,389\,H^4}{1152} + \frac{1715\,d\,H^4}{24} - \frac{9583\,d^2\,H^4}{576} - \frac{119\,d^3\,H^4}{24} + \frac{2947\,d^4\,H^4}{1152}$$

In[79]:=
```
Expand[%78 /. {H ^ 4 → d}]
```

Out[79]=

$$\frac{8519\,d}{5760} - \frac{175\,d^2}{24} + \frac{7553\,d^3}{576} - \frac{245\,d^4}{24} + \frac{16\,751\,d^5}{5760}$$

In[80]:=
```
Expand[(1 / d) * %79]
```

Out[80]=

$$\frac{8519}{5760} - \frac{175\,d}{24} + \frac{7553\,d^2}{576} - \frac{245\,d^3}{24} + \frac{16\,751\,d^4}{5760}$$

In[81]:=
```
Factor[%80]
```

Out[81]=

$$\frac{7\,(-1+d)\,\left(-1217+4783\,d-6007\,d^2+2393\,d^3\right)}{5760}$$

In[82]:=
```
FunctionExpand[1 - Binomial[6 - d, 6]]
```

Out[82]=

$$1 - \frac{1}{720}\,(-6+d)\,(-5+d)\,(-4+d)\,(-3+d)\,(-2+d)\,(-1+d)$$

In[83]:=
```
Expand[24 * 7 * (H ^ 5 - %82) - (1 / 5) * (f1 ^ 5) + (f1 ^ 3) * (f2) - (f1 ^ 2) * (f3) -
  (f1) * (f2 ^ 2) + (f1) * (f4) + (f2) * (f3) + (1 / 2) * (f1 ^ 2 - 2 * f2) * l2 * (d - 7) * H +
  (1 / 30) * f1 * ((d - 7) ^ 4 * H ^ 4 - 4 * (d - 7) ^ 2 * H ^ 2 * l2 + (d - 7) * H * l3 - 3 * l2 ^ 2 + l4) +
  (1 / 2) * (f1 ^ 4 - 4 * f1 ^ 2 * f2 + 4 * f1 * f3 + 2 * f2 ^ 2 - 4 * f4) * (d - 7) * H -
  (1 / 3) * ((d - 7) ^ 2 * H ^ 2 + l2) * (f1 ^ 3 - 3 * f1 * f2 + 3 * f3)]
```

Out[83]=

$$-\frac{2058\,d}{5}+\frac{5684\,d^2}{15}-\frac{343\,d^3}{2}+\frac{245\,d^4}{6}-\frac{49\,d^5}{10}+\frac{7\,d^6}{30}-\frac{f1^5}{5}+f1^3\,f2-f1\,f2^2-f1^2\,f3+f2\,f3+f1\,f4-\frac{7\,f1^4\,H}{2}+\frac{1}{2}\,d\,f1^4\,H+14\,f1^2\,f2\,H-2\,d\,f1^2\,f2\,H-7\,f2^2\,H+d\,f2^2\,H-14\,f1\,f3\,H+2\,d\,f1\,f3\,H+14\,f4\,H-2\,d\,f4\,H-\frac{49\,f1^3\,H^2}{3}+\frac{14}{3}\,d\,f1^3\,H^2-\frac{1}{3}\,d^2\,f1^3\,H^2+49\,f1\,f2\,H^2-14\,d\,f1\,f2\,H^2+d^2\,f1\,f2\,H^2-49\,f3\,H^2+14\,d\,f3\,H^2-d^2\,f3\,H^2+\frac{2401\,f1\,H^4}{30}-\frac{686}{15}\,d\,f1\,H^4+\frac{49}{5}\,d^2\,f1\,H^4-\frac{14}{15}\,d^3\,f1\,H^4+\frac{1}{30}\,d^4\,f1\,H^4+168\,H^5-\frac{f1^3\,l2}{3}+f1\,f2\,l2-f3\,l2-\frac{7}{2}\,f1^2\,H\,l2+\frac{1}{2}\,d\,f1^2\,H\,l2+7\,f2\,H\,l2-d\,f2\,H\,l2-\frac{98}{15}\,f1\,H^2\,l2+\frac{28}{15}\,d\,f1\,H^2\,l2-\frac{2}{15}\,d^2\,f1\,H^2\,l2-\frac{f1\,l2^2}{10}-\frac{7\,f1\,H\,l3}{30}+\frac{1}{30}\,d\,f1\,H\,l3+\frac{f1\,l4}{30}$$

In[84]:=
```
Expand[%83 /. {l2 → (d ^ 2 - 7 * d + 21) * H ^ 2, l3 → (35 - 21 * d + 7 * d ^ 2 - d ^ 3) * H ^ 3,
   l4 → (d ^ 4 - 7 * d ^ 3 + 21 * d ^ 2 - 35 * d + 35) * H ^ 4,
   f1 → (7 / 2) * (d - 1) * H, f2 → (7 / 24) * (d - 1) * (19 * d - 17) * H ^ 2,
   f3 → (35 / 48) * (d - 1) ^ 2 * (7 * d - 5) * H ^ 3, f4 → %81 * H ^ 4}]
```

Out[84]=

$$-\frac{2058\,d}{5}+\frac{5684\,d^2}{15}-\frac{343\,d^3}{2}+\frac{245\,d^4}{6}-\frac{49\,d^5}{10}+\frac{7\,d^6}{30}+\frac{105\,287\,H^5}{256}-\frac{96\,439\,d\,H^5}{256}+\frac{63\,623\,d^2\,H^5}{384}-\frac{12\,887\,d^3\,H^5}{384}+\frac{413\,d^4\,H^5}{768}+\frac{595\,d^5\,H^5}{768}$$

In[85]:=
```
Expand[%84 /. {H ^ 5 → d}]
```

Out[85]=

$$-\frac{413\,d}{1280}+\frac{8519\,d^2}{3840}-\frac{2233\,d^3}{384}+\frac{931\,d^4}{128}-\frac{16\,751\,d^5}{3840}+\frac{3871\,d^6}{3840}$$

In[86]:=
```
Expand[(1 / d) * %85]
```

Out[86]=

$$-\frac{413}{1280}+\frac{8519\,d}{3840}-\frac{2233\,d^2}{384}+\frac{931\,d^3}{128}-\frac{16\,751\,d^4}{3840}+\frac{3871\,d^5}{3840}$$

In[87]:=
```
Factor[%86]
```

Out[87]=

$$\frac{7\,(-1+d)^2\,(-3+7\,d)\,\left(59-150\,d+79\,d^2\right)}{3840}$$

In[88]:=
```
FunctionExpand[1 - Binomial[7 - d, 7]]
```

Out[88]=

$$1+\frac{(-7+d)\,(-6+d)\,(-5+d)\,(-4+d)\,(-3+d)\,(-2+d)\,(-1+d)}{5040}$$

In[89]:=
```
Expand[120 * 7 * (%88 - H ^ 6) - (f1 / 12) * (l1 ^ 3 * l2 - 3 * l1 * l2 ^ 2 - l1 ^ 2 * l3 + l1 * l4) -
  (1 / 12) * (l1 ^ 4 * f1 ^ 2 - 4 * l1 ^ 2 * l2 * f1 ^ 2 - 3 * l2 ^ 2 * f1 ^ 2 - l1 * l3 * f1 ^ 2 + l4 * f1 ^ 2 -
     2 * l1 ^ 4 * f2 + 8 * l1 ^ 2 * l2 * f2 + 6 * l2 ^ 2 * f2 + 2 * l1 * l3 * f2 - 2 * l4 * f2) +
  (5 / 6) * l1 * l2 * (f1 ^ 3 - 3 * f1 * f2 + 3 * f3) + (5 / 12) * (l1 ^ 2 + l2) *
   (f1 ^ 4 - 4 * f1 ^ 2 * f2 + 2 * f2 ^ 2 + 4 * f1 * f3 - 4 * f4) + (l1 / 2) *
   (f1 ^ 5 - 5 * f1 ^ 3 * f2 + 5 * f1 * f2 ^ 2 + 5 * f1 ^ 2 * f3 - 5 * f2 * f3 - 5 * f1 * f4 + 5 * f5) +
  (1 / 6) * (f1 ^ 6 - 6 * f1 ^ 4 * f2 + 9 * f1 ^ 2 * f2 ^ 2 - 2 * f2 ^ 3 + 6 * f1 ^ 3 * f3 -
     12 * f1 * f2 * f3 + 3 * f3 ^ 2 - 6 * f1 ^ 2 * f4 + 6 * f2 * f4 + 6 * f1 * f5)]
```

Out[89]=

$$2178\,d-\frac{6566\,d^2}{3}+\frac{6769\,d^3}{6}-\frac{980\,d^4}{3}+\frac{161\,d^5}{3}-\frac{14\,d^6}{3}+\frac{d^7}{6}+\frac{f1^6}{6}-f1^4\,f2+\frac{3\,f1^2\,f2^2}{2}-\frac{f2^3}{3}+$$
$$f1^3\,f3-2\,f1\,f2\,f3+\frac{f3^2}{2}-f1^2\,f4+f2\,f4+f1\,f5-840\,H^6+\frac{f1^5\,l1}{2}-\frac{5}{2}\,f1^3\,f2\,l1+$$
$$\frac{5}{2}\,f1\,f2^2\,l1+\frac{5}{2}\,f1^2\,f3\,l1-\frac{5\,f2\,f3\,l1}{2}-\frac{5\,f1\,f4\,l1}{2}+\frac{5\,f5\,l1}{2}+\frac{5\,f1^4\,l1^2}{12}-$$
$$\frac{5}{3}\,f1^2\,f2\,l1^2+\frac{5\,f2^2\,l1^2}{6}+\frac{5}{3}\,f1\,f3\,l1^2-\frac{5\,f4\,l1^2}{3}-\frac{f1^2\,l1^4}{12}+\frac{f2\,l1^4}{6}+\frac{5\,f1^4\,l2}{12}-$$
$$\frac{5}{3}\,f1^2\,f2\,l2+\frac{5\,f2^2\,l2}{6}+\frac{5\,f1\,f3\,l2}{3}-\frac{5\,f4\,l2}{3}+\frac{5}{6}\,f1^3\,l1\,l2-\frac{5}{2}\,f1\,f2\,l1\,l2+$$
$$\frac{5\,f3\,l1\,l2}{2}+\frac{1}{3}\,f1^2\,l1^2\,l2-\frac{2}{3}\,f2\,l1^2\,l2-\frac{1}{12}\,f1\,l1^3\,l2+\frac{f1^2\,l2^2}{4}-\frac{f2\,l2^2}{2}+$$
$$\frac{1}{4}\,f1\,l1\,l2^2+\frac{1}{12}\,f1^2\,l1\,l3-\frac{f2\,l1\,l3}{6}+\frac{1}{12}\,f1\,l1^2\,l3-\frac{f1^2\,l4}{12}+\frac{f2\,l4}{6}-\frac{f1\,l1\,l4}{12}$$

