Pensieve header: Solving the WKO equations using free-Lie μ-calculus technology; continues pensieve://2013-05/.

Solving the Equations

```
SetDirectory["C:\\drorbn\\AcademicPensieve\\2013-10"];
<< "../2013-05/FreeLie.m"
$SeriesShowDegree = 3; $SeriesCompareDegree = 5;
<< "../2013-05/muCalculus.m"
```

```
μCoefficients[expr_] := Flatten[Last[Reap[Collect[expr, _LW | _CW, Sow[#] &]]]];
μCoefficients[l_List] := μCoefficients /@ l;
```

```
α = MakeLieSeries[{"1", "2"}, αs];
β = MakeLieSeries[{"1", "2"}, βs];
γ = MakeCWSeries[{"1", "2"}, γs];
V = M[{1 → α, 2 → β}, γ];
κs[d_, 1] := If[OddQ[d], 0, κs[d]];
κ = MakeCWSeries[{"1"}, κs];
Unprotect[C]; C = M[{1 → MakeLieSeries[0]}, κ];
```

```
HardR4[d_, V_] :=
  Module[{lhs = R⁺[2, 3] ** R⁺[1, 3] ** V, rhs = V ** (R⁺[1, 3] // dΔ[1, 1, 2])},
   {lhs[1]@d - rhs[1]@d, lhs[2]@d - rhs[2]@d,
    lhs[3]@d - rhs[3]@d, lhs[W]@d - rhs[W]@d}
  ];
TwistEq[d_, V_] :=
  Module[{lhs = V ** Θ[1, 2], rhs = R⁺[1, 2] ** (V // dσ[{1, 2} → {2, 1}])},
   {lhs[1]@d - rhs[1]@d, lhs[2]@d - rhs[2]@d, lhs[W]@d - rhs[W]@d}
  ];
UnitarityEq[d_, V_] :=
  Module[{lhs = V ** (V // dA[1] // dA[2]), rhs = dϵ[1] ⋃ dϵ[2]},
   {lhs[1]@d - rhs[1]@d, lhs[2]@d - rhs[2]@d, lhs[W]@d - rhs[W]@d}
  ];
CapEq[d_, V_, C_] := Module[
   {lhs = V ** (C // dΔ[1, 1, 2]) // dc[1] // dc[2], rhs = C ⋃ (C // dσ[1, 2])},
   {lhs[W]@d - rhs[W]@d}
  ];
VerticalFlipEq[d_, V_] :=
  Module[{lhs = V ** (V // dS[1] // dS[2]), rhs = R⁺[1, 2]},
   {lhs[1]@d - rhs[1]@d, lhs[2]@d - rhs[2]@d, lhs[W]@d - rhs[W]@d}
  ];
```

```
{V, C}
```

$$\left\{M\left[\left\{1 \to LS\left[\overline{1}\,\alpha s[1,1] + \overline{2}\,\alpha s[1,2], \overline{12}\,\alpha s[2,1], \overline{1\overline{12}}\,\alpha s[3,1] + \overline{\overline{12}2}\,\alpha s[3,2]\right],\right.\right.$$
$$\left.2 \to LS\left[\overline{1}\,\beta s[1,1] + \overline{2}\,\beta s[1,2], \overline{12}\,\beta s[2,1], \overline{1\overline{12}}\,\beta s[3,1] + \overline{\overline{12}2}\,\beta s[3,2]\right]\right\},$$
$$CWS\left[\widehat{1}\,\gamma s[1,1] + \widehat{2}\,\gamma s[1,2], \widehat{11}\,\gamma s[2,1] + \widehat{12}\,\gamma s[2,2] + \widehat{22}\,\gamma s[2,3],\right.$$
$$\left.\left.\widehat{111}\,\gamma s[3,1] + \widehat{112}\,\gamma s[3,2] + \widehat{122}\,\gamma s[3,3] + \widehat{222}\,\gamma s[3,4]\right]\right],$$
$$M\left[\{1 \to LS[0,0,0]\}, CWS\left[0, \widehat{11}\,\kappa s[2], 0\right]\right]\Big\}$$

```
HardR4[2, V]
```

$$\left\{0, 0, -\frac{\langle 12\rangle}{2} - \langle 12\rangle\,\alpha s[1,2] + \langle 12\rangle\,\beta s[1,1], 0\right\}$$

```
HardR4[2, V] // μCoefficients
```

$$\left\{\{0\}, \{0\}, \left\{-\frac{1}{2} - \alpha s[1,2] + \beta s[1,1]\right\}, \{0\}\right\}$$

```
TwistEq[1, V] // μCoefficients
```

$$\left\{\left\{\frac{1}{2} + \alpha s[1,2] - \beta s[1,1], \alpha s[1,1] - \beta s[1,2]\right\},\right.$$
$$\left\{-\frac{1}{2} - \alpha s[1,2] + \beta s[1,1], -\alpha s[1,1] + \beta s[1,2]\right\},$$
$$\left.\{\gamma s[1,1] - \gamma s[1,2], -\gamma s[1,1] + \gamma s[1,2]\}\right\}$$

```
CapEq[1, V, C] // μCoefficients
```

$$\{\{-\alpha s[1,1] + \gamma s[1,1], -\beta s[1,2] + \gamma s[1,2]\}\}$$

```
VerticalFlipEq[1, V] // μCoefficients
```

$$\{\{2\,\alpha s[1,1], 2\,\alpha s[1,2]\}, \{-1 + 2\,\beta s[1,1], 2\,\beta s[1,2]\}, \{\alpha s[1,1], \beta s[1,2]\}\}$$

```
UnitarityEq[1, V] // μCoefficients
```

$$\{\{0\}, \{0\}, \{-\alpha s[1,1] + 2\,\gamma s[1,1], -\beta s[1,2] + 2\,\gamma s[1,2]\}\}$$

```
Solve[(# == 0) & /@ Union[μCoefficients[{
     HardR4[2, V], TwistEq[1, V], CapEq[1, V, C], UnitarityEq[1, V]
    }]]]
```

$$\left\{\left\{\alpha s[1,2] \to -\frac{1}{2} + \beta s[1,1], \alpha s[1,1] \to 0, \beta s[1,2] \to 0, \gamma s[1,1] \to 0, \gamma s[1,2] \to 0\right\}\right\}$$

```
sol1 = Solve[(# == 0) & /@ Union[μCoefficients[{
      HardR4[2, V], TwistEq[1, V], CapEq[1, V, C], VerticalFlipEq[1, V]
     }]]]
```

$$\left\{\left\{\alpha s[1,1] \to 0, \alpha s[1,2] \to 0, \beta s[1,1] \to \frac{1}{2}, \beta s[1,2] \to 0, \gamma s[1,1] \to 0, \gamma s[1,2] \to 0\right\}\right\}$$

```
sol1 /. Rule → Set; {V, C}
```

$$\left\{M\left[\left\{1 \to LS\left[0, \overline{12}\,\alpha s[2,1], \overline{1\overline{12}}\,\alpha s[3,1] + \overline{\overline{12}2}\,\alpha s[3,2]\right],\right.\right.$$
$$\left.2 \to LS\left[\frac{\overline{1}}{2}, \overline{12}\,\beta s[2,1], \overline{1\overline{12}}\,\beta s[3,1] + \overline{\overline{12}2}\,\beta s[3,2]\right]\right\},$$
$$CWS\left[0, \widehat{11}\,\gamma s[2,1] + \widehat{12}\,\gamma s[2,2] + \widehat{22}\,\gamma s[2,3],\right.$$
$$\left.\left.\widehat{111}\,\gamma s[3,1] + \widehat{112}\,\gamma s[3,2] + \widehat{122}\,\gamma s[3,3] + \widehat{222}\,\gamma s[3,4]\right]\right],$$
$$\left.M\left[\{1 \to LS[0,0,0]\}, CWS\left[0, \widehat{11}\,\kappa s[2], 0\right]\right]\right\}$$

```
UnitarityEq[2, V]
```

