Pensieve Header: Solving for a PPS associator degree by degree.

Initialization

(Alt) In[ ]:=

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\People\\Kuno"];
<< FreeLie.m
<< AwCalculus.m
<< FAA.m
<< EmergentChordDiagrams.m
BeginProfile[]
```

FreeLie` implements / extends
  $\{*, +, **, \$SeriesShowDegree, \langle\rangle, \int, \equiv, ad, Ad, adSeries, AllCyclicWords, AllLyndonWords,$
  AllWords, Arbitrator, AS, ASeries, AW, b, BCH, BooleanSequence, BracketForm, BS, CC, Crop,
  cw, CW, CWS, CWSeries, D, Deg, DegreeScale, DerivationSeries, div, DK, DKS, DKSeries, EulerE,
  Exp, Inverse, j, J, JA, LieDerivation, LieMorphism, LieSeries, LS, LW, LyndonFactorization,
  Morphism, New, RandomCWSeries, Randomizer, RandomLieSeries, RC, SeriesSolve, Support,
  $t, tb, TopBracketForm, tr, UndeterminedCoefficients, \alpha Map, \Gamma, \iota, \Lambda, \sigma, \hbar, \frown, \smile\}.$

FreeLie` is in the public domain. Dror Bar-Natan is committed
  to support it within reason until July 15, 2022. This is version 150814.

AwCalculus` implements / extends $\{*, **, \equiv, dA, dc, deg, dm, dS, d\triangle, d\eta, d\sigma, El, Es, hA,$
  $hm, hS, h\triangle, h\eta, h\sigma, RandomElSeries, RandomEsSeries, tA, tha, tm, tS, t\triangle, t\eta, t\sigma, \Gamma, \Lambda\}.$

AwCalculus` is in the public domain. Dror Bar-Natan is committed
  to support it within reason until July 15, 2022. This is version 150909.

This is Profile.m of http://www.drorbn.net/AcademicPensieve/Projects/Profile/.

This version: April 2020. Original version: July 1994.

(Alt) Out[ ]=

ProfileRoot

(Alt) In[ ]:=

$$\Phi[2] = \mathbb{O}_{AR,\{x,y\},\{1\}}\left[\mathcal{A}_0\left[AW_1[\ ] + \frac{1}{24} AW_1[x, y] - \frac{1}{24} AW_1[y, x]\right]\right]$$

(Alt) Out[ ]=

$$\mathbb{O}_{AR,\{x,y\},\{1\}}\left[\mathcal{A}_0\left[AW_1[\ ] + \frac{1}{24} AW_1[x, y] - \frac{1}{24} AW_1[y, x]\right]\right]$$

(Alt) In[ ]:=

```
Pentagon_d_[Φ_] :=
  IM_d[Φ // sη_2, Φ // sσ_{1→2} // pΔ_{y→y,z} // p2s_{z→1}, Φ // sσ_{1→2} // p2s_{y→1} // pσ_{x→y} // pη_x] -
    IM_d[Φ // sσ_{1→2} // p2s_{y→1} // pΔ_{x→x,y}, Φ // sΔ_{1→1,2}]
```

Solving to Degree 3

(Alt) In[ ]:=

```
Select[Basis_3[O_{AR,{x,y},{1}}], FreeQ[#, A_{c[1]}] &]
```

(Alt) Out[ ]=

$$\{\mathbb{O}_{AR,\{x,y\},\{1\}}[\mathcal{A}_0[AW_1[x, x, x]]], \mathbb{O}_{AR,\{x,y\},\{1\}}[\mathcal{A}_0[AW_1[x, x, y]]],$$
$$\mathbb{O}_{AR,\{x,y\},\{1\}}[\mathcal{A}_0[AW_1[x, y, x]]], \mathbb{O}_{AR,\{x,y\},\{1\}}[\mathcal{A}_0[AW_1[x, y, y]]], \mathbb{O}_{AR,\{x,y\},\{1\}}[\mathcal{A}_0[AW_1[y, x, x]]],$$
$$\mathbb{O}_{AR,\{x,y\},\{1\}}[\mathcal{A}_0[AW_1[y, x, y]]], \mathbb{O}_{AR,\{x,y\},\{1\}}[\mathcal{A}_0[AW_1[y, y, x]]], \mathbb{O}_{AR,\{x,y\},\{1\}}[\mathcal{A}_0[AW_1[y, y, y]]]\}$$

(Alt) In[ ]:=

```
d = 3;  i = 0;
Φ[d] = Φ[d - 1] + Sum[c_{d,++i} B, {B, Select[Basis_d[O_{AR,{x,y},{1}}], FreeQ[#, A_{c[1]}] &]}]
```

(Alt) Out[ ]=

$$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[$$
$$\mathcal{A}_0\Big[AW_1[\ ] + \frac{1}{24} AW_1[x, y] - \frac{1}{24} AW_1[y, x] + c_{3,1} AW_1[x, x, x] + c_{3,2} AW_1[x, x, y] + c_{3,3} AW_1[x, y, x] +$$
$$c_{3,4} AW_1[x, y, y] + c_{3,5} AW_1[y, x, x] + c_{3,6} AW_1[y, x, y] + c_{3,7} AW_1[y, y, x] + c_{3,8} AW_1[y, y, y]\Big]\Big]$$

(Alt) In[ ]:=

```
rels = Union @@ (List @@ Pentagon_d[Φ[d]][[1]] /. {
    A_0[A_] :> Table[Coefficient[A, B], {B, Basis_{d,{x,y}}[AW_1 AW_2]}],
    A_{c[1,2]}[A_] :> Table[Coefficient[A, B], {B, AW_{\bar{2}}[] Basis_{d-1,{x,y}}[AW_1 AW_2 AW_{\bar{1}}]}]
  })
```

(Alt) Out[ ]=

$$\{0, -4 c_{3,1}, -3 c_{3,1}, -c_{3,1}, 3 c_{3,1}, 5 c_{3,1}, -2 c_{3,2} - c_{3,3}, -c_{3,3} - 2 c_{3,5},$$
$$-c_{3,2} - c_{3,3} - c_{3,5}, -c_{3,2} - c_{3,3} - c_{3,4} - c_{3,5}, c_{3,3} + 2 c_{3,5}, -2 c_{3,4} - c_{3,6},$$
$$-c_{3,3} - 2 c_{3,5} - c_{3,6}, c_{3,2} - c_{3,5} - c_{3,6}, -c_{3,2} - c_{3,3} + 2 c_{3,4} - c_{3,5} + c_{3,6},$$
$$c_{3,3} + c_{3,4} + 2 c_{3,5} + c_{3,6}, -c_{3,6} - 2 c_{3,7}, c_{3,2} + 2 c_{3,3} + 3 c_{3,5} - c_{3,6} - 2 c_{3,7},$$
$$c_{3,2} + 2 c_{3,3} + 3 c_{3,5} - c_{3,7}, -c_{3,4} - c_{3,6} - c_{3,7}, -c_{3,2} - c_{3,3} - c_{3,5} + c_{3,6} + c_{3,7},$$
$$-c_{3,2} - 2 c_{3,3} - 3 c_{3,5} + c_{3,6} + 2 c_{3,7}, -c_{3,2} - c_{3,3} - c_{3,5} + c_{3,6} + 2 c_{3,7}, -3 c_{3,8}, 3 c_{3,8}\}$$

(Alt) In[ ]:=
eqns = # == 0 & /@ rels

(Alt) Out[ ]=
$\{$True, $-4\,c_{3,1} == 0$, $-3\,c_{3,1} == 0$, $-c_{3,1} == 0$, $3\,c_{3,1} == 0$, $5\,c_{3,1} == 0$, $-2\,c_{3,2} - c_{3,3} == 0$,
$-c_{3,3} - 2\,c_{3,5} == 0$, $-c_{3,2} - c_{3,3} - c_{3,5} == 0$, $-c_{3,2} - c_{3,3} - c_{3,4} - c_{3,5} == 0$, $c_{3,3} + 2\,c_{3,5} == 0$,
$-2\,c_{3,4} - c_{3,6} == 0$, $-c_{3,3} - 2\,c_{3,5} - c_{3,6} == 0$, $c_{3,2} - c_{3,5} - c_{3,6} == 0$, $-c_{3,2} - c_{3,3} + 2\,c_{3,4} - c_{3,5} + c_{3,6} == 0$,
$c_{3,3} + c_{3,4} + 2\,c_{3,5} + c_{3,6} == 0$, $-c_{3,6} - 2\,c_{3,7} == 0$, $c_{3,2} + 2\,c_{3,3} + 3\,c_{3,5} - c_{3,6} - 2\,c_{3,7} == 0$,
$c_{3,2} + 2\,c_{3,3} + 3\,c_{3,5} - c_{3,7} == 0$, $-c_{3,4} - c_{3,6} - c_{3,7} == 0$, $-c_{3,2} - c_{3,3} - c_{3,5} + c_{3,6} + c_{3,7} == 0$,
$-c_{3,2} - 2\,c_{3,3} - 3\,c_{3,5} + c_{3,6} + 2\,c_{3,7} == 0$, $-c_{3,2} - c_{3,3} - c_{3,5} + c_{3,6} + 2\,c_{3,7} == 0$, $-3\,c_{3,8} == 0$, $3\,c_{3,8} == 0\}$

(Alt) In[ ]:=
vars = Union[Cases[eqns, $c_{d,\_}$, ∞]]

(Alt) Out[ ]=
$\{c_{3,1}, c_{3,2}, c_{3,3}, c_{3,4}, c_{3,5}, c_{3,6}, c_{3,7}, c_{3,8}\}$

(Alt) In[ ]:=
sol = Solve[eqns, vars]〚1〛

⋯ Solve: Equations may not give solutions for all "solve" variables.

(Alt) Out[ ]=
$\{c_{3,1} \to 0, c_{3,3} \to -2\,c_{3,2}, c_{3,4} \to 0, c_{3,5} \to c_{3,2}, c_{3,6} \to 0, c_{3,7} \to 0, c_{3,8} \to 0\}$

(Alt) In[ ]:=
sol /. Rule → Set

(Alt) Out[ ]=
$\{0, -2\,c_{3,2}, 0, c_{3,2}, 0, 0, 0\}$

(Alt) In[ ]:=
Φ[3]

(Alt) Out[ ]=
$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[$

$\mathscr{A}_0\Big[AW_1[\,] + \dfrac{1}{24}\,AW_1[x, y] - \dfrac{1}{24}\,AW_1[y, x] + c_{3,2}\,AW_1[x, x, y] - 2\,c_{3,2}\,AW_1[x, y, x] + c_{3,2}\,AW_1[y, x, x]\Big]\Big]$

(Alt) In[ ]:=
$c_{3,2}$ = 0

(Alt) Out[ ]=
0

(Alt) In[ ]:=
Φ[3]

(Alt) Out[ ]=
$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[\mathscr{A}_0\Big[AW_1[\,] + \dfrac{1}{24}\,AW_1[x, y] - \dfrac{1}{24}\,AW_1[y, x]\Big]\Big]$

Solving to Degree 4

(Alt) In[ ]:=

```
d = 4; i = 0;
Φ[d] = Φ[d - 1] + Sum[c_{d,++i} B, {B, Select[Basis_d[𝕆_{AR,{x,y},{1}}], FreeQ[#, 𝒜_{c[1]}] &}]]
```

(Alt) Out[ ]=

$$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[\mathscr{A}_0\Big[AW_1[\ ] + \frac{1}{24}AW_1[x, y] - \frac{1}{24}AW_1[y, x] + c_{4,1}AW_1[x, x, x, x] +$$

$$c_{4,2}AW_1[x, x, x, y] + c_{4,3}AW_1[x, x, y, x] + c_{4,4}AW_1[x, x, y, y] + c_{4,5}AW_1[x, y, x, x] +$$

$$c_{4,6}AW_1[x, y, x, y] + c_{4,7}AW_1[x, y, y, x] + c_{4,8}AW_1[x, y, y, y] + c_{4,9}AW_1[y, x, x, x] +$$

$$c_{4,10}AW_1[y, x, x, y] + c_{4,11}AW_1[y, x, y, x] + c_{4,12}AW_1[y, x, y, y] + c_{4,13}AW_1[y, y, x, x] +$$

$$c_{4,14}AW_1[y, y, x, y] + c_{4,15}AW_1[y, y, y, x] + c_{4,16}AW_1[y, y, y, y]\Big]\Big]$$

(Alt) In[ ]:=

```
rels = Union @@ (List @@ Pentagon_d[Φ[d]]〚1〛 /. {
        𝒜_0[A_] ⧴ Table[Coefficient[A, B], {B, Basis_{d,{x,y}}[AW_1 AW_2]}],
        𝒜_{c[1,2]}[A_] ⧴ Table[Coefficient[A, B], {B, AW_{2̄}[] Basis_{d-1,{x,y}}[AW_1 AW_2 AW_{1̄}]}]
      })
```

(Alt) Out[ ]=

$$\Big\{0, -16 c_{4,1}, -11 c_{4,1}, -7 c_{4,1}, -6 c_{4,1}, -4 c_{4,1}, -c_{4,1}, c_{4,1}, 6 c_{4,1}, 17 c_{4,1}, 20 c_{4,1},$$

$$-3 c_{4,2} - c_{4,3}, -2 c_{4,3} - 2 c_{4,5}, -3 c_{4,2} - 2 c_{4,3} - c_{4,5}, \frac{1}{576} - 4 c_{4,4} - 2 c_{4,6}, -2 c_{4,4} - c_{4,6} - c_{4,7},$$

$$-c_{4,3} - 2 c_{4,5} - 3 c_{4,9}, -c_{4,5} - 3 c_{4,9}, -3 c_{4,2} - 3 c_{4,3} - 2 c_{4,4} - 3 c_{4,5} - c_{4,6} - c_{4,7} - 3 c_{4,9},$$

$$-c_{4,2} - c_{4,3} - c_{4,5} - c_{4,9}, \frac{1}{576} - 4 c_{4,2} - 3 c_{4,3} - c_{4,4} - c_{4,5} - c_{4,6} - c_{4,9},$$

$$c_{4,3} + 2 c_{4,5} + 3 c_{4,9}, -\frac{1}{288} - 3 c_{4,3} - 3 c_{4,5} - c_{4,6} - c_{4,7} - c_{4,9} - 2 c_{4,10},$$

$$-2 c_{4,4} - c_{4,6} - c_{4,10}, -c_{4,2} - c_{4,3} + 2 c_{4,4} - c_{4,5} + c_{4,6} - c_{4,9} + c_{4,10},$$

$$5 c_{4,2} + c_{4,3} - 2 c_{4,5} - c_{4,6} - c_{4,7} - 3 c_{4,9} - 4 c_{4,10} - 2 c_{4,11}, -c_{4,6} - 2 c_{4,7} - c_{4,11},$$

$$5 c_{4,2} + 6 c_{4,3} + 3 c_{4,5} + c_{4,6} + 3 c_{4,9} - c_{4,11}, -c_{4,6} - 2 c_{4,10} - c_{4,11}, -\frac{1}{576} - c_{4,6} - 2 c_{4,7} - 2 c_{4,10} - c_{4,11},$$

$$-2 c_{4,3} - 4 c_{4,5} - c_{4,6} - 6 c_{4,9} - 2 c_{4,10} - c_{4,11}, 3 c_{4,2} + c_{4,3} - c_{4,5} - c_{4,6} - 3 c_{4,9} - 2 c_{4,10} - c_{4,11},$$

$$-\frac{1}{576} + 3 c_{4,2} + 3 c_{4,3} + 3 c_{4,5} - c_{4,6} - 2 c_{4,7} + 3 c_{4,9} - 2 c_{4,10} - c_{4,11},$$

$$\frac{1}{576} - c_{4,3} - 3 c_{4,5} - 5 c_{4,9} - c_{4,10} - c_{4,11}, -c_{4,2} - c_{4,3} - c_{4,5} + c_{4,6} + 2 c_{4,7} - c_{4,9} + c_{4,11},$$

$$-\frac{1}{576} - c_{4,2} - c_{4,3} + c_{4,9} + c_{4,10} + c_{4,11}, \frac{1}{576} - 3 c_{4,2} - 3 c_{4,3} - 3 c_{4,5} + c_{4,6} + 2 c_{4,7} - 3 c_{4,9} + 2 c_{4,10} + c_{4,11},$$

$$2 c_{4,3} + 2 c_{4,4} + 4 c_{4,5} + 2 c_{4,6} + c_{4,7} + 6 c_{4,9} + 2 c_{4,10} + c_{4,11},$$

$$3 c_{4,3} + c_{4,4} + 3 c_{4,5} + 2 c_{4,6} + c_{4,7} + 3 c_{4,9} + 3 c_{4,10} + c_{4,11}, -3 c_{4,8} - c_{4,12},$$

$$\frac{1}{576} + c_{4,4} + c_{4,9} - c_{4,12}, -2 c_{4,4} - c_{4,5} - 2 c_{4,6} - 2 c_{4,7} - 3 c_{4,8} - 3 c_{4,9} - c_{4,10} - c_{4,11} - c_{4,12},$$

$$-c_{4,2} - c_{4,3} - c_{4,5} + 3 c_{4,8} - c_{4,9} + c_{4,12}, \frac{1}{576} - 2 c_{4,11} - 4 c_{4,13},$$

$$\frac{1}{576} + 2\,c_{4,3} + 4\,c_{4,5} + 6\,c_{4,9} - 2\,c_{4,11} - 4\,c_{4,13},\ 5\,c_{4,2} + 5\,c_{4,3} + 7\,c_{4,5} + 11\,c_{4,9} - 2\,c_{4,10} - 2\,c_{4,11} - 4\,c_{4,13},$$

$$3\,c_{4,3} + 6\,c_{4,5} + 8\,c_{4,9} + 2\,c_{4,10} - 2\,c_{4,13},\ \frac{1}{288} + 2\,c_{4,3} + 2\,c_{4,5} + c_{4,9} - 2\,c_{4,11} - 2\,c_{4,13},$$

$$-c_{4,7} - c_{4,11} - 2\,c_{4,13},\ 3\,c_{4,2} + 5\,c_{4,3} + 7\,c_{4,5} - c_{4,7} + 9\,c_{4,9} - c_{4,11} - 2\,c_{4,13},\ -c_{4,10} - c_{4,11} - 2\,c_{4,13},$$

$$-c_{4,4} - c_{4,6} - c_{4,7} - c_{4,10} - c_{4,11} - c_{4,13},\ -\frac{1}{576} + c_{4,2} - c_{4,5} + c_{4,9} - c_{4,10} + c_{4,13},$$

$$-c_{4,2} - 2\,c_{4,3} - 2\,c_{4,5} - 4\,c_{4,9} + c_{4,11} + c_{4,13},\ -4\,c_{4,2} - 4\,c_{4,3} - 5\,c_{4,5} - 7\,c_{4,9} + c_{4,10} + c_{4,11} + 2\,c_{4,13},$$

$$-c_{4,2} - c_{4,3} - 2\,c_{4,5} - 4\,c_{4,9} + c_{4,10} + c_{4,11} + 2\,c_{4,13},\ -c_{4,2} - c_{4,3} - c_{4,5} - c_{4,9} + c_{4,10} + c_{4,11} + 2\,c_{4,13},$$

$$-3\,c_{4,2} - 3\,c_{4,3} - 3\,c_{4,5} + c_{4,6} + c_{4,7} - 3\,c_{4,9} + 2\,c_{4,10} + 2\,c_{4,11} + 2\,c_{4,13},$$

$$-5\,c_{4,2} - 5\,c_{4,3} - 2\,c_{4,5} + c_{4,7} - 3\,c_{4,9} + 2\,c_{4,10} + 3\,c_{4,11} + 2\,c_{4,13},$$

$$-\frac{1}{576} - 2\,c_{4,3} - 4\,c_{4,5} - 6\,c_{4,9} + 2\,c_{4,11} + 4\,c_{4,13},\ \frac{1}{288} - c_{4,6} - 2\,c_{4,7} - c_{4,9} - c_{4,10} - c_{4,11} - 3\,c_{4,12} - 2\,c_{4,14},$$

$$-2\,c_{4,12} - 2\,c_{4,14},\ 2\,c_{4,4} - c_{4,5} + c_{4,6} - 3\,c_{4,9} + c_{4,10} - 2\,c_{4,12} - 2\,c_{4,14},$$

$$-c_{4,5} - c_{4,6} - 2\,c_{4,7} - 3\,c_{4,9} - c_{4,10} - 2\,c_{4,11} - 2\,c_{4,12} - 2\,c_{4,13} - 2\,c_{4,14},$$

$$-3\,c_{4,8} - 2\,c_{4,12} - c_{4,14},\ -\frac{1}{576} - c_{4,4} - c_{4,6} - c_{4,7} - 4\,c_{4,8} - c_{4,9} - 2\,c_{4,12} - c_{4,14},$$

$$-c_{4,7} - c_{4,8} - 3\,c_{4,9} - c_{4,12} - c_{4,14},\ -\frac{1}{288} - 2\,c_{4,4} - c_{4,6} + c_{4,9} + 2\,c_{4,12} + c_{4,14},$$

$$-c_{4,2} - c_{4,3} - c_{4,5} - c_{4,9} + 2\,c_{4,12} + 2\,c_{4,14},\ 2\,c_{4,5} + c_{4,6} + 2\,c_{4,7} + 3\,c_{4,8} + 6\,c_{4,9} + c_{4,11} + 3\,c_{4,12} + 2\,c_{4,14},$$

$$c_{4,6} + 2\,c_{4,7} + 5\,c_{4,8} + 3\,c_{4,9} + 4\,c_{4,12} + 2\,c_{4,14},\ 2\,c_{4,4} + 2\,c_{4,6} - 3\,c_{4,9} + c_{4,10} - 2\,c_{4,12} - 4\,c_{4,14} - 3\,c_{4,15},$$

$$-c_{4,5} - 3\,c_{4,8} - 3\,c_{4,9} - 3\,c_{4,12} - 3\,c_{4,14} - 3\,c_{4,15},$$

$$-\frac{1}{576} - c_{4,7} - c_{4,9} - c_{4,11} - c_{4,12} - c_{4,13} - 3\,c_{4,14} - 3\,c_{4,15},\ -c_{4,12} - 2\,c_{4,14} - 3\,c_{4,15},$$

$$c_{4,3} + c_{4,4} + 2\,c_{4,5} + c_{4,6} + c_{4,7} + 3\,c_{4,9} + c_{4,10} + c_{4,11} - c_{4,12} + c_{4,13} - 2\,c_{4,14} - 3\,c_{4,15},$$

$$-c_{4,14} - 3\,c_{4,15},\ 2\,c_{4,4} + 2\,c_{4,5} + 3\,c_{4,6} + 4\,c_{4,7} + 6\,c_{4,9} + 2\,c_{4,10} + 3\,c_{4,11} + 2\,c_{4,13} - c_{4,14} - 3\,c_{4,15},$$

$$-c_{4,8} - c_{4,12} - c_{4,14} - c_{4,15},\ \frac{1}{576} + c_{4,4} + c_{4,6} + c_{4,7} + c_{4,9} - c_{4,12} - c_{4,14} - c_{4,15},$$

$$c_{4,4} + 2\,c_{4,6} + 4\,c_{4,7} + 3\,c_{4,9} + c_{4,10} + 2\,c_{4,11} + 2\,c_{4,12} + c_{4,13} + 2\,c_{4,14} - c_{4,15},$$

$$-c_{4,2} - c_{4,3} - c_{4,5} - c_{4,9} + c_{4,14} + 3\,c_{4,15},$$

$$-c_{4,3} - c_{4,4} - 2\,c_{4,5} - c_{4,6} - c_{4,7} - 3\,c_{4,9} - c_{4,10} - c_{4,11} + c_{4,12} - c_{4,13} + 2\,c_{4,14} + 3\,c_{4,15},$$

$$-2\,c_{4,4} - c_{4,5} - 2\,c_{4,6} - 2\,c_{4,7} - 3\,c_{4,9} - c_{4,10} - c_{4,11} + 2\,c_{4,12} + 3\,c_{4,14} + 3\,c_{4,15},$$

$$2\,c_{4,5} + 3\,c_{4,8} + 6\,c_{4,9} + 3\,c_{4,12} + 3\,c_{4,14} + 3\,c_{4,15},\ 2\,c_{4,7} + 3\,c_{4,9} + c_{4,11} + 3\,c_{4,12} + 5\,c_{4,14} + 3\,c_{4,15},$$

$$-2\,c_{4,4} - 3\,c_{4,6} - 4\,c_{4,7} - 3\,c_{4,9} - c_{4,10} - c_{4,11} + 2\,c_{4,14} + 5\,c_{4,15},$$

$$-12\,c_{4,16},\ -10\,c_{4,16},\ -6\,c_{4,16},\ -4\,c_{4,16},\ 4\,c_{4,16},\ 12\,c_{4,16},\ 14\,c_{4,16}\Big\}$$

(Alt) In[ ]:=