In[90]:=
```
Expand[%89 /.
  {l1 → (8 - d) * H, l2 → (d ^ 2 - 8 * d + 28) * H ^ 2, l3 → (56 - 28 * d + 8 * d ^ 2 - d ^ 3) * H ^ 3,
   l4 → (d ^ 4 - 8 * d ^ 3 + 28 * d ^ 2 - 56 * d + 70) * H ^ 4,
   l5 → (56 - 70 * d + 56 * d ^ 2 - 28 * d ^ 3 + 8 * d ^ 4 - d ^ 5) * H ^ 5,
   f1 → (7 / 2) * (d - 1) * H, f2 → (7 / 24) * (d - 1) * (19 * d - 17) * H ^ 2,
   f3 → (35 / 48) * (d - 1) ^ 2 * (7 * d - 5) * H ^ 3, f4 → %81 * H ^ 4, f5 → %87 * H ^ 5}]
```

Out[90]=

$$2178\,d - \frac{6566\,d^2}{3} + \frac{6769\,d^3}{6} - \frac{980\,d^4}{3} + \frac{161\,d^5}{3} - \frac{14\,d^6}{3} + \frac{d^7}{6} - \frac{903\,246\,323\,H^6}{414\,720} + \frac{8\,403\,241\,d\,H^6}{3840} - \frac{31\,158\,533\,d^2\,H^6}{27\,648} + \frac{124\,607\,d^3\,H^6}{384} - \frac{7\,133\,819\,d^4\,H^6}{138\,240} + \frac{4683\,d^5\,H^6}{1280} + \frac{3619\,d^6\,H^6}{82\,944}$$

In[91]:=
```
Expand[%90 /. {H ^ 6 → d}]
```

Out[91]=

$$\frac{13\,837\,d}{414\,720} - \frac{413\,d^2}{1280} + \frac{33\,019\,d^3}{27\,648} - \frac{833\,d^4}{384} + \frac{285\,061\,d^5}{138\,240} - \frac{3871\,d^6}{3840} + \frac{17\,443\,d^7}{82\,944}$$

In[92]:=
```
Expand[(1 / d) * %91]
```

Out[92]=

$$\frac{13\,837}{414\,720} - \frac{413\,d}{1280} + \frac{33\,019\,d^2}{27\,648} - \frac{833\,d^3}{384} + \frac{285\,061\,d^4}{138\,240} - \frac{3871\,d^5}{3840} + \frac{17\,443\,d^6}{82\,944}$$

In[93]:=
```
Factor[%92]
```

Out[93]=

$$\frac{(-1+d)\left(-13\,837 + 119\,975\,d - 375\,310\,d^2 + 524\,330\,d^3 - 330\,853\,d^4 + 87\,215\,d^5\right)}{414\,720}$$

In[94]:=
```
FunctionExpand[1 - Binomial[8 - d, 8]]
```

Out[94]=

$$1 - \frac{(-8+d)\,(-7+d)\,(-6+d)\,(-5+d)\,(-4+d)\,(-3+d)\,(-2+d)\,(-1+d)}{40\,320}$$

In[95]:=
```
d7 = -c1^6*(d1)/42 + (1/7)*c1^4*c2*d1 - (11/84)*c1^2*c2^2*d1 -
  5*c2^3*(d1)/42 - (5/84)*c1^3*c3*d1 - (11/84)*c1*c2*c3*d1 +
  c3^2*(d1)/84 + (5/84)*c1^2*c4*d1 + 3*c2*c4*(d1)/28 + c1*c5*(d1)/42 -
  c6*(d1)/42 + (1/4)*c1^3*c2*d1^2 - (3/4)*c1*c2^2*d1^2 -
  (1/4)*c1^2*c3*d1^2 + (1/4)*c1*c4*d1^2 + c1^4*(d1^3)/6 -
  (2/3)*c1^2*c2*d1^3 - c2^2*(d1^3)/2 - (1/6)*c1*c3*d1^3 +
  c4*(d1^3)/6 - (5/4)*c1*c2*d1^4 - c1^2*(d1^5)/2 - c2*(d1^5)/2 -
  c1*(d1^6)/2 - (d1^7)/7 - (1/2)*c1^3*c2*d2 + (3/2)*c1*c2^2*d2 +
  (1/2)*c1^2*c3*d2 - c1*c4*(d2)/2 - (1/2)*c1^4*d1*d2 + 2*c1^2*c2*d1*d2 +
  (3/2)*c2^2*d1*d2 + (1/2)*c1*c3*d1*d2 - c4*d1*(d2)/2 +
  5*c1*c2*d1^2*d2 + (5/2)*c1^2*d1^3*d2 + (5/2)*c2*d1^3*d2 +
  3*c1*d1^4*d2 + d1^5*d2 - (5/2)*c1*c2*d2^2 - (5/2)*c1^2*d1*d2^2 -
  (5/2)*c2*d1*d2^2 - (9/2)*c1*d1^2*d2^2 - 2*d1^3*d2^2 + c1*d2^3 +
  d1*d2^3 + c1^4*(d3)/2 - 2*c1^2*c2*d3 - 3*c2^2*(d3)/2 - c1*c3*(d3)/2 +
  c4*(d3)/2 - 5*c1*c2*d1*d3 - (5/2)*c1^2*d1^2*d3 - (5/2)*c2*d1^2*d3 -
  3*c1*d1^3*d3 - d1^4*d3 + (5/2)*c1^2*d2*d3 + 5*c2*d2*(d3)/2 +
  6*c1*d1*d2*d3 + 3*d1^2*d2*d3 - d2^2*d3 - 3*c1*(d3^2)/2 - d1*d3^2 +
  5*c1*c2*d4 + (5/2)*c1^2*d1*d4 + 5*c2*d1*(d4)/2 + 3*c1*d1^2*d4 +
  d1^3*d4 - 3*c1*d2*d4 - 2*d1*d2*d4 + d3*d4 - 5*c1^2*(d5)/2 - 5*c2*(d5)/2 -
  3*c1*d1*d5 - d1^2*d5 + d2*d5 + 3*c1*d6 + d1*d6 - 720*Chi*r + 720*d*r
```

Out[95]=

$$-\frac{c1^6\,d1}{42}+\frac{1}{7}c1^4\,c2\,d1-\frac{11}{84}c1^2\,c2^2\,d1-\frac{5\,c2^3\,d1}{42}-\frac{5}{84}c1^3\,c3\,d1-\frac{11}{84}c1\,c2\,c3\,d1+\frac{c3^2\,d1}{84}+$$
$$\frac{5}{84}c1^2\,c4\,d1+\frac{3\,c2\,c4\,d1}{28}+\frac{c1\,c5\,d1}{42}-\frac{c6\,d1}{42}+\frac{1}{4}c1^3\,c2\,d1^2-\frac{3}{4}c1\,c2^2\,d1^2-\frac{1}{4}c1^2\,c3\,d1^2+$$
$$\frac{1}{4}c1\,c4\,d1^2+\frac{c1^4\,d1^3}{6}-\frac{2}{3}c1^2\,c2\,d1^3-\frac{c2^2\,d1^3}{2}-\frac{1}{6}c1\,c3\,d1^3+\frac{c4\,d1^3}{6}-\frac{5}{4}c1\,c2\,d1^4-$$
$$\frac{c1^2\,d1^5}{2}-\frac{c2\,d1^5}{2}-\frac{c1\,d1^6}{2}-\frac{d1^7}{7}-\frac{1}{2}c1^3\,c2\,d2+\frac{3}{2}c1\,c2^2\,d2+\frac{1}{2}c1^2\,c3\,d2-\frac{c1\,c4\,d2}{2}-$$
$$\frac{1}{2}c1^4\,d1\,d2+2\,c1^2\,c2\,d1\,d2+\frac{3}{2}c2^2\,d1\,d2+\frac{1}{2}c1\,c3\,d1\,d2-\frac{c4\,d1\,d2}{2}+5\,c1\,c2\,d1^2\,d2+$$
$$\frac{5}{2}c1^2\,d1^3\,d2+\frac{5}{2}c2\,d1^3\,d2+3\,c1\,d1^4\,d2+d1^5\,d2-\frac{5}{2}c1\,c2\,d2^2-\frac{5}{2}c1^2\,d1\,d2^2-\frac{5}{2}c2\,d1\,d2^2-$$
$$\frac{9}{2}c1\,d1^2\,d2^2-2\,d1^3\,d2^2+c1\,d2^3+d1\,d2^3+\frac{c1^4\,d3}{2}-2\,c1^2\,c2\,d3-\frac{3\,c2^2\,d3}{2}-\frac{c1\,c3\,d3}{2}+$$
$$\frac{c4\,d3}{2}-5\,c1\,c2\,d1\,d3-\frac{5}{2}c1^2\,d1^2\,d3-\frac{5}{2}c2\,d1^2\,d3-3\,c1\,d1^3\,d3-d1^4\,d3+\frac{5}{2}c1^2\,d2\,d3+$$
$$\frac{5\,c2\,d2\,d3}{2}+6\,c1\,d1\,d2\,d3+3\,d1^2\,d2\,d3-d2^2\,d3-\frac{3\,c1\,d3^2}{2}-d1\,d3^2+5\,c1\,c2\,d4+$$
$$\frac{5}{2}c1^2\,d1\,d4+\frac{5\,c2\,d1\,d4}{2}+3\,c1\,d1^2\,d4+d1^3\,d4-3\,c1\,d2\,d4-2\,d1\,d2\,d4+d3\,d4-$$
$$\frac{5\,c1^2\,d5}{2}-\frac{5\,c2\,d5}{2}-3\,c1\,d1\,d5-d1^2\,d5+d2\,d5+3\,c1\,d6+d1\,d6-720\,Chi\,r+720\,d\,r$$