$$\{0, 0, CW[12]\,\alpha s[2,1] - CW[12]\,\beta s[2,1] + 2\,CW[11]\,\gamma s[2,1] + 2\,CW[12]\,\gamma s[2,2] + 2\,CW[22]\,\gamma s[2,3]\}$$

```
HardR4[3, V] // μCoefficients
```

$$\left\{\{0\}, \{0\}, \left\{-\frac{1}{24} - \alpha s[2,1], \frac{1}{12} + \beta s[2,1]\right\}, \{0\}\right\}$$

```
TwistEq[2, V] // μCoefficients
```

$$\left\{\left\{\frac{1}{8} + \alpha s[2,1] + \beta s[2,1]\right\}, \left\{\frac{1}{8} + \alpha s[2,1] + \beta s[2,1]\right\},\right.$$
$$\left.\{\gamma s[2,1] - \gamma s[2,3], -\gamma s[2,1] + \gamma s[2,3]\}\right\}$$

```
CapEq[2, V, C] // μCoefficients
```

$$\{\{\alpha s[2,1] - \beta s[2,1] + \gamma s[2,2] + 2\,\kappa s[2], \gamma s[2,1], \gamma s[2,3]\}\}$$

```
sol2 = Solve[(# == 0) & /@ Union[μCoefficients[{
       HardR4[3, V], TwistEq[2, V], UnitarityEq[2, V], CapEq[2, V, C]
      }]]]
```

$$\left\{\left\{\alpha s[2,1] \to -\frac{1}{24}, \beta s[2,1] \to -\frac{1}{12},\right.\right.$$
$$\left.\left.\gamma s[2,1] \to 0, \gamma s[2,2] \to -\frac{1}{48}, \gamma s[2,3] \to 0, \kappa s[2] \to -\frac{1}{96}\right\}\right\}$$

```
sol2 /. Rule → Set; {V, C}
```

$$\left\{M\left[\left\{1 \to LS\left[0, -\frac{\overline{12}}{24}, \overline{1\overline{12}}\,\alpha s[3,1] + \overline{\overline{12}2}\,\alpha s[3,2]\right],\right.\right.$$
$$\left.2 \to LS\left[\frac{\overline{1}}{2}, -\frac{\overline{12}}{12}, \overline{1\overline{12}}\,\beta s[3,1] + \overline{\overline{12}2}\,\beta s[3,2]\right]\right\},$$
$$CWS\left[0, -\frac{\widehat{12}}{48}, \widehat{111}\,\gamma s[3,1] + \widehat{112}\,\gamma s[3,2] + \widehat{122}\,\gamma s[3,3] + \widehat{222}\,\gamma s[3,4]\right]\right],$$
$$\left.M\left[\{1 \to LS[0,0,0]\}, CWS\left[0, -\frac{\widehat{11}}{96}, 0\right]\right]\right\}$$

```
UnitarityEq[3, V] // μCoefficients
```

$$\{\{0\}, \{0\}, \{\alpha s[3, 1] - \beta s[3, 1] + 2\gamma s[3, 2], -\alpha s[3, 2] + \beta s[3, 2] + 2\gamma s[3, 3], 2\gamma s[3, 1], 2\gamma s[3, 4]\}\}$$

```
HardR4[4, V] // μCoefficients
```

$$\{\{0\}, \{0\}, \{-\alpha s[3, 1], -\alpha s[3, 2] + \beta s[3, 1], \beta s[3, 2]\}, \{0\}\}$$

```
TwistEq[3, V] // μCoefficients
```

$$\{\{\alpha s[3, 1] - \beta s[3, 2], \alpha s[3, 2] - \beta s[3, 1]\}, \{-\alpha s[3, 1] + \beta s[3, 2], -\alpha s[3, 2] + \beta s[3, 1]\}, \{\gamma s[3, 1] - \gamma s[3, 4], -\gamma s[3, 1] + \gamma s[3, 4], \gamma s[3, 2] - \gamma s[3, 3], -\gamma s[3, 2] + \gamma s[3, 3]\}\}$$

```
CapEq[3, V, C] // μCoefficients
```

$$\{\{\alpha s[3, 1] - \beta s[3, 1] + \gamma s[3, 2], -\alpha s[3, 2] + \beta s[3, 2] + \gamma s[3, 3], \gamma s[3, 1], \gamma s[3, 4]\}\}$$

```
sol3 = Solve[(# == 0) & /@ Union[μCoefficients[{
       HardR4[4, V], TwistEq[3, V], UnitarityEq[3, V], CapEq[3, V, C]
      }]]]
```

$$\{\{\alpha s[3, 1] \to 0, \alpha s[3, 2] \to 0, \beta s[3, 1] \to 0, \beta s[3, 2] \to 0, \gamma s[3, 1] \to 0, \gamma s[3, 2] \to 0, \gamma s[3, 3] \to 0, \gamma s[3, 4] \to 0\}\}$$

```
sol3 /. Rule → Set; {V, C}
```

$$\left\{M\left[\left\{1 \to LS\left[0, -\frac{\overline{12}}{24}, 0\right], 2 \to LS\left[\frac{\overline{1}}{2}, -\frac{\overline{12}}{12}, 0\right]\right\}, CWS\left[0, -\frac{\widehat{12}}{48}, 0\right]\right], M\left[\{1 \to LS[0, 0, 0]\}, CWS\left[0, -\frac{\widehat{11}}{96}, 0\right]\right]\right\}$$

```
UnitarityEq[4, V] // μCoefficients
```

$$\left\{\{0\}, \{0\}, \left\{-\frac{1}{576} + \alpha s[4, 1] - \beta s[4, 1] + 2\gamma s[4, 2], -\frac{1}{1152} + \alpha s[4, 2] - \beta s[4, 2] + 2\gamma s[4, 3], -2\alpha s[4, 2] + 2\beta s[4, 2] + 2\gamma s[4, 4], \alpha s[4, 3] - \beta s[4, 3] + 2\gamma s[4, 5], 2\gamma s[4, 1], 2\gamma s[4, 6]\right\}\right\}$$

```
sol4 = Solve[(# == 0) & /@ Union[μCoefficients[{
       HardR4[5, V], TwistEq[4, V], UnitarityEq[4, V], CapEq[4, V, C]
      }]]]
```

$$\left\{\left\{\alpha s[4, 1] \to \frac{7}{5760}, \beta s[4, 1] \to \frac{1}{5760}, \alpha s[4, 2] \to -\frac{7}{5760}, \alpha s[4, 3] \to \frac{1}{1440}, \beta s[4, 2] \to -\frac{1}{720}, \beta s[4, 3] \to \frac{1}{720}, \gamma s[4, 1] \to 0, \gamma s[4, 2] \to \frac{1}{2880}, \gamma s[4, 3] \to \frac{1}{2880}, \gamma s[4, 4] \to \frac{1}{5760}, \gamma s[4, 5] \to \frac{1}{2880}, \gamma s[4, 6] \to 0, \kappa s[4] \to \frac{1}{11\,520}\right\}\right\}$$

```
sol4 /. Rule → Set; $SeriesShowDegree = 4; {V, C}
```