```
eqns = # == 0 & /@ rels
```

(Alt) Out[ ]=

$$\Big\{\text{True},\ -16\,c_{4,1} == 0,\ -11\,c_{4,1} == 0,\ -7\,c_{4,1} == 0,\ -6\,c_{4,1} == 0,\ -4\,c_{4,1} == 0,\ -c_{4,1} == 0,$$

$$c_{4,1} == 0,\ 6\,c_{4,1} == 0,\ 17\,c_{4,1} == 0,\ 20\,c_{4,1} == 0,\ -3\,c_{4,2} - c_{4,3} == 0,\ -2\,c_{4,3} - 2\,c_{4,5} == 0,$$

$$-3\,c_{4,2} - 2\,c_{4,3} - c_{4,5} == 0,\ \frac{1}{576} - 4\,c_{4,4} - 2\,c_{4,6} == 0,\ -2\,c_{4,4} - c_{4,6} - c_{4,7} == 0,$$

$$-c_{4,3} - 2\,c_{4,5} - 3\,c_{4,9} == 0,\ -c_{4,5} - 3\,c_{4,9} == 0,\ -3\,c_{4,2} - 3\,c_{4,3} - 2\,c_{4,4} - 3\,c_{4,5} - c_{4,6} - c_{4,7} - 3\,c_{4,9} == 0,$$

$$-c_{4,2} - c_{4,3} - c_{4,5} - c_{4,9} == 0, \quad \frac{1}{576} - 4\,c_{4,2} - 3\,c_{4,3} - c_{4,4} - c_{4,5} - c_{4,6} - c_{4,9} == 0,$$

$$c_{4,3} + 2\,c_{4,5} + 3\,c_{4,9} == 0, \quad -\frac{1}{288} - 3\,c_{4,3} - 3\,c_{4,5} - c_{4,6} - c_{4,7} - c_{4,9} - 2\,c_{4,10} == 0,$$

$$-2\,c_{4,4} - c_{4,6} - c_{4,10} == 0, \quad -c_{4,2} - c_{4,3} + 2\,c_{4,4} - c_{4,5} + c_{4,6} - c_{4,9} + c_{4,10} == 0,$$

$$5\,c_{4,2} + c_{4,3} - 2\,c_{4,5} - c_{4,6} - c_{4,7} - 3\,c_{4,9} - 4\,c_{4,10} - 2\,c_{4,11} == 0,$$

$$-c_{4,6} - 2\,c_{4,7} - c_{4,11} == 0, \quad 5\,c_{4,2} + 6\,c_{4,3} + 3\,c_{4,5} + c_{4,6} + 3\,c_{4,9} - c_{4,11} == 0,$$

$$-c_{4,6} - 2\,c_{4,10} - c_{4,11} == 0, \quad -\frac{1}{576} - c_{4,6} - 2\,c_{4,7} - 2\,c_{4,10} - c_{4,11} == 0,$$

$$-2\,c_{4,3} - 4\,c_{4,5} - c_{4,6} - 6\,c_{4,9} - 2\,c_{4,10} - c_{4,11} == 0, \quad 3\,c_{4,2} + c_{4,3} - c_{4,5} - c_{4,6} - 3\,c_{4,9} - 2\,c_{4,10} - c_{4,11} == 0,$$

$$-\frac{1}{576} + 3\,c_{4,2} + 3\,c_{4,3} + 3\,c_{4,5} - c_{4,6} - 2\,c_{4,7} + 3\,c_{4,9} - 2\,c_{4,10} - c_{4,11} == 0,$$

$$\frac{1}{576} - c_{4,3} - 3\,c_{4,5} - 5\,c_{4,9} - c_{4,10} - c_{4,11} == 0,$$

$$-c_{4,2} - c_{4,3} - c_{4,5} + c_{4,6} + 2\,c_{4,7} - c_{4,9} + c_{4,11} == 0, \quad -\frac{1}{576} - c_{4,2} - c_{4,3} + c_{4,9} + c_{4,10} + c_{4,11} == 0,$$

$$\frac{1}{576} - 3\,c_{4,2} - 3\,c_{4,3} - 3\,c_{4,5} + c_{4,6} + 2\,c_{4,7} - 3\,c_{4,9} + 2\,c_{4,10} + c_{4,11} == 0,$$

$$2\,c_{4,3} + 2\,c_{4,4} + 4\,c_{4,5} + 2\,c_{4,6} + c_{4,7} + 6\,c_{4,9} + 2\,c_{4,10} + c_{4,11} == 0,$$

$$3\,c_{4,3} + c_{4,4} + 3\,c_{4,5} + 2\,c_{4,6} + c_{4,7} + 3\,c_{4,9} + 3\,c_{4,10} + c_{4,11} == 0, \quad -3\,c_{4,8} - c_{4,12} == 0,$$

$$\frac{1}{576} + c_{4,4} + c_{4,9} - c_{4,12} == 0, \quad -2\,c_{4,4} - c_{4,5} - 2\,c_{4,6} - 2\,c_{4,7} - 3\,c_{4,8} - 3\,c_{4,9} - c_{4,10} - c_{4,11} - c_{4,12} == 0,$$

$$-c_{4,2} - c_{4,3} - c_{4,5} + 3\,c_{4,8} - c_{4,9} + c_{4,12} == 0, \quad \frac{1}{576} - 2\,c_{4,11} - 4\,c_{4,13} == 0,$$

$$\frac{1}{576} + 2\,c_{4,3} + 4\,c_{4,5} + 6\,c_{4,9} - 2\,c_{4,11} - 4\,c_{4,13} == 0,$$

$$5\,c_{4,2} + 5\,c_{4,3} + 7\,c_{4,5} + 11\,c_{4,9} - 2\,c_{4,10} - 2\,c_{4,11} - 4\,c_{4,13} == 0,$$

$$3\,c_{4,3} + 6\,c_{4,5} + 8\,c_{4,9} + 2\,c_{4,10} - 2\,c_{4,13} == 0, \quad \frac{1}{288} + 2\,c_{4,3} + 2\,c_{4,5} + c_{4,9} - 2\,c_{4,11} - 2\,c_{4,13} == 0,$$

$$-c_{4,7} - c_{4,11} - 2\,c_{4,13} == 0, \quad 3\,c_{4,2} + 5\,c_{4,3} + 7\,c_{4,5} - c_{4,7} + 9\,c_{4,9} - c_{4,11} - 2\,c_{4,13} == 0,$$

$$-c_{4,10} - c_{4,11} - 2\,c_{4,13} == 0, \quad -c_{4,4} - c_{4,6} - c_{4,7} - c_{4,10} - c_{4,11} - c_{4,13} == 0,$$

$$-\frac{1}{576} + c_{4,2} - c_{4,5} + c_{4,9} - c_{4,10} + c_{4,13} == 0, \quad -c_{4,2} - 2\,c_{4,3} - 2\,c_{4,5} - 4\,c_{4,9} + c_{4,11} + c_{4,13} == 0,$$

$$-4\,c_{4,2} - 4\,c_{4,3} - 5\,c_{4,5} - 7\,c_{4,9} + c_{4,10} + c_{4,11} + 2\,c_{4,13} == 0,$$

$$-c_{4,2} - c_{4,3} - 2\,c_{4,5} - 4\,c_{4,9} + c_{4,10} + c_{4,11} + 2\,c_{4,13} == 0,$$

$$-c_{4,2} - c_{4,3} - c_{4,5} - c_{4,9} + c_{4,10} + c_{4,11} + 2\,c_{4,13} == 0,$$

$$-3\,c_{4,2} - 3\,c_{4,3} - 3\,c_{4,5} + c_{4,6} + c_{4,7} - 3\,c_{4,9} + 2\,c_{4,10} + 2\,c_{4,11} + 2\,c_{4,13} == 0,$$

$$-5\,c_{4,2} - 5\,c_{4,3} - 2\,c_{4,5} + c_{4,7} - 3\,c_{4,9} + 2\,c_{4,10} + 3\,c_{4,11} + 2\,c_{4,13} == 0,$$

$$-\frac{1}{576} - 2\,c_{4,3} - 4\,c_{4,5} - 6\,c_{4,9} + 2\,c_{4,11} + 4\,c_{4,13} == 0,$$

$$\frac{1}{288} - c_{4,6} - 2\,c_{4,7} - c_{4,9} - c_{4,10} - c_{4,11} - 3\,c_{4,12} - 2\,c_{4,14} == 0,$$

$$-2\,c_{4,12} - 2\,c_{4,14} == 0, \quad 2\,c_{4,4} - c_{4,5} + c_{4,6} - 3\,c_{4,9} + c_{4,10} - 2\,c_{4,12} - 2\,c_{4,14} == 0,$$

$$-c_{4,5} - c_{4,6} - 2\,c_{4,7} - 3\,c_{4,9} - c_{4,10} - 2\,c_{4,11} - 2\,c_{4,12} - 2\,c_{4,13} - 2\,c_{4,14} == 0, \quad -3\,c_{4,8} - 2\,c_{4,12} - c_{4,14} == 0,$$

$-\dfrac{1}{576} - c_{4,4} - c_{4,6} - c_{4,7} - 4\,c_{4,8} - c_{4,9} - 2\,c_{4,12} - c_{4,14} == 0,\ -c_{4,7} - c_{4,8} - 3\,c_{4,9} - c_{4,12} - c_{4,14} == 0,$

$-\dfrac{1}{288} - 2\,c_{4,4} - c_{4,6} + c_{4,9} + 2\,c_{4,12} + c_{4,14} == 0,\ -c_{4,2} - c_{4,3} - c_{4,5} - c_{4,9} + 2\,c_{4,12} + 2\,c_{4,14} == 0,$

$2\,c_{4,5} + c_{4,6} + 2\,c_{4,7} + 3\,c_{4,8} + 6\,c_{4,9} + c_{4,11} + 3\,c_{4,12} + 2\,c_{4,14} == 0,$

$c_{4,6} + 2\,c_{4,7} + 5\,c_{4,8} + 3\,c_{4,9} + 4\,c_{4,12} + 2\,c_{4,14} == 0,$

$2\,c_{4,4} + 2\,c_{4,6} - 3\,c_{4,9} + c_{4,10} - 2\,c_{4,12} - 4\,c_{4,14} - 3\,c_{4,15} == 0,$

$-c_{4,5} - 3\,c_{4,8} - 3\,c_{4,9} - 3\,c_{4,12} - 3\,c_{4,14} - 3\,c_{4,15} == 0,$

$-\dfrac{1}{576} - c_{4,7} - c_{4,9} - c_{4,11} - c_{4,12} - c_{4,13} - 3\,c_{4,14} - 3\,c_{4,15} == 0,\ -c_{4,12} - 2\,c_{4,14} - 3\,c_{4,15} == 0,$

$c_{4,3} + c_{4,4} + 2\,c_{4,5} + c_{4,6} + c_{4,7} + 3\,c_{4,9} + c_{4,10} + c_{4,11} - c_{4,12} + c_{4,13} - 2\,c_{4,14} - 3\,c_{4,15} == 0,$

$-c_{4,14} - 3\,c_{4,15} == 0,\ 2\,c_{4,4} + 2\,c_{4,5} + 3\,c_{4,6} + 4\,c_{4,7} + 6\,c_{4,9} + 2\,c_{4,10} + 3\,c_{4,11} + 2\,c_{4,13} - c_{4,14} - 3\,c_{4,15} == 0,$

$-c_{4,8} - c_{4,12} - c_{4,14} - c_{4,15} == 0,\ \dfrac{1}{576} + c_{4,4} + c_{4,6} + c_{4,7} + c_{4,9} - c_{4,12} - c_{4,14} - c_{4,15} == 0,$

$c_{4,4} + 2\,c_{4,6} + 4\,c_{4,7} + 3\,c_{4,9} + c_{4,10} + 2\,c_{4,11} + 2\,c_{4,12} + c_{4,13} + 2\,c_{4,14} - c_{4,15} == 0,$

$-c_{4,2} - c_{4,3} - c_{4,5} - c_{4,9} + c_{4,14} + 3\,c_{4,15} == 0,$

$-c_{4,3} - c_{4,4} - 2\,c_{4,5} - c_{4,6} - c_{4,7} - 3\,c_{4,9} - c_{4,10} - c_{4,11} + c_{4,12} - c_{4,13} + 2\,c_{4,14} + 3\,c_{4,15} == 0,$

$-2\,c_{4,4} - c_{4,5} - 2\,c_{4,6} - 2\,c_{4,7} - 3\,c_{4,9} - c_{4,10} - c_{4,11} + 2\,c_{4,12} + 3\,c_{4,14} + 3\,c_{4,15} == 0,$

$2\,c_{4,5} + 3\,c_{4,8} + 6\,c_{4,9} + 3\,c_{4,12} + 3\,c_{4,14} + 3\,c_{4,15} == 0,\ 2\,c_{4,7} + 3\,c_{4,9} + c_{4,11} + 3\,c_{4,12} + 5\,c_{4,14} + 3\,c_{4,15} == 0,$

$-2\,c_{4,4} - 3\,c_{4,6} - 4\,c_{4,7} - 3\,c_{4,9} - c_{4,10} - c_{4,11} + 2\,c_{4,14} + 5\,c_{4,15} == 0,\ -12\,c_{4,16} == 0,$

$-10\,c_{4,16} == 0,\ -6\,c_{4,16} == 0,\ -4\,c_{4,16} == 0,\ 4\,c_{4,16} == 0,\ 12\,c_{4,16} == 0,\ 14\,c_{4,16} == 0\Big\}$

(Alt) In[ ]:=

vars = Union[Cases[eqns, $c_{d,\_}$, ∞]]

(Alt) Out[ ]=

$\{c_{4,1},\ c_{4,2},\ c_{4,3},\ c_{4,4},\ c_{4,5},\ c_{4,6},\ c_{4,7},\ c_{4,8},\ c_{4,9},\ c_{4,10},\ c_{4,11},\ c_{4,12},\ c_{4,13},\ c_{4,14},\ c_{4,15},\ c_{4,16}\}$

(Alt) In[ ]:=

sol = Solve[eqns, vars]〚1〛

(Alt) Out[ ]=

$\Big\{c_{4,1} \to 0,\ c_{4,2} \to -\dfrac{1}{1440},\ c_{4,3} \to \dfrac{1}{480},\ c_{4,4} \to \dfrac{7}{5760},\ c_{4,5} \to -\dfrac{1}{480},$

$c_{4,6} \to -\dfrac{1}{640},\ c_{4,7} \to -\dfrac{1}{1152},\ c_{4,8} \to -\dfrac{7}{5760},\ c_{4,9} \to \dfrac{1}{1440},\ c_{4,10} \to -\dfrac{1}{1152},$

$c_{4,11} \to \dfrac{19}{5760},\ c_{4,12} \to \dfrac{7}{1920},\ c_{4,13} \to -\dfrac{7}{5760},\ c_{4,14} \to -\dfrac{7}{1920},\ c_{4,15} \to \dfrac{7}{5760},\ c_{4,16} \to 0\Big\}$

(Alt) In[ ]:=

sol /. Rule → Set

(Alt) Out[ ]=

$\Big\{0,\ -\dfrac{1}{1440},\ \dfrac{1}{480},\ \dfrac{7}{5760},\ -\dfrac{1}{480},\ -\dfrac{1}{640},\ -\dfrac{1}{1152},$

$-\dfrac{7}{5760},\ \dfrac{1}{1440},\ -\dfrac{1}{1152},\ \dfrac{19}{5760},\ \dfrac{7}{1920},\ -\dfrac{7}{5760},\ -\dfrac{7}{1920},\ \dfrac{7}{5760},\ 0\Big\}$

(Alt) In[ ]:=

Φ[d]

(Alt) Out[ ]=

$$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[\mathscr{F}_0\Big[AW_1[\,] + \frac{1}{24}\,AW_1[x, y] - \frac{1}{24}\,AW_1[y, x] - \frac{AW_1[x, x, x, y]}{1440} + \frac{1}{480}\,AW_1[x, x, y, x] +$$

$$\frac{7\,AW_1[x, x, y, y]}{5760} - \frac{1}{480}\,AW_1[x, y, x, x] - \frac{1}{640}\,AW_1[x, y, x, y] - \frac{AW_1[x, y, y, x]}{1152} -$$

$$\frac{7\,AW_1[x, y, y, y]}{5760} + \frac{AW_1[y, x, x, x]}{1440} - \frac{AW_1[y, x, x, y]}{1152} + \frac{19\,AW_1[y, x, y, x]}{5760} +$$

$$\frac{7\,AW_1[y, x, y, y]}{1920} - \frac{7\,AW_1[y, y, x, x]}{5760} - \frac{7\,AW_1[y, y, x, y]}{1920} + \frac{7\,AW_1[y, y, y, x]}{5760}\Big]\Big]$$

(Alt) In[ ]:=

PrintProfile[]

(Alt) Out[ ]=

```
ProfileRoot is root. Profiled time: 31.547
   (  3)     0/    0 above EMBasis
   (  6)  0.016/ 30.450 above EMIM
   (  6)  0.015/ 0.093 above EMp2s
   (  4)  0.015/ 0.015 above EMp△
   (  2)     0/    0 above EMpσ
   (  2)  0.532/ 0.985 above EMs△
   (  6)     0/    0 above EMsσ
EMEM: called 6 times, time in 25.812/25.812
   (  6)  25.810/ 25.810 under EMIM
EMAR: called 76 times, time in 2.333/3.079
   ( 44)  1.376/ 1.765 under EMCF
   ( 32)  0.957/ 1.314 under ⓞ
   (228)  0.746/ 0.746 above FAAm
ⓞ: called 26 times, time in 1.422/4.515
   ( 24)  1.422/ 4.390 under EMsm
   (  2)     0/ 0.125 under EMs△
   ( 32)  0.957/ 1.314 above EMAR
   ( 26)  0.015/ 1.702 above EMCF
   ( 96)  0.077/ 0.077 above FAAm
FAAm: called 372 times, time in 1.087/1.087
   (228)  0.746/ 0.746 under EMAR
   ( 32)  0.046/ 0.046 under EMsm
   ( 16)  0.218/ 0.218 under EMs△
   ( 96)  0.077/ 0.077 under ⓞ
EMs△: called 2 times, time in 0.532/0.985
   (  2)  0.532/ 0.985 under ProfileRoot
   ( 16)  0.218/ 0.218 above FAAm
   (  4)  0.110/ 0.110 above FAAσ
   (  2)     0/ 0.125 above ⓞ
FAAσ: called 114 times, time in 0.284/0.284
   ( 20)  0.079/ 0.079 under EMsm
```

```
(  4)   0.110/ 0.110 under EMs△
( 90)   0.095/ 0.095 under EMsσ
EMsσ: called 18 times, time in 0.016/0.111
( 12)   0.016/ 0.111 under EMIM
(  6)      0/    0 under ProfileRoot
( 90)   0.095/ 0.095 above FAAσ
EMIM: called 6 times, time in 0.016/30.454
(  6)   0.016/ 30.450 under ProfileRoot
(  6)   25.810/ 25.810 above EMEM
( 12)      0/ 4.515 above EMsm
( 12)   0.016/ 0.111 above EMsσ
EMp△: called 4 times, time in 0.015/0.015
(  4)   0.015/ 0.015 under ProfileRoot
EMp2s: called 6 times, time in 0.015/0.093
(  6)   0.015/ 0.093 under ProfileRoot
(  6)      0/ 0.078 above EMCF
EMCF: called 32 times, time in 0.015/1.78
(  6)      0/ 0.078 under EMp2s
( 26)   0.015/ 1.702 under ◎
( 44)   1.376/ 1.765 above EMAR
EMsm: called 12 times, time in 0./4.515
( 12)      0/ 4.515 under EMIM
( 32)   0.046/ 0.046 above FAAm
( 20)   0.079/ 0.079 above FAAσ
( 24)   1.422/ 4.390 above ◎
EMpσ: called 2 times, time in 0./0.
(  2)      0/    0 under ProfileRoot
EMBasis: called 3 times, time in 0./0.
(  3)      0/    0 under ProfileRoot
```

Solving to Degree 5

$In[\circ]:=$ **d = 5; i = 0;**

$\Phi[d] = \Phi[d-1] + \text{Sum}[c_{d,++i} B, \{B, \text{Select}[\text{Basis}_d[\mathbb{O}_{AR,\{x,y\},\{1\}}], \text{FreeQ}[\#, \mathcal{A}_{c[1]}] \&]\}]$

Out[●]=

$$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[\mathcal{A}_0\Big[$$

$$AW_1[\,] + \frac{1}{24}\, AW_1[x, y] - \frac{1}{24}\, AW_1[y, x] - \frac{AW_1[x, x, x, y]}{1440} + \frac{1}{480}\, AW_1[x, x, y, x] + \frac{7\, AW_1[x, x, y, y]}{5760} -$$

$$\frac{1}{480}\, AW_1[x, y, x, x] - \frac{1}{640}\, AW_1[x, y, x, y] - \frac{AW_1[x, y, y, x]}{1152} - \frac{7\, AW_1[x, y, y, y]}{5760} +$$

$$\frac{AW_1[y, x, x, x]}{1440} - \frac{AW_1[y, x, x, y]}{1152} + \frac{19\, AW_1[y, x, y, x]}{5760} + \frac{7\, AW_1[y, x, y, y]}{1920} - \frac{7\, AW_1[y, y, x, x]}{5760} -$$

$$\frac{7\, AW_1[y, y, x, y]}{1920} + \frac{7\, AW_1[y, y, y, x]}{5760} + c_{5,1}\, AW_1[x, x, x, x, x] + c_{5,2}\, AW_1[x, x, x, x, y] +$$

$$c_{5,3}\, AW_1[x, x, x, y, x] + c_{5,4}\, AW_1[x, x, x, y, y] + c_{5,5}\, AW_1[x, x, y, x, x] +$$

$$c_{5,6}\, AW_1[x, x, y, x, y] + c_{5,7}\, AW_1[x, x, y, y, x] + c_{5,8}\, AW_1[x, x, y, y, y] +$$

$$c_{5,9}\, AW_1[x, y, x, x, x] + c_{5,10}\, AW_1[x, y, x, x, y] + c_{5,11}\, AW_1[x, y, x, y, x] +$$

$$c_{5,12}\, AW_1[x, y, x, y, y] + c_{5,13}\, AW_1[x, y, y, x, x] + c_{5,14}\, AW_1[x, y, y, x, y] +$$

$$c_{5,15}\, AW_1[x, y, y, y, x] + c_{5,16}\, AW_1[x, y, y, y, y] + c_{5,17}\, AW_1[y, x, x, x, x] +$$

$$c_{5,18}\, AW_1[y, x, x, x, y] + c_{5,19}\, AW_1[y, x, x, y, x] + c_{5,20}\, AW_1[y, x, x, y, y] +$$

$$c_{5,21}\, AW_1[y, x, y, x, x] + c_{5,22}\, AW_1[y, x, y, x, y] + c_{5,23}\, AW_1[y, x, y, y, x] +$$

$$c_{5,24}\, AW_1[y, x, y, y, y] + c_{5,25}\, AW_1[y, y, x, x, x] + c_{5,26}\, AW_1[y, y, x, x, y] +$$

$$c_{5,27}\, AW_1[y, y, x, y, x] + c_{5,28}\, AW_1[y, y, x, y, y] + c_{5,29}\, AW_1[y, y, y, x, x] +$$

$$c_{5,30}\, AW_1[y, y, y, x, y] + c_{5,31}\, AW_1[y, y, y, y, x] + c_{5,32}\, AW_1[y, y, y, y, y]\Big]\Big]$$

In[●]:=
```
Short[
  rels = Union @@ (List @@ Pentagon_d[Φ[d]][[1]] /. {
      𝒜_0[A_] :> Table[Coefficient[A, B], {B, Basis_{d,{x,y}}[AW_1 AW_2]}],
      𝒜_{c[1,2]}[A_] :> Table[Coefficient[A, B], {B, AW_2̄[] Basis_{d-1,{x,y}}[AW_1 AW_2 AW_1̄]}]
    }),
  10]
```

Out[●]//Short=

$$\{0, -55\, c_{5,1}, -40\, c_{5,1}, -35\, c_{5,1}, -31\, c_{5,1}, -26\, c_{5,1}, -10\, c_{5,1}, -5\, c_{5,1}, -c_{5,1}, 5\, c_{5,1}, 9\, c_{5,1}, 10\, c_{5,1},$$

$$49\, c_{5,1}, 50\, c_{5,1}, \ll251\gg, 3\, c_{5,9} + 14\, c_{5,16} + 12\, c_{5,17} + 14\, c_{5,24} + 14\, c_{5,28} + 14\, c_{5,30} + 14\, c_{5,31},$$

$$-3\, c_{5,8} - 5\, c_{5,12} - 8\, c_{5,14} - 12\, c_{5,15} - 6\, c_{5,17} - 2\, c_{5,20} - 3\, c_{5,22} - 4\, c_{5,23} - 6\, c_{5,24} - c_{5,26} -$$

$$c_{5,27} - 3\, c_{5,28} + 6\, c_{5,30} + 17\, c_{5,31}, -6\, c_{5,8} - 3\, c_{5,9} - 8\, c_{5,12} - 10\, c_{5,14} - 12\, c_{5,15} - 12\, c_{5,17} -$$

$$4\, c_{5,20} - 5\, c_{5,22} - 6\, c_{5,23} - 2\, c_{5,26} - 2\, c_{5,27} + 4\, c_{5,28} + 11\, c_{5,30} + 20\, c_{5,31}, -50\, c_{5,32},$$

$$-30\, c_{5,32}, -25\, c_{5,32}, -20\, c_{5,32}, -10\, c_{5,32}, -5\, c_{5,32}, 5\, c_{5,32}, 30\, c_{5,32}, 45\, c_{5,32}, 70\, c_{5,32}\}$$

In[●]:=
```
eqns = # == 0 & /@ rels;
```

In[●]:=
```
vars = Union[Cases[eqns, c_{d,_}, ∞]]
```

Out[●]=

$$\{c_{5,1}, c_{5,2}, c_{5,3}, c_{5,4}, c_{5,5}, c_{5,6}, c_{5,7}, c_{5,8}, c_{5,9}, c_{5,10}, c_{5,11}, c_{5,12}, c_{5,13}, c_{5,14}, c_{5,15}, c_{5,16}, c_{5,17},$$

$$c_{5,18}, c_{5,19}, c_{5,20}, c_{5,21}, c_{5,22}, c_{5,23}, c_{5,24}, c_{5,25}, c_{5,26}, c_{5,27}, c_{5,28}, c_{5,29}, c_{5,30}, c_{5,31}, c_{5,32}\}$$

In[ ]:= **sol = Solve[eqns, vars]〚1〛**

⋯ Solve: Equations may not give solutions for all "solve" variables.

Out[ ]=

$$\Big\{ c_{5,1} \to 0, \; c_{5,2} \to c_{5,8}, \; c_{5,3} \to -4\, c_{5,8}, \; c_{5,4} \to -c_{5,8}, \; c_{5,5} \to 6\, c_{5,8}, \; c_{5,6} \to \frac{3\, c_{5,8}}{2},$$

$$c_{5,7} \to \frac{3\, c_{5,8}}{2}, \; c_{5,9} \to -4\, c_{5,8}, \; c_{5,10} \to \frac{3\, c_{5,8}}{2}, \; c_{5,11} \to -6\, c_{5,8}, \; c_{5,12} \to -4\, c_{5,8}, \; c_{5,13} \to \frac{3\, c_{5,8}}{2},$$

$$c_{5,14} \to 6\, c_{5,8}, \; c_{5,15} \to -4\, c_{5,8}, \; c_{5,16} \to 0, \; c_{5,17} \to c_{5,8}, \; c_{5,18} \to -c_{5,8}, \; c_{5,19} \to \frac{3\, c_{5,8}}{2},$$

$$c_{5,20} \to c_{5,8}, \; c_{5,21} \to \frac{3\, c_{5,8}}{2}, \; c_{5,22} \to -4\, c_{5,8}, \; c_{5,23} \to 6\, c_{5,8}, \; c_{5,24} \to 0, \; c_{5,25} \to -c_{5,8},$$

$$c_{5,26} \to c_{5,8}, \; c_{5,27} \to -4\, c_{5,8}, \; c_{5,28} \to 0, \; c_{5,29} \to c_{5,8}, \; c_{5,30} \to 0, \; c_{5,31} \to 0, \; c_{5,32} \to 0 \Big\}$$

In[ ]:= **sol /. Rule → Set**

Out[ ]=

$$\Big\{ 0, \; c_{5,8}, \; -4\, c_{5,8}, \; -c_{5,8}, \; 6\, c_{5,8}, \; \frac{3\, c_{5,8}}{2}, \; \frac{3\, c_{5,8}}{2}, \; -4\, c_{5,8}, \; \frac{3\, c_{5,8}}{2}, \; -6\, c_{5,8}, \; -4\, c_{5,8}, \; \frac{3\, c_{5,8}}{2}, \; 6\, c_{5,8},$$

$$-4\, c_{5,8}, \; 0, \; c_{5,8}, \; -c_{5,8}, \; \frac{3\, c_{5,8}}{2}, \; c_{5,8}, \; \frac{3\, c_{5,8}}{2}, \; -4\, c_{5,8}, \; 6\, c_{5,8}, \; 0, \; -c_{5,8}, \; c_{5,8}, \; -4\, c_{5,8}, \; 0, \; c_{5,8}, \; 0, \; 0, \; 0 \Big\}$$

In[ ]:= **c_{5,8} = 0**

Out[ ]=

0

In[ ]:= **Φ[d]**

Out[ ]=

$$\mathbb{O}_{AR,\{x,y\},\{1\}} \Big[\mathcal{A}_0 \Big[AW_1[\,] + \frac{1}{24} AW_1[x, y] - \frac{1}{24} AW_1[y, x] - \frac{AW_1[x, x, x, y]}{1440} + \frac{1}{480} AW_1[x, x, y, x] +$$

$$\frac{7\, AW_1[x, x, y, y]}{5760} - \frac{1}{480} AW_1[x, y, x, x] - \frac{1}{640} AW_1[x, y, x, y] - \frac{AW_1[x, y, y, x]}{1152} -$$

$$\frac{7\, AW_1[x, y, y, y]}{5760} + \frac{AW_1[y, x, x, x]}{1440} - \frac{AW_1[y, x, x, y]}{1152} + \frac{19\, AW_1[y, x, y, x]}{5760} +$$

$$\frac{7\, AW_1[y, x, y, y]}{1920} - \frac{7\, AW_1[y, y, x, x]}{5760} - \frac{7\, AW_1[y, y, x, y]}{1920} + \frac{7\, AW_1[y, y, y, x]}{5760} \Big] \Big]$$

Solving to Degree 6

$In[\circ]:=$ `d = 6; i = 0;`

`Φ[d] = Φ[d - 1] + Sum[c_{d,++i} B, {B, Select[Basis_d[O_{AR,{x,y},{1}}], FreeQ[#, 𝒜_{c[1]}] &]}]`

$Out[\circ]=$

$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[\mathscr{A}_0\Big[AW_1[\,] + \frac{1}{24} AW_1[x, y] - \frac{1}{24} AW_1[y, x] - \frac{AW_1[x, x, x, y]}{1440} + \frac{1}{480} AW_1[x, x, y, x] +$

$\frac{7 AW_1[x, x, y, y]}{5760} - \frac{1}{480} AW_1[x, y, x, x] - \frac{1}{640} AW_1[x, y, x, y] - \frac{AW_1[x, y, y, x]}{1152} -$

$\frac{7 AW_1[x, y, y, y]}{5760} + \frac{AW_1[y, x, x, x]}{1440} - \frac{AW_1[y, x, x, y]}{1152} + \frac{19 AW_1[y, x, y, x]}{5760} + \frac{7 AW_1[y, x, y, y]}{1920} -$

$\frac{7 AW_1[y, y, x, x]}{5760} - \frac{7 AW_1[y, y, x, y]}{1920} + \frac{7 AW_1[y, y, y, x]}{5760} + c_{6,1} AW_1[x, x, x, x, x, x] +$

$c_{6,2} AW_1[x, x, x, x, x, y] + c_{6,3} AW_1[x, x, x, x, y, x] + c_{6,4} AW_1[x, x, x, x, y, y] +$

$c_{6,5} AW_1[x, x, x, y, x, x] + c_{6,6} AW_1[x, x, x, y, x, y] + c_{6,7} AW_1[x, x, x, y, y, x] +$

$c_{6,8} AW_1[x, x, x, y, y, y] + c_{6,9} AW_1[x, x, y, x, x, x] + c_{6,10} AW_1[x, x, y, x, x, y] +$

$c_{6,11} AW_1[x, x, y, x, y, x] + c_{6,12} AW_1[x, x, y, x, y, y] + c_{6,13} AW_1[x, x, y, y, x, x] +$

$c_{6,14} AW_1[x, x, y, y, x, y] + c_{6,15} AW_1[x, x, y, y, y, x] + c_{6,16} AW_1[x, x, y, y, y, y] +$

$c_{6,17} AW_1[x, y, x, x, x, x] + c_{6,18} AW_1[x, y, x, x, x, y] + c_{6,19} AW_1[x, y, x, x, y, x] +$

$c_{6,20} AW_1[x, y, x, x, y, y] + c_{6,21} AW_1[x, y, x, y, x, x] + c_{6,22} AW_1[x, y, x, y, x, y] +$

$c_{6,23} AW_1[x, y, x, y, y, x] + c_{6,24} AW_1[x, y, x, y, y, y] + c_{6,25} AW_1[x, y, y, x, x, x] +$

$c_{6,26} AW_1[x, y, y, x, x, y] + c_{6,27} AW_1[x, y, y, x, y, x] + c_{6,28} AW_1[x, y, y, x, y, y] +$

$c_{6,29} AW_1[x, y, y, y, x, x] + c_{6,30} AW_1[x, y, y, y, x, y] + c_{6,31} AW_1[x, y, y, y, y, x] +$

$c_{6,32} AW_1[x, y, y, y, y, y] + c_{6,33} AW_1[y, x, x, x, x, x] + c_{6,34} AW_1[y, x, x, x, x, y] +$

$c_{6,35} AW_1[y, x, x, x, y, x] + c_{6,36} AW_1[y, x, x, x, y, y] + c_{6,37} AW_1[y, x, x, y, x, x] +$

$c_{6,38} AW_1[y, x, x, y, x, y] + c_{6,39} AW_1[y, x, x, y, y, x] + c_{6,40} AW_1[y, x, x, y, y, y] +$

$c_{6,41} AW_1[y, x, y, x, x, x] + c_{6,42} AW_1[y, x, y, x, x, y] + c_{6,43} AW_1[y, x, y, x, y, x] +$

$c_{6,44} AW_1[y, x, y, x, y, y] + c_{6,45} AW_1[y, x, y, y, x, x] + c_{6,46} AW_1[y, x, y, y, x, y] +$

$c_{6,47} AW_1[y, x, y, y, y, x] + c_{6,48} AW_1[y, x, y, y, y, y] + c_{6,49} AW_1[y, y, x, x, x, x] +$

$c_{6,50} AW_1[y, y, x, x, x, y] + c_{6,51} AW_1[y, y, x, x, y, x] + c_{6,52} AW_1[y, y, x, x, y, y] +$

$c_{6,53} AW_1[y, y, x, y, x, x] + c_{6,54} AW_1[y, y, x, y, x, y] + c_{6,55} AW_1[y, y, x, y, y, x] +$

$c_{6,56} AW_1[y, y, x, y, y, y] + c_{6,57} AW_1[y, y, y, x, x, x] + c_{6,58} AW_1[y, y, y, x, x, y] +$

$c_{6,59} AW_1[y, y, y, x, y, x] + c_{6,60} AW_1[y, y, y, x, y, y] + c_{6,61} AW_1[y, y, y, y, x, x] +$

$c_{6,62} AW_1[y, y, y, y, x, y] + c_{6,63} AW_1[y, y, y, y, y, x] + c_{6,64} AW_1[y, y, y, y, y, y]\Big]\Big]$