In[96]:=
```
Expand[%95 /. {r → 7, Chi → %94, c1 → (9 - d) * H,
   c2 → (d ^ 2 - 9 * d + 36) * H ^ 2, c3 → (84 - 36 * d + 9 * d ^ 2 - d ^ 3) * H ^ 3,
   c4 → (d ^ 4 - 9 * d ^ 3 + 36 * d ^ 2 - 84 * d + 126) * H ^ 4,
   c5 → (126 - 126 * d + 84 * d ^ 2 - 36 * d ^ 3 + 9 * d ^ 4 - d ^ 5) * H ^ 5,
   c6 → (84 - 126 * d + 126 * d ^ 2 - 84 * d ^ 3 + 36 * d ^ 4 - 9 * d ^ 5 + d ^ 6) * H ^ 6,
   d1 → (7 / 2) * (d - 1) * H, d2 → (7 / 24) * (d - 1) * (19 * d - 17) * H ^ 2,
   d3 → (35 / 48) * (d - 1) ^ 2 * (7 * d - 5) * H ^ 3,
   d4 → %81 * H ^ 4, d5 → %87 * H ^ 5, d6 → %93 * H ^ 6}]
```

Out[96]=

$$-8658\,d+\frac{29\,531\,d^2}{2}-\frac{16\,821\,d^3}{2}+\frac{22\,449\,d^4}{8}-567\,d^5+\frac{273\,d^6}{4}-\frac{9\,d^7}{2}+\frac{d^8}{8}+\frac{7\,181\,290\,607\,H^7}{829\,440}-\frac{12\,247\,082\,483\,d\,H^7}{829\,440}+\frac{465\,062\,045\,d^2\,H^7}{55\,296}-\frac{775\,774\,573\,d^3\,H^7}{276\,480}+\frac{156\,680\,111\,d^4\,H^7}{276\,480}-\frac{18\,805\,619\,d^5\,H^7}{276\,480}+\frac{729\,053\,d^6\,H^7}{165\,888}-\frac{83\,821\,d^7\,H^7}{829\,440}$$

In[97]:=
```
Expand[%96 /. {H ^ 7 → d}]
```

Out[97]=

$$-\frac{913\,d}{829\,440}+\frac{13\,837\,d^2}{829\,440}-\frac{4963\,d^3}{55\,296}+\frac{62\,867\,d^4}{276\,480}-\frac{84\,049\,d^5}{276\,480}+\frac{64\,141\,d^6}{276\,480}-\frac{17\,443\,d^7}{165\,888}+\frac{19\,859\,d^8}{829\,440}$$

In[98]:=
```
Expand[(1 / d) * %97]
```

Out[98]=

$$-\frac{913}{829\,440}+\frac{13\,837\,d}{829\,440}-\frac{4963\,d^2}{55\,296}+\frac{62\,867\,d^3}{276\,480}-\frac{84\,049\,d^4}{276\,480}+\frac{64\,141\,d^5}{276\,480}-\frac{17\,443\,d^6}{165\,888}+\frac{19\,859\,d^7}{829\,440}$$

In[99]:=
```
Factor[%98]
```

Out[99]=

$$\frac{(-1+d)^2\,(-1+7\,d)\,\left(913-5620\,d+10\,170\,d^2-6380\,d^3+2837\,d^4\right)}{829\,440}$$

In[100]:=

```
Expand[p1 /. {c1 → (10 - d) * H,
   c2 → (d^2 - 10 * d + 45) * H^2, c3 → (120 - 45 * d + 10 * d^2 - d^3) * H^3,
   c4 → (d^4 - 10 * d^3 + 45 * d^2 - 120 * d + 210) * H^4,
   c5 → (252 - 210 * d + 120 * d^2 - 45 * d^3 + 10 * d^4 - d^5) * H^5,
   c6 → (d^6 - 10 * d^5 + 45 * d^4 - 120 * d^3 + 210 * d^2 - 252 * d + 210) * H^6,
   c7 → (120 - 210 * d + 252 * d^2 - 210 * d^3 + 120 * d^4 - 45 * d^5 + 10 * d^6 - d^7) * H^7,
   c8 → (45 - 120 * d + 210 * d^2 - 252 * d^3 + 210 * d^4 - 120 * d^5 +
       45 * d^6 - 10 * d^7 + d^8) * H^8, f1 → (7 / 2) * (d - 1) * H,
   f2 → (7 / 24) * (d - 1) * (19 * d - 17) * H^2, f3 → (35 / 48) * (d - 1) ^2 * (7 * d - 5) * H^3,
   f4 → %81 * H^4, f5 → %87 * H^5, f6 → %93 * H^6, f7 → %99 * H^7}]
```

Out[100]=

$$\frac{784\,611\,428\,561\,H^8}{143\,327\,232\,000}+\frac{781\,d\,H^8}{80}+\frac{37\,936\,816\,247\,d^2\,H^8}{7\,166\,361\,600}+\frac{2513\,d^3\,H^8}{2880}-\frac{6\,545\,449\,687\,d^4\,H^8}{23\,887\,872\,000}-\frac{203\,d^5\,H^8}{1440}+\frac{39\,463\,103\,d^6\,H^8}{7\,166\,361\,600}+\frac{17\,d^7\,H^8}{2880}+\frac{71\,618\,561\,d^8\,H^8}{143\,327\,232\,000}+\frac{781\,H^8\,t}{40}+\frac{75\,077\,d\,H^8\,t}{2880}+\frac{22\,981\,d^2\,H^8\,t}{2160}+\frac{14\,609\,d^3\,H^8\,t}{11\,520}-\frac{343\,d^4\,H^8\,t}{1080}-\frac{217\,d^5\,H^8\,t}{1920}+\frac{7\,d^6\,H^8\,t}{2160}+\frac{17\,d^7\,H^8\,t}{11\,520}+\frac{75\,077\,H^8\,t^2}{2880}+\frac{38\,423\,d\,H^8\,t^2}{1440}+\frac{47\,383\,d^2\,H^8\,t^2}{5760}+\frac{203}{288}\,d^3\,H^8\,t^2-\frac{1127\,d^4\,H^8\,t^2}{8640}-\frac{7}{240}\,d^5\,H^8\,t^2+\frac{7\,d^6\,H^8\,t^2}{17\,280}+\frac{38\,423\,H^8\,t^3}{2160}+\frac{26\,719\,d\,H^8\,t^3}{1920}+\frac{343}{108}\,d^2\,H^8\,t^3+\frac{217\,d^3\,H^8\,t^3}{1152}-\frac{49\,d^4\,H^8\,t^3}{2160}-\frac{7\,d^5\,H^8\,t^3}{2880}+\frac{26\,719\,H^8\,t^4}{3840}+\frac{1169}{288}\,d\,H^8\,t^4+\frac{1127\,d^2\,H^8\,t^4}{1728}+\frac{7}{288}\,d^3\,H^8\,t^4-\frac{49\,d^4\,H^8\,t^4}{34\,560}+\frac{1169\,H^8\,t^5}{720}+\frac{3857\,d\,H^8\,t^5}{5760}+\frac{49}{720}\,d^2\,H^8\,t^5+\frac{7\,d^3\,H^8\,t^5}{5760}+\frac{3857\,H^8\,t^6}{17\,280}+\frac{7}{120}\,d\,H^8\,t^6+\frac{49\,d^2\,H^8\,t^6}{17\,280}+\frac{H^8\,t^7}{60}+\frac{1}{480}\,d\,H^8\,t^7+\frac{H^8\,t^8}{1920}$$

In[101]:=

```
Expand[%100 /. {H^8 → d}]
```

Out[101]=

$$\frac{784\,611\,428\,561\,d}{143\,327\,232\,000}+\frac{781\,d^2}{80}+\frac{37\,936\,816\,247\,d^3}{7\,166\,361\,600}+\frac{2513\,d^4}{2880}-\frac{6\,545\,449\,687\,d^5}{23\,887\,872\,000}-\frac{203\,d^6}{1440}+\frac{39\,463\,103\,d^7}{7\,166\,361\,600}+\frac{17\,d^8}{2880}+\frac{71\,618\,561\,d^9}{143\,327\,232\,000}+\frac{781\,d\,t}{40}+\frac{75\,077\,d^2\,t}{2880}+\frac{22\,981\,d^3\,t}{2160}+\frac{14\,609\,d^4\,t}{11\,520}-\frac{343\,d^5\,t}{1080}-\frac{217\,d^6\,t}{1920}+\frac{7\,d^7\,t}{2160}+\frac{17\,d^8\,t}{11\,520}+\frac{75\,077\,d\,t^2}{2880}+\frac{38\,423\,d^2\,t^2}{1440}+\frac{47\,383\,d^3\,t^2}{5760}+\frac{203\,d^4\,t^2}{288}-\frac{1127\,d^5\,t^2}{8640}-\frac{7\,d^6\,t^2}{240}+\frac{7\,d^7\,t^2}{17\,280}+\frac{38\,423\,d\,t^3}{2160}+\frac{26\,719\,d^2\,t^3}{1920}+\frac{343\,d^3\,t^3}{108}+\frac{217\,d^4\,t^3}{1152}-\frac{49\,d^5\,t^3}{2160}-\frac{7\,d^6\,t^3}{2880}+\frac{26\,719\,d\,t^4}{3840}+\frac{1169\,d^2\,t^4}{288}+\frac{1127\,d^3\,t^4}{1728}+\frac{7\,d^4\,t^4}{288}-\frac{49\,d^5\,t^4}{34\,560}+\frac{1169\,d\,t^5}{720}+\frac{3857\,d^2\,t^5}{5760}+\frac{49\,d^3\,t^5}{720}+\frac{7\,d^4\,t^5}{5760}+\frac{3857\,d\,t^6}{17\,280}+\frac{7\,d^2\,t^6}{120}+\frac{49\,d^3\,t^6}{17\,280}+\frac{d\,t^7}{60}+\frac{d^2\,t^7}{480}+\frac{d\,t^8}{1920}$$

In[102]:=

```
Expand[p2 /. {c1 → (10 - d) * H,
   c2 → (d ^ 2 - 10 * d + 45) * H ^ 2, c3 → (120 - 45 * d + 10 * d ^ 2 - d ^ 3) * H ^ 3,
   c4 → (d ^ 4 - 10 * d ^ 3 + 45 * d ^ 2 - 120 * d + 210) * H ^ 4,
   c5 → (252 - 210 * d + 120 * d ^ 2 - 45 * d ^ 3 + 10 * d ^ 4 - d ^ 5) * H ^ 5,
   c6 → (d ^ 6 - 10 * d ^ 5 + 45 * d ^ 4 - 120 * d ^ 3 + 210 * d ^ 2 - 252 * d + 210) * H ^ 6,
   c7 → (120 - 210 * d + 252 * d ^ 2 - 210 * d ^ 3 + 120 * d ^ 4 - 45 * d ^ 5 + 10 * d ^ 6 - d ^ 7) * H ^ 7,
   c8 → (45 - 120 * d + 210 * d ^ 2 - 252 * d ^ 3 + 210 * d ^ 4 - 120 * d ^ 5 +
       45 * d ^ 6 - 10 * d ^ 7 + d ^ 8) * H ^ 8, f1 → (7 / 2) * (d - 1) * H,
   f2 → (7 / 24) * (d - 1) * (19 * d - 17) * H ^ 2, f3 → (35 / 48) * (d - 1) ^ 2 * (7 * d - 5) * H ^ 3,
   f4 → %81 * H ^ 4, f5 → %87 * H ^ 5, f6 → %93 * H ^ 6, f7 → %99 * H ^ 7}]
```