$$\left\{M\left[\left\{1 \to LS\left[0, -\frac{\overline{12}}{24}, 0, \frac{7\,\overline{1\,\overline{1\,\overline{12}}}}{5760} - \frac{7\,\overline{1\,\overline{12\,2}}}{5760} + \frac{\overline{\overline{12}\,2\,2}}{1440}\right],\right.\right.$$

$$\left.2 \to LS\left[\frac{\overline{1}}{2}, -\frac{\overline{12}}{12}, 0, \frac{\overline{1\,\overline{1\,\overline{12}}}}{5760} - \frac{1}{720}\,\overline{1\,\overline{12\,2}} + \frac{1}{720}\,\overline{\overline{12}\,2\,2}\right]\right\},$$

$$CWS\left[0, -\frac{\widehat{12}}{48}, 0, \frac{\widehat{1112}}{2880} + \frac{\widehat{1122}}{2880} + \frac{\widehat{1212}}{5760} + \frac{\widehat{1222}}{2880}\right]\Big],$$

$$M\left[\{1 \to LS[0, 0, 0, 0]\}, CWS\left[0, -\frac{\widehat{11}}{96}, 0, \frac{\widehat{1111}}{11\,520}\right]\right]\Big\}$$

```
VerticalFlipEq[#, V] & /@ {2, 3, 4}
```

```
{{0, 0, 0}, {0, 0, 0}, {0, 0, 0}}
```

```
sol5 = Solve[(# == 0) & /@ Union[μCoefficients[{
       HardR4[6, V], TwistEq[5, V], UnitarityEq[5, V], CapEq[5, V, C]
      }]]]
```

$$\left\{\left\{\alpha s[5, 1] \to 0, \alpha s[5, 3] \to 0, \beta s[5, 1] \to -\frac{1}{7680}, \alpha s[5, 6] \to 0, \alpha s[5, 2] \to 0,\right.\right.$$

$$\alpha s[5, 4] \to 0, \beta s[5, 2] \to \frac{1}{3840}, \alpha s[5, 5] \to 0, \beta s[5, 3] \to -\frac{1}{6912}, \beta s[5, 4] \to 0,$$

$$\beta s[5, 5] \to 0, \beta s[5, 6] \to 0, \gamma s[5, 1] \to 0, \gamma s[5, 2] \to 0, \gamma s[5, 3] \to 0,$$

$$\left.\gamma s[5, 4] \to 0, \gamma s[5, 5] \to 0, \gamma s[5, 6] \to 0, \gamma s[5, 7] \to 0, \gamma s[5, 8] \to 0\right\}\Big\}$$

```
sol5 /. Rule → Set; $SeriesShowDegree = 5; {V, C}
```

$$\left\{M\left[\left\{1 \to LS\left[0, -\frac{\overline{12}}{24}, 0, \frac{7\,\overline{1\,\overline{1\,\overline{12}}}}{5760} - \frac{7\,\overline{1\,\overline{12\,2}}}{5760} + \frac{\overline{\overline{12}\,2\,2}}{1440}, 0\right], 2 \to\right.\right.$$

$$\left.LS\left[\frac{\overline{1}}{2}, -\frac{\overline{12}}{12}, 0, \frac{\overline{1\,\overline{1\,\overline{12}}}}{5760} - \frac{1}{720}\,\overline{1\,\overline{12\,2}} + \frac{1}{720}\,\overline{\overline{12}\,2\,2}, -\frac{\overline{11\,\overline{1\,\overline{12}}}}{7680} + \frac{\overline{11\,\overline{12\,2}}}{3840} - \frac{\overline{\overline{12}\,\overline{12}}}{6912}\right]\right\},$$

$$CWS\left[0, -\frac{\widehat{12}}{48}, 0, \frac{\widehat{1112}}{2880} + \frac{\widehat{1122}}{2880} + \frac{\widehat{1212}}{5760} + \frac{\widehat{1222}}{2880}, 0\right]\Big],$$

$$M\left[\{1 \to LS[0, 0, 0, 0, 0]\}, CWS\left[0, -\frac{\widehat{11}}{96}, 0, \frac{\widehat{1111}}{11\,520}, 0\right]\right]\Big\}$$

```
VerticalFlipEq[5, V]
```

```
{0, 0, 0}
```

```
sol6 = Solve[(# == 0) & /@ Union[μCoefficients[{
       HardR4[7, V], TwistEq[6, V], UnitarityEq[6, V], CapEq[6, V, C]
      }]]]
```

$$\left\{\left\{\alpha s[6,1] \to -\frac{31}{967\,680},\ \alpha s[6,3] \to -\frac{31}{645\,120},\ \beta s[6,1] \to -\frac{1}{645\,120},\right.\right.$$
$$\alpha s[6,9] \to -\frac{1}{60\,480},\ \alpha s[6,2] \to \frac{31}{483\,840},\ \beta s[6,2] \to \frac{23}{483\,840},\ \alpha s[6,7] \to \frac{13}{241\,920},$$
$$\alpha s[6,4] \to -\frac{83}{967\,680},\ \beta s[6,3] \to -\frac{41}{580\,608},\ \alpha s[6,8] \to \frac{101}{1\,451\,520},$$
$$\alpha s[6,5] \to -\frac{31}{725\,760},\ \alpha s[6,6] \to \frac{527}{5\,806\,080},\ \beta s[6,4] \to -\frac{13}{161\,280},\ \beta s[6,5] \to -\frac{1}{22\,680},$$
$$\beta s[6,6] \to \frac{71}{483\,840},\ \beta s[6,7] \to \frac{1}{15\,120},\ \beta s[6,8] \to \frac{1}{12\,096},\ \beta s[6,9] \to -\frac{1}{30\,240},$$
$$\gamma s[6,1] \to 0,\ \gamma s[6,2] \to -\frac{1}{120\,960},\ \gamma s[6,3] \to -\frac{1}{120\,960},\ \gamma s[6,4] \to -\frac{1}{120\,960},$$
$$\gamma s[6,5] \to -\frac{1}{120\,960},\ \gamma s[6,6] \to -\frac{1}{241\,920},\ \gamma s[6,7] \to -\frac{1}{120\,960},\ \gamma s[6,8] \to -\frac{1}{120\,960},$$
$$\gamma s[6,9] \to -\frac{1}{120\,960},\ \gamma s[6,10] \to -\frac{1}{362\,880},\ \gamma s[6,11] \to -\frac{1}{120\,960},$$
$$\left.\left.\gamma s[6,12] \to -\frac{1}{241\,920},\ \gamma s[6,13] \to -\frac{1}{120\,960},\ \gamma s[6,14] \to 0,\ \kappa s[6] \to -\frac{1}{725\,760}\right\}\right\}$$

```
sol6 /. Rule → Set; $SeriesShowDegree = 6; {V, C}
```

$$\left\{M\left[\left\{1 \to LS\left[0, -\frac{\overline{12}}{24}, 0, \frac{7\,\overline{1\,\overline{1\,\overline{12}}}}{5760} - \frac{7\,\overline{1\,\overline{12\,2}}}{5760} + \frac{\overline{12\,2\,2}}{1440},\right.\right.\right.$$

$$0, -\frac{31\,\overline{1\,\overline{1\,\overline{1\,\overline{1\,\overline{12}}}}}}{967\,680} + \frac{31\,\overline{1\,\overline{1\,\overline{1\,\overline{12\,2}}}}}{483\,840} - \frac{83\,\overline{1\,\overline{1\,\overline{12\,2\,2}}}}{967\,680} - \frac{31\,\overline{1\,\overline{12}\,\overline{12\,2}}}{725\,760} -$$