```
In[ ]:=  Short[
           rels = Union @@ (List @@ Pentagon_d[Φ[d]][[1]] /. {
               𝒜_0[A_] :> Table[Coefficient[A, B], {B, Basis_{d,{x,y}}[AW_1 AW_2]}],
               𝒜_{c[1,2]}[A_] :> Table[Coefficient[A, B], {B, AW_{\bar{2}}[] Basis_{d-1,{x,y}}[AW_1 AW_2 AW_{\bar{1}}]}]
             }),
           10]
```

$Out[ ]//Short=$

$$\{0, -186\,c_{6,1}, -165\,c_{6,1}, -156\,c_{6,1}, -111\,c_{6,1}, -105\,c_{6,1}, -80\,c_{6,1}, -57\,c_{6,1},$$
$$-20\,c_{6,1}, -15\,c_{6,1}, -11\,c_{6,1}, -6\,c_{6,1}, -c_{6,1}, c_{6,1}, 15\,c_{6,1}, 49\,c_{6,1}, \ll752\gg,$$
$$-12\,c_{6,16} - 6\,c_{6,17} - 18\,c_{6,24} - 26\,c_{6,28} - 36\,c_{6,30} - 48\,c_{6,31} - 30\,c_{6,33} - 9\,c_{6,40} - 13\,c_{6,44} - 18\,c_{6,46} -$$
$$24\,c_{6,47} - 24\,c_{6,48} - 6\,c_{6,52} - 8\,c_{6,54} - 10\,c_{6,55} - 21\,c_{6,56} - 3\,c_{6,58} - 3\,c_{6,59} + 3\,c_{6,60} + 41\,c_{6,62} + 85\,c_{6,63},$$
$$-150\,c_{6,64}, -101\,c_{6,64}, -60\,c_{6,64}, -56\,c_{6,64}, -20\,c_{6,64}, -15\,c_{6,64}, -6\,c_{6,64},$$
$$6\,c_{6,64}, 30\,c_{6,64}, 39\,c_{6,64}, 60\,c_{6,64}, 124\,c_{6,64}, 210\,c_{6,64}, 270\,c_{6,64}\}$$