Out[102]=

$$\frac{4\,588\,414\,559\,H^8}{4\,478\,976\,000}+\frac{760\,879\,d\,H^8}{103\,680}+\frac{3\,020\,091\,833\,d^2\,H^8}{223\,948\,800}+\frac{10\,927\,d^3\,H^8}{1080}+\frac{2\,397\,401\,447\,d^4\,H^8}{746\,496\,000}+$$
$$\frac{3577\,d^5\,H^8}{34\,560}-\frac{48\,436\,783\,d^6\,H^8}{223\,948\,800}-\frac{3101\,d^7\,H^8}{51\,840}-\frac{23\,844\,241\,d^8\,H^8}{4\,478\,976\,000}+\frac{760\,879\,H^8\,t}{103\,680}+\frac{23\,227}{810}\,d\,H^8\,t+$$
$$\frac{77\,273\,d^2\,H^8\,t}{2160}+\frac{27\,601\,d^3\,H^8\,t}{1440}+\frac{147\,637\,d^4\,H^8\,t}{34\,560}+\frac{427\,d^5\,H^8\,t}{8640}-\frac{7007\,d^6\,H^8\,t}{51\,840}-\frac{443\,d^7\,H^8\,t}{25\,920}+$$
$$\frac{23\,227\,H^8\,t^2}{1620}+\frac{18\,473}{480}\,d\,H^8\,t^2+\frac{37\,247\,d^2\,H^8\,t^2}{1080}+\frac{15\,239\,d^3\,H^8\,t^2}{1152}+\frac{34\,727\,d^4\,H^8\,t^2}{17\,280}+$$
$$\frac{49\,d^5\,H^8\,t^2}{5760}-\frac{1001\,d^6\,H^8\,t^2}{51\,840}+\frac{18\,473\,H^8\,t^3}{1440}+\frac{215\,173\,d\,H^8\,t^3}{8640}+\frac{18\,473\,d^2\,H^8\,t^3}{1152}+$$
$$\frac{3661}{864}\,d^3\,H^8\,t^3+\frac{2303\,d^4\,H^8\,t^3}{5760}+\frac{7\,d^5\,H^8\,t^3}{8640}+\frac{215\,173\,H^8\,t^4}{34\,560}+\frac{10\,045\,d\,H^8\,t^4}{1152}+$$
$$\frac{13\,391\,d^2\,H^8\,t^4}{3456}+\frac{245}{384}\,d^3\,H^8\,t^4+\frac{329\,d^4\,H^8\,t^4}{11\,520}+\frac{2009\,H^8\,t^5}{1152}+\frac{973}{576}\,d\,H^8\,t^5+\frac{539\,d^2\,H^8\,t^5}{1152}+$$
$$\frac{7}{192}\,d^3\,H^8\,t^5+\frac{973\,H^8\,t^6}{3456}+\frac{49}{288}\,d\,H^8\,t^6+\frac{77\,d^2\,H^8\,t^6}{3456}+\frac{7\,H^8\,t^7}{288}+\frac{1}{144}\,d\,H^8\,t^7+\frac{H^8\,t^8}{1152}$$

In[103]:=

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Expand[%102 /. {H^8 → d}]
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Out[103]=

$$\frac{4\,588\,414\,559\,d}{4\,478\,976\,000}+\frac{760\,879\,d^2}{103\,680}+\frac{3\,020\,091\,833\,d^3}{223\,948\,800}+\frac{10\,927\,d^4}{1080}+\frac{2\,397\,401\,447\,d^5}{746\,496\,000}+\frac{3577\,d^6}{34\,560}-\frac{48\,436\,783\,d^7}{223\,948\,800}-\frac{3101\,d^8}{51\,840}-\frac{23\,844\,241\,d^9}{4\,478\,976\,000}+\frac{760\,879\,d\,t}{103\,680}+\frac{23\,227\,d^2\,t}{810}+\frac{77\,273\,d^3\,t}{2160}+\frac{27\,601\,d^4\,t}{1440}+\frac{147\,637\,d^5\,t}{34\,560}+\frac{427\,d^6\,t}{8640}-\frac{7007\,d^7\,t}{51\,840}-\frac{443\,d^8\,t}{25\,920}+\frac{23\,227\,d\,t^2}{1620}+\frac{18\,473\,d^2\,t^2}{480}+\frac{37\,247\,d^3\,t^2}{1080}+\frac{15\,239\,d^4\,t^2}{1152}+\frac{34\,727\,d^5\,t^2}{17\,280}+\frac{49\,d^6\,t^2}{5760}-\frac{1001\,d^7\,t^2}{51\,840}+\frac{18\,473\,d\,t^3}{1440}+\frac{215\,173\,d^2\,t^3}{8640}+\frac{18\,473\,d^3\,t^3}{1152}+\frac{3661\,d^4\,t^3}{864}+\frac{2303\,d^5\,t^3}{5760}+\frac{7\,d^6\,t^3}{8640}+\frac{215\,173\,d\,t^4}{34\,560}+\frac{10\,045\,d^2\,t^4}{1152}+\frac{13\,391\,d^3\,t^4}{3456}+\frac{245\,d^4\,t^4}{384}+\frac{329\,d^5\,t^4}{11\,520}+\frac{2009\,d\,t^5}{1152}+\frac{973\,d^2\,t^5}{576}+\frac{539\,d^3\,t^5}{1152}+\frac{7\,d^4\,t^5}{192}+\frac{973\,d\,t^6}{3456}+\frac{49\,d^2\,t^6}{288}+\frac{77\,d^3\,t^6}{3456}+\frac{7\,d\,t^7}{288}+\frac{d^2\,t^7}{144}+\frac{d\,t^8}{1152}$$

In[104]:=

```
Expand[p2 /. {t → (t + (7 / 2) * (d - 1)), c1 → (10 - d) * H,
   c2 → (d ^ 2 - 10 * d + 45) * H ^ 2, c3 → (120 - 45 * d + 10 * d ^ 2 - d ^ 3) * H ^ 3,
   c4 → (d ^ 4 - 10 * d ^ 3 + 45 * d ^ 2 - 120 * d + 210) * H ^ 4,
   c5 → (252 - 210 * d + 120 * d ^ 2 - 45 * d ^ 3 + 10 * d ^ 4 - d ^ 5) * H ^ 5,
   c6 → (d ^ 6 - 10 * d ^ 5 + 45 * d ^ 4 - 120 * d ^ 3 + 210 * d ^ 2 - 252 * d + 210) * H ^ 6, c7 →
    (120 - 210 * d + 252 * d ^ 2 - 210 * d ^ 3 + 120 * d ^ 4 - 45 * d ^ 5 + 10 * d ^ 6 - d ^ 7) * H ^ 7, c8 →
    (45 - 120 * d + 210 * d ^ 2 - 252 * d ^ 3 + 210 * d ^ 4 - 120 * d ^ 5 + 45 * d ^ 6 - 10 * d ^ 7 + d ^ 8) *
     H ^ 8, f1 → - (7 / 2) * (d - 1) * H, f2 → (7 / 24) * (d - 1) * (19 * d - 17) * H ^ 2,
   f3 → - (35 / 48) * (d - 1) ^ 2 * (7 * d - 5) * H ^ 3, f4 → %81 * H ^ 4,
   f5 → - (%87) * H ^ 5, f6 → %93 * H ^ 6, f7 → - (%99) * H ^ 7}]
```

Out[104]=

$$-\frac{2\,913\,392\,207\,H^8}{8\,957\,952\,000}+\frac{289\,d\,H^8}{46\,080}+\frac{2\,495\,665\,111\,d^2\,H^8}{447\,897\,600}+\frac{194\,803\,d^3\,H^8}{15\,360}+\frac{17\,081\,536\,969\,d^4\,H^8}{1\,492\,992\,000}+$$
$$\frac{74\,137\,d^5\,H^8}{15\,360}+\frac{370\,588\,639\,d^6\,H^8}{447\,897\,600}-\frac{709\,d^7\,H^8}{46\,080}-\frac{136\,744\,607\,d^8\,H^8}{8\,957\,952\,000}+\frac{289\,H^8\,t}{69\,120}+\frac{207\,569\,d\,H^8\,t}{27\,648}+$$
$$\frac{309\,113\,d^2\,H^8\,t}{11\,520}+\frac{1\,583\,323\,d^3\,H^8\,t}{46\,080}+\frac{466\,627\,d^4\,H^8\,t}{23\,040}+\frac{51\,569\,d^5\,H^8\,t}{9216}+\frac{623\,d^6\,H^8\,t}{1080}-$$
$$\frac{709\,d^7\,H^8\,t}{138\,240}+\frac{207\,569\,H^8\,t^2}{82\,944}+\frac{47\,047\,d\,H^8\,t^2}{2560}+\frac{2\,545\,613\,d^2\,H^8\,t^2}{69\,120}+\frac{7889}{256}\,d^3\,H^8\,t^2+$$
$$\frac{329\,651\,d^4\,H^8\,t^2}{27\,648}+\frac{5103\,d^5\,H^8\,t^2}{2560}+\frac{623\,d^6\,H^8\,t^2}{6480}+\frac{47\,047\,H^8\,t^3}{11\,520}+\frac{389\,767\,d\,H^8\,t^3}{23\,040}+$$
$$\frac{25\,529\,d^2\,H^8\,t^3}{1152}+\frac{28\,049\,d^3\,H^8\,t^3}{2304}+\frac{3647\,d^4\,H^8\,t^3}{1280}+\frac{567\,d^5\,H^8\,t^3}{2560}+\frac{389\,767\,H^8\,t^4}{138\,240}+$$
$$\frac{245}{32}\,d\,H^8\,t^4+\frac{91\,049\,d^2\,H^8\,t^4}{13\,824}+\frac{35}{16}\,d^3\,H^8\,t^4+\frac{3647\,d^4\,H^8\,t^4}{15\,360}+\frac{49\,H^8\,t^5}{48}+\frac{175}{96}\,d\,H^8\,t^5+$$
$$\frac{91}{96}\,d^2\,H^8\,t^5+\frac{7}{48}\,d^3\,H^8\,t^5+\frac{175\,H^8\,t^6}{864}+\frac{7}{32}\,d\,H^8\,t^6+\frac{91\,d^2\,H^8\,t^6}{1728}+\frac{H^8\,t^7}{48}+\frac{1}{96}\,d\,H^8\,t^7+\frac{H^8\,t^8}{1152}$$