$$\left.\frac{31\,\overline{1\,\overline{1\,\overline{12}\,\overline{12}}}}{645\,120} + \frac{13\,\overline{1\,\overline{12\,2\,2}}}{241\,920} + \frac{101\,\overline{12\,\overline{12\,2\,2}}}{1\,451\,520} + \frac{527\,\overline{1\,\overline{12\,2\,12}}}{5\,806\,080} - \frac{\overline{12\,2\,2\,2}}{60\,480}\right],$$

$$2 \to LS\left[\frac{\overline{1}}{2}, -\frac{\overline{12}}{12}, 0, \frac{\overline{1\,\overline{1\,\overline{12}}}}{5760} - \frac{1}{720}\,\overline{1\,\overline{12\,2}} + \frac{1}{720}\,\overline{\overline{12\,2}\,2}, -\frac{\overline{11\,\overline{1\,\overline{12}}}}{7680} + \frac{\overline{11\,\overline{12\,2}}}{3840} - \frac{\overline{1\,\overline{12}\,\overline{12}}}{6912},\right.$$

$$-\frac{\overline{1\,1\,\overline{1\,\overline{1\,\overline{12}}}}}{645\,120} + \frac{23\,\overline{1\,1\,\overline{1\,\overline{12\,2}}}}{483\,840} - \frac{13\,\overline{1\,1\,\overline{12\,2\,2}}}{161\,280} - \frac{\overline{1\,\overline{12}\,\overline{12\,2}}}{22\,680} -$$

$$\left.\left.\frac{41\,\overline{1\,\overline{1\,\overline{12}\,\overline{12}}}}{580\,608} + \frac{\overline{1\,\overline{12\,2\,2}}}{15\,120} + \frac{\overline{12\,\overline{12\,2\,2}}}{12\,096} + \frac{71\,\overline{1\,\overline{12\,2\,12}}}{483\,840} - \frac{\overline{12\,2\,2\,2}}{30\,240}\right]\right\},$$

$$CWS\left[0, -\frac{\widehat{12}}{48}, 0, \frac{\widehat{1112}}{2880} + \frac{\widehat{1122}}{2880} + \frac{\widehat{1212}}{5760} + \frac{\widehat{1222}}{2880}, 0, -\frac{\widehat{111112}}{120\,960} - \frac{\widehat{111122}}{120\,960} - \frac{\widehat{111212}}{120\,960} - \frac{\widehat{111222}}{120\,960} -\right.$$

$$\left.\frac{\widehat{112112}}{241\,920} - \frac{\widehat{112122}}{120\,960} - \frac{\widehat{112212}}{120\,960} - \frac{\widehat{112222}}{120\,960} - \frac{\widehat{121212}}{362\,880} - \frac{\widehat{121222}}{120\,960} - \frac{\widehat{122122}}{241\,920} - \frac{\widehat{122222}}{120\,960}\right]\Big],$$

$$M\left[\{1 \to LS[0, 0, 0, 0, 0, 0]\}, CWS\left[0, -\frac{\widehat{11}}{96}, 0, \frac{\widehat{1111}}{11\,520}, 0, -\frac{\widehat{111111}}{725\,760}\right]\right]\Big\}$$

```
VerticalFlipEq[6, V]
```

```
{0, 0, 0}
```

```
sol7 = Solve[(# == 0) & /@ Union[μCoefficients[{
       HardR4[8, V], TwistEq[7, V], UnitarityEq[7, V], CapEq[7, V, C]
      }]]]
```

$$\left\{\left\{\alpha s[7,1]\to 0,\ \alpha s[7,3]\to 0,\ \beta s[7,1]\to \frac{1}{258\,048},\ \alpha s[7,18]\to 0,\ \alpha s[7,2]\to 0,\right.\right.$$
$$\alpha s[7,5]\to 0,\ \alpha s[7,14]\to 0,\ \beta s[7,2]\to -\frac{5}{387\,072},\ \alpha s[7,4]\to 0,\ \alpha s[7,16]\to 0,$$
$$\beta s[7,3]\to \frac{5}{290\,304},\ \alpha s[7,10]\to 0,\ \alpha s[7,6]\to 0,\ \alpha s[7,7]\to 0,\ \alpha s[7,8]\to 0,$$
$$\beta s[7,4]\to \frac{1}{64\,512},\ \alpha s[7,17]\to 0,\ \beta s[7,5]\to -\frac{7}{1\,658\,880},\ \alpha s[7,9]\to 0,$$
$$\alpha s[7,11]\to 0,\ \beta s[7,6]\to \frac{1}{96\,768},\ \alpha s[7,13]\to 0,\ \beta s[7,7]\to -\frac{1}{60\,480},$$
$$\alpha s[7,12]\to 0,\ \beta s[7,8]\to -\frac{1}{96\,768},\ \beta s[7,9]\to -\frac{1}{207\,360},\ \alpha s[7,15]\to 0,$$
$$\beta s[7,10]\to 0,\ \beta s[7,11]\to -\frac{17}{1\,451\,520},\ \beta s[7,12]\to 0,\ \beta s[7,13]\to \frac{1}{207\,360},$$
$$\beta s[7,14]\to 0,\ \beta s[7,15]\to 0,\ \beta s[7,16]\to 0,\ \beta s[7,17]\to 0,\ \beta s[7,18]\to 0,$$
$$\gamma s[7,1]\to 0,\ \gamma s[7,2]\to 0,\ \gamma s[7,3]\to 0,\ \gamma s[7,4]\to 0,\ \gamma s[7,5]\to 0,$$
$$\gamma s[7,6]\to 0,\ \gamma s[7,7]\to 0,\ \gamma s[7,8]\to 0,\ \gamma s[7,9]\to 0,\ \gamma s[7,10]\to 0,$$
$$\gamma s[7,11]\to 0,\ \gamma s[7,12]\to 0,\ \gamma s[7,13]\to 0,\ \gamma s[7,14]\to 0,\ \gamma s[7,15]\to 0,$$
$$\left.\left.\gamma s[7,16]\to 0,\ \gamma s[7,17]\to 0,\ \gamma s[7,18]\to 0,\ \gamma s[7,19]\to 0,\ \gamma s[7,20]\to 0\right\}\right\}$$

```
sol7 /. Rule → Set; $SeriesShowDegree = 7; {V, C}
```

$$\left\{M\left[\left\{1 \to LS\left[0, -\frac{\overline{12}}{24}, 0, \frac{7\,\overline{1\,\overline{112}}}{5760} - \frac{7\,\overline{1\,\overline{122}}}{5760} + \frac{\overline{122\,2}}{1440}, 0,\right.\right.\right.$$

$$-\frac{31\,\overline{111\,\overline{112}}}{967\,680} + \frac{31\,\overline{111\,\overline{122}}}{483\,840} - \frac{83\,\overline{11\,\overline{122\,2}}}{967\,680} - \frac{31\,\overline{1\,\overline{12}\,\overline{122}}}{725\,760} - \frac{31\,\overline{1\,\overline{112}\,\overline{12}}}{645\,120} +$$

$$\left.\frac{13\,\overline{1\,\overline{122\,2}}}{241\,920} + \frac{101\,\overline{12}\,\overline{122\,2}}{1\,451\,520} + \frac{527\,\overline{1\,\overline{122}\,\overline{12}}}{5\,806\,080} - \frac{\overline{122\,222}}{60\,480}, 0\right],$$