```
In[ ]:=  eqns = # == 0 & /@ rels;
```

```
In[ ]:=  vars = Union[Cases[eqns, c_{d,_}, ∞]]
```

$Out[ ]=$

$$\{c_{6,1}, c_{6,2}, c_{6,3}, c_{6,4}, c_{6,5}, c_{6,6}, c_{6,7}, c_{6,8}, c_{6,9}, c_{6,10}, c_{6,11}, c_{6,12}, c_{6,13}, c_{6,14}, c_{6,15}, c_{6,16}, c_{6,17},$$
$$c_{6,18}, c_{6,19}, c_{6,20}, c_{6,21}, c_{6,22}, c_{6,23}, c_{6,24}, c_{6,25}, c_{6,26}, c_{6,27}, c_{6,28}, c_{6,29}, c_{6,30}, c_{6,31}, c_{6,32}, c_{6,33},$$
$$c_{6,34}, c_{6,35}, c_{6,36}, c_{6,37}, c_{6,38}, c_{6,39}, c_{6,40}, c_{6,41}, c_{6,42}, c_{6,43}, c_{6,44}, c_{6,45}, c_{6,46}, c_{6,47}, c_{6,48}, c_{6,49},$$
$$c_{6,50}, c_{6,51}, c_{6,52}, c_{6,53}, c_{6,54}, c_{6,55}, c_{6,56}, c_{6,57}, c_{6,58}, c_{6,59}, c_{6,60}, c_{6,61}, c_{6,62}, c_{6,63}, c_{6,64}\}$$

In[◦]:= **sol = Solve[eqns, vars]〚1〛**

Out[◦]=

$$\left\{ c_{6,1} \to 0, \ c_{6,2} \to \frac{1}{60480}, \ c_{6,3} \to -\frac{1}{12096}, \ c_{6,4} \to -\frac{13}{241920}, \ c_{6,5} \to \frac{1}{6048}, \ c_{6,6} \to \frac{19}{145152}, \right.$$

$$c_{6,7} \to \frac{61}{725760}, \ c_{6,8} \to \frac{83}{967680}, \ c_{6,9} \to -\frac{1}{6048}, \ c_{6,10} \to -\frac{17}{241920}, \ c_{6,11} \to -\frac{61}{241920},$$

$$c_{6,12} \to -\frac{89}{414720}, \ c_{6,13} \to 0, \ c_{6,14} \to \frac{71}{967680}, \ c_{6,15} \to -\frac{337}{2903040}, \ c_{6,16} \to -\frac{31}{483840},$$

$$c_{6,17} \to \frac{1}{12096}, \ c_{6,18} \to \frac{13}{725760}, \ c_{6,19} \to \frac{1}{11520}, \ c_{6,20} \to \frac{37}{580608}, \ c_{6,21} \to \frac{1}{6048}, \ c_{6,22} \to \frac{79}{967680},$$

$$c_{6,23} \to \frac{71}{322560}, \ c_{6,24} \to \frac{73}{483840}, \ c_{6,25} \to -\frac{1}{18144}, \ c_{6,26} \to -\frac{53}{967680}, \ c_{6,27} \to -\frac{23}{193536},$$

$$c_{6,28} \to -\frac{11}{161280}, \ c_{6,29} \to \frac{19}{290304}, \ c_{6,30} \to -\frac{1}{193536}, \ c_{6,31} \to \frac{7}{138240}, \ c_{6,32} \to \frac{31}{967680},$$

$$c_{6,33} \to -\frac{1}{60480}, \ c_{6,34} \to \frac{1}{34560}, \ c_{6,35} \to -\frac{97}{725760}, \ c_{6,36} \to -\frac{103}{967680}, \ c_{6,37} \to \frac{19}{120960},$$

$$c_{6,38} \to \frac{583}{2903040}, \ c_{6,39} \to \frac{53}{967680}, \ c_{6,40} \to \frac{17}{161280}, \ c_{6,41} \to -\frac{29}{181440}, \ c_{6,42} \to -\frac{289}{2903040},$$

$$c_{6,43} \to \frac{55}{193536}, \ c_{6,44} \to -\frac{17}{53760}, \ c_{6,45} \to -\frac{11}{483840}, \ c_{6,46} \to \frac{7}{46080}, \ c_{6,47} \to -\frac{191}{967680},$$

$$c_{6,48} \to -\frac{31}{193536}, \ c_{6,49} \to \frac{13}{241920}, \ c_{6,50} \to \frac{1}{17920}, \ c_{6,51} \to -\frac{19}{1451520}, \ c_{6,52} \to 0, \ c_{6,53} \to \frac{89}{414720},$$

$$c_{6,54} \to \frac{53}{322560}, \ c_{6,55} \to \frac{71}{322560}, \ c_{6,56} \to \frac{31}{96768}, \ c_{6,57} \to -\frac{83}{967680}, \ c_{6,58} \to -\frac{53}{967680},$$

$$\left. c_{6,59} \to -\frac{13}{64512}, \ c_{6,60} \to -\frac{31}{96768}, \ c_{6,61} \to \frac{31}{483840}, \ c_{6,62} \to \frac{31}{193536}, \ c_{6,63} \to -\frac{31}{967680}, \ c_{6,64} \to 0 \right\}$$

In[◦]:= **sol /. Rule → Set**

Out[◦]=

$$\left\{ 0, \ \frac{1}{60480}, \ -\frac{1}{12096}, \ -\frac{13}{241920}, \ \frac{1}{6048}, \ \frac{19}{145152}, \ \frac{61}{725760}, \ \frac{83}{967680}, \ -\frac{1}{6048}, \ -\frac{17}{241920}, \right.$$

$$-\frac{61}{241920}, \ -\frac{89}{414720}, \ 0, \ \frac{71}{967680}, \ -\frac{337}{2903040}, \ -\frac{31}{483840}, \ \frac{1}{12096}, \ \frac{13}{725760}, \ \frac{1}{11520},$$

$$\frac{37}{580608}, \ \frac{1}{6048}, \ \frac{79}{967680}, \ \frac{71}{322560}, \ \frac{73}{483840}, \ -\frac{1}{18144}, \ -\frac{53}{967680}, \ -\frac{23}{193536}, \ -\frac{11}{161280},$$

$$\frac{19}{290304}, \ -\frac{1}{193536}, \ \frac{7}{138240}, \ \frac{31}{967680}, \ -\frac{1}{60480}, \ \frac{1}{34560}, \ -\frac{97}{725760}, \ -\frac{103}{967680}, \ \frac{19}{120960},$$

$$\frac{583}{2903040}, \ \frac{53}{967680}, \ \frac{17}{161280}, \ -\frac{29}{181440}, \ -\frac{289}{2903040}, \ \frac{55}{193536}, \ -\frac{17}{53760}, \ -\frac{11}{483840},$$

$$\frac{7}{46080}, \ -\frac{191}{967680}, \ -\frac{31}{193536}, \ \frac{13}{241920}, \ \frac{1}{17920}, \ -\frac{19}{1451520}, \ 0, \ \frac{89}{414720}, \ \frac{53}{322560}, \ \frac{71}{322560},$$

$$\left. \frac{31}{96768}, \ -\frac{83}{967680}, \ -\frac{53}{967680}, \ -\frac{13}{64512}, \ -\frac{31}{96768}, \ \frac{31}{483840}, \ \frac{31}{193536}, \ -\frac{31}{967680}, \ 0 \right\}$$

In[◦]:= **Φ[d]**

Out[◦]=

$$\mathbb{O}_{AR,\{x,y\},\{1\}}\left[\mathcal{F}_0\left[AW_1[\ ] + \frac{1}{24} AW_1[x, y] - \frac{1}{24} AW_1[y, x] - \frac{AW_1[x, x, x, y]}{1440} + \frac{1}{480} AW_1[x, x, y, x] + \right. \right.$$

$$\frac{7\,AW_1[x,x,y,y]}{5760} - \frac{1}{480}\,AW_1[x,y,x,x] - \frac{1}{640}\,AW_1[x,y,x,y] - \frac{AW_1[x,y,y,x]}{1152} -$$

$$\frac{7\,AW_1[x,y,y,y]}{5760} + \frac{AW_1[y,x,x,x]}{1440} - \frac{AW_1[y,x,x,y]}{1152} + \frac{19\,AW_1[y,x,y,x]}{5760} +$$

$$\frac{7\,AW_1[y,x,y,y]}{1920} - \frac{7\,AW_1[y,y,x,x]}{5760} - \frac{7\,AW_1[y,y,x,y]}{1920} + \frac{7\,AW_1[y,y,y,x]}{5760} +$$

$$\frac{AW_1[x,x,x,x,x,y]}{60480} - \frac{AW_1[x,x,x,x,y,x]}{12096} - \frac{13\,AW_1[x,x,x,x,y,y]}{241920} +$$

$$\frac{AW_1[x,x,x,y,x,x]}{6048} + \frac{19\,AW_1[x,x,x,y,x,y]}{145152} + \frac{61\,AW_1[x,x,x,y,y,x]}{725760} +$$

$$\frac{83\,AW_1[x,x,x,y,y,y]}{967680} - \frac{AW_1[x,x,y,x,x,x]}{6048} - \frac{17\,AW_1[x,x,y,x,x,y]}{241920} -$$

$$\frac{61\,AW_1[x,x,y,x,y,x]}{241920} - \frac{89\,AW_1[x,x,y,x,y,y]}{414720} + \frac{71\,AW_1[x,x,y,y,x,y]}{967680} -$$

$$\frac{337\,AW_1[x,x,y,y,y,x]}{2903040} - \frac{31\,AW_1[x,x,y,y,y,y]}{483840} + \frac{AW_1[x,y,x,x,x,x]}{12096} +$$

$$\frac{13\,AW_1[x,y,x,x,x,y]}{725760} + \frac{AW_1[x,y,x,x,y,x]}{11520} + \frac{37\,AW_1[x,y,x,x,y,y]}{580608} +$$

$$\frac{AW_1[x,y,x,y,x,x]}{6048} + \frac{79\,AW_1[x,y,x,y,x,y]}{967680} + \frac{71\,AW_1[x,y,x,y,y,x]}{322560} +$$

$$\frac{73\,AW_1[x,y,x,y,y,y]}{483840} - \frac{AW_1[x,y,y,x,x,x]}{18144} - \frac{53\,AW_1[x,y,y,x,x,y]}{967680} -$$

$$\frac{23\,AW_1[x,y,y,x,y,x]}{193536} - \frac{11\,AW_1[x,y,y,x,y,y]}{161280} + \frac{19\,AW_1[x,y,y,y,x,x]}{290304} -$$

$$\frac{AW_1[x,y,y,y,x,y]}{193536} + \frac{7\,AW_1[x,y,y,y,y,x]}{138240} + \frac{31\,AW_1[x,y,y,y,y,y]}{967680} -$$

$$\frac{AW_1[y,x,x,x,x,x]}{60480} + \frac{AW_1[y,x,x,x,x,y]}{34560} - \frac{97\,AW_1[y,x,x,x,y,x]}{725760} -$$

$$\frac{103\,AW_1[y,x,x,x,y,y]}{967680} + \frac{19\,AW_1[y,x,x,y,x,x]}{120960} + \frac{583\,AW_1[y,x,x,y,x,y]}{2903040} +$$

$$\frac{53\,AW_1[y,x,x,y,y,x]}{967680} + \frac{17\,AW_1[y,x,x,y,y,y]}{161280} - \frac{29\,AW_1[y,x,y,x,x,x]}{181440} -$$

$$\frac{289\,AW_1[y,x,y,x,x,y]}{2903040} - \frac{55\,AW_1[y,x,y,x,y,x]}{193536} - \frac{17\,AW_1[y,x,y,x,y,y]}{53760} -$$

$$\frac{11\,AW_1[y,x,y,y,x,x]}{483840} + \frac{7\,AW_1[y,x,y,y,x,y]}{46080} - \frac{191\,AW_1[y,x,y,y,y,x]}{967680} -$$

$$\frac{31\,AW_1[y,x,y,y,y,y]}{193536} + \frac{13\,AW_1[y,y,x,x,x,x]}{241920} + \frac{AW_1[y,y,x,x,x,y]}{17920} -$$

$$\frac{19\,AW_1[y,y,x,x,y,y]}{1451520} + \frac{89\,AW_1[y,y,x,y,x,x]}{414720} + \frac{53\,AW_1[y,y,x,y,x,y]}{322560} +$$

$$\frac{71\,AW_1[y,y,x,y,y,x]}{322560} + \frac{31\,AW_1[y,y,x,y,y,y]}{96768} - \frac{83\,AW_1[y,y,y,x,x,x]}{967680} -$$

$$\frac{53\,AW_1[y,y,y,x,x,y]}{967680} - \frac{13\,AW_1[y,y,y,x,y,y]}{64512} - \frac{31\,AW_1[y,y,y,x,y,x]}{96768} +$$

$$\frac{31\,AW_1[y, y, y, y, x, x]}{483\,840} + \frac{31\,AW_1[y, y, y, y, x, y]}{193\,536} - \frac{31\,AW_1[y, y, y, y, x, x]}{967\,680}\bigg]\bigg]$$

Solving to Degree 7

In[ ]:= **d = 7; i = 0;**

Φ[d] = Φ[d – 1] + Sum[c$_{d,++i}$ B, {B, Select[Basis$_d$[$\mathbb{O}_{AR,\{x,y\},\{1\}}$], FreeQ[#, $\mathscr{A}_{c[1]}$] &]}]

Out[ ]=

$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[\mathscr{A}_0\Big[$

$AW_1[\,] + \dfrac{1}{24}\,AW_1[x, y] - \dfrac{1}{24}\,AW_1[y, x] - \dfrac{AW_1[x, x, x, y]}{1440} + \dfrac{1}{480}\,AW_1[x, x, y, x] + \dfrac{7\,AW_1[x, x, y, y]}{5760} -$

$\dfrac{1}{480}\,AW_1[x, y, x, x] - \dfrac{1}{640}\,AW_1[x, y, x, y] - \dfrac{AW_1[x, y, y, x]}{1152} - \dfrac{7\,AW_1[x, y, y, y]}{5760} +$

$\dfrac{AW_1[y, x, x, x]}{1440} - \dfrac{AW_1[y, x, x, y]}{1152} + \dfrac{19\,AW_1[y, x, y, x]}{5760} + \dfrac{7\,AW_1[y, x, y, y]}{1920} - \dfrac{7\,AW_1[y, y, x, x]}{5760} -$

$\dfrac{7\,AW_1[y, y, x, y]}{1920} + \dfrac{7\,AW_1[y, y, y, x]}{5760} + \dfrac{AW_1[x, x, x, x, x, y]}{60\,480} - \dfrac{AW_1[x, x, x, x, y, x]}{12\,096} -$

$\dfrac{13\,AW_1[x, x, x, x, y, y]}{241\,920} + \dfrac{AW_1[x, x, x, y, x, x]}{6048} + \dfrac{19\,AW_1[x, x, x, y, x, y]}{145\,152} +$

$\dfrac{61\,AW_1[x, x, x, y, y, x]}{725\,760} + \dfrac{83\,AW_1[x, x, x, y, y, y]}{967\,680} - \dfrac{AW_1[x, x, y, x, x, x]}{6048} -$

$\dfrac{17\,AW_1[x, x, y, x, x, y]}{241\,920} - \dfrac{61\,AW_1[x, x, y, x, y, x]}{241\,920} - \dfrac{89\,AW_1[x, x, y, x, y, y]}{414\,720} +$

$\dfrac{71\,AW_1[x, x, y, y, x, y]}{967\,680} - \dfrac{337\,AW_1[x, x, y, y, y, x]}{2\,903\,040} - \dfrac{31\,AW_1[x, x, y, y, y, y]}{483\,840} +$

$\dfrac{AW_1[x, y, x, x, x, x]}{12\,096} + \dfrac{13\,AW_1[x, y, x, x, x, y]}{725\,760} + \dfrac{AW_1[x, y, x, x, y, x]}{11\,520} +$

$\dfrac{37\,AW_1[x, y, x, x, y, y]}{580\,608} + \dfrac{AW_1[x, y, x, y, x, x]}{6048} + \dfrac{79\,AW_1[x, y, x, y, x, y]}{967\,680} +$

$\dfrac{71\,AW_1[x, y, x, y, y, x]}{322\,560} + \dfrac{73\,AW_1[x, y, x, y, y, y]}{483\,840} - \dfrac{AW_1[x, y, y, x, x, x]}{18\,144} -$

$\dfrac{53\,AW_1[x, y, y, x, x, y]}{967\,680} - \dfrac{23\,AW_1[x, y, y, x, y, y]}{193\,536} - \dfrac{11\,AW_1[x, y, y, x, y, y]}{161\,280} +$

$\dfrac{19\,AW_1[x, y, y, y, x, x]}{290\,304} - \dfrac{AW_1[x, y, y, y, x, y]}{193\,536} + \dfrac{7\,AW_1[x, y, y, y, y, x]}{138\,240} +$

$\dfrac{31\,AW_1[x, y, y, y, y, y]}{967\,680} - \dfrac{AW_1[y, x, x, x, x, x]}{60\,480} + \dfrac{AW_1[y, x, x, x, x, y]}{34\,560} -$

$\dfrac{97\,AW_1[y, x, x, x, y, x]}{725\,760} - \dfrac{103\,AW_1[y, x, x, x, y, y]}{967\,680} + \dfrac{19\,AW_1[y, x, x, y, x, x]}{120\,960} +$

$\dfrac{583\,AW_1[y, x, x, y, x, y]}{2\,903\,040} + \dfrac{53\,AW_1[y, x, x, y, y, x]}{967\,680} + \dfrac{17\,AW_1[y, x, x, y, y, y]}{161\,280} -$

$\dfrac{29\,AW_1[y, x, y, x, x, x]}{181\,440} - \dfrac{289\,AW_1[y, x, y, x, x, y]}{2\,903\,040} - \dfrac{55\,AW_1[y, x, y, x, y, x]}{193\,536}$

$$\frac{17\,AW_1[y, x, y, x, y, y]}{53\,760} - \frac{11\,AW_1[y, x, y, y, x, x]}{483\,840} + \frac{7\,AW_1[y, x, y, y, x, y]}{46\,080} -$$

$$\frac{191\,AW_1[y, x, y, y, y, x]}{967\,680} - \frac{31\,AW_1[y, x, y, y, y, y]}{193\,536} + \frac{13\,AW_1[y, y, x, x, x, x]}{241\,920} +$$

$$\frac{AW_1[y, y, x, x, x, y]}{17\,920} - \frac{19\,AW_1[y, y, x, x, y, x]}{1\,451\,520} + \frac{89\,AW_1[y, y, x, y, x, x]}{414\,720} +$$

$$\frac{53\,AW_1[y, y, x, y, x, y]}{322\,560} + \frac{71\,AW_1[y, y, x, y, y, x]}{322\,560} + \frac{31\,AW_1[y, y, x, y, y, y]}{96\,768} -$$

$$\frac{83\,AW_1[y, y, y, x, x, x]}{967\,680} - \frac{53\,AW_1[y, y, y, x, x, y]}{967\,680} - \frac{13\,AW_1[y, y, y, x, y, x]}{64\,512} -$$

$$\frac{31\,AW_1[y, y, y, x, y, y]}{96\,768} + \frac{31\,AW_1[y, y, y, y, x, x]}{483\,840} + \frac{31\,AW_1[y, y, y, y, x, y]}{193\,536} -$$

$$\frac{31\,AW_1[y, y, y, y, y, x]}{967\,680} + c_{7,1}\,AW_1[x, x, x, x, x, x, x] + c_{7,2}\,AW_1[x, x, x, x, x, x, y] +$$

$c_{7,3}\,AW_1[x, x, x, x, x, y, x] + c_{7,4}\,AW_1[x, x, x, x, x, y, y] + c_{7,5}\,AW_1[x, x, x, x, y, x, x] +$

$c_{7,6}\,AW_1[x, x, x, x, y, x, y] + c_{7,7}\,AW_1[x, x, x, x, y, y, x] + c_{7,8}\,AW_1[x, x, x, x, y, y, y] +$

$c_{7,9}\,AW_1[x, x, x, y, x, x, x] + c_{7,10}\,AW_1[x, x, x, y, x, x, y] + c_{7,11}\,AW_1[x, x, x, y, x, y, x] +$

$c_{7,12}\,AW_1[x, x, x, y, x, y, y] + c_{7,13}\,AW_1[x, x, x, y, y, x, x] + c_{7,14}\,AW_1[x, x, x, y, y, x, y] +$

$c_{7,15}\,AW_1[x, x, x, y, y, y, x] + c_{7,16}\,AW_1[x, x, x, y, y, y, y] + c_{7,17}\,AW_1[x, x, y, x, x, x, x] +$

$c_{7,18}\,AW_1[x, x, y, x, x, x, y] + c_{7,19}\,AW_1[x, x, y, x, x, y, x] + c_{7,20}\,AW_1[x, x, y, x, x, y, y] +$

$c_{7,21}\,AW_1[x, x, y, x, y, x, x] + c_{7,22}\,AW_1[x, x, y, x, y, x, y] + c_{7,23}\,AW_1[x, x, y, x, y, y, x] +$

$c_{7,24}\,AW_1[x, x, y, x, y, y, y] + c_{7,25}\,AW_1[x, x, y, y, x, x, x] + c_{7,26}\,AW_1[x, x, y, y, x, x, y] +$

$c_{7,27}\,AW_1[x, x, y, y, x, y, x] + c_{7,28}\,AW_1[x, x, y, y, x, y, y] + c_{7,29}\,AW_1[x, x, y, y, y, x, x] +$

$c_{7,30}\,AW_1[x, x, y, y, y, x, y] + c_{7,31}\,AW_1[x, x, y, y, y, y, x] + c_{7,32}\,AW_1[x, x, y, y, y, y, y] +$

$c_{7,33}\,AW_1[x, y, x, x, x, x, x] + c_{7,34}\,AW_1[x, y, x, x, x, x, y] + c_{7,35}\,AW_1[x, y, x, x, x, y, x] +$

$c_{7,36}\,AW_1[x, y, x, x, x, y, y] + c_{7,37}\,AW_1[x, y, x, x, y, x, x] + c_{7,38}\,AW_1[x, y, x, x, y, x, y] +$

$c_{7,39}\,AW_1[x, y, x, x, y, y, x] + c_{7,40}\,AW_1[x, y, x, x, y, y, y] + c_{7,41}\,AW_1[x, y, x, y, x, x, x] +$

$c_{7,42}\,AW_1[x, y, x, y, x, x, y] + c_{7,43}\,AW_1[x, y, x, y, x, y, x] + c_{7,44}\,AW_1[x, y, x, y, x, y, y] +$

$c_{7,45}\,AW_1[x, y, x, y, y, x, x] + c_{7,46}\,AW_1[x, y, x, y, y, x, y] + c_{7,47}\,AW_1[x, y, x, y, y, y, x] +$

$c_{7,48}\,AW_1[x, y, x, y, y, y, y] + c_{7,49}\,AW_1[x, y, y, x, x, x, x] + c_{7,50}\,AW_1[x, y, y, x, x, x, y] +$

$c_{7,51}\,AW_1[x, y, y, x, x, y, x] + c_{7,52}\,AW_1[x, y, y, x, x, y, y] + c_{7,53}\,AW_1[x, y, y, x, y, x, x] +$

$c_{7,54}\,AW_1[x, y, y, x, y, x, y] + c_{7,55}\,AW_1[x, y, y, x, y, y, x] + c_{7,56}\,AW_1[x, y, y, x, y, y, y] +$

$c_{7,57}\,AW_1[x, y, y, y, x, x, x] + c_{7,58}\,AW_1[x, y, y, y, x, x, y] + c_{7,59}\,AW_1[x, y, y, y, x, y, x] +$

$c_{7,60}\,AW_1[x, y, y, y, x, y, y] + c_{7,61}\,AW_1[x, y, y, y, y, x, x] + c_{7,62}\,AW_1[x, y, y, y, y, x, y] +$

$c_{7,63}\,AW_1[x, y, y, y, y, y, x] + c_{7,64}\,AW_1[x, y, y, y, y, y, y] + c_{7,65}\,AW_1[y, x, x, x, x, x, x] +$

$c_{7,66}\,AW_1[y, x, x, x, x, x, y] + c_{7,67}\,AW_1[y, x, x, x, x, y, x] + c_{7,68}\,AW_1[y, x, x, x, x, y, y] +$

$c_{7,69}\,AW_1[y, x, x, x, y, x, x] + c_{7,70}\,AW_1[y, x, x, x, y, x, y] + c_{7,71}\,AW_1[y, x, x, x, y, y, x] +$

$c_{7,72}\,AW_1[y, x, x, x, y, y, y] + c_{7,73}\,AW_1[y, x, x, y, x, x, x] + c_{7,74}\,AW_1[y, x, x, y, x, x, y] +$

$c_{7,75}\,AW_1[y, x, x, y, x, y, x] + c_{7,76}\,AW_1[y, x, x, y, x, y, y] + c_{7,77}\,AW_1[y, x, x, y, y, x, x] +$

$c_{7,78}\,AW_1[y, x, x, y, y, x, y] + c_{7,79}\,AW_1[y, x, x, y, y, y, x] + c_{7,80}\,AW_1[y, x, x, y, y, y, y] +$

$c_{7,81}\,AW_1[y, x, y, x, x, x, x] + c_{7,82}\,AW_1[y, x, y, x, x, x, y] + c_{7,83}\,AW_1[y, x, y, x, x, y, x] +$

$c_{7,84}\,AW_1[y, x, y, x, x, y, y] + c_{7,85}\,AW_1[y, x, y, x, y, x, x] + c_{7,86}\,AW_1[y, x, y, x, y, x, y] +$

$c_{7,87}\,AW_1[y, x, y, x, y, y, x] + c_{7,88}\,AW_1[y, x, y, x, y, y, y] + c_{7,89}\,AW_1[y, x, y, y, x, x, x] +$

$c_{7,90}\,AW_1[y, x, y, y, x, x, y] + c_{7,91}\,AW_1[y, x, y, y, x, y, x] + c_{7,92}\,AW_1[y, x, y, y, x, y, y] +$

$c_{7,93}\,AW_1[y, x, y, y, y, x, x] + c_{7,94}\,AW_1[y, x, y, y, y, x, y] + c_{7,95}\,AW_1[y, x, y, y, y, y, x] +$

$c_{7,96} AW_1[y, x, y, y, y, y, y] + c_{7,97} AW_1[y, y, x, x, x, x, x] + c_{7,98} AW_1[y, y, x, x, x, x, y] +$

$c_{7,99} AW_1[y, y, x, x, x, y, x] + c_{7,100} AW_1[y, y, x, x, x, y, y] + c_{7,101} AW_1[y, y, x, x, y, x, x] +$

$c_{7,102} AW_1[y, y, x, x, y, x, y] + c_{7,103} AW_1[y, y, x, x, y, y, x] + c_{7,104} AW_1[y, y, x, x, y, y, y] +$

$c_{7,105} AW_1[y, y, x, y, x, x, x] + c_{7,106} AW_1[y, y, x, y, x, x, y] + c_{7,107} AW_1[y, y, x, y, x, y, x] +$

$c_{7,108} AW_1[y, y, x, y, x, y, y] + c_{7,109} AW_1[y, y, x, y, y, x, x] + c_{7,110} AW_1[y, y, x, y, y, x, y] +$

$c_{7,111} AW_1[y, y, x, y, y, y, x] + c_{7,112} AW_1[y, y, x, y, y, y, y] + c_{7,113} AW_1[y, y, y, x, x, x, x] +$

$c_{7,114} AW_1[y, y, y, x, x, x, y] + c_{7,115} AW_1[y, y, y, x, x, y, x] + c_{7,116} AW_1[y, y, y, x, x, y, y] +$

$c_{7,117} AW_1[y, y, y, x, y, x, x] + c_{7,118} AW_1[y, y, y, x, y, x, y] + c_{7,119} AW_1[y, y, y, x, y, y, x] +$

$c_{7,120} AW_1[y, y, y, x, y, y, y] + c_{7,121} AW_1[y, y, y, y, x, x, x] + c_{7,122} AW_1[y, y, y, y, x, x, y] +$

$c_{7,123} AW_1[y, y, y, y, x, y, x] + c_{7,124} AW_1[y, y, y, y, x, y, y] + c_{7,125} AW_1[y, y, y, y, y, x, x] +$

$c_{7,126} AW_1[y, y, y, y, y, x, y] + c_{7,127} AW_1[y, y, y, y, y, y, x] + c_{7,128} AW_1[y, y, y, y, y, y, y] \Big] \Big]$

In[ ]:= **Short[**
  rels = Union @@ (List @@ Pentagon$_d$[Φ[d]][[1]] /. {
    𝓐$_0$[A_] :> Table[Coefficient[A, B], {B, Basis$_{d,\{x,y\}}$[AW$_1$ AW$_2$]}],
    𝓐$_{c[1,2]}$[A_] :> Table[Coefficient[A, B], {B, AW$_{\bar{2}}$[] Basis$_{d-1,\{x,y\}}$[AW$_1$ AW$_2$ AW$_{\bar{1}}$]}]
  }),
  10]

Out[ ]//Short=

$\{0, -777 c_{7,1}, -651 c_{7,1}, -546 c_{7,1}, -399 c_{7,1}, -385 c_{7,1}, -351 c_{7,1}, -245 c_{7,1}, -140 c_{7,1}, -120 c_{7,1},$

$-77 c_{7,1}, -71 c_{7,1}, -35 c_{7,1}, -21 c_{7,1}, -7 c_{7,1}, -c_{7,1}, 7 c_{7,1}, 13 c_{7,1}, 21 c_{7,1}, 35 c_{7,1},$

$175 c_{7,1}, 189 c_{7,1}, \ll2034\gg, -707 c_{7,128}, -525 c_{7,128}, -392 c_{7,128}, -350 c_{7,128}, -336 c_{7,128},$

$-140 c_{7,128}, -119 c_{7,128}, -105 c_{7,128}, -56 c_{7,128}, -42 c_{7,128}, -35 c_{7,128}, -21 c_{7,128}, -7 c_{7,128},$

$7 c_{7,128}, 105 c_{7,128}, 189 c_{7,128}, 273 c_{7,128}, 315 c_{7,128}, 490 c_{7,128}, 868 c_{7,128}, 945 c_{7,128}\}$

In[ ]:= **eqns = # == 0 & /@ rels;**

In[ ]:= **vars = Union[Cases[eqns, c$_{d,\_}$, ∞]]**

Out[ ]=

$\{c_{7,1}, c_{7,2}, c_{7,3}, c_{7,4}, c_{7,5}, c_{7,6}, c_{7,7}, c_{7,8}, c_{7,9}, c_{7,10}, c_{7,11}, c_{7,12}, c_{7,13}, c_{7,14}, c_{7,15}, c_{7,16},$

$c_{7,17}, c_{7,18}, c_{7,19}, c_{7,20}, c_{7,21}, c_{7,22}, c_{7,23}, c_{7,24}, c_{7,25}, c_{7,26}, c_{7,27}, c_{7,28}, c_{7,29}, c_{7,30}, c_{7,31},$

$c_{7,32}, c_{7,33}, c_{7,34}, c_{7,35}, c_{7,36}, c_{7,37}, c_{7,38}, c_{7,39}, c_{7,40}, c_{7,41}, c_{7,42}, c_{7,43}, c_{7,44}, c_{7,45}, c_{7,46},$

$c_{7,47}, c_{7,48}, c_{7,49}, c_{7,50}, c_{7,51}, c_{7,52}, c_{7,53}, c_{7,54}, c_{7,55}, c_{7,56}, c_{7,57}, c_{7,58}, c_{7,59}, c_{7,60},$

$c_{7,61}, c_{7,62}, c_{7,63}, c_{7,64}, c_{7,65}, c_{7,66}, c_{7,67}, c_{7,68}, c_{7,69}, c_{7,70}, c_{7,71}, c_{7,72}, c_{7,73}, c_{7,74},$

$c_{7,75}, c_{7,76}, c_{7,77}, c_{7,78}, c_{7,79}, c_{7,80}, c_{7,81}, c_{7,82}, c_{7,83}, c_{7,84}, c_{7,85}, c_{7,86}, c_{7,87}, c_{7,88},$

$c_{7,89}, c_{7,90}, c_{7,91}, c_{7,92}, c_{7,93}, c_{7,94}, c_{7,95}, c_{7,96}, c_{7,97}, c_{7,98}, c_{7,99}, c_{7,100}, c_{7,101}, c_{7,102},$

$c_{7,103}, c_{7,104}, c_{7,105}, c_{7,106}, c_{7,107}, c_{7,108}, c_{7,109}, c_{7,110}, c_{7,111}, c_{7,112}, c_{7,113}, c_{7,114}, c_{7,115},$

$c_{7,116}, c_{7,117}, c_{7,118}, c_{7,119}, c_{7,120}, c_{7,121}, c_{7,122}, c_{7,123}, c_{7,124}, c_{7,125}, c_{7,126}, c_{7,127}, c_{7,128}\}$