In[105]:=

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Expand[%104 /. {H^8 → d}]
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Out[105]=

$$-\frac{2\,913\,392\,207\,d}{8\,957\,952\,000}+\frac{289\,d^2}{46\,080}+\frac{2\,495\,665\,111\,d^3}{447\,897\,600}+\frac{194\,803\,d^4}{15\,360}+\frac{17\,081\,536\,969\,d^5}{1\,492\,992\,000}+$$
$$\frac{74\,137\,d^6}{15\,360}+\frac{370\,588\,639\,d^7}{447\,897\,600}-\frac{709\,d^8}{46\,080}-\frac{136\,744\,607\,d^9}{8\,957\,952\,000}+\frac{289\,d\,t}{69\,120}+\frac{207\,569\,d^2\,t}{27\,648}+$$
$$\frac{309\,113\,d^3\,t}{11\,520}+\frac{1\,583\,323\,d^4\,t}{46\,080}+\frac{466\,627\,d^5\,t}{23\,040}+\frac{51\,569\,d^6\,t}{9216}+\frac{623\,d^7\,t}{1080}-\frac{709\,d^8\,t}{138\,240}+$$
$$\frac{207\,569\,d\,t^2}{82\,944}+\frac{47\,047\,d^2\,t^2}{2560}+\frac{2\,545\,613\,d^3\,t^2}{69\,120}+\frac{7889\,d^4\,t^2}{256}+\frac{329\,651\,d^5\,t^2}{27\,648}+\frac{5103\,d^6\,t^2}{2560}+$$
$$\frac{623\,d^7\,t^2}{6480}+\frac{47\,047\,d\,t^3}{11\,520}+\frac{389\,767\,d^2\,t^3}{23\,040}+\frac{25\,529\,d^3\,t^3}{1152}+\frac{28\,049\,d^4\,t^3}{2304}+\frac{3647\,d^5\,t^3}{1280}+$$
$$\frac{567\,d^6\,t^3}{2560}+\frac{389\,767\,d\,t^4}{138\,240}+\frac{245\,d^2\,t^4}{32}+\frac{91\,049\,d^3\,t^4}{13\,824}+\frac{35\,d^4\,t^4}{16}+\frac{3647\,d^5\,t^4}{15\,360}+\frac{49\,d\,t^5}{48}+$$
$$\frac{175\,d^2\,t^5}{96}+\frac{91\,d^3\,t^5}{96}+\frac{7\,d^4\,t^5}{48}+\frac{175\,d\,t^6}{864}+\frac{7\,d^2\,t^6}{32}+\frac{91\,d^3\,t^6}{1728}+\frac{d\,t^7}{48}+\frac{d^2\,t^7}{96}+\frac{d\,t^8}{1152}$$

In[106]:=

```
Expand[p1 /. {t → (t + (7 / 2) * (d - 1)), c1 → (10 - d) * H,
   c2 → (d ^ 2 - 10 * d + 45) * H ^ 2, c3 → (120 - 45 * d + 10 * d ^ 2 - d ^ 3) * H ^ 3,
   c4 → (d ^ 4 - 10 * d ^ 3 + 45 * d ^ 2 - 120 * d + 210) * H ^ 4,
   c5 → (252 - 210 * d + 120 * d ^ 2 - 45 * d ^ 3 + 10 * d ^ 4 - d ^ 5) * H ^ 5,
   c6 → (d ^ 6 - 10 * d ^ 5 + 45 * d ^ 4 - 120 * d ^ 3 + 210 * d ^ 2 - 252 * d + 210) * H ^ 6, c7 →
    (120 - 210 * d + 252 * d ^ 2 - 210 * d ^ 3 + 120 * d ^ 4 - 45 * d ^ 5 + 10 * d ^ 6 - d ^ 7) * H ^ 7, c8 →
    (45 - 120 * d + 210 * d ^ 2 - 252 * d ^ 3 + 210 * d ^ 4 - 120 * d ^ 5 + 45 * d ^ 6 - 10 * d ^ 7 + d ^ 8) *
     H ^ 8, f1 → - (7 / 2) * (d - 1) * H, f2 → (7 / 24) * (d - 1) * (19 * d - 17) * H ^ 2,
   f3 → - (35 / 48) * (d - 1) ^ 2 * (7 * d - 5) * H ^ 3, f4 → %81 * H ^ 4,
   f5 → - (%87) * H ^ 5, f6 → %93 * H ^ 6, f7 → - (%99) * H ^ 7}]
```

Out[106]=

$$-\frac{4\,053\,139\,039\,H^8}{143\,327\,232\,000}-\frac{137\,d\,H^8}{192}-\frac{10\,744\,423\,513\,d^2\,H^8}{7\,166\,361\,600}+\frac{4403\,d^3\,H^8}{2304}+\frac{188\,962\,273\,913\,d^4\,H^8}{23\,887\,872\,000}+$$
$$\frac{9667\,d^5\,H^8}{1152}+\frac{28\,941\,086\,063\,d^6\,H^8}{7\,166\,361\,600}+\frac{2099\,d^7\,H^8}{2304}+\frac{11\,282\,180\,561\,d^8\,H^8}{143\,327\,232\,000}-\frac{137\,H^8\,t}{384}-$$
$$\frac{17\,713\,d\,H^8\,t}{11\,520}+\frac{39\,361\,d^2\,H^8\,t}{13\,824}+\frac{1477}{90}\,d^3\,H^8\,t+\frac{154\,721\,d^4\,H^8\,t}{6912}+\frac{153\,643\,d^5\,H^8\,t}{11\,520}+$$
$$\frac{50\,113\,d^6\,H^8\,t}{13\,824}+\frac{2099\,d^7\,H^8\,t}{5760}-\frac{17\,713\,H^8\,t^2}{46\,080}+\frac{3269\,d\,H^8\,t^2}{2304}+\frac{36\,239\,d^2\,H^8\,t^2}{2880}+\frac{26\,915\,d^3\,H^8\,t^2}{1152}+$$
$$\frac{2\,464\,609\,d^4\,H^8\,t^2}{138\,240}+\frac{1533}{256}\,d^5\,H^8\,t^2+\frac{50\,113\,d^6\,H^8\,t^2}{69\,120}+\frac{3269\,H^8\,t^3}{13\,824}+\frac{8141\,d\,H^8\,t^3}{1920}+$$
$$\frac{82\,915\,d^2\,H^8\,t^3}{6912}+\frac{2387}{192}\,d^3\,H^8\,t^3+\frac{73\,829\,d^4\,H^8\,t^3}{13\,824}+\frac{511}{640}\,d^5\,H^8\,t^3+\frac{8141\,H^8\,t^4}{15\,360}+\frac{875}{288}\,d\,H^8\,t^4+$$
$$\frac{66\,283\,d^2\,H^8\,t^4}{13\,824}+\frac{805}{288}\,d^3\,H^8\,t^4+\frac{73\,829\,d^4\,H^8\,t^4}{138\,240}+\frac{175\,H^8\,t^5}{576}+\frac{35}{36}\,d\,H^8\,t^5+\frac{497}{576}\,d^2\,H^8\,t^5+$$
$$\frac{161}{720}\,d^3\,H^8\,t^5+\frac{35\,H^8\,t^6}{432}+\frac{7}{48}\,d\,H^8\,t^6+\frac{497\,d^2\,H^8\,t^6}{8640}+\frac{H^8\,t^7}{96}+\frac{1}{120}\,d\,H^8\,t^7+\frac{H^8\,t^8}{1920}$$

In[107]:=

```
Expand[%106 /. {H^8 → d}]
```

Out[107]=

$$-\frac{4\,053\,139\,039\,d}{143\,327\,232\,000}-\frac{137\,d^2}{192}-\frac{10\,744\,423\,513\,d^3}{7\,166\,361\,600}+\frac{4403\,d^4}{2304}+\frac{188\,962\,273\,913\,d^5}{23\,887\,872\,000}+\frac{9667\,d^6}{1152}+\frac{28\,941\,086\,063\,d^7}{7\,166\,361\,600}+\frac{2099\,d^8}{2304}+\frac{11\,282\,180\,561\,d^9}{143\,327\,232\,000}-\frac{137\,d\,t}{384}-\frac{17\,713\,d^2\,t}{11\,520}+\frac{39\,361\,d^3\,t}{13\,824}+\frac{1477\,d^4\,t}{90}+\frac{154\,721\,d^5\,t}{6912}+\frac{153\,643\,d^6\,t}{11\,520}+\frac{50\,113\,d^7\,t}{13\,824}+\frac{2099\,d^8\,t}{5760}-\frac{17\,713\,d\,t^2}{46\,080}+\frac{3269\,d^2\,t^2}{2304}+\frac{36\,239\,d^3\,t^2}{2880}+\frac{26\,915\,d^4\,t^2}{1152}+\frac{2\,464\,609\,d^5\,t^2}{138\,240}+\frac{1533\,d^6\,t^2}{256}+\frac{50\,113\,d^7\,t^2}{69\,120}+\frac{3269\,d\,t^3}{13\,824}+\frac{8141\,d^2\,t^3}{1920}+\frac{82\,915\,d^3\,t^3}{6912}+\frac{2387\,d^4\,t^3}{192}+\frac{73\,829\,d^5\,t^3}{13\,824}+\frac{511\,d^6\,t^3}{640}+\frac{8141\,d\,t^4}{15\,360}+\frac{875\,d^2\,t^4}{288}+\frac{66\,283\,d^3\,t^4}{13\,824}+\frac{805\,d^4\,t^4}{288}+\frac{73\,829\,d^5\,t^4}{138\,240}+\frac{175\,d\,t^5}{576}+\frac{35\,d^2\,t^5}{36}+\frac{497\,d^3\,t^5}{576}+\frac{161\,d^4\,t^5}{720}+\frac{35\,d\,t^6}{432}+\frac{7\,d^2\,t^6}{48}+\frac{497\,d^3\,t^6}{8640}+\frac{d\,t^7}{96}+\frac{d^2\,t^7}{120}+\frac{d\,t^8}{1920}$$