$$2 \to LS\left[\frac{1}{2}, -\frac{\overline{12}}{12}, 0, \frac{\overline{1\,\overline{112}}}{5760} - \frac{1}{720}\,\overline{1\,\overline{122}} + \frac{1}{720}\,\overline{122\,2}, -\frac{\overline{11\,\overline{112}}}{7680} + \frac{\overline{11\,\overline{122}}}{3840} - \frac{\overline{1\,\overline{12}\,\overline{12}}}{6912},\right.$$

$$-\frac{\overline{111\,\overline{112}}}{645\,120} + \frac{23\,\overline{111\,\overline{122}}}{483\,840} - \frac{13\,\overline{11\,\overline{122\,2}}}{161\,280} - \frac{\overline{1\,\overline{12}\,\overline{122}}}{22\,680} -$$

$$\frac{41\,\overline{1\,\overline{112}\,\overline{12}}}{580\,608} + \frac{\overline{1\,\overline{122\,22}}}{15\,120} + \frac{\overline{12}\,\overline{122\,2}}{12\,096} + \frac{71\,\overline{1\,\overline{122}\,\overline{12}}}{483\,840} - \frac{\overline{122\,222}}{30\,240},$$

$$\frac{\overline{1111\,\overline{112}}}{258\,048} - \frac{5\,\overline{1111\,\overline{122}}}{387\,072} + \frac{\overline{111\,\overline{122\,2}}}{64\,512} + \frac{\overline{11\,\overline{12}\,\overline{122}}}{96\,768} + \frac{5\,\overline{11\,\overline{112}\,\overline{12}}}{290\,304} - \frac{\overline{11\,\overline{122\,22}}}{96\,768} -$$

$$\left.\left.\frac{17\,\overline{1\,\overline{12}\,\overline{122\,2}}}{1\,451\,520} - \frac{\overline{11\,\overline{122}\,\overline{12}}}{60\,480} - \frac{\overline{1\,\overline{12}\,\overline{1\,\overline{122}}}}{207\,360} - \frac{7\,\overline{1\,\overline{112}\,\overline{1\,\overline{12}}}}{1\,658\,880} + \frac{\overline{1\,\overline{122\,2}\,\overline{12}}}{207\,360}\right]\right\},$$

$$CWS\left[0, -\frac{\widehat{12}}{48}, 0, \frac{\widehat{1112}}{2880} + \frac{\widehat{1122}}{2880} + \frac{\widehat{1212}}{5760} + \frac{\widehat{1222}}{2880}, 0,\right.$$

$$-\frac{\widehat{111112}}{120\,960} - \frac{\widehat{111122}}{120\,960} - \frac{\widehat{111212}}{120\,960} - \frac{\widehat{111222}}{120\,960} - \frac{\widehat{112112}}{241\,920} - \frac{\widehat{112122}}{120\,960} -$$

$$\left.\frac{\widehat{112212}}{120\,960} - \frac{\widehat{112222}}{120\,960} - \frac{\widehat{121212}}{362\,880} - \frac{\widehat{121222}}{120\,960} - \frac{\widehat{122122}}{241\,920} - \frac{\widehat{122222}}{120\,960}, 0\right]\Big],$$

$$M\left[\{1 \to LS[0, 0, 0, 0, 0, 0, 0]\}, CWS\left[0, -\frac{\widehat{11}}{96}, 0, \frac{\widehat{1111}}{11\,520}, 0, -\frac{\widehat{111111}}{725\,760}, 0\right]\right]\Big\}$$

```
VerticalFlipEq[7, V]
```

```
{0, 0, 0}
```

```
sol8 = Solve[(# == 0) & /@ Union[μCoefficients[{
       HardR4[9, V], TwistEq[8, V], UnitarityEq[8, V], CapEq[8, V, C]
      }]]]
```

$$\left\{\left\{\alpha s[8, 1] \to \frac{127}{154\,828\,800}, \beta s[8, 1] \to \frac{1}{77\,414\,400}, \alpha s[8, 3] \to \frac{127}{30\,965\,760},\right.\right.$$

$$\alpha s[8,30]\to\frac{1}{2\,419\,200},\ \alpha s[8,5]\to-\frac{127}{77\,414\,400},\ \alpha s[8,2]\to-\frac{127}{51\,609\,600},$$
$$\alpha s[8,4]\to\frac{2399}{464\,486\,400},\ \beta s[8,2]\to-\frac{587}{464\,486\,400},\ \alpha s[8,25]\to-\frac{19}{9\,676\,800},$$
$$\alpha s[8,10]\to-\frac{733}{23\,224\,320}-6\,\beta s[8,27],\ \beta s[8,3]\to\frac{929}{55\,738\,368}+2\,\beta s[8,27],$$
$$\alpha s[8,16]\to-\frac{7549}{348\,364\,800}-4\,\beta s[8,27],\ \alpha s[8,6]\to\frac{4589}{348\,364\,800}+2\,\beta s[8,27],$$
$$\alpha s[8,7]\to\frac{5783}{696\,729\,600}+4\,\beta s[8,27],\ \alpha s[8,28]\to-\frac{493}{29\,030\,400}-2\,\beta s[8,27],$$
$$\alpha s[8,8]\to-\frac{2893}{464\,486\,400},\ \beta s[8,4]\to\frac{253}{66\,355\,200},\ \alpha s[8,15]\to\frac{271}{58\,060\,800},$$
$$\beta s[8,5]\to\frac{797}{232\,243\,200}+\beta s[8,27],\ \alpha s[8,29]\to-\frac{49}{1\,382\,400}-5\,\beta s[8,27],$$
$$\alpha s[8,9]\to\frac{19}{9\,289\,728}+\beta s[8,27],\ \alpha s[8,12]\to\frac{3733}{232\,243\,200}+2\,\beta s[8,27],$$
$$\alpha s[8,20]\to\frac{1661}{87\,091\,200}+\frac{3}{2}\beta s[8,27],\ \beta s[8,6]\to-\frac{3427}{348\,364\,800}-\frac{3}{2}\beta s[8,27],$$
$$\alpha s[8,11]\to-\frac{25\,399}{1\,393\,459\,200}-\frac{3}{2}\beta s[8,27],\ \alpha s[8,24]\to-\frac{121}{7\,257\,600}-\frac{3}{2}\beta s[8,27],$$
$$\beta s[8,7]\to-\frac{4697}{99\,532\,800}-\frac{9}{2}\beta s[8,27],\ \alpha s[8,13]\to-\frac{14\,099}{696\,729\,600}-\frac{9}{2}\beta s[8,27],$$
$$\alpha s[8,14]\to-\frac{16\,483}{1\,393\,459\,200}-\frac{9}{2}\beta s[8,27],\ \beta s[8,8]\to-\frac{43}{7\,257\,600},$$
$$\alpha s[8,22]\to-\frac{1933}{348\,364\,800}-\frac{3}{2}\beta s[8,27],\ \beta s[8,9]\to\frac{281}{92\,897\,280}+\frac{3}{2}\beta s[8,27],$$
$$\alpha s[8,17]\to\frac{6857}{464\,486\,400}+\frac{3}{2}\beta s[8,27],\ \beta s[8,10]\to\frac{271}{30\,965\,760},$$
$$\alpha s[8,19]\to\frac{9907}{348\,364\,800}+\frac{9}{2}\beta s[8,27],\ \alpha s[8,26]\to\frac{629}{12\,902\,400}+6\,\beta s[8,27],$$
$$\alpha s[8,18]\to\frac{3239}{174\,182\,400}+\frac{9}{2}\beta s[8,27],\ \alpha s[8,21]\to\frac{449}{9\,676\,800}+9\,\beta s[8,27],$$
$$\beta s[8,11]\to\frac{29}{24\,883\,200}+\frac{3}{2}\beta s[8,27],\ \alpha s[8,23]\to-\frac{299}{5\,529\,600}-\frac{15}{2}\beta s[8,27],$$
$$\beta s[8,12]\to\frac{2281}{464\,486\,400},\ \beta s[8,13]\to-\frac{1}{108\,864}-3\,\beta s[8,27],$$
$$\beta s[8,14]\to\frac{1991}{174\,182\,400}-\frac{3}{2}\beta s[8,27],\ \beta s[8,15]\to\frac{73}{14\,515\,200},$$
$$\beta s[8,16]\to-\frac{5653}{1\,393\,459\,200}-\frac{3}{2}\beta s[8,27],\ \alpha s[8,27]\to-\frac{1}{30\,720}-\frac{9}{2}\beta s[8,27],$$
$$\beta s[8,17]\to\frac{47}{6\,451\,200},\ \beta s[8,18]\to\frac{41}{5\,443\,200}+3\,\beta s[8,27],$$
$$\beta s[8,19]\to\frac{151}{14\,515\,200}+\frac{3}{2}\beta s[8,27],\ \beta s[8,20]\to-\frac{1}{1\,088\,640}-2\,\beta s[8,27],$$