In[ ]:= **sol = Solve[eqns, vars][[1]]**

⋯ Solve: Equations may not give solutions for all "solve" variables.

Out[•]=

$\{c_{7,1} \to 0, \ c_{7,2} \to c_{7,32}, \ c_{7,3} \to -6\,c_{7,32}, \ c_{7,4} \to -2\,c_{7,32}, \ c_{7,5} \to 15\,c_{7,32}, \ c_{7,6} \to 5\,c_{7,32}, \ c_{7,7} \to 5\,c_{7,32},$

$c_{7,8} \to 3\,c_{7,32}, \ c_{7,9} \to -20\,c_{7,32}, \ c_{7,10} \to -2\,c_{7,32}, \ c_{7,11} \to -16\,c_{7,32}, \ c_{7,12} \to -\dfrac{141\,c_{7,32}}{16},$

$c_{7,13} \to -2\,c_{7,32}, \ c_{7,14} \to \dfrac{45\,c_{7,32}}{8}, \ c_{7,15} \to -\dfrac{141\,c_{7,32}}{16}, \ c_{7,16} \to -2\,c_{7,32}, \ c_{7,17} \to 15\,c_{7,32},$

$c_{7,18} \to -2\,c_{7,32}, \ c_{7,19} \to 12\,c_{7,32}, \ c_{7,20} \to \dfrac{45\,c_{7,32}}{8}, \ c_{7,21} \to 12\,c_{7,32}, \ c_{7,22} \to -\dfrac{99\,c_{7,32}}{16},$

$c_{7,23} \to \dfrac{171\,c_{7,32}}{8}, \ c_{7,24} \to 5\,c_{7,32}, \ c_{7,25} \to -2\,c_{7,32}, \ c_{7,26} \to -\dfrac{9\,c_{7,32}}{4}, \ c_{7,27} \to -\dfrac{99\,c_{7,32}}{16},$

$c_{7,28} \to -2\,c_{7,32}, \ c_{7,29} \to \dfrac{45\,c_{7,32}}{8}, \ c_{7,30} \to -2\,c_{7,32}, \ c_{7,31} \to 5\,c_{7,32}, \ c_{7,33} \to -6\,c_{7,32}, \ c_{7,34} \to 5\,c_{7,32},$

$c_{7,35} \to -16\,c_{7,32}, \ c_{7,36} \to -\dfrac{141\,c_{7,32}}{16}, \ c_{7,37} \to 12\,c_{7,32}, \ c_{7,38} \to \dfrac{171\,c_{7,32}}{8}, \ c_{7,39} \to -\dfrac{99\,c_{7,32}}{16},$

$c_{7,40} \to 5\,c_{7,32}, \ c_{7,41} \to -16\,c_{7,32}, \ c_{7,42} \to -\dfrac{99\,c_{7,32}}{16}, \ c_{7,43} \to -18\,c_{7,32}, \ c_{7,44} \to -16\,c_{7,32},$

$c_{7,45} \to -\dfrac{99\,c_{7,32}}{16}, \ c_{7,46} \to 12\,c_{7,32}, \ c_{7,47} \to -16\,c_{7,32}, \ c_{7,48} \to -6\,c_{7,32}, \ c_{7,49} \to 5\,c_{7,32},$

$c_{7,50} \to \dfrac{45\,c_{7,32}}{8}, \ c_{7,51} \to -\dfrac{99\,c_{7,32}}{16}, \ c_{7,52} \to -2\,c_{7,32}, \ c_{7,53} \to \dfrac{171\,c_{7,32}}{8}, \ c_{7,54} \to 12\,c_{7,32},$

$c_{7,55} \to 12\,c_{7,32}, \ c_{7,56} \to 15\,c_{7,32}, \ c_{7,57} \to -\dfrac{141\,c_{7,32}}{16}, \ c_{7,58} \to -2\,c_{7,32}, \ c_{7,59} \to -16\,c_{7,32},$

$c_{7,60} \to -20\,c_{7,32}, \ c_{7,61} \to 5\,c_{7,32}, \ c_{7,62} \to 15\,c_{7,32}, \ c_{7,63} \to -6\,c_{7,32}, \ c_{7,64} \to 0, \ c_{7,65} \to c_{7,32},$

$c_{7,66} \to -2\,c_{7,32}, \ c_{7,67} \to 5\,c_{7,32}, \ c_{7,68} \to 3\,c_{7,32}, \ c_{7,69} \to -2\,c_{7,32}, \ c_{7,70} \to -\dfrac{141\,c_{7,32}}{16}, \ c_{7,71} \to \dfrac{45\,c_{7,32}}{8},$

$c_{7,72} \to -2\,c_{7,32}, \ c_{7,73} \to -2\,c_{7,32}, \ c_{7,74} \to \dfrac{45\,c_{7,32}}{8}, \ c_{7,75} \to -\dfrac{99\,c_{7,32}}{16}, \ c_{7,76} \to 5\,c_{7,32},$

$c_{7,77} \to -\dfrac{9\,c_{7,32}}{4}, \ c_{7,78} \to -2\,c_{7,32}, \ c_{7,79} \to -2\,c_{7,32}, \ c_{7,80} \to c_{7,32}, \ c_{7,81} \to 5\,c_{7,32}, \ c_{7,82} \to -\dfrac{141\,c_{7,32}}{16},$

$c_{7,83} \to \dfrac{171\,c_{7,32}}{8}, \ c_{7,84} \to 5\,c_{7,32}, \ c_{7,85} \to -\dfrac{99\,c_{7,32}}{16}, \ c_{7,86} \to -16\,c_{7,32}, \ c_{7,87} \to 12\,c_{7,32},$

$c_{7,88} \to -6\,c_{7,32}, \ c_{7,89} \to \dfrac{45\,c_{7,32}}{8}, \ c_{7,90} \to -2\,c_{7,32}, \ c_{7,91} \to 12\,c_{7,32}, \ c_{7,92} \to 15\,c_{7,32}, \ c_{7,93} \to -2\,c_{7,32},$

$c_{7,94} \to -20\,c_{7,32}, \ c_{7,95} \to 15\,c_{7,32}, \ c_{7,96} \to 0, \ c_{7,97} \to -2\,c_{7,32}, \ c_{7,98} \to 3\,c_{7,32}, \ c_{7,99} \to -\dfrac{141\,c_{7,32}}{16},$

$c_{7,100} \to -2\,c_{7,32}, \ c_{7,101} \to \dfrac{45\,c_{7,32}}{8}, \ c_{7,102} \to 5\,c_{7,32}, \ c_{7,103} \to -2\,c_{7,32}, \ c_{7,104} \to c_{7,32},$

$c_{7,105} \to -\dfrac{141\,c_{7,32}}{16}, \ c_{7,106} \to 5\,c_{7,32}, \ c_{7,107} \to -16\,c_{7,32}, \ c_{7,108} \to -6\,c_{7,32}, \ c_{7,109} \to -2\,c_{7,32},$

$c_{7,110} \to 15\,c_{7,32}, \ c_{7,111} \to -20\,c_{7,32}, \ c_{7,112} \to 0, \ c_{7,113} \to 3\,c_{7,32}, \ c_{7,114} \to -2\,c_{7,32}, \ c_{7,115} \to 5\,c_{7,32},$

$c_{7,116} \to c_{7,32}, \ c_{7,117} \to 5\,c_{7,32}, \ c_{7,118} \to -6\,c_{7,32}, \ c_{7,119} \to 15\,c_{7,32}, \ c_{7,120} \to 0, \ c_{7,121} \to -2\,c_{7,32},$

$c_{7,122} \to c_{7,32}, \ c_{7,123} \to -6\,c_{7,32}, \ c_{7,124} \to 0, \ c_{7,125} \to c_{7,32}, \ c_{7,126} \to 0, \ c_{7,127} \to 0, \ c_{7,128} \to 0\}$

In[ ]:= **sol /. Rule → Set**

Out[ ]=

$\Big\{0,\ c_{7,32},\ -6\,c_{7,32},\ -2\,c_{7,32},\ 15\,c_{7,32},\ 5\,c_{7,32},\ 5\,c_{7,32},\ 3\,c_{7,32},\ -20\,c_{7,32},\ -2\,c_{7,32},\ -16\,c_{7,32},$

$-\dfrac{141\,c_{7,32}}{16},\ -2\,c_{7,32},\ \dfrac{45\,c_{7,32}}{8},\ -\dfrac{141\,c_{7,32}}{16},\ -2\,c_{7,32},\ 15\,c_{7,32},\ -2\,c_{7,32},\ 12\,c_{7,32},\ \dfrac{45\,c_{7,32}}{8},$

$12\,c_{7,32},\ -\dfrac{99\,c_{7,32}}{16},\ \dfrac{171\,c_{7,32}}{8},\ 5\,c_{7,32},\ -2\,c_{7,32},\ -\dfrac{9\,c_{7,32}}{4},\ -\dfrac{99\,c_{7,32}}{16},\ -2\,c_{7,32},\ \dfrac{45\,c_{7,32}}{8},$

$-2\,c_{7,32},\ 5\,c_{7,32},\ -6\,c_{7,32},\ 5\,c_{7,32},\ -16\,c_{7,32},\ -\dfrac{141\,c_{7,32}}{16},\ 12\,c_{7,32},\ \dfrac{171\,c_{7,32}}{8},\ -\dfrac{99\,c_{7,32}}{16},$

$5\,c_{7,32},\ -16\,c_{7,32},\ -\dfrac{99\,c_{7,32}}{16},\ -18\,c_{7,32},\ -16\,c_{7,32},\ -\dfrac{99\,c_{7,32}}{16},\ 12\,c_{7,32},\ -16\,c_{7,32},\ -6\,c_{7,32},$

$5\,c_{7,32},\ \dfrac{45\,c_{7,32}}{8},\ -\dfrac{99\,c_{7,32}}{16},\ -2\,c_{7,32},\ \dfrac{171\,c_{7,32}}{8},\ 12\,c_{7,32},\ 12\,c_{7,32},\ 15\,c_{7,32},\ -\dfrac{141\,c_{7,32}}{16},$

$-2\,c_{7,32},\ -16\,c_{7,32},\ -20\,c_{7,32},\ 5\,c_{7,32},\ 15\,c_{7,32},\ -6\,c_{7,32},\ 0,\ c_{7,32},\ -2\,c_{7,32},\ 5\,c_{7,32},$

$3\,c_{7,32},\ -2\,c_{7,32},\ -\dfrac{141\,c_{7,32}}{16},\ \dfrac{45\,c_{7,32}}{8},\ -2\,c_{7,32},\ -2\,c_{7,32},\ \dfrac{45\,c_{7,32}}{8},\ -\dfrac{99\,c_{7,32}}{16},\ 5\,c_{7,32},$

$-\dfrac{9\,c_{7,32}}{4},\ -2\,c_{7,32},\ -2\,c_{7,32},\ c_{7,32},\ 5\,c_{7,32},\ -\dfrac{141\,c_{7,32}}{16},\ \dfrac{171\,c_{7,32}}{8},\ 5\,c_{7,32},\ -\dfrac{99\,c_{7,32}}{16},$

$-16\,c_{7,32},\ 12\,c_{7,32},\ -6\,c_{7,32},\ \dfrac{45\,c_{7,32}}{8},\ -2\,c_{7,32},\ 12\,c_{7,32},\ 15\,c_{7,32},\ -2\,c_{7,32},\ -20\,c_{7,32},$

$15\,c_{7,32},\ 0,\ -2\,c_{7,32},\ 3\,c_{7,32},\ -\dfrac{141\,c_{7,32}}{16},\ -2\,c_{7,32},\ \dfrac{45\,c_{7,32}}{8},\ 5\,c_{7,32},\ -2\,c_{7,32},\ c_{7,32},$

$-\dfrac{141\,c_{7,32}}{16},\ 5\,c_{7,32},\ -16\,c_{7,32},\ -6\,c_{7,32},\ -2\,c_{7,32},\ 15\,c_{7,32},\ -20\,c_{7,32},\ 0,\ 3\,c_{7,32},\ -2\,c_{7,32},$

$5\,c_{7,32},\ c_{7,32},\ 5\,c_{7,32},\ -6\,c_{7,32},\ 15\,c_{7,32},\ 0,\ -2\,c_{7,32},\ c_{7,32},\ -6\,c_{7,32},\ 0,\ c_{7,32},\ 0,\ 0,\ 0\Big\}$

In[ ]:= **$c_{7,32}$ = 0**

Out[ ]=

0

In[ ]:= **Φ[d]**

Out[ ]=

$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[\mathcal{A}_0\Big[\mathrm{AW}_1[\ ] + \dfrac{1}{24}\,\mathrm{AW}_1[x,y] - \dfrac{1}{24}\,\mathrm{AW}_1[y,x] - \dfrac{\mathrm{AW}_1[x,x,x,y]}{1440} + \dfrac{1}{480}\,\mathrm{AW}_1[x,x,y,x] +$

$\dfrac{7\,\mathrm{AW}_1[x,x,y,y]}{5760} - \dfrac{1}{480}\,\mathrm{AW}_1[x,y,x,x] - \dfrac{1}{640}\,\mathrm{AW}_1[x,y,x,y] - \dfrac{\mathrm{AW}_1[x,y,y,x]}{1152} -$

$\dfrac{7\,\mathrm{AW}_1[x,y,y,y]}{5760} + \dfrac{\mathrm{AW}_1[y,x,x,x]}{1440} - \dfrac{\mathrm{AW}_1[y,x,x,y]}{1152} + \dfrac{19\,\mathrm{AW}_1[y,x,y,x]}{5760} +$

$\dfrac{7\,\mathrm{AW}_1[y,x,y,y]}{1920} - \dfrac{7\,\mathrm{AW}_1[y,y,x,x]}{5760} - \dfrac{7\,\mathrm{AW}_1[y,y,x,y]}{1920} + \dfrac{7\,\mathrm{AW}_1[y,y,y,x]}{5760} +$

$\dfrac{\mathrm{AW}_1[x,x,x,x,x,y]}{60480} - \dfrac{\mathrm{AW}_1[x,x,x,x,y,x]}{12096} - \dfrac{13\,\mathrm{AW}_1[x,x,x,x,y,y]}{241920} +$

$\dfrac{\mathrm{AW}_1[x,x,x,y,x,x]}{6048} + \dfrac{19\,\mathrm{AW}_1[x,x,x,y,x,y]}{145152} + \dfrac{61\,\mathrm{AW}_1[x,x,x,y,y,x]}{725760} +$

$$\frac{83\,AW_1[x,x,x,y,y,y]}{967\,680} - \frac{AW_1[x,x,y,x,x,x]}{6048} - \frac{17\,AW_1[x,x,y,x,x,y]}{241\,920} -$$

$$\frac{61\,AW_1[x,x,y,x,y,x]}{241\,920} - \frac{89\,AW_1[x,x,y,x,y,y]}{414\,720} + \frac{71\,AW_1[x,x,y,y,x,y]}{967\,680} -$$

$$\frac{337\,AW_1[x,x,y,y,y,x]}{2\,903\,040} - \frac{31\,AW_1[x,x,y,y,y,y]}{483\,840} + \frac{AW_1[x,y,x,x,x,x]}{12\,096} +$$

$$\frac{13\,AW_1[x,y,x,x,x,y]}{725\,760} + \frac{AW_1[x,y,x,x,y,x]}{11\,520} + \frac{37\,AW_1[x,y,x,x,y,y]}{580\,608} +$$

$$\frac{AW_1[x,y,x,y,x,x]}{6048} + \frac{79\,AW_1[x,y,x,y,x,y]}{967\,680} + \frac{71\,AW_1[x,y,x,y,y,x]}{322\,560} +$$

$$\frac{73\,AW_1[x,y,x,y,y,y]}{483\,840} - \frac{AW_1[x,y,y,x,x,x]}{18\,144} - \frac{53\,AW_1[x,y,y,x,x,y]}{967\,680} -$$

$$\frac{23\,AW_1[x,y,y,x,y,x]}{193\,536} - \frac{11\,AW_1[x,y,y,x,y,y]}{161\,280} + \frac{19\,AW_1[x,y,y,y,x,x]}{290\,304} -$$

$$\frac{AW_1[x,y,y,y,x,y]}{193\,536} + \frac{7\,AW_1[x,y,y,y,y,x]}{138\,240} + \frac{31\,AW_1[x,y,y,y,y,y]}{967\,680} -$$

$$\frac{AW_1[y,x,x,x,x,x]}{60\,480} + \frac{AW_1[y,x,x,x,x,y]}{34\,560} - \frac{97\,AW_1[y,x,x,x,y,x]}{725\,760} -$$

$$\frac{103\,AW_1[y,x,x,x,y,y]}{967\,680} + \frac{19\,AW_1[y,x,x,y,x,x]}{120\,960} + \frac{583\,AW_1[y,x,x,y,x,y]}{2\,903\,040} +$$

$$\frac{53\,AW_1[y,x,x,y,y,x]}{967\,680} + \frac{17\,AW_1[y,x,x,y,y,y]}{161\,280} - \frac{29\,AW_1[y,x,y,x,x,x]}{181\,440} -$$

$$\frac{289\,AW_1[y,x,y,x,x,y]}{2\,903\,040} - \frac{55\,AW_1[y,x,y,x,y,x]}{193\,536} - \frac{17\,AW_1[y,x,y,x,y,y]}{53\,760} -$$

$$\frac{11\,AW_1[y,x,y,y,x,x]}{483\,840} + \frac{7\,AW_1[y,x,y,y,x,y]}{46\,080} - \frac{191\,AW_1[y,x,y,y,y,x]}{967\,680} -$$

$$\frac{31\,AW_1[y,x,y,y,y,y]}{193\,536} + \frac{13\,AW_1[y,y,x,x,x,x]}{241\,920} + \frac{AW_1[y,y,x,x,x,y]}{17\,920} -$$

$$\frac{19\,AW_1[y,y,x,x,y,x]}{1\,451\,520} + \frac{89\,AW_1[y,y,x,x,y,y]}{414\,720} + \frac{53\,AW_1[y,y,x,y,x,y]}{322\,560} +$$

$$\frac{71\,AW_1[y,y,x,y,y,x]}{322\,560} + \frac{31\,AW_1[y,y,x,y,y,y]}{96\,768} - \frac{83\,AW_1[y,y,y,x,x,x]}{967\,680} -$$

$$\frac{53\,AW_1[y,y,y,x,x,y]}{967\,680} - \frac{13\,AW_1[y,y,y,x,y,x]}{64\,512} - \frac{31\,AW_1[y,y,y,x,y,y]}{96\,768} +$$

$$\frac{31\,AW_1[y,y,y,y,x,x]}{483\,840} + \frac{31\,AW_1[y,y,y,y,x,y]}{193\,536} - \frac{31\,AW_1[y,y,y,y,y,x]}{967\,680}\Big]\Big]$$

Solving to Degree 8

$In[\bullet]:=$ `d = 8;  i = 0;`
`Φ[d] = Φ[d - 1] + Sum[c`$_{d,++i}$` B, {B, Select[Basis`$_d$`[𝕆`$_{AR,\{x,y\},\{1\}}$`], FreeQ[#, 𝒜`$_{c[1]}$`] &]}]`

$Out[\bullet]=$

$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[\mathcal{A}_0\Big[$

$$AW_1[\,] + \frac{1}{24} AW_1[x, y] - \frac{1}{24} AW_1[y, x] - \frac{AW_1[x, x, x, y]}{1440} + \frac{1}{480} AW_1[x, x, y, x] + \frac{7 AW_1[x, x, y, y]}{5760} -$$

$$\frac{1}{480} AW_1[x, y, x, x] - \frac{1}{640} AW_1[x, y, x, y] - \frac{AW_1[x, y, y, x]}{1152} - \frac{7 AW_1[x, y, y, y]}{5760} +$$

$$\frac{AW_1[y, x, x, x]}{1440} - \frac{AW_1[y, x, x, y]}{1152} + \frac{19 AW_1[y, x, y, x]}{5760} + \frac{7 AW_1[y, x, y, y]}{1920} - \frac{7 AW_1[y, y, x, x]}{5760} -$$

$$\frac{7 AW_1[y, y, x, y]}{1920} + \frac{7 AW_1[y, y, y, x]}{5760} + \frac{AW_1[x, x, x, x, x, y]}{60480} - \frac{AW_1[x, x, x, x, y, x]}{12096} -$$

$$\frac{13 AW_1[x, x, x, x, y, y]}{241920} + \frac{AW_1[x, x, x, y, x, x]}{6048} + \frac{19 AW_1[x, x, x, y, x, y]}{145152} +$$

$$\frac{61 AW_1[x, x, x, y, y, x]}{725760} + \frac{83 AW_1[x, x, x, y, y, y]}{967680} - \frac{AW_1[x, x, y, x, x, x]}{6048} -$$

$$\frac{17 AW_1[x, x, y, x, x, y]}{241920} - \frac{61 AW_1[x, x, y, x, y, x]}{241920} - \frac{89 AW_1[x, x, y, x, y, y]}{414720} +$$

$$\frac{71 AW_1[x, x, y, y, x, y]}{967680} - \frac{337 AW_1[x, x, y, y, y, x]}{2903040} - \frac{31 AW_1[x, x, y, y, y, y]}{483840} +$$

$$\frac{AW_1[x, y, x, x, x, x]}{12096} + \frac{13 AW_1[x, y, x, x, x, y]}{725760} + \frac{AW_1[x, y, x, x, y, x]}{11520} +$$

$$\frac{37 AW_1[x, y, x, x, y, y]}{580608} + \frac{AW_1[x, y, x, y, x, x]}{6048} + \frac{79 AW_1[x, y, x, y, x, y]}{967680} +$$

$$\frac{71 AW_1[x, y, x, y, y, x]}{322560} + \frac{73 AW_1[x, y, x, y, y, y]}{483840} - \frac{AW_1[x, y, y, x, x, x]}{18144} -$$

$$\frac{53 AW_1[x, y, y, x, x, y]}{967680} - \frac{23 AW_1[x, y, y, x, y, x]}{193536} - \frac{11 AW_1[x, y, y, x, y, y]}{161280} +$$

$$\frac{19 AW_1[x, y, y, y, x, x]}{290304} - \frac{AW_1[x, y, y, y, x, y]}{193536} + \frac{7 AW_1[x, y, y, y, y, x]}{138240} +$$

$$\frac{31 AW_1[x, y, y, y, y, y]}{967680} - \frac{AW_1[y, x, x, x, x, x]}{60480} + \frac{AW_1[y, x, x, x, x, y]}{34560} -$$

$$\frac{97 AW_1[y, x, x, x, y, x]}{725760} - \frac{103 AW_1[y, x, x, x, y, y]}{967680} + \frac{19 AW_1[y, x, x, y, x, x]}{120960} +$$

$$\frac{583 AW_1[y, x, x, y, x, y]}{2903040} + \frac{53 AW_1[y, x, x, y, y, x]}{967680} + \frac{17 AW_1[y, x, x, y, y, y]}{161280} -$$

$$\frac{29 AW_1[y, x, y, x, x, x]}{181440} - \frac{289 AW_1[y, x, y, x, x, y]}{2903040} - \frac{55 AW_1[y, x, y, x, y, x]}{193536} +$$

$$\frac{17 AW_1[y, x, y, x, y, y]}{53760} - \frac{11 AW_1[y, x, y, y, x, x]}{483840} + \frac{7 AW_1[y, x, y, y, x, y]}{46080} -$$

$$\frac{191 AW_1[y, x, y, y, y, x]}{967680} - \frac{31 AW_1[y, x, y, y, y, y]}{193536} + \frac{13 AW_1[y, y, x, x, x, x]}{241920} +$$

$$\frac{AW_1[y, y, x, x, x, y]}{17920} - \frac{19 AW_1[y, y, x, x, y, x]}{1451520} + \frac{89 AW_1[y, y, x, y, x, x]}{414720} +$$

$$\frac{53 AW_1[y, y, x, y, x, y]}{322560} + \frac{71 AW_1[y, y, x, y, y, x]}{322560} + \frac{31 AW_1[y, y, x, y, y, y]}{96768} -$$

$$\frac{83 AW_1[y, y, y, x, x, x]}{967680} - \frac{53 AW_1[y, y, y, x, x, y]}{967680} - \frac{13 AW_1[y, y, y, x, y, x]}{64512}$$

$$\frac{31\,AW_1[y,\,y,\,y,\,x,\,y,\,y]}{96\,768} + \frac{31\,AW_1[y,\,y,\,y,\,y,\,x,\,x]}{483\,840} + \frac{31\,AW_1[y,\,y,\,y,\,y,\,x,\,y]}{193\,536} -$$

$$\frac{31\,AW_1[y,\,y,\,y,\,y,\,y,\,x]}{967\,680} + c_{8,1}\,AW_1[x,\,x,\,x,\,x,\,x,\,x,\,x,\,x] + c_{8,2}\,AW_1[x,\,x,\,x,\,x,\,x,\,x,\,x,\,y] +$$

$c_{8,3}\,AW_1[x,\,x,\,x,\,x,\,x,\,x,\,y,\,x] + c_{8,4}\,AW_1[x,\,x,\,x,\,x,\,x,\,x,\,y,\,y] +$

$c_{8,5}\,AW_1[x,\,x,\,x,\,x,\,x,\,y,\,x,\,x] + c_{8,6}\,AW_1[x,\,x,\,x,\,x,\,x,\,y,\,x,\,y] +$

$c_{8,7}\,AW_1[x,\,x,\,x,\,x,\,x,\,y,\,y,\,x] + c_{8,8}\,AW_1[x,\,x,\,x,\,x,\,x,\,y,\,y,\,y] +$

$c_{8,9}\,AW_1[x,\,x,\,x,\,x,\,y,\,x,\,x,\,x] + c_{8,10}\,AW_1[x,\,x,\,x,\,x,\,y,\,x,\,x,\,y] +$

$c_{8,11}\,AW_1[x,\,x,\,x,\,x,\,y,\,x,\,y,\,x] + c_{8,12}\,AW_1[x,\,x,\,x,\,x,\,y,\,x,\,y,\,y] +$

$c_{8,13}\,AW_1[x,\,x,\,x,\,x,\,y,\,y,\,x,\,x] + c_{8,14}\,AW_1[x,\,x,\,x,\,x,\,y,\,y,\,x,\,y] +$

$c_{8,15}\,AW_1[x,\,x,\,x,\,x,\,y,\,y,\,y,\,x] + c_{8,16}\,AW_1[x,\,x,\,x,\,x,\,y,\,y,\,y,\,y] +$

$c_{8,17}\,AW_1[x,\,x,\,x,\,y,\,x,\,x,\,x,\,x] + c_{8,18}\,AW_1[x,\,x,\,x,\,y,\,x,\,x,\,x,\,y] +$

$c_{8,19}\,AW_1[x,\,x,\,x,\,y,\,x,\,x,\,y,\,x] + c_{8,20}\,AW_1[x,\,x,\,x,\,y,\,x,\,x,\,y,\,y] +$

$c_{8,21}\,AW_1[x,\,x,\,x,\,y,\,x,\,y,\,x,\,x] + c_{8,22}\,AW_1[x,\,x,\,x,\,y,\,x,\,y,\,x,\,y] +$

$c_{8,23}\,AW_1[x,\,x,\,x,\,y,\,x,\,y,\,y,\,x] + c_{8,24}\,AW_1[x,\,x,\,x,\,y,\,x,\,y,\,y,\,y] +$

$c_{8,25}\,AW_1[x,\,x,\,x,\,y,\,y,\,x,\,x,\,x] + c_{8,26}\,AW_1[x,\,x,\,x,\,y,\,y,\,x,\,x,\,y] +$

$c_{8,27}\,AW_1[x,\,x,\,x,\,y,\,y,\,x,\,y,\,x] + c_{8,28}\,AW_1[x,\,x,\,x,\,y,\,y,\,x,\,y,\,y] +$

$c_{8,29}\,AW_1[x,\,x,\,x,\,y,\,y,\,y,\,x,\,x] + c_{8,30}\,AW_1[x,\,x,\,x,\,y,\,y,\,y,\,x,\,y] +$

$c_{8,31}\,AW_1[x,\,x,\,x,\,y,\,y,\,y,\,y,\,x] + c_{8,32}\,AW_1[x,\,x,\,x,\,y,\,y,\,y,\,y,\,y] +$

$c_{8,33}\,AW_1[x,\,x,\,y,\,x,\,x,\,x,\,x,\,x] + c_{8,34}\,AW_1[x,\,x,\,y,\,x,\,x,\,x,\,x,\,y] +$

$c_{8,35}\,AW_1[x,\,x,\,y,\,x,\,x,\,x,\,y,\,x] + c_{8,36}\,AW_1[x,\,x,\,y,\,x,\,x,\,x,\,y,\,y] +$

$c_{8,37}\,AW_1[x,\,x,\,y,\,x,\,x,\,y,\,x,\,x] + c_{8,38}\,AW_1[x,\,x,\,y,\,x,\,x,\,y,\,x,\,y] +$

$c_{8,39}\,AW_1[x,\,x,\,y,\,x,\,x,\,y,\,y,\,x] + c_{8,40}\,AW_1[x,\,x,\,y,\,x,\,x,\,y,\,y,\,y] +$

$c_{8,41}\,AW_1[x,\,x,\,y,\,x,\,y,\,x,\,x,\,x] + c_{8,42}\,AW_1[x,\,x,\,y,\,x,\,y,\,x,\,x,\,y] +$

$c_{8,43}\,AW_1[x,\,x,\,y,\,x,\,y,\,x,\,y,\,x] + c_{8,44}\,AW_1[x,\,x,\,y,\,x,\,y,\,x,\,y,\,y] +$

$c_{8,45}\,AW_1[x,\,x,\,y,\,x,\,y,\,y,\,x,\,x] + c_{8,46}\,AW_1[x,\,x,\,y,\,x,\,y,\,y,\,x,\,y] +$

$c_{8,47}\,AW_1[x,\,x,\,y,\,x,\,y,\,y,\,y,\,x] + c_{8,48}\,AW_1[x,\,x,\,y,\,x,\,y,\,y,\,y,\,y] +$

$c_{8,49}\,AW_1[x,\,x,\,y,\,y,\,x,\,x,\,x,\,x] + c_{8,50}\,AW_1[x,\,x,\,y,\,y,\,x,\,x,\,x,\,y] +$

$c_{8,51}\,AW_1[x,\,x,\,y,\,y,\,x,\,x,\,y,\,x] + c_{8,52}\,AW_1[x,\,x,\,y,\,y,\,x,\,x,\,y,\,y] +$

$c_{8,53}\,AW_1[x,\,x,\,y,\,y,\,x,\,y,\,x,\,x] + c_{8,54}\,AW_1[x,\,x,\,y,\,y,\,x,\,y,\,x,\,y] +$

$c_{8,55}\,AW_1[x,\,x,\,y,\,y,\,x,\,y,\,y,\,x] + c_{8,56}\,AW_1[x,\,x,\,y,\,y,\,x,\,y,\,y,\,y] +$

$c_{8,57}\,AW_1[x,\,x,\,y,\,y,\,y,\,x,\,x,\,x] + c_{8,58}\,AW_1[x,\,x,\,y,\,y,\,y,\,x,\,x,\,y] +$

$c_{8,59}\,AW_1[x,\,x,\,y,\,y,\,y,\,x,\,y,\,x] + c_{8,60}\,AW_1[x,\,x,\,y,\,y,\,y,\,x,\,y,\,y] +$

$c_{8,61}\,AW_1[x,\,x,\,y,\,y,\,y,\,y,\,x,\,x] + c_{8,62}\,AW_1[x,\,x,\,y,\,y,\,y,\,y,\,x,\,y] +$

$c_{8,63}\,AW_1[x,\,x,\,y,\,y,\,y,\,y,\,y,\,x] + c_{8,64}\,AW_1[x,\,x,\,y,\,y,\,y,\,y,\,y,\,y] +$

$c_{8,65}\,AW_1[x,\,y,\,x,\,x,\,x,\,x,\,x,\,x] + c_{8,66}\,AW_1[x,\,y,\,x,\,x,\,x,\,x,\,x,\,y] +$

$c_{8,67}\,AW_1[x,\,y,\,x,\,x,\,x,\,x,\,y,\,x] + c_{8,68}\,AW_1[x,\,y,\,x,\,x,\,x,\,x,\,y,\,y] +$

$c_{8,69}\,AW_1[x,\,y,\,x,\,x,\,x,\,y,\,x,\,x] + c_{8,70}\,AW_1[x,\,y,\,x,\,x,\,x,\,y,\,x,\,y] +$

$c_{8,71}\,AW_1[x,\,y,\,x,\,x,\,x,\,y,\,y,\,x] + c_{8,72}\,AW_1[x,\,y,\,x,\,x,\,x,\,y,\,y,\,y] +$

$c_{8,73}\,AW_1[x,\,y,\,x,\,x,\,y,\,x,\,x,\,x] + c_{8,74}\,AW_1[x,\,y,\,x,\,x,\,y,\,x,\,x,\,y] +$

$c_{8,75}\,AW_1[x,\,y,\,x,\,x,\,y,\,x,\,y,\,x] + c_{8,76}\,AW_1[x,\,y,\,x,\,x,\,y,\,x,\,y,\,y] +$

$c_{8,77}\,AW_1[x,\,y,\,x,\,x,\,y,\,y,\,x,\,x] + c_{8,78}\,AW_1[x,\,y,\,x,\,x,\,y,\,y,\,x,\,y] +$

$c_{8,79}\,AW_1[x,\,y,\,x,\,x,\,y,\,y,\,y,\,x] + c_{8,80}\,AW_1[x,\,y,\,x,\,x,\,y,\,y,\,y,\,y] +$

$c_{8,81}\,AW_1[x,\,y,\,x,\,y,\,x,\,x,\,x,\,x] + c_{8,82}\,AW_1[x,\,y,\,x,\,y,\,x,\,x,\,x,\,y] +$

$c_{8,83}\,AW_1[x,\,y,\,x,\,y,\,x,\,x,\,y,\,x] + c_{8,84}\,AW_1[x,\,y,\,x,\,y,\,x,\,x,\,y,\,y] +$

$c_{8,85} AW_1[x, y, x, y, x, y, x, x] + c_{8,86} AW_1[x, y, x, y, x, y, x, y] +$

$c_{8,87} AW_1[x, y, x, y, x, y, y, x] + c_{8,88} AW_1[x, y, x, y, x, y, y, y] +$

$c_{8,89} AW_1[x, y, x, y, y, x, x, x] + c_{8,90} AW_1[x, y, x, y, y, x, x, y] +$

$c_{8,91} AW_1[x, y, x, y, y, x, y, x] + c_{8,92} AW_1[x, y, x, y, y, x, y, y] +$

$c_{8,93} AW_1[x, y, x, y, y, y, x, x] + c_{8,94} AW_1[x, y, x, y, y, y, x, y] +$

$c_{8,95} AW_1[x, y, x, y, y, y, y, x] + c_{8,96} AW_1[x, y, x, y, y, y, y, y] +$

$c_{8,97} AW_1[x, y, y, x, x, x, x, x] + c_{8,98} AW_1[x, y, y, x, x, x, x, y] +$

$c_{8,99} AW_1[x, y, y, x, x, x, y, x] + c_{8,100} AW_1[x, y, y, x, x, x, y, y] +$

$c_{8,101} AW_1[x, y, y, x, x, y, x, x] + c_{8,102} AW_1[x, y, y, x, x, y, x, y] +$

$c_{8,103} AW_1[x, y, y, x, x, y, y, x] + c_{8,104} AW_1[x, y, y, x, x, y, y, y] +$

$c_{8,105} AW_1[x, y, y, x, y, x, x, x] + c_{8,106} AW_1[x, y, y, x, y, x, x, y] +$

$c_{8,107} AW_1[x, y, y, x, y, x, y, x] + c_{8,108} AW_1[x, y, y, x, y, x, y, y] +$