In[108]:=

```
Expand[%101 /. {t → m - (7 / 2) * (d - 1)}]
```

Out[108]=

$$\frac{513\,397\,845\,100\,961\,d}{143\,327\,232\,000}-\frac{3\,234\,753\,d^2}{256}+\frac{136\,776\,814\,811\,687\,d^3}{7\,166\,361\,600}-\frac{4\,128\,509\,d^4}{256}+\frac{199\,155\,939\,265\,913\,d^5}{23\,887\,872\,000}-\frac{2\,073\,001\,d^6}{768}+\frac{3\,827\,890\,074\,863\,d^7}{7\,166\,361\,600}-\frac{45\,341\,d^8}{768}+\frac{399\,973\,316\,561\,d^9}{143\,327\,232\,000}+\frac{1\,078\,251\,d\,m}{256}-\frac{32\,769\,729\,d^2\,m}{2560}+\frac{3\,134\,579\,d^3\,m}{192}-\frac{43\,508\,143\,d^4\,m}{3840}+\frac{10\,646\,671\,d^5\,m}{2304}-\frac{25\,508\,329\,d^6\,m}{23\,040}+\frac{166\,117\,d^7\,m}{1152}-\frac{45\,341\,d^8\,m}{5760}+\frac{10\,923\,243\,d\,m^2}{5120}-\frac{2\,803\,269\,d^2\,m^2}{512}+\frac{132\,147\,757\,d^3\,m^2}{23\,040}-\frac{803\,915\,d^4\,m^2}{256}+\frac{131\,018\,209\,d^5\,m^2}{138\,240}-\frac{76\,517\,d^6\,m^2}{512}+\frac{166\,117\,d^7\,m^2}{17\,280}+\frac{934\,423\,d\,m^3}{1536}-\frac{4\,924\,423\,d^2\,m^3}{3840}+\frac{2\,441\,915\,d^3\,m^3}{2304}-\frac{494\,683\,d^4\,m^3}{1152}+\frac{393\,029\,d^5\,m^3}{4608}-\frac{76\,517\,d^6\,m^3}{11\,520}+\frac{4\,924\,423\,d\,m^4}{46\,080}-\frac{11\,375\,d^2\,m^4}{64}+\frac{1\,502\,683\,d^3\,m^4}{13\,824}-\frac{1855\,d^4\,m^4}{64}+\frac{393\,029\,d^5\,m^4}{138\,240}+\frac{2275\,d\,m^5}{192}-\frac{175\,d^2\,m^5}{12}+\frac{1127\,d^3\,m^5}{192}-\frac{371\,d^4\,m^5}{480}+\frac{175\,d\,m^6}{216}-\frac{21\,d^2\,m^6}{32}+\frac{1127\,d^3\,m^6}{8640}+\frac{d\,m^7}{32}-\frac{d^2\,m^7}{80}+\frac{d\,m^8}{1920}$$

In[109]:=

```
Expand[%103 /. {t → m - (7 / 2) * (d - 1)}]
```

Out[109]=

$$\frac{29\,526\,126\,063\,793\,d}{8\,957\,952\,000} - \frac{870\,925\,783\,d^2}{82\,944} + \frac{6\,358\,487\,753\,911\,d^3}{447\,897\,600} - \frac{294\,039\,053\,d^4}{27\,648} + \frac{7\,197\,243\,852\,169\,d^5}{1\,492\,992\,000} - \frac{37\,304\,239\,d^6}{27\,648} + \frac{101\,311\,255\,039\,d^7}{447\,897\,600} - \frac{1\,699\,061\,d^8}{82\,944} + \frac{6\,668\,724\,193\,d^9}{8\,957\,952\,000} + \frac{870\,925\,783\,d\,m}{207\,360} - \frac{954\,207\,685\,d^2\,m}{82\,944} + \frac{452\,976\,139\,d^3\,m}{34\,560} - \frac{24\,727\,451\,d^4\,m}{3072} + \frac{198\,599\,989\,d^5\,m}{69\,120} - \frac{16\,427\,285\,d^6\,m}{27\,648} + \frac{1\,697\,017\,d^7\,m}{25\,920} - \frac{242\,723\,d^8\,m}{82\,944} + \frac{190\,841\,537\,d\,m^2}{82\,944} - \frac{8\,158\,843\,d^2\,m^2}{1536} + \frac{342\,945\,617\,d^3\,m^2}{69\,120} - \frac{5\,528\,915\,d^4\,m^2}{2304} + \frac{17\,497\,907\,d^5\,m^2}{27\,648} - \frac{396\,361\,d^6\,m^2}{4608} + \frac{242\,431\,d^7\,m^2}{51\,840} + \frac{8\,158\,843\,d\,m^3}{11\,520} - \frac{18\,533\,767\,d^2\,m^3}{13\,824} + \frac{1\,136\,261\,d^3\,m^3}{1152} - \frac{2\,436\,245\,d^4\,m^3}{6912} + \frac{703\,787\,d^5\,m^3}{11\,520} - \frac{56\,623\,d^6\,m^3}{13\,824} + \frac{18\,533\,767\,d\,m^4}{138\,240} - \frac{57\,575\,d^2\,m^4}{288} + \frac{1\,502\,249\,d^3\,m^4}{13\,824} - \frac{1225\,d^4\,m^4}{48} + \frac{100\,541\,d^5\,m^4}{46\,080} + \frac{2303\,d\,m^5}{144} - \frac{5075\,d^2\,m^5}{288} + \frac{1813\,d^3\,m^5}{288} - \frac{35\,d^4\,m^5}{48} + \frac{1015\,d\,m^6}{864} - \frac{245\,d^2\,m^6}{288} + \frac{259\,d^3\,m^6}{1728} + \frac{7\,d\,m^7}{144} - \frac{5\,d^2\,m^7}{288} + \frac{d\,m^8}{1152}$$

In[110]:=

```
Expand[%105 /. {t → m - (7 / 2) * (d - 1)}]
```

Out[110]=

$$\frac{7\,572\,278\,446\,559\,d}{4\,478\,976\,000} - \frac{245\,528\,881\,d^2}{51\,840} + \frac{1\,247\,393\,724\,473\,d^3}{223\,948\,800} - \frac{1\,549\,457\,d^4}{432} + \frac{1\,027\,698\,058\,247\,d^5}{746\,496\,000} - \frac{5\,515\,783\,d^6}{17\,280} + \frac{9\,546\,382\,577\,d^7}{223\,948\,800} - \frac{14\,573\,d^8}{5184} + \frac{242\,742\,959\,d^9}{4\,478\,976\,000} + \frac{245\,528\,881\,d\,m}{103\,680} - \frac{18\,412\,031\,d^2\,m}{3240} + \frac{24\,240\,853\,d^3\,m}{4320} - \frac{94\,465\,d^4\,m}{32} + \frac{30\,740\,983\,d^5\,m}{34\,560} - \frac{328\,181\,d^6\,m}{2160} + \frac{689\,689\,d^7\,m}{51\,840} - \frac{1121\,d^8\,m}{2592} + \frac{18\,412\,031\,d\,m^2}{12\,960} - \frac{42\,952\,d^2\,m^2}{15} + \frac{39\,926\,159\,d^3\,m^2}{17\,280} - \frac{549\,731\,d^4\,m^2}{576} + \frac{1\,830\,661\,d^5\,m^2}{8640} - \frac{68\,341\,d^6\,m^2}{2880} + \frac{53\,053\,d^7\,m^2}{51\,840} + \frac{21\,476\,d\,m^3}{45} - \frac{3\,396\,673\,d^2\,m^3}{4320} + \frac{573\,937\,d^3\,m^3}{1152} - \frac{32\,753\,d^4\,m^3}{216} + \frac{127\,127\,d^5\,m^3}{5760} - \frac{5257\,d^6\,m^3}{4320} + \frac{3\,396\,673\,d\,m^4}{34\,560} - \frac{73\,255\,d^2\,m^4}{576} + \frac{102\,613\,d^3\,m^4}{1728} - \frac{2275\,d^4\,m^4}{192} + \frac{9779\,d^5\,m^4}{11\,520} + \frac{14\,651\,d\,m^5}{1152} - \frac{3493\,d^2\,m^5}{288} + \frac{4277\,d^3\,m^5}{1152} - \frac{35\,d^4\,m^5}{96} + \frac{3493\,d\,m^6}{3456} - \frac{91\,d^2\,m^6}{144} + \frac{329\,d^3\,m^6}{3456} + \frac{13\,d\,m^7}{288} - \frac{d^2\,m^7}{72} + \frac{d\,m^8}{1152}$$

In[111]:=

```
Expand[%107 /. {t → m - (7 / 2) * (d - 1)}]
```

Out[111]=

$$\frac{67\,498\,793\,060\,561\,d}{143\,327\,232\,000}-\frac{177\,759\,d^2}{160}+\frac{7\,800\,211\,243\,127\,d^3}{7\,166\,361\,600}-\frac{369\,677\,d^4}{640}+\frac{4\,303\,569\,007\,913\,d^5}{23\,887\,872\,000}-\frac{31\,871\,d^6}{960}+\frac{24\,709\,497\,023\,d^7}{7\,166\,361\,600}-\frac{359\,d^8}{1920}+\frac{743\,464\,961\,d^9}{143\,327\,232\,000}+\frac{59\,253\,d\,m}{80}-\frac{475\,569\,d^2\,m}{320}+\frac{583\,093\,d^3\,m}{480}-\frac{2\,011\,037\,d^4\,m}{3840}+\frac{45\,941\,d^5\,m}{360}-\frac{99\,407\,d^6\,m}{5760}+\frac{1687\,d^7\,m}{1440}-\frac{359\,d^8\,m}{11\,520}+\frac{158\,523\,d\,m^2}{320}-\frac{265\,503\,d^2\,m^2}{320}+\frac{634\,865\,d^3\,m^2}{1152}-\frac{11\,879\,d^4\,m^2}{64}+\frac{143\,339\,d^5\,m^2}{4320}-\frac{469\,d^6\,m^2}{160}+\frac{1687\,d^7\,m^2}{17\,280}+\frac{88\,501\,d\,m^3}{480}-\frac{481\,957\,d^2\,m^3}{1920}+\frac{2345\,d^3\,m^3}{18}-\frac{37\,079\,d^4\,m^3}{1152}+\frac{5411\,d^5\,m^3}{1440}-\frac{469\,d^6\,m^3}{2880}+\frac{481\,957\,d\,m^4}{11\,520}-\frac{2849\,d^2\,m^4}{64}+\frac{3661\,d^3\,m^4}{216}-\frac{175\,d^4\,m^4}{64}+\frac{5411\,d^5\,m^4}{34\,560}+\frac{2849\,d\,m^5}{480}-\frac{8897\,d^2\,m^5}{1920}+\frac{553\,d^3\,m^5}{480}-\frac{35\,d^4\,m^5}{384}+\frac{8897\,d\,m^6}{17\,280}-\frac{21\,d^2\,m^6}{80}+\frac{553\,d^3\,m^6}{17\,280}+\frac{d\,m^7}{40}-\frac{d^2\,m^7}{160}+\frac{d\,m^8}{1920}$$