$$\beta s[8,21]\to -\frac{391}{17\,418\,240}-\frac{3}{2}\beta s[8,27],\ \beta s[8,22]\to -\frac{1313}{87\,091\,200}-3\beta s[8,27],$$
$$\beta s[8,23]\to -\frac{1}{92\,160},\ \beta s[8,24]\to -\frac{151}{14\,515\,200},\ \beta s[8,25]\to -\frac{1}{403\,200},$$
$$\beta s[8,26]\to \frac{2459}{87\,091\,200}+2\beta s[8,27],\ \beta s[8,28]\to -\frac{1}{172\,800},\ \beta s[8,29]\to -\frac{1}{172\,800},$$
$$\beta s[8,30]\to \frac{1}{1\,209\,600},\ \gamma s[8,1]\to 0,\ \gamma s[8,2]\to \frac{1}{4\,838\,400},\ \gamma s[8,3]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,4]\to \frac{1}{4\,838\,400},\ \gamma s[8,5]\to \frac{1}{4\,838\,400},\ \gamma s[8,6]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,7]\to \frac{1}{4\,838\,400},\ \gamma s[8,8]\to \frac{1}{4\,838\,400},\ \gamma s[8,9]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,10]\to \frac{1}{9\,676\,800},\ \gamma s[8,11]\to \frac{1}{4\,838\,400},\ \gamma s[8,12]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,13]\to \frac{1}{4\,838\,400},\ \gamma s[8,14]\to \frac{1}{4\,838\,400},\ \gamma s[8,15]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,16]\to \frac{1}{4\,838\,400},\ \gamma s[8,17]\to \frac{1}{4\,838\,400},\ \gamma s[8,18]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,19]\to \frac{1}{4\,838\,400},\ \gamma s[8,20]\to \frac{1}{4\,838\,400},\ \gamma s[8,21]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,22]\to \frac{1}{4\,838\,400},\ \gamma s[8,23]\to \frac{1}{9\,676\,800},\ \gamma s[8,24]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,25]\to \frac{1}{4\,838\,400},\ \gamma s[8,26]\to \frac{1}{4\,838\,400},\ \gamma s[8,27]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,28]\to \frac{1}{4\,838\,400},\ \gamma s[8,29]\to \frac{1}{19\,353\,600},\ \gamma s[8,30]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,31]\to \frac{1}{4\,838\,400},\ \gamma s[8,32]\to \frac{1}{4\,838\,400},\ \gamma s[8,33]\to \frac{1}{4\,838\,400},$$
$$\gamma s[8,34]\to \frac{1}{9\,676\,800},\ \gamma s[8,35]\to \frac{1}{4\,838\,400},\ \gamma s[8,36]\to 0,\ \kappa s[8]\to \frac{1}{38\,707\,200}\Big\}\Big\}$$

```
βs[8, 27] = 1; sol8 /. Rule → Set; $SeriesShowDegree = 8; {V, C}
```

$$\Big\{M\Big[\Big\{1\to LS\Big[0,\ -\frac{\overline{12}}{24},\ 0,\ \frac{7\,\overline{1\,\overline{1\,\overline{12}}}}{5760}-\frac{7\,\overline{1\,\overline{12\,2}}}{5760}+\frac{\overline{\overline{12}\,2\,2}}{1440},$$
$$0,\ -\frac{31\,\overline{1\,\overline{1\,\overline{1\,\overline{1\,\overline{12}}}}}}{967\,680}+\frac{31\,\overline{1\,\overline{1\,\overline{1\,\overline{12\,2}}}}}{483\,840}-\frac{83\,\overline{1\,\overline{1\,\overline{\overline{12}\,2\,2}}}}{967\,680}-\frac{31\,\overline{1\,\overline{\overline{12}\,\overline{12\,2}}}}{725\,760}-$$
$$\frac{31\,\overline{1\,\overline{1\,\overline{\overline{12}\,\overline{12}}}}}{645\,120}+\frac{13\,\overline{1\,\overline{\overline{12}\,2\,2\,2}}}{241\,920}+\frac{101\,\overline{\overline{12}\,\overline{12}\,\overline{12\,2\,2}}}{1\,451\,520}+\frac{527\,\overline{1\,\overline{12\,2\,\overline{12}}}}{5\,806\,080}-\frac{\overline{\overline{12\,2}\,2\,2\,2}}{60\,480},$$
$$0,\ \frac{127\,\overline{1\,1\,1\,1\,1\,\overline{1\,\overline{12}}}}{154\,828\,800}-\frac{127\,\overline{1\,1\,1\,1\,\overline{1\,\overline{12\,2}}}}{51\,609\,600}+\frac{2399\,\overline{1\,1\,1\,\overline{1\,\overline{2\,2\,2}}}}{464\,486\,400}+$$

$$\frac{696\,734\,189\,\overline{1\,1\,\overline{1\,2}\,\overline{1\,2\,2}}}{348\,364\,800}+\frac{127\,\overline{1\,1\,\overline{1\,1\,\overline{1\,2}\,\overline{1\,2}}}}{30\,965\,760}-\frac{2893\,\overline{1\,1\,\overline{1\,1\,\overline{1\,2\,2}\,2\,2}}}{464\,486\,400}-$$

$$\frac{2\,090\,214\,199\,\overline{1\,1\,\overline{1\,2}\,\overline{1\,2\,2}\,2}}{1\,393\,459\,200}+\frac{2\,786\,924\,183\,\overline{1\,1\,\overline{1\,1\,\overline{1\,2\,2}\,\overline{1\,2}}}}{696\,729\,600}+\frac{271\,\overline{1\,1\,\overline{1\,2\,2}\,2\,2\,2}}{58\,060\,800}+$$

$$\frac{783\,824\,039\,\overline{1\,\overline{1\,2}\,\overline{1\,2}\,\overline{1\,2\,2}}}{174\,182\,400}+\frac{130\,638\,461\,\overline{1\,\overline{1\,2}\,\overline{1\,2\,2}\,2\,2}}{87\,091\,200}+\frac{9\,289\,747\,\overline{1\,\overline{1\,1\,\overline{1\,2}}\,\overline{1\,2}\,\overline{1\,2\,2}}}{9\,289\,728}-$$