$c_{8,109} AW_1[x, y, y, x, y, y, x, x] + c_{8,110} AW_1[x, y, y, x, y, y, x, y] +$

$c_{8,111} AW_1[x, y, y, x, y, y, y, x] + c_{8,112} AW_1[x, y, y, x, y, y, y, y] +$

$c_{8,113} AW_1[x, y, y, y, x, x, x, x] + c_{8,114} AW_1[x, y, y, y, x, x, x, y] +$

$c_{8,115} AW_1[x, y, y, y, x, x, y, x] + c_{8,116} AW_1[x, y, y, y, x, x, y, y] +$

$c_{8,117} AW_1[x, y, y, y, x, y, x, x] + c_{8,118} AW_1[x, y, y, y, x, y, x, y] +$

$c_{8,119} AW_1[x, y, y, y, x, y, y, x] + c_{8,120} AW_1[x, y, y, y, x, y, y, y] +$

$c_{8,121} AW_1[x, y, y, y, y, x, x, x] + c_{8,122} AW_1[x, y, y, y, y, x, x, y] +$

$c_{8,123} AW_1[x, y, y, y, y, x, y, x] + c_{8,124} AW_1[x, y, y, y, y, x, y, y] +$

$c_{8,125} AW_1[x, y, y, y, y, y, x, x] + c_{8,126} AW_1[x, y, y, y, y, y, x, y] +$

$c_{8,127} AW_1[x, y, y, y, y, y, y, x] + c_{8,128} AW_1[x, y, y, y, y, y, y, y] +$

$c_{8,129} AW_1[y, x, x, x, x, x, x, x] + c_{8,130} AW_1[y, x, x, x, x, x, x, y] +$

$c_{8,131} AW_1[y, x, x, x, x, x, y, x] + c_{8,132} AW_1[y, x, x, x, x, x, y, y] +$

$c_{8,133} AW_1[y, x, x, x, x, y, x, x] + c_{8,134} AW_1[y, x, x, x, x, y, x, y] +$

$c_{8,135} AW_1[y, x, x, x, x, y, y, x] + c_{8,136} AW_1[y, x, x, x, x, y, y, y] +$

$c_{8,137} AW_1[y, x, x, x, y, x, x, x] + c_{8,138} AW_1[y, x, x, x, y, x, x, y] +$

$c_{8,139} AW_1[y, x, x, x, y, x, y, x] + c_{8,140} AW_1[y, x, x, x, y, x, y, y] +$

$c_{8,141} AW_1[y, x, x, x, y, y, x, x] + c_{8,142} AW_1[y, x, x, x, y, y, x, y] +$

$c_{8,143} AW_1[y, x, x, x, y, y, y, x] + c_{8,144} AW_1[y, x, x, x, y, y, y, y] +$

$c_{8,145} AW_1[y, x, x, y, x, x, x, x] + c_{8,146} AW_1[y, x, x, y, x, x, x, y] +$

$c_{8,147} AW_1[y, x, x, y, x, x, y, x] + c_{8,148} AW_1[y, x, x, y, x, x, y, y] +$

$c_{8,149} AW_1[y, x, x, y, x, y, x, x] + c_{8,150} AW_1[y, x, x, y, x, y, x, y] +$

$c_{8,151} AW_1[y, x, x, y, x, y, y, x] + c_{8,152} AW_1[y, x, x, y, x, y, y, y] +$

$c_{8,153} AW_1[y, x, x, y, y, x, x, x] + c_{8,154} AW_1[y, x, x, y, y, x, x, y] +$

$c_{8,155} AW_1[y, x, x, y, y, x, y, x] + c_{8,156} AW_1[y, x, x, y, y, x, y, y] +$

$c_{8,157} AW_1[y, x, x, y, y, y, x, x] + c_{8,158} AW_1[y, x, x, y, y, y, x, y] +$

$c_{8,159} AW_1[y, x, x, y, y, y, y, x] + c_{8,160} AW_1[y, x, x, y, y, y, y, y] +$

$c_{8,161} AW_1[y, x, y, x, x, x, x, x] + c_{8,162} AW_1[y, x, y, x, x, x, x, y] +$

$c_{8,163} AW_1[y, x, y, x, x, x, y, x] + c_{8,164} AW_1[y, x, y, x, x, x, y, y] +$

$c_{8,165} AW_1[y, x, y, x, x, y, x, x] + c_{8,166} AW_1[y, x, y, x, x, y, x, y] +$

$c_{8,167} AW_1[y, x, y, x, x, y, y, x] + c_{8,168} AW_1[y, x, y, x, x, y, y, y] +$

$c_{8,169} AW_1[y, x, y, x, y, x, x, x] + c_{8,170} AW_1[y, x, y, x, y, x, x, y] +$

$c_{8,171} AW_1[y, x, y, x, y, x, y, x] + c_{8,172} AW_1[y, x, y, x, y, x, y, y] +$

$c_{8,173} AW_1[y, x, y, x, y, y, x, x] + c_{8,174} AW_1[y, x, y, x, y, y, x, y] +$

$c_{8,175} \, \mathrm{AW}_1 [y, x, y, x, y, y, y, x] + c_{8,176} \, \mathrm{AW}_1 [y, x, y, x, y, y, y, y] +$

$c_{8,177} \, \mathrm{AW}_1 [y, x, y, y, x, x, x, x] + c_{8,178} \, \mathrm{AW}_1 [y, x, y, y, x, x, x, y] +$

$c_{8,179} \, \mathrm{AW}_1 [y, x, y, y, x, x, y, x] + c_{8,180} \, \mathrm{AW}_1 [y, x, y, y, x, x, y, y] +$

$c_{8,181} \, \mathrm{AW}_1 [y, x, y, y, x, y, x, x] + c_{8,182} \, \mathrm{AW}_1 [y, x, y, y, x, y, x, y] +$

$c_{8,183} \, \mathrm{AW}_1 [y, x, y, y, x, y, y, x] + c_{8,184} \, \mathrm{AW}_1 [y, x, y, y, x, y, y, y] +$

$c_{8,185} \, \mathrm{AW}_1 [y, x, y, y, y, x, x, x] + c_{8,186} \, \mathrm{AW}_1 [y, x, y, y, y, x, x, y] +$

$c_{8,187} \, \mathrm{AW}_1 [y, x, y, y, y, x, y, x] + c_{8,188} \, \mathrm{AW}_1 [y, x, y, y, y, x, y, y] +$

$c_{8,189} \, \mathrm{AW}_1 [y, x, y, y, y, y, x, x] + c_{8,190} \, \mathrm{AW}_1 [y, x, y, y, y, y, x, y] +$

$c_{8,191} \, \mathrm{AW}_1 [y, x, y, y, y, y, y, x] + c_{8,192} \, \mathrm{AW}_1 [y, x, y, y, y, y, y, y] +$

$c_{8,193} \, \mathrm{AW}_1 [y, y, x, x, x, x, x, x] + c_{8,194} \, \mathrm{AW}_1 [y, y, x, x, x, x, x, y] +$

$c_{8,195} \, \mathrm{AW}_1 [y, y, x, x, x, x, y, x] + c_{8,196} \, \mathrm{AW}_1 [y, y, x, x, x, x, y, y] +$

$c_{8,197} \, \mathrm{AW}_1 [y, y, x, x, x, y, x, x] + c_{8,198} \, \mathrm{AW}_1 [y, y, x, x, x, y, x, y] +$

$c_{8,199} \, \mathrm{AW}_1 [y, y, x, x, x, y, y, x] + c_{8,200} \, \mathrm{AW}_1 [y, y, x, x, x, y, y, y] +$

$c_{8,201} \, \mathrm{AW}_1 [y, y, x, x, y, x, x, x] + c_{8,202} \, \mathrm{AW}_1 [y, y, x, x, y, x, x, y] +$

$c_{8,203} \, \mathrm{AW}_1 [y, y, x, x, y, x, y, x] + c_{8,204} \, \mathrm{AW}_1 [y, y, x, x, y, x, y, y] +$

$c_{8,205} \, \mathrm{AW}_1 [y, y, x, x, y, y, x, x] + c_{8,206} \, \mathrm{AW}_1 [y, y, x, x, y, y, x, y] +$

$c_{8,207} \, \mathrm{AW}_1 [y, y, x, x, y, y, y, x] + c_{8,208} \, \mathrm{AW}_1 [y, y, x, x, y, y, y, y] +$

$c_{8,209} \, \mathrm{AW}_1 [y, y, x, y, x, x, x, x] + c_{8,210} \, \mathrm{AW}_1 [y, y, x, y, x, x, x, y] +$

$c_{8,211} \, \mathrm{AW}_1 [y, y, x, y, x, x, y, x] + c_{8,212} \, \mathrm{AW}_1 [y, y, x, y, x, x, y, y] +$

$c_{8,213} \, \mathrm{AW}_1 [y, y, x, y, x, y, x, x] + c_{8,214} \, \mathrm{AW}_1 [y, y, x, y, x, y, x, y] +$

$c_{8,215} \, \mathrm{AW}_1 [y, y, x, y, x, y, y, x] + c_{8,216} \, \mathrm{AW}_1 [y, y, x, y, x, y, y, y] +$

$c_{8,217} \, \mathrm{AW}_1 [y, y, x, y, y, x, x, x] + c_{8,218} \, \mathrm{AW}_1 [y, y, x, y, y, x, x, y] +$

$c_{8,219} \, \mathrm{AW}_1 [y, y, x, y, y, x, y, x] + c_{8,220} \, \mathrm{AW}_1 [y, y, x, y, y, x, y, y] +$

$c_{8,221} \, \mathrm{AW}_1 [y, y, x, y, y, y, x, x] + c_{8,222} \, \mathrm{AW}_1 [y, y, x, y, y, y, x, y] +$

$c_{8,223} \, \mathrm{AW}_1 [y, y, x, y, y, y, y, x] + c_{8,224} \, \mathrm{AW}_1 [y, y, x, y, y, y, y, y] +$

$c_{8,225} \, \mathrm{AW}_1 [y, y, y, x, x, x, x, x] + c_{8,226} \, \mathrm{AW}_1 [y, y, y, x, x, x, x, y] +$

$c_{8,227} \, \mathrm{AW}_1 [y, y, y, x, x, x, y, x] + c_{8,228} \, \mathrm{AW}_1 [y, y, y, x, x, x, y, y] +$

$c_{8,229} \, \mathrm{AW}_1 [y, y, y, x, x, y, x, x] + c_{8,230} \, \mathrm{AW}_1 [y, y, y, x, x, y, x, y] +$

$c_{8,231} \, \mathrm{AW}_1 [y, y, y, x, x, y, y, x] + c_{8,232} \, \mathrm{AW}_1 [y, y, y, x, x, y, y, y] +$

$c_{8,233} \, \mathrm{AW}_1 [y, y, y, x, y, x, x, x] + c_{8,234} \, \mathrm{AW}_1 [y, y, y, x, y, x, x, y] +$

$c_{8,235} \, \mathrm{AW}_1 [y, y, y, x, y, x, y, x] + c_{8,236} \, \mathrm{AW}_1 [y, y, y, x, y, x, y, y] +$

$c_{8,237} \, \mathrm{AW}_1 [y, y, y, x, y, y, x, x] + c_{8,238} \, \mathrm{AW}_1 [y, y, y, x, y, y, x, y] +$

$c_{8,239} \, \mathrm{AW}_1 [y, y, y, x, y, y, y, x] + c_{8,240} \, \mathrm{AW}_1 [y, y, y, x, y, y, y, y] +$

$c_{8,241} \, \mathrm{AW}_1 [y, y, y, y, x, x, x, x] + c_{8,242} \, \mathrm{AW}_1 [y, y, y, y, x, x, x, y] +$

$c_{8,243} \, \mathrm{AW}_1 [y, y, y, y, x, x, y, x] + c_{8,244} \, \mathrm{AW}_1 [y, y, y, y, x, x, y, y] +$

$c_{8,245} \, \mathrm{AW}_1 [y, y, y, y, x, y, x, x] + c_{8,246} \, \mathrm{AW}_1 [y, y, y, y, x, y, x, y] +$

$c_{8,247} \, \mathrm{AW}_1 [y, y, y, y, x, y, y, x] + c_{8,248} \, \mathrm{AW}_1 [y, y, y, y, x, y, y, y] +$

$c_{8,249} \, \mathrm{AW}_1 [y, y, y, y, y, x, x, x] + c_{8,250} \, \mathrm{AW}_1 [y, y, y, y, y, x, x, y] +$

$c_{8,251} \, \mathrm{AW}_1 [y, y, y, y, y, x, y, x] + c_{8,252} \, \mathrm{AW}_1 [y, y, y, y, y, x, y, y] +$

$c_{8,253} \, \mathrm{AW}_1 [y, y, y, y, y, y, x, x] + c_{8,254} \, \mathrm{AW}_1 [y, y, y, y, y, y, x, y] +$

$c_{8,255} \, \mathrm{AW}_1 [y, y, y, y, y, y, y, x] + c_{8,256} \, \mathrm{AW}_1 [y, y, y, y, y, y, y, y] \Big] \Big]$

$In[\circ]:=$ **Short[**
    rels = Union @@ (List @@ Pentagon$_d$[Φ[d]]⟦1⟧ /. {
        $\mathcal{A}_0$[$A\_$] :→ Table[Coefficient[A, B], {B, Basis$_{d,\{x,y\}}$[AW$_1$ AW$_2$]}],
        $\mathcal{A}_{c[1,2]}$[$A\_$] :→ Table[Coefficient[A, B], {B, AW$_{\overline{2}}$[] Basis$_{d-1,\{x,y\}}$[AW$_1$ AW$_2$ AW$_{\overline{1}}$]}]
    }),
    10]

$Out[\circ]//Short=$
{0, $-3108\,c_{8,1}$, $-2808\,c_{8,1}$, $-1736\,c_{8,1}$, $-1596\,c_{8,1}$, $-1456\,c_{8,1}$, $-1023\,c_{8,1}$, $-960\,c_{8,1}$,
$-770\,c_{8,1}$, $-568\,c_{8,1}$, $-490\,c_{8,1}$, $-351\,c_{8,1}$, $-308\,c_{8,1}$, $-247\,c_{8,1}$, $-224\,c_{8,1}$, $-70\,c_{8,1}$,
$-56\,c_{8,1}$, $-28\,c_{8,1}$, $-15\,c_{8,1}$, $-8\,c_{8,1}$, $-c_{8,1}$, $c_{8,1}$, $28\,c_{8,1}$, $70\,c_{8,1}$, $97\,c_{8,1}$, $104\,c_{8,1}$,
$280\,c_{8,1}$, $\ll5259\gg$, $-2688\,c_{8,256}$, $-1568\,c_{8,256}$, $-1400\,c_{8,256}$, $-1002\,c_{8,256}$, $-952\,c_{8,256}$,
$-700\,c_{8,256}$, $-448\,c_{8,256}$, $-316\,c_{8,256}$, $-280\,c_{8,256}$, $-246\,c_{8,256}$, $-168\,c_{8,256}$, $-70\,c_{8,256}$,
$-56\,c_{8,256}$, $-28\,c_{8,256}$, $-8\,c_{8,256}$, $8\,c_{8,256}$, $56\,c_{8,256}$, $76\,c_{8,256}$, $168\,c_{8,256}$, $280\,c_{8,256}$,
$734\,c_{8,256}$, $762\,c_{8,256}$, $980\,c_{8,256}$, $1092\,c_{8,256}$, $1512\,c_{8,256}$, $2520\,c_{8,256}$, $3472\,c_{8,256}$}

$In[\circ]:=$ **eqns = # == 0 & /@ rels;**

$In[\circ]:=$ **vars = Union[Cases[eqns, c$_{d,\_}$, ∞]]**

$Out[\circ]=$
{$c_{8,1}$, $c_{8,2}$, $c_{8,3}$, $c_{8,4}$, $c_{8,5}$, $c_{8,6}$, $c_{8,7}$, $c_{8,8}$, $c_{8,9}$, $c_{8,10}$, $c_{8,11}$, $c_{8,12}$, $c_{8,13}$, $c_{8,14}$, $c_{8,15}$, $c_{8,16}$,
$c_{8,17}$, $c_{8,18}$, $c_{8,19}$, $c_{8,20}$, $c_{8,21}$, $c_{8,22}$, $c_{8,23}$, $c_{8,24}$, $c_{8,25}$, $c_{8,26}$, $c_{8,27}$, $c_{8,28}$, $c_{8,29}$, $c_{8,30}$,
$c_{8,31}$, $c_{8,32}$, $c_{8,33}$, $c_{8,34}$, $c_{8,35}$, $c_{8,36}$, $c_{8,37}$, $c_{8,38}$, $c_{8,39}$, $c_{8,40}$, $c_{8,41}$, $c_{8,42}$, $c_{8,43}$, $c_{8,44}$,
$c_{8,45}$, $c_{8,46}$, $c_{8,47}$, $c_{8,48}$, $c_{8,49}$, $c_{8,50}$, $c_{8,51}$, $c_{8,52}$, $c_{8,53}$, $c_{8,54}$, $c_{8,55}$, $c_{8,56}$, $c_{8,57}$, $c_{8,58}$,
$c_{8,59}$, $c_{8,60}$, $c_{8,61}$, $c_{8,62}$, $c_{8,63}$, $c_{8,64}$, $c_{8,65}$, $c_{8,66}$, $c_{8,67}$, $c_{8,68}$, $c_{8,69}$, $c_{8,70}$, $c_{8,71}$, $c_{8,72}$,
$c_{8,73}$, $c_{8,74}$, $c_{8,75}$, $c_{8,76}$, $c_{8,77}$, $c_{8,78}$, $c_{8,79}$, $c_{8,80}$, $c_{8,81}$, $c_{8,82}$, $c_{8,83}$, $c_{8,84}$, $c_{8,85}$, $c_{8,86}$,
$c_{8,87}$, $c_{8,88}$, $c_{8,89}$, $c_{8,90}$, $c_{8,91}$, $c_{8,92}$, $c_{8,93}$, $c_{8,94}$, $c_{8,95}$, $c_{8,96}$, $c_{8,97}$, $c_{8,98}$, $c_{8,99}$, $c_{8,100}$,
$c_{8,101}$, $c_{8,102}$, $c_{8,103}$, $c_{8,104}$, $c_{8,105}$, $c_{8,106}$, $c_{8,107}$, $c_{8,108}$, $c_{8,109}$, $c_{8,110}$, $c_{8,111}$, $c_{8,112}$, $c_{8,113}$,
$c_{8,114}$, $c_{8,115}$, $c_{8,116}$, $c_{8,117}$, $c_{8,118}$, $c_{8,119}$, $c_{8,120}$, $c_{8,121}$, $c_{8,122}$, $c_{8,123}$, $c_{8,124}$, $c_{8,125}$, $c_{8,126}$,
$c_{8,127}$, $c_{8,128}$, $c_{8,129}$, $c_{8,130}$, $c_{8,131}$, $c_{8,132}$, $c_{8,133}$, $c_{8,134}$, $c_{8,135}$, $c_{8,136}$, $c_{8,137}$, $c_{8,138}$, $c_{8,139}$,
$c_{8,140}$, $c_{8,141}$, $c_{8,142}$, $c_{8,143}$, $c_{8,144}$, $c_{8,145}$, $c_{8,146}$, $c_{8,147}$, $c_{8,148}$, $c_{8,149}$, $c_{8,150}$, $c_{8,151}$, $c_{8,152}$,
$c_{8,153}$, $c_{8,154}$, $c_{8,155}$, $c_{8,156}$, $c_{8,157}$, $c_{8,158}$, $c_{8,159}$, $c_{8,160}$, $c_{8,161}$, $c_{8,162}$, $c_{8,163}$, $c_{8,164}$, $c_{8,165}$,
$c_{8,166}$, $c_{8,167}$, $c_{8,168}$, $c_{8,169}$, $c_{8,170}$, $c_{8,171}$, $c_{8,172}$, $c_{8,173}$, $c_{8,174}$, $c_{8,175}$, $c_{8,176}$, $c_{8,177}$, $c_{8,178}$,
$c_{8,179}$, $c_{8,180}$, $c_{8,181}$, $c_{8,182}$, $c_{8,183}$, $c_{8,184}$, $c_{8,185}$, $c_{8,186}$, $c_{8,187}$, $c_{8,188}$, $c_{8,189}$, $c_{8,190}$, $c_{8,191}$,
$c_{8,192}$, $c_{8,193}$, $c_{8,194}$, $c_{8,195}$, $c_{8,196}$, $c_{8,197}$, $c_{8,198}$, $c_{8,199}$, $c_{8,200}$, $c_{8,201}$, $c_{8,202}$, $c_{8,203}$, $c_{8,204}$,
$c_{8,205}$, $c_{8,206}$, $c_{8,207}$, $c_{8,208}$, $c_{8,209}$, $c_{8,210}$, $c_{8,211}$, $c_{8,212}$, $c_{8,213}$, $c_{8,214}$, $c_{8,215}$, $c_{8,216}$, $c_{8,217}$,
$c_{8,218}$, $c_{8,219}$, $c_{8,220}$, $c_{8,221}$, $c_{8,222}$, $c_{8,223}$, $c_{8,224}$, $c_{8,225}$, $c_{8,226}$, $c_{8,227}$, $c_{8,228}$, $c_{8,229}$, $c_{8,230}$,
$c_{8,231}$, $c_{8,232}$, $c_{8,233}$, $c_{8,234}$, $c_{8,235}$, $c_{8,236}$, $c_{8,237}$, $c_{8,238}$, $c_{8,239}$, $c_{8,240}$, $c_{8,241}$, $c_{8,242}$, $c_{8,243}$,
$c_{8,244}$, $c_{8,245}$, $c_{8,246}$, $c_{8,247}$, $c_{8,248}$, $c_{8,249}$, $c_{8,250}$, $c_{8,251}$, $c_{8,252}$, $c_{8,253}$, $c_{8,254}$, $c_{8,255}$, $c_{8,256}$}

$In[\circ]:=$ **sol = Solve[eqns, vars]⟦1⟧**

    ⊙⊙ Solve: Equations may not give solutions for all "solve" variables.

$Out[\circ]=$
$$\left\{c_{8,1} \to 0,\ c_{8,2} \to -\frac{1}{2\,419\,200},\ c_{8,3} \to \frac{1}{345\,600},\ c_{8,4} \to \frac{19}{9\,676\,800},\ c_{8,5} \to -\frac{1}{115\,200},\right.$$
$$\left. c_{8,7} \to -\frac{19}{1\,612\,800} - c_{8,6},\ c_{8,8} \to -\frac{271}{58\,060\,800},\ c_{8,9} \to \frac{1}{69\,120},\ c_{8,10} \to -\frac{457}{58\,060\,800} - \frac{5\,c_{8,6}}{2},\right.$$

$$c_{8,11} \to \frac{457}{29\,030\,400}, \ c_{8,12} \to \frac{587}{69\,672\,960} - \frac{3\,c_{8,6}}{4}, \ c_{8,13} \to \frac{179}{8\,294\,400} + \frac{5\,c_{8,6}}{2}, \ c_{8,14} \to \frac{223}{174\,182\,400},$$

$$c_{8,15} \to \frac{1583}{116\,121\,600} + \frac{3\,c_{8,6}}{4}, \ c_{8,16} \to \frac{2893}{464\,486\,400}, \ c_{8,17} \to -\frac{1}{69\,120}, \ c_{8,18} \to -\frac{73}{9\,676\,800},$$

$$c_{8,19} \to \frac{1571}{29\,030\,400} + 10\,c_{8,6}, \ c_{8,20} \to \frac{1619}{116\,121\,600} + \frac{15\,c_{8,6}}{4}, \ c_{8,21} \to -\frac{71}{829\,440} - 10\,c_{8,6},$$

$$c_{8,22} \to -\frac{79}{1\,935\,360} - \frac{9\,c_{8,6}}{2}, \ c_{8,23} \to -\frac{3617}{174\,182\,400}, \ c_{8,24} \to -\frac{83}{7\,962\,624} + \frac{3\,c_{8,6}}{4}, \ c_{8,25} \to -\frac{1}{4\,147\,200},$$

$$c_{8,26} \to \frac{109}{58\,060\,800}, \ c_{8,27} \to \frac{1391}{43\,545\,600} + \frac{9\,c_{8,6}}{2}, \ c_{8,28} \to -\frac{35\,237}{1\,393\,459\,200} - \frac{15\,c_{8,6}}{4},$$

$$c_{8,29} \to -\frac{109}{3\,317\,760} - \frac{15\,c_{8,6}}{4}, \ c_{8,30} \to \frac{32\,899}{1\,393\,459\,200} + \frac{15\,c_{8,6}}{4}, \ c_{8,31} \to -\frac{5951}{464\,486\,400} - \frac{3\,c_{8,6}}{4},$$

$$c_{8,32} \to -\frac{2399}{464\,486\,400}, \ c_{8,33} \to \frac{1}{115\,200}, \ c_{8,34} \to \frac{1093}{58\,060\,800} + \frac{5\,c_{8,6}}{2}, \ c_{8,35} \to -\frac{1529}{29\,030\,400} - 10\,c_{8,6},$$

$$c_{8,36} \to -\frac{4813}{348\,364\,800} - \frac{15\,c_{8,6}}{4}, \ c_{8,37} \to -\frac{1}{460\,800}, \ c_{8,38} \to \frac{1517}{38\,707\,200} + \frac{27\,c_{8,6}}{4},$$

$$c_{8,39} \to -\frac{919}{23\,224\,320} - \frac{27\,c_{8,6}}{4}, \ c_{8,40} \to \frac{2311}{1\,393\,459\,200}, \ c_{8,41} \to \frac{361}{4\,147\,200} + 10\,c_{8,6},$$

$$c_{8,42} \to \frac{113}{11\,612\,160}, \ c_{8,43} \to \frac{1429}{58\,060\,800}, \ c_{8,44} \to \frac{25\,189}{464\,486\,400} + \frac{9\,c_{8,6}}{2}, \ c_{8,45} \to \frac{323}{5\,529\,600} + \frac{27\,c_{8,6}}{4},$$

$$c_{8,46} \to -\frac{22\,231}{464\,486\,400} - \frac{27\,c_{8,6}}{4}, \ c_{8,47} \to \frac{4297}{199\,065\,600}, \ c_{8,48} \to \frac{10\,963}{1\,393\,459\,200} - c_{8,6},$$

$$c_{8,49} \to -\frac{179}{8\,294\,400} - \frac{5\,c_{8,6}}{2}, \ c_{8,50} \to -\frac{467}{87\,091\,200}, \ c_{8,51} \to \frac{1}{1\,382\,400}, \ c_{8,52} \to -\frac{419}{464\,486\,400},$$

$$c_{8,53} \to -\frac{337}{5\,529\,600} - \frac{27\,c_{8,6}}{4}, \ c_{8,54} \to -\frac{31}{2\,457\,600}, \ c_{8,55} \to \frac{3349}{92\,897\,280} + \frac{27\,c_{8,6}}{4},$$

$$c_{8,56} \to \frac{83}{17\,203\,200} + \frac{5\,c_{8,6}}{2}, \ c_{8,57} \to \frac{559}{16\,588\,800} + \frac{15\,c_{8,6}}{4}, \ c_{8,58} \to \frac{1027}{278\,691\,840},$$

$$c_{8,59} \to -\frac{24\,697}{1\,393\,459\,200} - \frac{9\,c_{8,6}}{2}, \ c_{8,60} \to \frac{19\,619}{1\,393\,459\,200}, \ c_{8,61} \to -\frac{49}{66\,355\,200},$$

$$c_{8,62} \to -\frac{3697}{154\,828\,800} - \frac{5\,c_{8,6}}{2}, \ c_{8,63} \to \frac{1951}{154\,828\,800} + c_{8,6}, \ c_{8,64} \to \frac{127}{51\,609\,600}, \ c_{8,65} \to -\frac{1}{345\,600},$$

$$c_{8,66} \to -\frac{31}{4\,838\,400} - c_{8,6}, \ c_{8,67} \to -\frac{163}{29\,030\,400}, \ c_{8,68} \to \frac{29}{16\,588\,800} + \frac{3\,c_{8,6}}{4}, \ c_{8,69} \to \frac{53}{829\,440} + 10\,c_{8,6},$$

$$c_{8,70} \to -\frac{391}{174\,182\,400}, \ c_{8,71} \to \frac{1993}{87\,091\,200} + \frac{9\,c_{8,6}}{2}, \ c_{8,72} \to -\frac{13\,781}{1\,393\,459\,200} - \frac{3\,c_{8,6}}{4},$$

$$c_{8,73} \to -\frac{259}{4\,147\,200} - 10\,c_{8,6}, \ c_{8,74} \to -\frac{4559}{116\,121\,600} - \frac{27\,c_{8,6}}{4}, \ c_{8,75} \to \frac{19}{2\,764\,800},$$

$$c_{8,76} \to \frac{4679}{1\,393\,459\,200}, \ c_{8,77} \to \frac{1}{552\,960}, \ c_{8,78} \to \frac{133}{2\,457\,600} + \frac{27\,c_{8,6}}{4}, \ c_{8,79} \to -\frac{43\,369}{1\,393\,459\,200} - \frac{9\,c_{8,6}}{2},$$

$$c_{8,80} \to \frac{12\,323}{1\,393\,459\,200} + c_{8,6}, \ c_{8,81} \to -\frac{17}{1\,382\,400}, \ c_{8,82} \to \frac{661}{24\,883\,200} + \frac{9\,c_{8,6}}{2}, \ c_{8,83} \to -\frac{599}{29\,030\,400},$$

$$c_{8,84} \to -\frac{12\,637}{278\,691\,840} - \frac{9\,c_{8,6}}{2}, \ c_{8,85} \to -\frac{1}{92\,160}, \ c_{8,86} \to -\frac{2339}{464\,486\,400}, \ c_{8,87} \to -\frac{1807}{92\,897\,280},$$

$$c_{8,88} \to -\frac{5687}{464\,486\,400}, \quad c_{8,89} \to -\frac{101}{2\,764\,800} - \frac{9\,c_{8,6}}{2}, \quad c_{8,90} \to \frac{677}{464\,486\,400}, \quad c_{8,91} \to -\frac{1609}{154\,828\,800},$$

$$c_{8,92} \to -\frac{5257}{66\,355\,200} - 10\,c_{8,6}, \quad c_{8,93} \to \frac{541}{22\,118\,400} + \frac{9\,c_{8,6}}{2}, \quad c_{8,94} \to \frac{33\,893}{464\,486\,400} + 10\,c_{8,6},$$

$$c_{8,95} \to -\frac{6931}{464\,486\,400}, \quad c_{8,96} \to -\frac{3881}{464\,486\,400}, \quad c_{8,97} \to \frac{23}{2\,073\,600} + c_{8,6}, \quad c_{8,98} \to \frac{53}{29\,030\,400},$$

$$c_{8,99} \to -\frac{4031}{174\,182\,400} - \frac{9\,c_{8,6}}{2}, \quad c_{8,100} \to \frac{8863}{278\,691\,840} + \frac{15\,c_{8,6}}{4}, \quad c_{8,101} \to \frac{49}{1\,105\,920} + \frac{27\,c_{8,6}}{4},$$

$$c_{8,102} \to -\frac{69\,901}{1\,393\,459\,200} - \frac{27\,c_{8,6}}{4}, \quad c_{8,103} \to \frac{59}{30\,965\,760}, \quad c_{8,104} \to -\frac{1097}{66\,355\,200} - \frac{5\,c_{8,6}}{2},$$

$$c_{8,105} \to \frac{61}{4\,147\,200}, \quad c_{8,106} \to \frac{77\,299}{1\,393\,459\,200} + \frac{27\,c_{8,6}}{4}, \quad c_{8,107} \to \frac{365}{18\,579\,456},$$

$$c_{8,108} \to \frac{869}{10\,321\,920} + 10\,c_{8,6}, \quad c_{8,109} \to -\frac{101}{2\,654\,208} - \frac{27\,c_{8,6}}{4}, \quad c_{8,110} \to \frac{2213}{464\,486\,400},$$

$$c_{8,111} \to -\frac{4951}{92\,897\,280} - 10\,c_{8,6}, \quad c_{8,112} \to \frac{4927}{464\,486\,400}, \quad c_{8,113} \to -\frac{7}{614\,400} - \frac{3\,c_{8,6}}{4},$$