In[112]:=

```
FunctionExpand[Binomial[m + 9, 9] - Binomial[9 + m - d, 9] +
  6 * (Binomial[m - (7 / 2) * (d - 1) + 9, 9] - Binomial[9 + m - (7 / 2) * (d - 1) - d, 9]) -
  5 * 7 * d * Binomial[8 + m - (7 / 2) * (d - 1), 8] + 4 * %108 - 3 * %109 + 2 * %110 - %111]
```

Out[112]=

$$-\frac{67\,498\,793\,060\,561\,d}{143\,327\,232\,000}+\frac{177\,759\,d^2}{160}-\frac{7\,800\,211\,243\,127\,d^3}{7\,166\,361\,600}+\frac{369\,677\,d^4}{640}-\frac{4\,303\,569\,007\,913\,d^5}{23\,887\,872\,000}+\frac{31\,871\,d^6}{960}-\frac{24\,709\,497\,023\,d^7}{7\,166\,361\,600}+\frac{359\,d^8}{1920}-\frac{743\,464\,961\,d^9}{143\,327\,232\,000}-\frac{1}{294\,912}d\,(-23+7\,d-2\,m)\,(-21+7\,d-2\,m)\,(-19+7\,d-2\,m)\,(-17+7\,d-2\,m)\,(-15+7\,d-2\,m)\,(-13+7\,d-2\,m)\,(-11+7\,d-2\,m)\,(-9+7\,d-2\,m)-\frac{1}{30\,965\,760}(-25+7\,d-2\,m)\,(-23+7\,d-2\,m)\,(-21+7\,d-2\,m)\,(-19+7\,d-2\,m)\,(-17+7\,d-2\,m)\,(-15+7\,d-2\,m)\,(-13+7\,d-2\,m)\,(-11+7\,d-2\,m)\,(-9+7\,d-2\,m)+\frac{1}{30\,965\,760}(-25+9\,d-2\,m)\,(-23+9\,d-2\,m)\,(-21+9\,d-2\,m)\,(-19+9\,d-2\,m)\,(-17+9\,d-2\,m)\,(-15+9\,d-2\,m)\,(-13+9\,d-2\,m)\,(-11+9\,d-2\,m)\,(-9+9\,d-2\,m)+\frac{1}{362\,880}(-9+d-m)\,(-8+d-m)\,(-7+d-m)\,(-6+d-m)\,(-5+d-m)\,(-4+d-m)\,(-3+d-m)\,(-2+d-m)\,(-1+d-m)-\frac{59\,253\,d\,m}{80}+\frac{475\,569\,d^2\,m}{320}-\frac{583\,093\,d^3\,m}{480}+\frac{2\,011\,037\,d^4\,m}{3840}-\frac{45\,941\,d^5\,m}{360}+\frac{99\,407\,d^6\,m}{5760}-\frac{1687\,d^7\,m}{1440}+\frac{359\,d^8\,m}{11\,520}-\frac{158\,523\,d\,m^2}{320}+\frac{265\,503\,d^2\,m^2}{320}-\frac{634\,865\,d^3\,m^2}{1152}+\frac{11\,879\,d^4\,m^2}{64}-\frac{143\,339\,d^5\,m^2}{4320}+\frac{469\,d^6\,m^2}{160}-\frac{1687\,d^7\,m^2}{17\,280}-\frac{88\,501\,d\,m^3}{480}+\frac{481\,957\,d^2\,m^3}{1920}-\frac{2345\,d^3\,m^3}{18}+\frac{37\,079\,d^4\,m^3}{1152}-\frac{5411\,d^5\,m^3}{1440}+\frac{469\,d^6\,m^3}{2880}-$$

$$\frac{481957\,d\,m^4}{11520}+\frac{2849\,d^2\,m^4}{64}-\frac{3661\,d^3\,m^4}{216}+\frac{175\,d^4\,m^4}{64}-\frac{5411\,d^5\,m^4}{34560}-\frac{2849\,d\,m^5}{480}+$$
$$\frac{8897\,d^2\,m^5}{1920}-\frac{553\,d^3\,m^5}{480}+\frac{35\,d^4\,m^5}{384}-\frac{8897\,d\,m^6}{17280}+\frac{21\,d^2\,m^6}{80}-\frac{553\,d^3\,m^6}{17280}-\frac{d\,m^7}{40}+\frac{d^2\,m^7}{160}-$$
$$\frac{d\,m^8}{1920}+\frac{(1+m)\,(2+m)\,(3+m)\,(4+m)\,(5+m)\,(6+m)\,(7+m)\,(8+m)\,(9+m)}{362880}+$$
$$4\left(\frac{513397845100961\,d}{143327232000}-\frac{3234753\,d^2}{256}+\frac{136776814811687\,d^3}{7166361600}-\frac{4128509\,d^4}{256}+\right.$$
$$\frac{199155939265913\,d^5}{23887872000}-\frac{2073001\,d^6}{768}+\frac{3827890074863\,d^7}{7166361600}-\frac{45341\,d^8}{768}+$$
$$\frac{399973316561\,d^9}{143327232000}+\frac{1078251\,d\,m}{256}-\frac{32769729\,d^2\,m}{2560}+\frac{3134579\,d^3\,m}{192}-$$
$$\frac{43508143\,d^4\,m}{3840}+\frac{10646671\,d^5\,m}{2304}-\frac{25508329\,d^6\,m}{23040}+\frac{166117\,d^7\,m}{1152}-\frac{45341\,d^8\,m}{5760}+$$
$$\frac{10923243\,d\,m^2}{5120}-\frac{2803269\,d^2\,m^2}{512}+\frac{132147757\,d^3\,m^2}{23040}-\frac{803915\,d^4\,m^2}{256}+$$
$$\frac{131018209\,d^5\,m^2}{138240}-\frac{76517\,d^6\,m^2}{512}+\frac{166117\,d^7\,m^2}{17280}+\frac{934423\,d\,m^3}{1536}-\frac{4924423\,d^2\,m^3}{3840}+$$
$$\frac{2441915\,d^3\,m^3}{2304}-\frac{494683\,d^4\,m^3}{1152}+\frac{393029\,d^5\,m^3}{4608}-\frac{76517\,d^6\,m^3}{11520}+\frac{4924423\,d\,m^4}{46080}-$$
$$\frac{11375\,d^2\,m^4}{64}+\frac{1502683\,d^3\,m^4}{13824}-\frac{1855\,d^4\,m^4}{64}+\frac{393029\,d^5\,m^4}{138240}+\frac{2275\,d\,m^5}{192}-\frac{175\,d^2\,m^5}{12}+$$
$$\left.\frac{1127\,d^3\,m^5}{192}-\frac{371\,d^4\,m^5}{480}+\frac{175\,d\,m^6}{216}-\frac{21\,d^2\,m^6}{32}+\frac{1127\,d^3\,m^6}{8640}+\frac{d\,m^7}{32}-\frac{d^2\,m^7}{80}+\frac{d\,m^8}{1920}\right)-$$
$$3\left(\frac{29526126063793\,d}{8957952000}-\frac{870925783\,d^2}{82944}+\frac{6358487753911\,d^3}{447897600}-\frac{294039053\,d^4}{27648}+\right.$$
$$\frac{7197243852169\,d^5}{1492992000}-\frac{37304239\,d^6}{27648}+\frac{101311255039\,d^7}{447897600}-\frac{1699061\,d^8}{82944}+$$
$$\frac{6668724193\,d^9}{8957952000}+\frac{870925783\,d\,m}{207360}-\frac{954207685\,d^2\,m}{82944}+\frac{452976139\,d^3\,m}{34560}-$$
$$\frac{24727451\,d^4\,m}{3072}+\frac{198599989\,d^5\,m}{69120}-\frac{16427285\,d^6\,m}{27648}+\frac{1697017\,d^7\,m}{25920}-\frac{242723\,d^8\,m}{82944}+$$
$$\frac{190841537\,d\,m^2}{82944}-\frac{8158843\,d^2\,m^2}{1536}+\frac{342945617\,d^3\,m^2}{69120}-\frac{5528915\,d^4\,m^2}{2304}+$$
$$\frac{17497907\,d^5\,m^2}{27648}-\frac{396361\,d^6\,m^2}{4608}+\frac{242431\,d^7\,m^2}{51840}+\frac{8158843\,d\,m^3}{11520}-\frac{18533767\,d^2\,m^3}{13824}+$$
$$\frac{1136261\,d^3\,m^3}{1152}-\frac{2436245\,d^4\,m^3}{6912}+\frac{703787\,d^5\,m^3}{11520}-\frac{56623\,d^6\,m^3}{13824}+\frac{18533767\,d\,m^4}{138240}-$$
$$\frac{57575\,d^2\,m^4}{288}+\frac{1502249\,d^3\,m^4}{13824}-\frac{1225\,d^4\,m^4}{48}+\frac{100541\,d^5\,m^4}{46080}+\frac{2303\,d\,m^5}{144}-\frac{5075\,d^2\,m^5}{288}+$$
$$\left.\frac{1813\,d^3\,m^5}{288}-\frac{35\,d^4\,m^5}{48}+\frac{1015\,d\,m^6}{864}-\frac{245\,d^2\,m^6}{288}+\frac{259\,d^3\,m^6}{1728}+\frac{7\,d\,m^7}{144}-\frac{5\,d^2\,m^7}{288}+\frac{d\,m^8}{1152}\right)+$$