$$\frac{127\,\overline{1\,1\,\overline{1\,\overline{1\,2}}\,\overline{1\,\overline{1\,2}}}}{77\,414\,400}-\frac{3\,135\,297\,299\,\overline{1\,1\,\overline{1\,2\,2}\,\overline{1\,2\,2}}}{696\,729\,600}-\frac{6\,270\,582\,883\,\overline{1\,1\,\overline{1\,2\,2}\,2\,\overline{1\,2}}}{1\,393\,459\,200}-$$

$$\frac{522\,549\,133\,\overline{1\,\overline{1\,2\,2}\,\overline{1\,2\,2}\,2}}{348\,364\,800}-\frac{139\,346\,653\,\overline{1\,1\,\overline{1\,2}\,\overline{1\,2\,\overline{1\,2}}}}{23\,224\,320}-\frac{19\,\overline{1\,\overline{1\,2\,2}\,2\,2\,2\,2}}{9\,676\,800}+$$

$$\frac{77\,415\,029\,\overline{\overline{1\,2}\,\overline{1\,2}\,\overline{1\,2\,2}\,2}}{12\,902\,400}-\frac{58\,061\,293\,\overline{\overline{1\,2}\,\overline{1\,2\,2}\,2\,2\,2}}{29\,030\,400}+\frac{696\,736\,457\,\overline{\overline{1\,\overline{1\,2}}\,\overline{1\,\overline{1\,2\,2}}\,2}}{464\,486\,400}-$$

$$\frac{1\,393\,466\,749\,\overline{\overline{1\,\overline{1\,2}}\,\overline{1\,\overline{1\,2}}\,\overline{1\,\overline{1\,2}}}}{348\,364\,800}+\frac{464\,490\,133\,\overline{1\,1\,\overline{1\,2\,2}\,\overline{1\,\overline{1\,2}}}}{232\,243\,200}+\frac{1\,567\,651\,507\,\overline{1\,\overline{1\,2}\,\overline{1\,2\,2}\,\overline{1\,2}}}{348\,364\,800}-$$

$$\frac{41\,472\,299\,\overline{1\,\overline{1\,2\,2}\,2\,\overline{1\,2\,2}}}{5\,529\,600}-\frac{10\,886\,521\,\overline{1\,\overline{1\,2\,2}\,2\,2\,\overline{1\,2}}}{7\,257\,600}-\frac{6\,912\,049\,\overline{\overline{1\,2\,2}\,\overline{1\,2\,2}\,2\,2}}{1\,382\,400}-$$

$$\frac{138\,241\,\overline{\overline{1\,2}\,\overline{1\,2\,2}\,\overline{1\,2\,2}}}{30\,720}+\frac{87\,091\,649\,\overline{1\,\overline{1\,2\,2}\,\overline{1\,2}\,\overline{1\,2}}}{9\,676\,800}+\frac{\overline{1\,2\,2\,2\,2\,2\,2}}{2\,419\,200}\Big],$$

$$2\to \text{LS}\Big[\frac{\overline{1}}{2},-\frac{\overline{1\,2}}{12},0,\frac{\overline{1\,1\,\overline{1\,2}}}{5760}-\frac{1}{720}\,\overline{1\,\overline{1\,2\,2}}+\frac{1}{720}\,\overline{\overline{1\,2\,2}\,2},-\frac{\overline{1\,1\,\overline{1\,1\,\overline{1\,2}}}}{7680}+\frac{\overline{1\,1\,\overline{1\,2\,2}}}{3840}-\frac{\overline{1\,\overline{1\,2}\,\overline{1\,2}}}{6912},$$

$$-\frac{\overline{1\,1\,\overline{1\,1\,\overline{1\,2}}}}{645\,120}+\frac{23\,\overline{1\,1\,\overline{1\,1\,\overline{1\,2\,2}}}}{483\,840}-\frac{13\,\overline{1\,1\,\overline{1\,2\,2}\,2}}{161\,280}-\frac{\overline{1\,\overline{1\,2}\,\overline{1\,2\,2}}}{22\,680}-$$

$$\frac{41\,\overline{1\,\overline{1\,\overline{1\,2}}\,\overline{1\,2}}}{580\,608}+\frac{\overline{1\,\overline{1\,2\,2}\,2\,2}}{15\,120}+\frac{\overline{\overline{1\,2}\,\overline{1\,2\,2}\,2}}{12\,096}+\frac{71\,\overline{1\,\overline{1\,2\,2}\,\overline{1\,2}}}{483\,840}-\frac{\overline{\overline{1\,2\,2}\,2\,2\,2}}{30\,240},$$

$$\frac{\overbrace{1111\,1\overline{12}}}{258\,048}-\frac{\overbrace{5\,1111\,1\overline{22}}}{387\,072}+\frac{\overbrace{111\,1\overline{22}\,2}}{64\,512}+\frac{\overbrace{11\overline{12}\,1\overline{22}}}{96\,768}+\frac{\overbrace{5\,11\,1\overline{12}\,1\overline{2}}}{290\,304}-\frac{\overbrace{11\,1\overline{22}\,22}}{96\,768}-$$

$$\frac{\overbrace{17\,1\overline{12}\,1\overline{22}\,2}}{1\,451\,520}-\frac{\overbrace{11\,1\overline{22}\,1\overline{2}}}{60\,480}-\frac{\overbrace{1\overline{12}\,1\,1\overline{22}}}{207\,360}-\frac{\overbrace{7\,1\,1\overline{12}\,1\overline{12}}}{1\,658\,880}+\frac{\overbrace{1\,1\overline{22}\,2\overline{12}}}{207\,360},$$

$$\frac{\overbrace{11111\,1\overline{12}}}{77\,414\,400}-\frac{\overbrace{587\,11111\,1\overline{22}}}{464\,486\,400}+\frac{\overbrace{253\,1111\,1\overline{22}\,2}}{66\,355\,200}-\frac{\overbrace{522\,550\,627\,11\overline{12}\,1\overline{22}}}{348\,364\,800}+$$

$$\frac{\overbrace{111\,477\,665\,11\,1\overline{12}\,1\overline{2}}}{55\,738\,368}-\frac{\overbrace{43\,111\,1\overline{22}\,22}}{7\,257\,600}+\frac{\overbrace{37\,324\,829\,11\overline{12}\,1\overline{22}\,2}}{24\,883\,200}-$$

$$\frac{\overbrace{447\,902\,297\,11\,1\overline{22}\,1\overline{2}}}{99\,532\,800}+\frac{\overbrace{73\,11\,1\overline{22}\,222}}{14\,515\,200}+\frac{\overbrace{16\,329\,641\,11\overline{22}\,1\overline{22}}}{5\,443\,200}-$$

$$\frac{\overbrace{2\,177\,281\,1\overline{12}\,1\overline{22}\,22}}{1\,088\,640}+\frac{\overbrace{139\,346\,201\,1\,1\overline{12}\,1\,1\overline{22}}}{92\,897\,280}+\frac{\overbrace{232\,243\,997\,11\,1\overline{12}\,1\overline{12}}}{232\,243\,200}-$$

$$\frac{\overbrace{326\,593\,11\,1\overline{22}\,1\overline{22}}}{108\,864}-\frac{\overbrace{261\,271\,609\,11\,1\overline{22}\,2\overline{12}}}{174\,182\,400}-\frac{\overbrace{261\,274\,913\,1\,1\overline{22}\,1\overline{22}\,2}}{87\,091\,200}+$$