$$c_{8,114} \to -\frac{13\,549}{464\,486\,400} - \frac{15\,c_{8,6}}{4}, \quad c_{8,115} \to \frac{32\,341}{1\,393\,459\,200} + \frac{9\,c_{8,6}}{2}, \quad c_{8,116} \to -\frac{8417}{1\,393\,459\,200},$$

$$c_{8,117} \to -\frac{671}{66\,355\,200}, \quad c_{8,118} \to -\frac{35\,459}{464\,486\,400} - 10\,c_{8,6}, \quad c_{8,119} \to \frac{5137}{92\,897\,280} + 10\,c_{8,6},$$

$$c_{8,120} \to -\frac{683}{92\,897\,280}, \quad c_{8,121} \to \frac{557}{66\,355\,200} + \frac{3\,c_{8,6}}{4}, \quad c_{8,122} \to \frac{359}{17\,203\,200} + \frac{5\,c_{8,6}}{2},$$

$$c_{8,123} \to \frac{307}{66\,355\,200}, \quad c_{8,124} \to -\frac{319}{464\,486\,400}, \quad c_{8,125} \to -\frac{187}{22\,118\,400} - c_{8,6}, \quad c_{8,126} \to \frac{13}{4\,423\,680},$$

$$c_{8,127} \to -\frac{107}{51\,609\,600}, \quad c_{8,128} \to -\frac{127}{154\,828\,800}, \quad c_{8,129} \to \frac{1}{2\,419\,200}, \quad c_{8,130} \to -\frac{1}{1\,075\,200},$$

$$c_{8,131} \to \frac{29}{2\,419\,200} + c_{8,6}, \quad c_{8,132} \to \frac{43}{11\,612\,160}, \quad c_{8,133} \to -\frac{1577}{58\,060\,800} - \frac{5\,c_{8,6}}{2},$$

$$c_{8,134} \to -\frac{5413}{348\,364\,800} - \frac{3\,c_{8,6}}{4}, \quad c_{8,135} \to -\frac{823}{174\,182\,400}, \quad c_{8,136} \to -\frac{323}{51\,609\,600}, \quad c_{8,137} \to \frac{433}{29\,030\,400},$$

$$c_{8,138} \to \frac{899}{23\,224\,320} + \frac{15\,c_{8,6}}{4}, \quad c_{8,139} \to -\frac{1}{76\,800} - \frac{9\,c_{8,6}}{2}, \quad c_{8,140} \to \frac{4829}{199\,065\,600} + \frac{3\,c_{8,6}}{4},$$

$$c_{8,141} \to \frac{787}{174\,182\,400}, \quad c_{8,142} \to -\frac{36\,941}{1\,393\,459\,200} - \frac{15\,c_{8,6}}{4}, \quad c_{8,143} \to \frac{51\,803}{1\,393\,459\,200} + \frac{15\,c_{8,6}}{4},$$

$$c_{8,144} \to \frac{1411}{154\,828\,800}, \quad c_{8,145} \to \frac{257}{58\,060\,800} + \frac{5\,c_{8,6}}{2}, \quad c_{8,146} \to -\frac{2587}{69\,672\,960} - \frac{15\,c_{8,6}}{4},$$

$$c_{8,147} \to \frac{4009}{116\,121\,600} + \frac{27\,c_{8,6}}{4}, \quad c_{8,148} \to -\frac{16\,801}{1\,393\,459\,200}, \quad c_{8,149} \to -\frac{107}{5\,806\,080},$$

$$c_{8,150} \to \frac{1163}{66\,355\,200} + \frac{9\,c_{8,6}}{2}, \quad c_{8,151} \to -\frac{32\,303}{464\,486\,400} - \frac{27\,c_{8,6}}{4}, \quad c_{8,152} \to -\frac{40\,237}{1\,393\,459\,200} - c_{8,6},$$

$$c_{8,153} \to \frac{89}{87\,091\,200}, \quad c_{8,154} \to \frac{59}{30\,965\,760}, \quad c_{8,155} \to \frac{631}{154\,828\,800}, \quad c_{8,156} \to \frac{10\,457}{464\,486\,400} + \frac{5\,c_{8,6}}{2},$$

$$c_{8,157} \to -\frac{2081}{278\,691\,840}, \quad c_{8,158} \to -\frac{313}{55\,738\,368}, \quad c_{8,159} \to -\frac{11\,243}{464\,486\,400} - \frac{5\,c_{8,6}}{2},$$

$c_{8,160} \to -\dfrac{2977}{464\,486\,400}$, $c_{8,161} \to \dfrac{1}{1\,451\,520} - c_{8,6}$, $c_{8,162} \to \dfrac{181}{23\,224\,320} + \dfrac{3\,c_{8,6}}{4}$, $c_{8,163} \to \dfrac{1439}{87\,091\,200}$,

$c_{8,164} \to \dfrac{11\,219}{1\,393\,459\,200} - \dfrac{3\,c_{8,6}}{4}$, $c_{8,165} \to -\dfrac{5689}{116\,121\,600} - \dfrac{27\,c_{8,6}}{4}$, $c_{8,166} \to -\dfrac{13\,361}{1\,393\,459\,200}$,

$c_{8,167} \to \dfrac{2833}{51\,609\,600} + \dfrac{27\,c_{8,6}}{4}$, $c_{8,168} \to \dfrac{13\,843}{1\,393\,459\,200} + c_{8,6}$, $c_{8,169} \to \dfrac{8459}{174\,182\,400} + \dfrac{9\,c_{8,6}}{2}$,

$c_{8,170} \to -\dfrac{25\,273}{1\,393\,459\,200} - \dfrac{9\,c_{8,6}}{2}$, $c_{8,171} \to \dfrac{11\,813}{464\,486\,400}$, $c_{8,172} \to \dfrac{12\,449}{464\,486\,400}$,

$c_{8,173} \to \dfrac{5417}{464\,486\,400}$, $c_{8,174} \to -\dfrac{32\,507}{464\,486\,400} - 10\,c_{8,6}$, $c_{8,175} \to \dfrac{14\,447}{154\,828\,800} + 10\,c_{8,6}$,

$c_{8,176} \to \dfrac{9551}{464\,486\,400}$, $c_{8,177} \to -\dfrac{613}{174\,182\,400}$, $c_{8,178} \to \dfrac{25\,913}{1\,393\,459\,200} + \dfrac{15\,c_{8,6}}{4}$,

$c_{8,179} \to -\dfrac{59\,807}{1\,393\,459\,200} - \dfrac{27\,c_{8,6}}{4}$, $c_{8,180} \to -\dfrac{1093}{66\,355\,200} - \dfrac{5\,c_{8,6}}{2}$, $c_{8,181} \to \dfrac{43\,649}{1\,393\,459\,200} + \dfrac{27\,c_{8,6}}{4}$,

$c_{8,182} \to \dfrac{23\,741}{464\,486\,400} + 10\,c_{8,6}$, $c_{8,183} \to -\dfrac{5003}{464\,486\,400}$, $c_{8,184} \to -\dfrac{9463}{464\,486\,400}$,

$c_{8,185} \to -\dfrac{24\,391}{1\,393\,459\,200} - \dfrac{15\,c_{8,6}}{4}$, $c_{8,186} \to \dfrac{197}{39\,813\,120}$, $c_{8,187} \to -\dfrac{389}{7\,372\,800} - 10\,c_{8,6}$,

$c_{8,188} \to \dfrac{11\,521}{464\,486\,400}$, $c_{8,189} \to \dfrac{7793}{464\,486\,400} + \dfrac{5\,c_{8,6}}{2}$, $c_{8,190} \to -\dfrac{6187}{464\,486\,400}$, $c_{8,191} \to \dfrac{1471}{154\,828\,800}$,

$c_{8,192} \to \dfrac{127}{22\,118\,400}$, $c_{8,193} \to -\dfrac{19}{9\,676\,800}$, $c_{8,194} \to -\dfrac{1}{1\,612\,800}$, $c_{8,195} \to -\dfrac{757}{116\,121\,600} - \dfrac{3\,c_{8,6}}{4}$,

$c_{8,196} \to -\dfrac{49}{66\,355\,200}$, $c_{8,197} \to \dfrac{1139}{69\,672\,960} + \dfrac{15\,c_{8,6}}{4}$, $c_{8,198} \to -\dfrac{2393}{1\,393\,459\,200} + \dfrac{3\,c_{8,6}}{4}$,

$c_{8,199} \to -\dfrac{1961}{55\,738\,368} - \dfrac{15\,c_{8,6}}{4}$, $c_{8,200} \to -\dfrac{581}{66\,355\,200}$, $c_{8,201} \to -\dfrac{1717}{116\,121\,600} - \dfrac{15\,c_{8,6}}{4}$,

$c_{8,202} \to \dfrac{1619}{154\,828\,800}$, $c_{8,203} \to \dfrac{973}{22\,118\,400} + \dfrac{9\,c_{8,6}}{2}$, $c_{8,204} \to \dfrac{491}{66\,355\,200} - c_{8,6}$,

$c_{8,205} \to \dfrac{221}{92\,897\,280}$, $c_{8,206} \to \dfrac{1387}{66\,355\,200} + \dfrac{5\,c_{8,6}}{2}$, $c_{8,207} \to \dfrac{6359}{1\,393\,459\,200}$, $c_{8,208} \to \dfrac{127}{22\,118\,400}$,

$c_{8,209} \to -\dfrac{587}{69\,672\,960} + \dfrac{3\,c_{8,6}}{4}$, $c_{8,210} \to -\dfrac{509}{39\,813\,120} - \dfrac{3\,c_{8,6}}{4}$, $c_{8,211} \to -\dfrac{9241}{464\,486\,400}$,

$c_{8,212} \to -\dfrac{157}{13\,271\,040} + c_{8,6}$, $c_{8,213} \to -\dfrac{21\,661}{464\,486\,400} - \dfrac{9\,c_{8,6}}{2}$, $c_{8,214} \to -\dfrac{3683}{464\,486\,400}$,

$c_{8,215} \to -\dfrac{2917}{30\,965\,760} - 10\,c_{8,6}$, $c_{8,216} \to -\dfrac{17}{819\,200}$, $c_{8,217} \to \dfrac{31\,709}{1\,393\,459\,200} + \dfrac{15\,c_{8,6}}{4}$,

$c_{8,218} \to -\dfrac{7667}{464\,486\,400} - \dfrac{5\,c_{8,6}}{2}$, $c_{8,219} \to \dfrac{29\,893}{464\,486\,400} + 10\,c_{8,6}$, $c_{8,220} \to -\dfrac{49}{7\,372\,800}$,

$c_{8,221} \to -\dfrac{2689}{278\,691\,840}$, $c_{8,222} \to \dfrac{853}{464\,486\,400}$, $c_{8,223} \to -\dfrac{7939}{464\,486\,400}$, $c_{8,224} \to -\dfrac{127}{7\,372\,800}$,

$c_{8,225} \to \dfrac{271}{58\,060\,800}$, $c_{8,226} \to \dfrac{19}{10\,321\,920}$, $c_{8,227} \to \dfrac{22\,289}{1\,393\,459\,200} + \dfrac{3\,c_{8,6}}{4}$, $c_{8,228} \to \dfrac{679}{66\,355\,200}$,

$c_{8,229} \to -\dfrac{5839}{1\,393\,459\,200}$, $c_{8,230} \to -\dfrac{22\,609}{1\,393\,459\,200} - c_{8,6}$, $c_{8,231} \to \dfrac{9229}{464\,486\,400} + \dfrac{5\,c_{8,6}}{2}$,

$$c_{8,232} \to -\frac{49}{66\,355\,200}, \ c_{8,233} \to \frac{2243}{199\,065\,600} - \frac{3\,c_{8,6}}{4}, \ c_{8,234} \to \frac{30\,007}{1\,393\,459\,200} + c_{8,6}, \ c_{8,235} \to \frac{10\,469}{464\,486\,400},$$

$$c_{8,236} \to \frac{557}{22\,118\,400}, \ c_{8,237} \to -\frac{2927}{464\,486\,400} - \frac{5\,c_{8,6}}{2}, \ c_{8,238} \to \frac{241}{92\,897\,280}, \ c_{8,239} \to \frac{10\,301}{464\,486\,400},$$

$$c_{8,240} \to \frac{127}{4\,423\,680}, \ c_{8,241} \to -\frac{2893}{464\,486\,400}, \ c_{8,242} \to -\frac{2993}{464\,486\,400}, \ c_{8,243} \to -\frac{16\,043}{1\,393\,459\,200} - c_{8,6},$$

$$c_{8,244} \to -\frac{127}{22\,118\,400}, \ c_{8,245} \to -\frac{10\,963}{1\,393\,459\,200} + c_{8,6}, \ c_{8,246} \to -\frac{6451}{464\,486\,400}, \ c_{8,247} \to -\frac{8027}{464\,486\,400},$$

$$c_{8,248} \to -\frac{127}{4\,423\,680}, \ c_{8,249} \to \frac{2399}{464\,486\,400}, \ c_{8,250} \to \frac{2357}{464\,486\,400}, \ c_{8,251} \to \frac{643}{66\,355\,200},$$

$$c_{8,252} \to \frac{127}{7\,372\,800}, \ c_{8,253} \to -\frac{127}{51\,609\,600}, \ c_{8,254} \to -\frac{127}{22\,118\,400}, \ c_{8,255} \to \frac{127}{154\,828\,800}, \ c_{8,256} \to 0 \Big\}$$

In[ ]:= **sol /. Rule → Set**

Out[ ]=

$$\Big\{0, \ -\frac{1}{2\,419\,200}, \ \frac{1}{345\,600}, \ \frac{19}{9\,676\,800}, \ -\frac{1}{115\,200}, \ -\frac{19}{1\,612\,800} - c_{8,6}, \ -\frac{271}{58\,060\,800}, \ \frac{1}{69\,120},$$

$$-\frac{457}{58\,060\,800} - \frac{5\,c_{8,6}}{2}, \ \frac{457}{29\,030\,400}, \ \frac{587}{69\,672\,960} - \frac{3\,c_{8,6}}{4}, \ \frac{179}{8\,294\,400} + \frac{5\,c_{8,6}}{2}, \ \frac{223}{174\,182\,400},$$

$$\frac{1583}{116\,121\,600} + \frac{3\,c_{8,6}}{4}, \ \frac{2893}{464\,486\,400}, \ -\frac{1}{69\,120}, \ -\frac{73}{9\,676\,800}, \ \frac{1571}{29\,030\,400} + 10\,c_{8,6}, \ \frac{1619}{116\,121\,600} + \frac{15\,c_{8,6}}{4},$$

$$-\frac{71}{829\,440} - 10\,c_{8,6}, \ -\frac{79}{1\,935\,360} - \frac{9\,c_{8,6}}{2}, \ -\frac{3617}{174\,182\,400}, \ -\frac{83}{7\,962\,624} + \frac{3\,c_{8,6}}{4}, \ -\frac{1}{4\,147\,200}, \ \frac{109}{58\,060\,800},$$

$$\frac{1391}{43\,545\,600} + \frac{9\,c_{8,6}}{2}, \ -\frac{35\,237}{1\,393\,459\,200} - \frac{15\,c_{8,6}}{4}, \ -\frac{109}{3\,317\,760} - \frac{15\,c_{8,6}}{4}, \ \frac{32\,899}{1\,393\,459\,200} + \frac{15\,c_{8,6}}{4},$$

$$-\frac{5951}{464\,486\,400} - \frac{3\,c_{8,6}}{4}, \ -\frac{2399}{464\,486\,400}, \ \frac{1}{115\,200}, \ \frac{1093}{58\,060\,800} + \frac{5\,c_{8,6}}{2}, \ -\frac{1529}{29\,030\,400} - 10\,c_{8,6},$$

$$-\frac{4813}{348\,364\,800} - \frac{15\,c_{8,6}}{4}, \ -\frac{1}{460\,800}, \ \frac{1517}{38\,707\,200} + \frac{27\,c_{8,6}}{4}, \ -\frac{919}{23\,224\,320} - \frac{27\,c_{8,6}}{4}, \ \frac{2311}{1\,393\,459\,200},$$

$$\frac{361}{4\,147\,200} + 10\,c_{8,6}, \ \frac{113}{11\,612\,160}, \ \frac{1429}{58\,060\,800}, \ \frac{25\,189}{464\,486\,400} + \frac{9\,c_{8,6}}{2}, \ \frac{323}{5\,529\,600} + \frac{27\,c_{8,6}}{4},$$

$$-\frac{22\,231}{464\,486\,400} - \frac{27\,c_{8,6}}{4}, \ \frac{4297}{199\,065\,600}, \ \frac{10\,963}{1\,393\,459\,200} - c_{8,6}, \ -\frac{179}{8\,294\,400} - \frac{5\,c_{8,6}}{2}, \ \frac{467}{87\,091\,200},$$

$$\frac{1}{1\,382\,400}, \ -\frac{419}{464\,486\,400}, \ \frac{337}{5\,529\,600} - \frac{27\,c_{8,6}}{4}, \ -\frac{31}{2\,457\,600}, \ \frac{3349}{92\,897\,280} + \frac{27\,c_{8,6}}{4},$$

$$\frac{83}{17\,203\,200} + \frac{5\,c_{8,6}}{2}, \ \frac{559}{16\,588\,800} + \frac{15\,c_{8,6}}{4}, \ \frac{1027}{278\,691\,840}, \ -\frac{24\,697}{1\,393\,459\,200} - \frac{9\,c_{8,6}}{2}, \ \frac{19\,619}{1\,393\,459\,200},$$

$$-\frac{49}{66\,355\,200}, \ -\frac{3697}{154\,828\,800} - \frac{5\,c_{8,6}}{2}, \ \frac{1951}{154\,828\,800} + c_{8,6}, \ \frac{127}{51\,609\,600}, \ -\frac{1}{345\,600}, \ -\frac{31}{4\,838\,400} - c_{8,6},$$

$$-\frac{163}{29\,030\,400}, \ \frac{29}{16\,588\,800} + \frac{3\,c_{8,6}}{4}, \ \frac{53}{829\,440} + 10\,c_{8,6}, \ -\frac{391}{174\,182\,400}, \ \frac{1993}{87\,091\,200} + \frac{9\,c_{8,6}}{2},$$

$$\frac{13\,781}{1\,393\,459\,200} - \frac{3\,c_{8,6}}{4}, \ -\frac{259}{4\,147\,200} - 10\,c_{8,6}, \ -\frac{4559}{116\,121\,600} - \frac{27\,c_{8,6}}{4}, \ \frac{19}{2\,764\,800}, \ \frac{4679}{1\,393\,459\,200},$$

$$\frac{1}{552\,960}, \ \frac{133}{2\,457\,600} + \frac{27\,c_{8,6}}{4}, \ -\frac{43\,369}{1\,393\,459\,200} - \frac{9\,c_{8,6}}{2}, \ \frac{12\,323}{1\,393\,459\,200} + c_{8,6}, \ -\frac{17}{1\,382\,400},$$

$$\frac{661}{24\,883\,200} + \frac{9\,c_{8,6}}{2},\ -\frac{599}{29\,030\,400},\ \frac{12\,637}{278\,691\,840} - \frac{9\,c_{8,6}}{2},\ -\frac{1}{92\,160},\ \frac{2339}{464\,486\,400},\ -\frac{1807}{92\,897\,280},$$

$$\frac{5687}{464\,486\,400},\ -\frac{101}{2\,764\,800} - \frac{9\,c_{8,6}}{2},\ \frac{677}{464\,486\,400},\ -\frac{1609}{154\,828\,800},\ \frac{5257}{66\,355\,200} - 10\,c_{8,6},$$

$$\frac{541}{22\,118\,400} + \frac{9\,c_{8,6}}{2},\ \frac{33\,893}{464\,486\,400} + 10\,c_{8,6},\ -\frac{6931}{464\,486\,400},\ -\frac{3881}{464\,486\,400},\ \frac{23}{2\,073\,600} + c_{8,6},$$

$$\frac{53}{29\,030\,400},\ -\frac{4031}{174\,182\,400} - \frac{9\,c_{8,6}}{2},\ \frac{8863}{278\,691\,840} + \frac{15\,c_{8,6}}{4},\ \frac{49}{1\,105\,920} + \frac{27\,c_{8,6}}{4},$$

$$\frac{69\,901}{1\,393\,459\,200} - \frac{27\,c_{8,6}}{4},\ \frac{59}{30\,965\,760},\ -\frac{1097}{66\,355\,200} - \frac{5\,c_{8,6}}{2},\ \frac{61}{4\,147\,200},\ \frac{77\,299}{1\,393\,459\,200} + \frac{27\,c_{8,6}}{4},$$

$$\frac{365}{18\,579\,456},\ \frac{869}{10\,321\,920} + 10\,c_{8,6},\ -\frac{101}{2\,654\,208} - \frac{27\,c_{8,6}}{4},\ \frac{2213}{464\,486\,400},\ -\frac{4951}{92\,897\,280} - 10\,c_{8,6},$$

$$\frac{4927}{464\,486\,400},\ -\frac{7}{614\,400} - \frac{3\,c_{8,6}}{4},\ \frac{13\,549}{464\,486\,400} - \frac{15\,c_{8,6}}{4},\ \frac{32\,341}{1\,393\,459\,200} + \frac{9\,c_{8,6}}{2},\ -\frac{8417}{1\,393\,459\,200},$$

$$-\frac{671}{66\,355\,200},\ -\frac{35\,459}{464\,486\,400} - 10\,c_{8,6},\ \frac{5137}{92\,897\,280} + 10\,c_{8,6},\ -\frac{683}{92\,897\,280},\ \frac{557}{66\,355\,200} + \frac{3\,c_{8,6}}{4},$$

$$\frac{359}{17\,203\,200} + \frac{5\,c_{8,6}}{2},\ \frac{307}{66\,355\,200},\ -\frac{319}{464\,486\,400},\ -\frac{187}{22\,118\,400} - c_{8,6},\ \frac{13}{4\,423\,680},\ -\frac{107}{51\,609\,600},$$

$$-\frac{127}{154\,828\,800},\ \frac{1}{2\,419\,200},\ -\frac{1}{1\,075\,200},\ \frac{29}{2\,419\,200} + c_{8,6},\ \frac{43}{11\,612\,160},\ -\frac{1577}{58\,060\,800} - \frac{5\,c_{8,6}}{2},$$

$$\frac{5413}{348\,364\,800} - \frac{3\,c_{8,6}}{4},\ \frac{823}{174\,182\,400},\ \frac{323}{51\,609\,600},\ \frac{433}{29\,030\,400},\ \frac{899}{23\,224\,320} + \frac{15\,c_{8,6}}{4},$$

$$-\frac{1}{76\,800} - \frac{9\,c_{8,6}}{2},\ \frac{4829}{199\,065\,600} + \frac{3\,c_{8,6}}{4},\ \frac{787}{174\,182\,400},\ -\frac{36\,941}{1\,393\,459\,200} - \frac{15\,c_{8,6}}{4},$$

$$\frac{51\,803}{1\,393\,459\,200} + \frac{15\,c_{8,6}}{4},\ \frac{1411}{154\,828\,800},\ \frac{257}{58\,060\,800} + \frac{5\,c_{8,6}}{2},\ -\frac{2587}{69\,672\,960} - \frac{15\,c_{8,6}}{4},$$

$$\frac{4009}{116\,121\,600} + \frac{27\,c_{8,6}}{4},\ \frac{16\,801}{1\,393\,459\,200},\ \frac{107}{5\,806\,080},\ \frac{1163}{66\,355\,200} + \frac{9\,c_{8,6}}{2},\ -\frac{32\,303}{464\,486\,400} - \frac{27\,c_{8,6}}{4},$$

$$-\frac{40\,237}{1\,393\,459\,200} - c_{8,6},\ \frac{89}{87\,091\,200},\ \frac{59}{30\,965\,760},\ \frac{631}{154\,828\,800},\ \frac{10\,457}{464\,486\,400} + \frac{5\,c_{8,6}}{2},\ -\frac{2081}{278\,691\,840},$$

$$-\frac{313}{55\,738\,368},\ -\frac{11\,243}{464\,486\,400} - \frac{5\,c_{8,6}}{2},\ -\frac{2977}{464\,486\,400},\ \frac{1}{1\,451\,520} - c_{8,6},\ \frac{181}{23\,224\,320} + \frac{3\,c_{8,6}}{4},$$

$$\frac{1439}{87\,091\,200},\ \frac{11\,219}{1\,393\,459\,200} + \frac{3\,c_{8,6}}{4},\ -\frac{5689}{116\,121\,600} - \frac{27\,c_{8,6}}{4},\ -\frac{13\,361}{1\,393\,459\,200},\ \frac{2833}{51\,609\,600} + \frac{27\,c_{8,6}}{4},$$

$$\frac{13\,843}{1\,393\,459\,200} + c_{8,6},\ \frac{8459}{174\,182\,400} + \frac{9\,c_{8,6}}{2},\ -\frac{25\,273}{1\,393\,459\,200} - \frac{9\,c_{8,6}}{2},\ \frac{11\,813}{464\,486\,400},\ \frac{12\,449}{464\,486\,400},$$

$$\frac{5417}{464\,486\,400},\ -\frac{32\,507}{464\,486\,400} - 10\,c_{8,6},\ \frac{14\,447}{154\,828\,800} + 10\,c_{8,6},\ \frac{9551}{464\,486\,400},\ -\frac{613}{174\,182\,400},$$

$$\frac{25\,913}{1\,393\,459\,200} + \frac{15\,c_{8,6}}{4},\ -\frac{59\,807}{1\,393\,459\,200} - \frac{27\,c_{8,6}}{4},\ \frac{1093}{66\,355\,200} - \frac{5\,c_{8,6}}{2},\ \frac{43\,649}{1\,393\,459\,200} + \frac{27\,c_{8,6}}{4},$$

$$\frac{23\,741}{464\,486\,400} + 10\,c_{8,6},\ -\frac{5003}{464\,486\,400},\ -\frac{9463}{464\,486\,400},\ -\frac{24\,391}{1\,393\,459\,200} - \frac{15\,c_{8,6}}{4},\ \frac{197}{39\,813\,120},$$

$$-\frac{389}{7\,372\,800} - 10\,c_{8,6},\ \frac{11\,521}{464\,486\,400},\ \frac{7793}{464\,486\,400} + \frac{5\,c_{8,6}}{2},\ -\frac{6187}{464\,486\,400},\ \frac{1471}{154\,828\,800},$$

$$\frac{127}{22118400}, -\frac{19}{9676800}, -\frac{1}{1612800}, -\frac{757}{116121600} - \frac{3 c_{8,6}}{4}, -\frac{49}{66355200}, \frac{1139}{69672960} + \frac{15 c_{8,6}}{4},$$

$$-\frac{2393}{1393459200} + \frac{3 c_{8,6}}{4}, \frac{1961}{55738368} - \frac{15 c_{8,6}}{4}, -\frac{581}{66355200}, -\frac{1717}{116121600} - \frac{15 c_{8,6}}{4},$$

$$\frac{1619}{154828800}, \frac{973}{22118400} + \frac{9 c_{8,6}}{2}, \frac{491}{66355200} - c_{8,6}, \frac{221}{92897280}, \frac{1387}{66355200} + \frac{5 c_{8,6}}{2},$$

$$\frac{6359}{1393459200}, \frac{127}{22118400}, -\frac{587}{69672960} + \frac{3 c_{8,6}}{4}, -\frac{509}{39813120} - \frac{3 c_{8,6}}{4}, -\frac{9241}{464486400},$$

$$-\frac{157}{13271040} + c_{8,6}, -\frac{21661}{464486400} - \frac{9 c_{8,6}}{2}, -\frac{3683}{464486400}, -\frac{2917}{30965760} - 10 c_{8,6}, -\frac{17}{819200},$$

$$\frac{31709}{1393459200} + \frac{15 c_{8,6}}{4}, -\frac{7667}{464486400} - \frac{5 c_{8,6}}{2}, \frac{29893}{464486400} + 10 c_{8,6}, -\frac{49}{7372800}, -\frac{2689}{278691840},$$

$$\frac{853}{464486400}, -\frac{7939}{464486400}, -\frac{127}{7372800}, \frac{271}{58060800}, \frac{19}{10321920}, \frac{22289}{1393459200} + \frac{3 c_{8,6}}{4},$$

$$\frac{679}{66355200}, -\frac{5839}{1393459200}, -\frac{22609}{1393459200} - c_{8,6}, \frac{9229}{464486400} + \frac{5 c_{8,6}}{2}, -\frac{49}{66355200},$$

$$-\frac{2243}{199065600} - \frac{3 c_{8,6}}{4}, \frac{30007}{1393459200} + c_{8,6}, \frac{10469}{464486400}, \frac{557}{22118400}, -\frac{2927}{464486400} - \frac{5 c_{8,6}}{2},$$

$$\frac{241}{92897280}, \frac{10301}{464486400}, \frac{127}{4423680}, \frac{2893}{464486400}, -\frac{2993}{464486400}, -\frac{16043}{1393459200} - c_{8,6},$$

$$-\frac{127}{22118400}, -\frac{10963}{1393459200} + c_{8,6}, -\frac{6451}{464486400}, -\frac{8027}{464486400}, \frac{127}{4423680}, \frac{2399}{464486400},$$

$$\frac{2357}{464486400}, \frac{643}{66355200}, \frac{127}{7372800}, -\frac{127}{51609600}, -\frac{127}{22118400}, \frac{127}{154828800}, 0\}$$

In[•]:= $c_{8,6} = -\dfrac{13}{3628800}$

Out[•]=

$$-\frac{13}{3628800}$$

In[•]:= $\Phi[d]$

Out[•]=

$$\mathbb{O}_{AR,\{x,y\},\{1\}}\Big[\mathcal{A}_0\Big[$$

$$AW_1[] + \frac{1}{24} AW_1[x,y] - \frac{1}{24} AW_1[y,x] - \frac{AW_1[x,x,x,y]}{1440} + \frac{1}{480} AW_1[x,x,y,x] + \frac{7 AW_1[x,x,y,y]}{5760} -$$

$$\frac{1}{480} AW_1[x,y,x,x] - \frac{1}{640} AW_1[x,y,x,y] - \frac{AW_1[x,y,y,x]}{1152} - \frac{7 AW_1[x,y,y,y]}{5760} +$$

$$\frac{AW_1[y,x,x,x]}{1440} - \frac{AW_1[y,x,x,y]}{1152} + \frac{19 AW_1[y,x,y,x]}{5760} + \frac{7 AW_1[y,x,y,y]}{1920} - \frac{7 AW_1[y,y,x,x]}{5760} -$$

$$\frac{7 AW_1[y,y,x,y]}{1920} + \frac{7 AW_1[y,y,y,x]}{5760} + \frac{AW_1[x,x,x,x,x,y]}{60480} - \frac{AW_1[x,x,x,x,y,x]}{12096} -$$