$$2\left(\frac{7\,572\,278\,446\,559\,d}{4\,478\,976\,000}-\frac{245\,528\,881\,d^2}{51\,840}+\frac{1\,247\,393\,724\,473\,d^3}{223\,948\,800}-\frac{1\,549\,457\,d^4}{432}+\frac{1\,027\,698\,058\,247\,d^5}{746\,496\,000}-\frac{5\,515\,783\,d^6}{17\,280}+\frac{9\,546\,382\,577\,d^7}{223\,948\,800}-\frac{14\,573\,d^8}{5184}+\frac{242\,742\,959\,d^9}{4\,478\,976\,000}+\frac{245\,528\,881\,d\,m}{103\,680}-\frac{18\,412\,031\,d^2\,m}{3240}+\frac{24\,240\,853\,d^3\,m}{4320}-\frac{94\,465\,d^4\,m}{32}+\frac{30\,740\,983\,d^5\,m}{34\,560}-\frac{328\,181\,d^6\,m}{2160}+\frac{689\,689\,d^7\,m}{51\,840}-\frac{1121\,d^8\,m}{2592}+\frac{18\,412\,031\,d\,m^2}{12\,960}-\frac{42\,952\,d^2\,m^2}{15}+\frac{39\,926\,159\,d^3\,m^2}{17\,280}-\frac{549\,731\,d^4\,m^2}{576}+\frac{1\,830\,661\,d^5\,m^2}{8640}-\frac{68\,341\,d^6\,m^2}{2880}+\frac{53\,053\,d^7\,m^2}{51\,840}+\frac{21\,476\,d\,m^3}{45}-\frac{3\,396\,673\,d^2\,m^3}{4320}+\frac{573\,937\,d^3\,m^3}{1152}-\frac{32\,753\,d^4\,m^3}{216}+\frac{127\,127\,d^5\,m^3}{5760}-\frac{5257\,d^6\,m^3}{4320}+\frac{3\,396\,673\,d\,m^4}{34\,560}-\frac{73\,255\,d^2\,m^4}{576}+\frac{102\,613\,d^3\,m^4}{1728}-\frac{2275\,d^4\,m^4}{192}+\frac{9779\,d^5\,m^4}{11\,520}+\frac{14\,651\,d\,m^5}{1152}-\frac{3493\,d^2\,m^5}{288}+\frac{4277\,d^3\,m^5}{1152}-\frac{35\,d^4\,m^5}{96}+\frac{3493\,d\,m^6}{3456}-\frac{91\,d^2\,m^6}{144}+\frac{329\,d^3\,m^6}{3456}+\frac{13\,d\,m^7}{288}-\frac{d^2\,m^7}{72}+\frac{d\,m^8}{1152}\right)$$

In[113]:=

```
Expand[%]
```

Out[113]=

$$\frac{22\,024\,437\,079\,d}{28\,665\,446\,400}-\frac{667\,859\,d^2}{82\,944}+\frac{9\,602\,823\,917\,d^3}{286\,654\,464}-\frac{9\,997\,253\,d^4}{138\,240}+\frac{426\,516\,947\,647\,d^5}{4\,777\,574\,400}-\frac{1\,817\,291\,d^6}{27\,648}+\frac{8\,245\,412\,741\,d^7}{286\,654\,464}-\frac{2\,861\,741\,d^8}{414\,720}+\frac{19\,863\,510\,439\,d^9}{28\,665\,446\,400}+\frac{94\,541\,d\,m}{414\,720}-\frac{1\,903\,321\,d^2\,m}{829\,440}+\frac{1\,245\,769\,d^3\,m}{138\,240}-\frac{989\,695\,d^4\,m}{55\,296}+\frac{2\,703\,953\,d^5\,m}{138\,240}-\frac{3\,324\,433\,d^6\,m}{276\,480}+\frac{1\,638\,373\,d^7\,m}{414\,720}-\frac{88\,423\,d^8\,m}{165\,888}+\frac{13\,837\,d\,m^2}{829\,440}-\frac{413\,d^2\,m^2}{2560}+\frac{33\,019\,d^3\,m^2}{55\,296}-\frac{833\,d^4\,m^2}{768}+\frac{285\,061\,d^5\,m^2}{276\,480}-\frac{3871\,d^6\,m^2}{7680}+\frac{17\,443\,d^7\,m^2}{165\,888}$$

In[114]:=

```
v0 = %113 /. {m → 0}
```

Out[114]=

$$\frac{22\,024\,437\,079\,d}{28\,665\,446\,400}-\frac{667\,859\,d^2}{82\,944}+\frac{9\,602\,823\,917\,d^3}{286\,654\,464}-\frac{9\,997\,253\,d^4}{138\,240}+\frac{426\,516\,947\,647\,d^5}{4\,777\,574\,400}-\frac{1\,817\,291\,d^6}{27\,648}+\frac{8\,245\,412\,741\,d^7}{286\,654\,464}-\frac{2\,861\,741\,d^8}{414\,720}+\frac{19\,863\,510\,439\,d^9}{28\,665\,446\,400}$$

In[115]:=

```
Factor[%]
```

Out[115]=

$$\frac{1}{28\,665\,446\,400}(-1+d)\,d\,\left(-22\,024\,437\,079+208\,787\,633\,321\,d-751\,494\,758\,379\,d^2+1\,321\,535\,623\,701\,d^3-1\,237\,566\,062\,181\,d^4+646\,601\,246\,619\,d^5-177\,940\,027\,481\,d^6+19\,863\,510\,439\,d^7\right)$$

In[116]:=

```
v1 = %113 /. {m → 1}
```

Out[116]=

$$\frac{29\,037\,317\,719\,d}{28\,665\,446\,400}-\frac{2\,905\,241\,d^2}{276\,480}+\frac{61\,786\,105\,057\,d^3}{1\,433\,272\,320}-\frac{8\,414\,287\,d^4}{92\,160}+\frac{524\,891\,417\,407\,d^5}{4\,777\,574\,400}-\frac{7\,212\,233\,d^6}{92\,160}+\frac{47\,039\,988\,313\,d^7}{1\,433\,272\,320}-\frac{2\,055\,199\,d^8}{276\,480}+\frac{19\,863\,510\,439\,d^9}{28\,665\,446\,400}$$

In[117]:=

```
Factor[%]
```

Out[117]=

$$\frac{1}{28\,665\,446\,400}(-1+d)\,d\,\left(-29\,037\,317\,719+272\,178\,069\,161\,d-963\,544\,031\,979\,d^2+1\,653\,635\,796\,501\,d^3-1\,495\,712\,707\,941\,d^4+747\,580\,244\,379\,d^5-193\,219\,521\,881\,d^6+19\,863\,510\,439\,d^7\right)$$

In[118]:=

```
DZ = Expand[%93 * d]
```

Out[118]=

$$\frac{13\,837\,d}{414\,720}-\frac{413\,d^2}{1280}+\frac{33\,019\,d^3}{27\,648}-\frac{833\,d^4}{384}+\frac{285\,061\,d^5}{138\,240}-\frac{3871\,d^6}{3840}+\frac{17\,443\,d^7}{82\,944}$$

In[119]:=

```
Factor[%]
```

Out[119]=

$$\frac{(-1+d)\,d\,\left(-13\,837+119\,975\,d-375\,310\,d^2+524\,330\,d^3-330\,853\,d^4+87\,215\,d^5\right)}{414\,720}$$

In[120]:=

```
HK = Expand[DZ + 2 * (v0 - v1)]
```

Out[120]=

$$-\frac{94\,541\,d}{207\,360}+\frac{1\,903\,321\,d^2}{414\,720}-\frac{1\,245\,769\,d^3}{69\,120}+\frac{989\,695\,d^4}{27\,648}-\frac{2\,703\,953\,d^5}{69\,120}+\frac{3\,324\,433\,d^6}{138\,240}-\frac{1\,638\,373\,d^7}{207\,360}+\frac{88\,423\,d^8}{82\,944}$$

In[121]:=

```
Factor[%]
```

Out[121]=

$$\frac{1}{414\,720}(-1+d)\,d\,\left(189\,082-1\,714\,239\,d+5\,760\,375\,d^2-9\,085\,050\,d^3+7\,138\,668\,d^4-2\,834\,631\,d^5+442\,115\,d^6\right)$$

In[122]:=

```
K2 = Expand[(9 * d - 27) * HK - (1 / 4) * (9 * d - 27) ^ 2 * DZ]
```

Out[122]=

$$\frac{382\,729\,d}{61\,440}-\frac{1\,201\,021\,d^2}{18\,432}+\frac{24\,920\,093\,d^3}{92\,160}-\frac{17\,870\,503\,d^4}{30\,720}+\frac{1\,372\,483\,d^5}{1920}-\frac{3\,214\,477\,d^6}{6144}+\frac{2\,326\,523\,d^7}{10\,240}-\frac{4\,970\,071\,d^8}{92\,160}+\frac{196\,705\,d^9}{36\,864}$$

In[123]:=

```
Factor[%]
```

Out[123]=

$$\frac{1}{184\,320}(-3+d)\,(-1+d)\,d\,\left(382\,729-3\,493\,098\,d+11\,828\,355\,d^2-18\,805\,500\,d^3+14\,902\,671\,d^4-6\,006\,042\,d^5+983\,525\,d^6\right)$$

In[124]:=

```
C2 = Expand[-(1 / 120) * (12 529 - 8592 * d + 1463 * d ^ 2) * DZ + (1 / 5) * (26 * d - 71) * HK]
```

Out[124]=

$$\frac{29\,766\,391\,d}{9\,953\,280}-\frac{1\,739\,809\,d^2}{55\,296}+\frac{81\,862\,907\,d^3}{622\,080}-\frac{5\,273\,303\,d^4}{18\,432}+\frac{591\,328\,801\,d^5}{1\,658\,880}-\frac{4\,894\,897\,d^6}{18\,432}+\frac{146\,775\,601\,d^7}{1\,244\,160}-\frac{1\,596\,743\,d^8}{55\,296}+\frac{29\,656\,843\,d^9}{9\,953\,280}$$

In[125]:=

```
Factor[%]
```

Out[125]=

$$\frac{1}{9\,953\,280}(-1+d)\,d\,\left(-29\,766\,391+283\,399\,229\,d-1\,026\,407\,283\,d^2+1\,821\,176\,337\,d^3-1\,726\,796\,469\,d^4+916\,447\,911\,d^5-257\,756\,897\,d^6+29\,656\,843\,d^7\right)$$

In[126]:=

```
Expand[12 * v0 - K2 - C2]
```

Out[126]=

$$-\frac{281\,d}{2\,388\,787\,200}+\frac{913\,d^3}{119\,439\,360}-\frac{39\,473\,d^5}{398\,131\,200}+\frac{41\,737\,d^7}{119\,439\,360}-\frac{615\,881\,d^9}{2\,388\,787\,200}$$

In[127]:=

```
Factor[%]
```

Out[127]=

$$-\frac{(-1+d)\,d\,(1+d)\,(-1+7\,d)\,(1+7\,d)\,\left(281-4210\,d^2+12\,569\,d^4\right)}{2\,388\,787\,200}$$