$$\frac{13 AW_1[x,x,x,x,y,y]}{241920} + \frac{AW_1[x,x,x,y,x,x]}{6048} + \frac{19 AW_1[x,x,x,y,x,y]}{145152} +$$

$$\frac{61\,AW_1[x,x,x,y,y,x]}{725\,760} + \frac{83\,AW_1[x,x,x,y,y,y]}{967\,680} - \frac{AW_1[x,x,y,x,x,x]}{6048} -$$

$$\frac{17\,AW_1[x,x,y,x,x,y]}{241\,920} - \frac{61\,AW_1[x,x,y,x,y,x]}{241\,920} - \frac{89\,AW_1[x,x,y,x,y,y]}{414\,720} +$$

$$\frac{71\,AW_1[x,x,y,y,x,y]}{967\,680} - \frac{337\,AW_1[x,x,y,y,y,x]}{2\,903\,040} - \frac{31\,AW_1[x,x,y,y,y,y]}{483\,840} +$$

$$\frac{AW_1[x,y,x,x,x,x]}{12\,096} + \frac{13\,AW_1[x,y,x,x,x,y]}{725\,760} + \frac{AW_1[x,y,x,x,y,x]}{11\,520} +$$

$$\frac{37\,AW_1[x,y,x,x,y,y]}{580\,608} + \frac{AW_1[x,y,x,y,x,x]}{6048} + \frac{79\,AW_1[x,y,x,y,x,y]}{967\,680} +$$

$$\frac{71\,AW_1[x,y,x,y,y,x]}{322\,560} + \frac{73\,AW_1[x,y,x,y,y,y]}{483\,840} - \frac{AW_1[x,y,y,x,x,x]}{18\,144} -$$

$$\frac{53\,AW_1[x,y,y,x,x,y]}{967\,680} + \frac{23\,AW_1[x,y,y,x,y,x]}{193\,536} - \frac{11\,AW_1[x,y,y,x,y,y]}{161\,280} +$$

$$\frac{19\,AW_1[x,y,y,y,x,x]}{290\,304} - \frac{AW_1[x,y,y,y,x,y]}{193\,536} + \frac{7\,AW_1[x,y,y,y,y,x]}{138\,240} +$$

$$\frac{31\,AW_1[x,y,y,y,y,y]}{967\,680} - \frac{AW_1[y,x,x,x,x,x]}{60\,480} + \frac{AW_1[y,x,x,x,x,y]}{34\,560} -$$

$$\frac{97\,AW_1[y,x,x,x,y,x]}{725\,760} - \frac{103\,AW_1[y,x,x,x,y,y]}{967\,680} + \frac{19\,AW_1[y,x,x,y,x,x]}{120\,960} +$$

$$\frac{583\,AW_1[y,x,x,y,x,y]}{2\,903\,040} + \frac{53\,AW_1[y,x,x,y,y,x]}{967\,680} + \frac{17\,AW_1[y,x,x,y,y,y]}{161\,280} -$$

$$\frac{29\,AW_1[y,x,y,x,x,x]}{181\,440} - \frac{289\,AW_1[y,x,y,x,x,y]}{2\,903\,040} - \frac{55\,AW_1[y,x,y,x,y,x]}{193\,536} -$$

$$\frac{17\,AW_1[y,x,y,x,y,y]}{53\,760} - \frac{11\,AW_1[y,x,y,y,x,x]}{483\,840} + \frac{7\,AW_1[y,x,y,y,x,y]}{46\,080} -$$

$$\frac{191\,AW_1[y,x,y,y,y,x]}{967\,680} - \frac{31\,AW_1[y,x,y,y,y,y]}{193\,536} + \frac{13\,AW_1[y,y,x,x,x,x]}{241\,920} +$$

$$\frac{AW_1[y,y,x,x,x,y]}{17\,920} - \frac{19\,AW_1[y,y,x,x,y,x]}{1\,451\,520} + \frac{89\,AW_1[y,y,x,y,x,x]}{414\,720} +$$

$$\frac{53\,AW_1[y,y,x,y,x,y]}{322\,560} + \frac{71\,AW_1[y,y,x,y,y,x]}{322\,560} + \frac{31\,AW_1[y,y,x,y,y,y]}{96\,768} -$$

$$\frac{83\,AW_1[y,y,y,x,x,x]}{967\,680} + \frac{53\,AW_1[y,y,y,x,x,y]}{967\,680} - \frac{13\,AW_1[y,y,y,x,y,x]}{64\,512} -$$

$$\frac{31\,AW_1[y,y,y,x,y,y]}{96\,768} + \frac{31\,AW_1[y,y,y,y,x,x]}{483\,840} + \frac{31\,AW_1[y,y,y,y,x,y]}{193\,536} -$$

$$\frac{31\,AW_1[y,y,y,y,y,x]}{967\,680} - \frac{AW_1[x,x,x,x,x,x,x,y]}{2\,419\,200} + \frac{AW_1[x,x,x,x,x,x,y,x]}{345\,600} +$$

$$\frac{19\,AW_1[x,x,x,x,x,x,y,y]}{9\,676\,800} - \frac{AW_1[x,x,x,x,x,y,x,x]}{115\,200} - \frac{13\,AW_1[x,x,x,x,x,y,x,y]}{3\,628\,800} -$$

$$\frac{17\,AW_1[x,x,x,x,x,y,y,x]}{2\,073\,600} - \frac{271\,AW_1[x,x,x,x,x,y,y,y]}{58\,060\,800} +$$

$$\frac{AW_1[x,x,x,x,y,x,x,x]}{69\,120} + \frac{AW_1[x,x,x,x,y,x,x,y]}{921\,600} + \frac{457\,AW_1[x,x,x,x,y,x,y,x]}{29\,030\,400} +$$

$$\frac{553 \, AW_1[x, x, x, x, y, x, y, y]}{49\,766\,400} + \frac{733 \, AW_1[x, x, x, x, y, y, x, x]}{58\,060\,800} +$$

$$\frac{223 \, AW_1[x, x, x, x, y, y, x, y]}{174\,182\,400} + \frac{1271 \, AW_1[x, x, x, x, y, y, y, x]}{116\,121\,600} +$$

$$\frac{2893 \, AW_1[x, x, x, x, y, y, y, y]}{464\,486\,400} - \frac{AW_1[x, x, x, y, x, x, x, x]}{69\,120} - \frac{73 \, AW_1[x, x, x, y, x, x, x, y]}{9\,676\,800} +$$

$$\frac{59 \, AW_1[x, x, x, y, x, x, y, x]}{3\,225\,600} + \frac{59 \, AW_1[x, x, x, y, x, x, y, y]}{116\,121\,600} -$$

$$\frac{289 \, AW_1[x, x, x, y, x, y, x, x]}{5\,806\,080} - \frac{239 \, AW_1[x, x, x, y, x, y, x, y]}{9\,676\,800} -$$

$$\frac{3617 \, AW_1[x, x, x, y, x, y, y, x]}{174\,182\,400} - \frac{18\,269 \, AW_1[x, x, x, y, x, y, y, y]}{1\,393\,459\,200} -$$

$$\frac{AW_1[x, x, x, y, y, x, x, x]}{4\,147\,200} + \frac{109 \, AW_1[x, x, x, y, y, x, x, y]}{58\,060\,800} + \frac{689 \, AW_1[x, x, x, y, y, x, y, x]}{43\,545\,600} -$$

$$\frac{16\,517 \, AW_1[x, x, x, y, y, x, y, y]}{1\,393\,459\,200} - \frac{451 \, AW_1[x, x, x, y, y, y, x, x]}{23\,224\,320} +$$

$$\frac{14\,179 \, AW_1[x, x, x, y, y, y, x, y]}{1\,393\,459\,200} - \frac{4703 \, AW_1[x, x, x, y, y, y, y, x]}{464\,486\,400} -$$

$$\frac{2399 \, AW_1[x, x, x, y, y, y, y, y]}{464\,486\,400} + \frac{AW_1[x, x, y, x, x, x, x, x]}{115\,200} +$$

$$\frac{191 \, AW_1[x, x, y, x, x, x, x, y]}{19\,353\,600} - \frac{163 \, AW_1[x, x, y, x, x, x, y, x]}{9\,676\,800} -$$

$$\frac{19 \, AW_1[x, x, y, x, x, x, y, y]}{49\,766\,400} - \frac{AW_1[x, x, y, x, x, y, x, x]}{460\,800} + \frac{83 \, AW_1[x, x, y, x, x, y, x, y]}{5\,529\,600} -$$

$$\frac{1787 \, AW_1[x, x, y, x, x, y, y, x]}{116\,121\,600} + \frac{2311 \, AW_1[x, x, y, x, x, y, y, y]}{1\,393\,459\,200} +$$

$$\frac{1487 \, AW_1[x, x, y, x, y, x, x, x]}{29\,030\,400} + \frac{113 \, AW_1[x, x, y, x, y, x, x, y]}{11\,612\,160} +$$

$$\frac{1429 \, AW_1[x, x, y, x, y, x, y, x]}{58\,060\,800} + \frac{17\,701 \, AW_1[x, x, y, x, y, x, y, y]}{464\,486\,400} +$$

$$\frac{53 \, AW_1[x, x, y, x, y, y, x, x]}{1\,548\,288} - \frac{10\,999 \, AW_1[x, x, y, x, y, y, x, y]}{464\,486\,400} +$$

$$\frac{4297 \, AW_1[x, x, y, x, y, y, y, x]}{199\,065\,600} + \frac{3191 \, AW_1[x, x, y, x, y, y, y, y]}{278\,691\,840} -$$

$$\frac{733 \, AW_1[x, x, y, y, x, x, x, x]}{58\,060\,800} - \frac{467 \, AW_1[x, x, y, y, x, x, x, y]}{87\,091\,200} + \frac{AW_1[x, x, y, y, x, x, y, x]}{1\,382\,400} -$$

$$\frac{419 \, AW_1[x, x, y, y, x, x, y, y]}{464\,486\,400} - \frac{1423 \, AW_1[x, x, y, y, x, y, x, x]}{38\,707\,200} -$$

$$\frac{31 \, AW_1[x, x, y, y, x, y, x, y]}{2\,457\,600} + \frac{5513 \, AW_1[x, x, y, y, x, y, y, x]}{464\,486\,400} -$$

$$\frac{1919 \, AW_1[x, x, y, y, x, y, y, y]}{464\,486\,400} + \frac{2353 \, AW_1[x, x, y, y, y, x, x, x]}{116\,121\,600} +$$

$$\frac{1027 \, AW_1[x, x, y, y, y, x, x, y]}{278\,691\,840} - \frac{319 \, AW_1[x, x, y, y, y, x, y, x]}{199\,065\,600} +$$

$$\frac{19\,619\;AW_1[x, x, y, y, y, x, y, y]}{1\,393\,459\,200} - \frac{49\;AW_1[x, x, y, y, y, y, x, x]}{66\,355\,200} -$$

$$\frac{6931\;AW_1[x, x, y, y, y, y, x, y]}{464\,486\,400} + \frac{4189\;AW_1[x, x, y, y, y, y, y, x]}{464\,486\,400} +$$

$$\frac{127\;AW_1[x, x, y, y, y, y, y, y]}{51\,609\,600} - \frac{AW_1[x, y, x, x, x, x, x, x]}{345\,600} - \frac{41\;AW_1[x, y, x, x, x, x, x, y]}{14\,515\,200} -$$

$$\frac{163\;AW_1[x, y, x, x, x, x, y, x]}{29\,030\,400} - \frac{109\;AW_1[x, y, x, x, x, x, y, y]}{116\,121\,600} +$$

$$\frac{163\;AW_1[x, y, x, x, x, y, x, x]}{5\,806\,080} - \frac{391\;AW_1[x, y, x, x, x, y, x, y]}{174\,182\,400} +$$

$$\frac{589\;AW_1[x, y, x, x, x, y, y, x]}{87\,091\,200} - \frac{10\,037\;AW_1[x, y, x, x, x, y, y, y]}{1\,393\,459\,200} -$$

$$\frac{773\;AW_1[x, y, x, x, y, x, x, x]}{29\,030\,400} - \frac{1751\;AW_1[x, y, x, x, y, x, x, y]}{116\,121\,600} +$$

$$\frac{19\;AW_1[x, y, x, x, y, x, y, x]}{2\,764\,800} + \frac{4679\;AW_1[x, y, x, x, y, x, y, y]}{1\,393\,459\,200} + \frac{AW_1[x, y, x, x, y, y, x, x]}{552\,960} +$$

$$\frac{103\;AW_1[x, y, x, x, y, y, x, y]}{3\,440\,640} - \frac{4181\;AW_1[x, y, x, x, y, y, x, y]}{278\,691\,840} +$$

$$\frac{7331\;AW_1[x, y, x, x, y, y, y, y]}{1\,393\,459\,200} - \frac{17\;AW_1[x, y, x, y, x, x, x, x]}{1\,382\,400} +$$

$$\frac{1819\;AW_1[x, y, x, y, x, x, x, y]}{174\,182\,400} - \frac{599\;AW_1[x, y, x, y, x, x, y, x]}{29\,030\,400} -$$

$$\frac{40\,721\;AW_1[x, y, x, y, x, x, y, y]}{1\,393\,459\,200} - \frac{AW_1[x, y, x, y, x, y, x, x]}{92\,160} -$$

$$\frac{2339\;AW_1[x, y, x, y, x, y, x, y]}{464\,486\,400} - \frac{1807\;AW_1[x, y, x, y, x, y, y, x]}{92\,897\,280} -$$

$$\frac{5687\;AW_1[x, y, x, y, x, y, y, y]}{464\,486\,400} - \frac{79\;AW_1[x, y, x, y, y, x, x, x]}{3\,870\,720} +$$

$$\frac{677\;AW_1[x, y, x, y, y, x, x, y]}{464\,486\,400} - \frac{1609\;AW_1[x, y, x, y, y, x, y, x]}{154\,828\,800} -$$

$$\frac{20\,159\;AW_1[x, y, x, y, y, x, y, y]}{464\,486\,400} + \frac{1291\;AW_1[x, y, x, y, y, y, x, x]}{154\,828\,800} +$$

$$\frac{213\;AW_1[x, y, x, y, y, y, x, y]}{5\,734\,400} - \frac{6931\;AW_1[x, y, x, y, y, y, y, x]}{464\,486\,400} -$$

$$\frac{3881\;AW_1[x, y, x, y, y, y, y, y]}{464\,486\,400} + \frac{109\;AW_1[x, y, y, x, x, x, x, y]}{14\,515\,200} +$$

$$\frac{53\;AW_1[x, y, y, x, x, x, x, y]}{29\,030\,400} - \frac{1223\;AW_1[x, y, y, x, x, x, y, x]}{174\,182\,400} +$$

$$\frac{5119\;AW_1[x, y, y, x, x, x, y, y]}{278\,691\,840} - \frac{779\;AW_1[x, y, y, x, x, y, x, x]}{38\,707\,200} -$$

$$\frac{7241\;AW_1[x, y, y, x, x, y, x, x]}{278\,691\,840} + \frac{59\;AW_1[x, y, y, x, x, y, y, x]}{30\,965\,760} -$$

$$\frac{391\;AW_1[x, y, y, x, x, y, y, y]}{51\,609\,600} + \frac{61\;AW_1[x, y, y, x, y, x, x, x]}{4\,147\,200} +$$

$$\frac{6229\,AW_1[x,y,y,x,y,x,x,y]}{199\,065\,600} + \frac{365\,AW_1[x,y,y,x,y,x,y,x]}{18\,579\,456} +$$

$$\frac{4493\,AW_1[x,y,y,x,y,x,y,y]}{92\,897\,280} - \frac{6443\,AW_1[x,y,y,x,y,y,x,x]}{464\,486\,400} +$$

$$\frac{2213\,AW_1[x,y,y,x,y,y,x,y]}{464\,486\,400} - \frac{541\,AW_1[x,y,y,x,y,y,y,x]}{30\,965\,760} +$$

$$\frac{4927\,AW_1[x,y,y,x,y,y,y,y]}{464\,486\,400} - \frac{337\,AW_1[x,y,y,y,x,x,x,x]}{38\,707\,200} -$$

$$\frac{7309\,AW_1[x,y,y,y,x,x,x,y]}{464\,486\,400} + \frac{1411\,AW_1[x,y,y,y,x,x,y,x]}{199\,065\,600} -$$

$$\frac{8417\,AW_1[x,y,y,y,x,x,y,y]}{1\,393\,459\,200} - \frac{671\,AW_1[x,y,y,y,x,y,x,x]}{66\,355\,200} -$$

$$\frac{697\,AW_1[x,y,y,y,x,y,x,y]}{17\,203\,200} + \frac{67\,AW_1[x,y,y,y,x,y,y,x]}{3\,440\,640} -$$

$$\frac{683\,AW_1[x,y,y,y,x,y,y,y]}{92\,897\,280} + \frac{2651\,AW_1[x,y,y,y,y,x,x,x]}{464\,486\,400} +$$

$$\frac{5533\,AW_1[x,y,y,y,y,x,x,y]}{464\,486\,400} + \frac{307\,AW_1[x,y,y,y,y,x,y,y]}{66\,355\,200} -$$

$$\frac{319\,AW_1[x,y,y,y,y,x,y,y]}{464\,486\,400} - \frac{2263\,AW_1[x,y,y,y,y,y,x,x]}{464\,486\,400} +$$

$$\frac{13\,AW_1[x,y,y,y,y,y,x,y]}{4\,423\,680} - \frac{107\,AW_1[x,y,y,y,y,y,y,x]}{51\,609\,600} -$$

$$\frac{127\,AW_1[x,y,y,y,y,y,y,y]}{154\,828\,800} + \frac{AW_1[y,x,x,x,x,x,x,x]}{2\,419\,200} - \frac{AW_1[y,x,x,x,x,x,x,y]}{1\,075\,200} +$$

$$\frac{61\,AW_1[y,x,x,x,x,x,y,x]}{7\,257\,600} + \frac{43\,AW_1[y,x,x,x,x,x,y,y]}{11\,612\,160} -$$

$$\frac{151\,AW_1[y,x,x,x,x,y,x,x]}{8\,294\,400} - \frac{4477\,AW_1[y,x,x,x,x,y,x,y]}{348\,364\,800} -$$

$$\frac{823\,AW_1[y,x,x,x,x,y,y,x]}{174\,182\,400} - \frac{323\,AW_1[y,x,x,x,x,y,y,y]}{51\,609\,600} +$$

$$\frac{433\,AW_1[y,x,x,x,y,x,x,x]}{29\,030\,400} + \frac{587\,AW_1[y,x,x,x,y,x,x,y]}{23\,224\,320} + \frac{AW_1[y,x,x,x,y,x,y,x]}{322\,560} +$$

$$\frac{30\,059\,AW_1[y,x,x,x,y,x,y,y]}{1\,393\,459\,200} + \frac{787\,AW_1[y,x,x,x,y,y,x,x]}{174\,182\,400} -$$

$$\frac{2603\,AW_1[y,x,x,x,y,y,x,y]}{199\,065\,600} + \frac{33\,083\,AW_1[y,x,x,x,y,y,y,y]}{1\,393\,459\,200} +$$

$$\frac{1411\,AW_1[y,x,x,x,y,y,y,y]}{154\,828\,800} - \frac{263\,AW_1[y,x,x,y,x,x,x,x]}{58\,060\,800} +$$

$$\frac{1651\,AW_1[y,x,x,y,x,x,x,y]}{69\,672\,960} + \frac{1201\,AW_1[y,x,x,y,x,x,y,x]}{116\,121\,600} -$$

$$\frac{16\,801\,AW_1[y,x,x,y,x,x,y,y]}{1\,393\,459\,200} - \frac{107\,AW_1[y,x,x,y,x,y,x,x]}{5\,806\,080} +$$

$$\frac{653\,AW_1[y,x,x,y,x,y,x,y]}{464\,486\,400} - \frac{21\,071\,AW_1[y,x,x,y,x,y,y,x]}{464\,486\,400}$$

$$\frac{1007\, AW_1[y, x, x, y, x, y, y, y]}{39\,813\,120} + \frac{89\, AW_1[y, x, x, y, y, x, x, x]}{87\,091\,200} +$$

$$\frac{59\, AW_1[y, x, x, y, y, x, x, y]}{30\,965\,760} + \frac{631\, AW_1[y, x, x, y, y, x, y, x]}{154\,828\,800} +$$

$$\frac{2099\, AW_1[y, x, x, y, y, x, y, y]}{154\,828\,800} - \frac{2081\, AW_1[y, x, x, y, y, y, x, x]}{278\,691\,840} -$$

$$\frac{313\, AW_1[y, x, x, y, y, y, x, y]}{55\,738\,368} - \frac{787\, AW_1[y, x, x, y, y, y, y, x]}{51\,609\,600} -$$

$$\frac{2977\, AW_1[y, x, x, y, y, y, y, y]}{464\,486\,400} + \frac{31\, AW_1[y, x, y, x, x, x, x, x]}{7\,257\,600} +$$

$$\frac{593\, AW_1[y, x, y, x, x, x, x, y]}{116\,121\,600} + \frac{1439\, AW_1[y, x, y, x, x, x, y, x]}{87\,091\,200} +$$

$$\frac{14\,963\, AW_1[y, x, y, x, x, x, y, y]}{1\,393\,459\,200} - \frac{2881\, AW_1[y, x, y, x, x, y, x, x]}{116\,121\,600} -$$

$$\frac{13\,361\, AW_1[y, x, y, x, x, y, x, y]}{1\,393\,459\,200} + \frac{317\, AW_1[y, x, y, x, x, y, y, x]}{10\,321\,920} +$$

$$\frac{8851\, AW_1[y, x, y, x, x, y, y, y]}{1\,393\,459\,200} + \frac{5651\, AW_1[y, x, y, x, y, x, x, x]}{174\,182\,400} -$$

$$\frac{2809\, AW_1[y, x, y, x, y, x, x, y]}{1\,393\,459\,200} + \frac{11\,813\, AW_1[y, x, y, x, y, x, y, x]}{464\,486\,400} +$$

$$\frac{12\,449\, AW_1[y, x, y, x, y, x, y, y]}{464\,486\,400} + \frac{5417\, AW_1[y, x, y, x, y, y, x, x]}{464\,486\,400} -$$

$$\frac{1763\, AW_1[y, x, y, x, y, y, x, y]}{51\,609\,600} + \frac{26\,701\, AW_1[y, x, y, x, y, y, y, x]}{464\,486\,400} +$$

$$\frac{9551\, AW_1[y, x, y, x, y, y, y, y]}{464\,486\,400} - \frac{613\, AW_1[y, x, y, y, x, x, x, x]}{174\,182\,400} +$$

$$\frac{7193\, AW_1[y, x, y, y, x, x, x, y]}{1\,393\,459\,200} - \frac{26\,111\, AW_1[y, x, y, y, x, x, y, x]}{1\,393\,459\,200} -$$

$$\frac{3491\, AW_1[y, x, y, y, x, x, y, y]}{464\,486\,400} + \frac{9953\, AW_1[y, x, y, y, x, y, x, x]}{1\,393\,459\,200} +$$

$$\frac{263\, AW_1[y, x, y, y, x, y, x, y]}{17\,203\,200} - \frac{5003\, AW_1[y, x, y, y, x, y, y, x]}{464\,486\,400} -$$

$$\frac{9463\, AW_1[y, x, y, y, x, y, y, y]}{464\,486\,400} - \frac{5671\, AW_1[y, x, y, y, y, x, x, x]}{1\,393\,459\,200} +$$

$$\frac{197\, AW_1[y, x, y, y, y, x, x, y]}{39\,813\,120} - \frac{7867\, AW_1[y, x, y, y, y, x, y, x]}{464\,486\,400} +$$

$$\frac{11\,521\, AW_1[y, x, y, y, y, x, y, y]}{464\,486\,400} + \frac{173\, AW_1[y, x, y, y, y, y, x, x]}{22\,118\,400} -$$

$$\frac{6187\, AW_1[y, x, y, y, y, y, x, y]}{464\,486\,400} + \frac{1471\, AW_1[y, x, y, y, y, y, y, x]}{154\,828\,800} +$$

$$\frac{127\, AW_1[y, x, y, y, y, y, y, y]}{22\,118\,400} - \frac{19\, AW_1[y, y, x, x, x, x, x, x]}{9\,676\,800} - \frac{AW_1[y, y, x, x, x, x, x, y]}{1\,612\,800} -$$

$$\frac{89\, AW_1[y, y, x, x, x, x, y, x]}{23\,224\,320} - \frac{49\, AW_1[y, y, x, x, x, x, y, y]}{66\,355\,200} + \frac{29\, AW_1[y, y, x, x, x, y, x, x]}{9\,953\,280} -$$

$$\frac{6137\,AW_1[y,\,y,\,x,\,x,\,x,\,y,\,x,\,y]}{1\,393\,459\,200} - \frac{6061\,AW_1[y,\,y,\,x,\,x,\,x,\,y,\,y,\,x]}{278\,691\,840} -$$

$$\frac{581\,AW_1[y,\,y,\,x,\,x,\,x,\,y,\,y,\,y]}{66\,355\,200} - \frac{157\,AW_1[y,\,y,\,x,\,x,\,y,\,x,\,x,\,x]}{116\,121\,600} +$$

$$\frac{1619\,AW_1[y,\,y,\,x,\,x,\,y,\,x,\,x,\,y]}{154\,828\,800} + \frac{863\,AW_1[y,\,y,\,x,\,x,\,y,\,x,\,y,\,x]}{30\,965\,760} +$$

$$\frac{5101\,AW_1[y,\,y,\,x,\,x,\,y,\,x,\,y,\,y]}{464\,486\,400} + \frac{221\,AW_1[y,\,y,\,x,\,x,\,y,\,y,\,x,\,x]}{92\,897\,280} +$$

$$\frac{5549\,AW_1[y,\,y,\,x,\,x,\,y,\,y,\,x,\,y]}{464\,486\,400} + \frac{6359\,AW_1[y,\,y,\,x,\,x,\,y,\,y,\,y,\,x]}{1\,393\,459\,200} +$$

$$\frac{127\,AW_1[y,\,y,\,x,\,x,\,y,\,y,\,y,\,y]}{22\,118\,400} - \frac{553\,AW_1[y,\,y,\,x,\,y,\,x,\,x,\,x,\,x]}{49\,766\,400} -$$

$$\frac{14\,071\,AW_1[y,\,y,\,x,\,y,\,x,\,x,\,x,\,y]}{1\,393\,459\,200} - \frac{9241\,AW_1[y,\,y,\,x,\,y,\,x,\,x,\,y,\,x]}{464\,486\,400} -$$

$$\frac{7159\,AW_1[y,\,y,\,x,\,y,\,x,\,x,\,y,\,y]}{464\,486\,400} - \frac{14\,173\,AW_1[y,\,y,\,x,\,y,\,x,\,y,\,x,\,x]}{464\,486\,400} -$$

$$\frac{3683\,AW_1[y,\,y,\,x,\,y,\,x,\,y,\,x,\,y]}{464\,486\,400} - \frac{5423\,AW_1[y,\,y,\,x,\,y,\,x,\,y,\,y,\,x]}{92\,897\,280} -$$

$$\frac{17\,AW_1[y,\,y,\,x,\,y,\,x,\,y,\,y,\,y]}{819\,200} + \frac{12\,989\,AW_1[y,\,y,\,x,\,y,\,y,\,x,\,x,\,x]}{1\,393\,459\,200} -$$

$$\frac{167\,AW_1[y,\,y,\,x,\,y,\,y,\,x,\,x,\,y]}{22\,118\,400} + \frac{13\,253\,AW_1[y,\,y,\,x,\,y,\,y,\,x,\,y,\,x]}{464\,486\,400} -$$

$$\frac{49\,AW_1[y,\,y,\,x,\,y,\,y,\,x,\,y,\,y]}{7\,372\,800} - \frac{2689\,AW_1[y,\,y,\,x,\,y,\,y,\,y,\,x,\,x]}{278\,691\,840} +$$

$$\frac{853\,AW_1[y,\,y,\,x,\,y,\,y,\,y,\,x,\,y]}{464\,486\,400} - \frac{7939\,AW_1[y,\,y,\,x,\,y,\,y,\,y,\,y,\,x]}{464\,486\,400} -$$

$$\frac{127\,AW_1[y,\,y,\,x,\,y,\,y,\,y,\,y,\,y]}{7\,372\,800} + \frac{271\,AW_1[y,\,y,\,y,\,x,\,x,\,x,\,x,\,x]}{58\,060\,800} +$$

$$\frac{19\,AW_1[y,\,y,\,y,\,x,\,x,\,x,\,x,\,y]}{10\,321\,920} + \frac{3709\,AW_1[y,\,y,\,y,\,x,\,x,\,x,\,y,\,x]}{278\,691\,840} +$$

$$\frac{679\,AW_1[y,\,y,\,y,\,x,\,x,\,x,\,y,\,y]}{66\,355\,200} - \frac{5839\,AW_1[y,\,y,\,y,\,x,\,x,\,y,\,x,\,x]}{1\,393\,459\,200} -$$

$$\frac{17\,617\,AW_1[y,\,y,\,y,\,x,\,x,\,y,\,x,\,y]}{1\,393\,459\,200} + \frac{5069\,AW_1[y,\,y,\,y,\,x,\,x,\,y,\,y,\,x]}{464\,486\,400} -$$

$$\frac{49\,AW_1[y,\,y,\,y,\,x,\,x,\,y,\,y,\,y]}{66\,355\,200} + \frac{3889\,AW_1[y,\,y,\,y,\,x,\,y,\,x,\,x,\,x]}{278\,691\,840} +$$

$$\frac{5003\,AW_1[y,\,y,\,y,\,x,\,y,\,x,\,x,\,y]}{278\,691\,840} + \frac{10\,469\,AW_1[y,\,y,\,y,\,x,\,y,\,x,\,y,\,x]}{464\,486\,400} +$$

$$\frac{557\,AW_1[y,\,y,\,y,\,x,\,y,\,x,\,y,\,y]}{22\,118\,400} + \frac{137\,AW_1[y,\,y,\,y,\,x,\,y,\,y,\,x,\,x]}{51\,609\,600} +$$

$$\frac{241\,AW_1[y,\,y,\,y,\,x,\,y,\,y,\,x,\,y]}{92\,897\,280} + \frac{10\,301\,AW_1[y,\,y,\,y,\,x,\,y,\,y,\,y,\,x]}{464\,486\,400} +$$

$$\frac{127\,AW_1[y,\,y,\,y,\,x,\,y,\,y,\,y,\,y]}{4\,423\,680} - \frac{2893\,AW_1[y,\,y,\,y,\,y,\,x,\,x,\,x,\,x]}{464\,486\,400} -$$

$$\frac{2993\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,x,\,x,\,x,\,y]}{464\,486\,400} - \frac{11\,051\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,x,\,x,\,y,\,x]}{1\,393\,459\,200} -$$

$$\frac{127\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,x,\,x,\,y,\,y]}{22\,118\,400} - \frac{3191\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,x,\,y,\,x,\,x]}{278\,691\,840} -$$

$$\frac{6451\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,x,\,y,\,x,\,y]}{464\,486\,400} - \frac{8027\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,x,\,y,\,y,\,x]}{464\,486\,400} -$$

$$\frac{127\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,x,\,y,\,y,\,y]}{4\,423\,680} + \frac{2399\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,y,\,x,\,x,\,x]}{464\,486\,400} +$$

$$\frac{2357\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,y,\,x,\,x,\,y]}{464\,486\,400} + \frac{643\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,y,\,x,\,y,\,x]}{66\,355\,200} +$$

$$\frac{127\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,y,\,x,\,y,\,y]}{7\,372\,800} - \frac{127\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,y,\,y,\,x,\,x]}{51\,609\,600} -$$

$$\frac{127\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,y,\,y,\,x,\,y]}{22\,118\,400} + \frac{127\,\mathrm{AW}_1[y,\,y,\,y,\,y,\,y,\,y,\,y,\,x]}{154\,828\,800}\bigg]\bigg]$$