$$\frac{\overbrace{271\,1\,1\overline{12}\,1\overline{2}\,1\overline{2}}}{30\,965\,760}-\frac{\overbrace{1\,1\overline{22}\,2222}}{403\,200}+\frac{\overbrace{174\,184\,859\,1\overline{2}\,1\overline{2}\,1\overline{22}\,2}}{87\,091\,200}-\frac{\overbrace{1\overline{2}\,1\overline{22}\,222}}{172\,800}+$$

$$\frac{\overbrace{47\,1\overline{12}\,1\,1\overline{22}\,2}}{6\,451\,200}-\frac{\overbrace{2\,090\,194\,453\,1\overline{12}\,1\overline{12}\,1\overline{2}}}{1\,393\,459\,200}+\frac{\overbrace{2281\,11\,1\overline{22}\,1\overline{12}}}{464\,486\,400}+$$

$$\frac{\overbrace{21\,772\,951\,1\overline{12}\,1\overline{22}\,1\overline{2}}}{14\,515\,200}-\frac{\overbrace{1\,1\overline{22}\,2\,1\overline{22}}}{92\,160}-\frac{\overbrace{151\,1\,1\overline{22}\,22\overline{12}}}{14\,515\,200}-$$

$$\frac{\overbrace{1\overline{2}2\,1\overline{22}\,22}}{172\,800}+\overbrace{1\overline{2}\,1\overline{22}\,1\overline{22}}-\frac{\overbrace{26\,127\,751\,1\,1\overline{22}\,1\overline{2}\,1\overline{2}}}{17\,418\,240}+\frac{\overbrace{1\overline{22}\,22222}}{1\,209\,600}\Big]\Big\},$$

$$\text{CWS}\Big[0,-\frac{\widehat{12}}{48},0,\frac{\widehat{1112}}{2880}+\frac{\widehat{1122}}{2880}+\frac{\widehat{1212}}{5760}+\frac{\widehat{1222}}{2880},0,$$

$$-\frac{\widehat{111112}}{120\,960}-\frac{\widehat{111122}}{120\,960}-\frac{\widehat{111212}}{120\,960}-\frac{\widehat{111222}}{120\,960}-\frac{\widehat{112112}}{241\,920}-\frac{\widehat{112122}}{120\,960}-$$

$$\frac{\widehat{112212}}{120\,960}-\frac{\widehat{112222}}{120\,960}-\frac{\widehat{121212}}{362\,880}-\frac{\widehat{121222}}{120\,960}-\frac{\widehat{122122}}{241\,920}-\frac{\widehat{122222}}{120\,960},$$

$$0,\ \frac{\widehat{11111112}}{4\,838\,400}+\frac{\widehat{11111122}}{4\,838\,400}+\frac{\widehat{11111212}}{4\,838\,400}+\frac{\widehat{11111222}}{4\,838\,400}+\frac{\widehat{11112112}}{4\,838\,400}+$$

$$\frac{\widehat{11112122}}{4\,838\,400}+\frac{\widehat{11112212}}{4\,838\,400}+\frac{\widehat{11112222}}{4\,838\,400}+\frac{\widehat{11121112}}{9\,676\,800}+\frac{\widehat{11121122}}{4\,838\,400}+$$

$$\frac{\widehat{11121212}}{4\,838\,400}+\frac{\widehat{11121222}}{4\,838\,400}+\frac{\widehat{11122112}}{4\,838\,400}+\frac{\widehat{11122122}}{4\,838\,400}+\frac{\widehat{11122212}}{4\,838\,400}+$$

$$\frac{\widehat{11122222}}{4\,838\,400}+\frac{\widehat{11211212}}{4\,838\,400}+\frac{\widehat{11211222}}{4\,838\,400}+\frac{\widehat{11212122}}{4\,838\,400}+\frac{\widehat{11212212}}{4\,838\,400}+$$

$$\frac{\widehat{11212222}}{4\,838\,400}+\frac{\widehat{11221122}}{9\,676\,800}+\frac{\widehat{11221212}}{4\,838\,400}+\frac{\widehat{11221222}}{4\,838\,400}+\frac{\widehat{11222122}}{4\,838\,400}+$$

$$\frac{\widehat{11222212}}{4\,838\,400}+\frac{\widehat{11222222}}{4\,838\,400}+\frac{\widehat{12121212}}{19\,353\,600}+\frac{\widehat{12121222}}{4\,838\,400}+\frac{\widehat{12122122}}{4\,838\,400}+$$

$$\frac{\widehat{12122222}}{4\,838\,400}+\frac{\widehat{12212222}}{4\,838\,400}+\frac{\widehat{12221222}}{9\,676\,800}+\frac{\widehat{12222222}}{4\,838\,400}\Big]\Big],$$

$$M\Big[\{1\to LS[0,\,0,\,0,\,0,\,0,\,0,\,0,\,0]\},\ CWS\Big[0,\,-\frac{\widehat{11}}{96},\,0,\,\frac{\widehat{1111}}{11\,520},$$

$$0,\,-\frac{\widehat{111111}}{725\,760},\,0,\,\frac{\widehat{11111111}}{38\,707\,200}\Big]\Big]\Big\}$$

```
Save["WKOSolution8-1.m", {αs, βs, γs, κs}]
```

```
VerticalFlipEq[8, V]
```

```
{0, 0, 0}
```

```
sol9 = Solve[(# == 0) & /@ Union[μCoefficients[{
       HardR4[10, V], TwistEq[9, V], UnitarityEq[9, V], CapEq[9, V, C]
      }]]]
```

$$\Big\{\Big\{\alpha s[9,\,1]\to 0,\ \alpha s[9,\,3]\to 0,\ \beta s[9,\,1]\to -\frac{1}{9\,830\,400},\ \alpha s[9,\,9]\to 0,\ \alpha s[9,\,56]\to 0,$$

$$\alpha s[9,\,2]\to 0,\ \alpha s[9,\,5]\to 0,\ \alpha s[9,\,48]\to 0,\ \beta s[9,\,2]\to \frac{43}{88\,473\,600},\ \alpha s[9,\,4]\to 0,$$

$$\alpha s[9,\,11]\to 0,\ \beta s[9,\,3]\to \frac{1271}{619\,315\,200},\ \alpha s[9,\,53]\to 0,\ \alpha s[9,\,6]\to 0,\ \alpha s[9,\,7]\to 0,$$

$$\alpha s[9,\,30]\to 0,\ \beta s[9,\,4]\to -\frac{91}{88\,473\,600},\ \alpha s[9,\,8]\to 0,\ \alpha s[9,\,54]\to 0,$$

$$\beta s[9,\,5]\to \frac{6589}{2\,786\,918\,400},\ \alpha s[9,\,13]\to 0,\ \alpha s[9,\,10]\to 0,\ \alpha s[9,\,39]\to 0,$$

$$\beta s[9,\,6]\to -\frac{13}{1\,474\,560},\ \alpha s[9,\,12]\to 0,\ \alpha s[9,\,47]\to 0,\ \beta s[9,\,7]\to -\frac{14\,867}{928\,972\,800},$$

$$\alpha s[9,\,15]\to 0,\ \alpha s[9,\,14]\to 0,\ \alpha s[9,\,16]\to 0,\ \beta s[9,\,8]\to \frac{19}{14\,745\,600},\ \alpha s[9,\,20]\to 0,$$

$$\beta s[9, 9] \to -\frac{533}{5\,573\,836\,800}, \alpha s[9, 18] \to 0, \alpha s[9, 55] \to 0, \alpha s[9, 17] \to 0, \alpha s[9, 43] \to 0,$$
$$\beta s[9, 10] \to \frac{863}{1\,857\,945\,600}, \alpha s[9, 19] \to 0, \alpha s[9, 35] \to 0, \beta s[9, 11] \to \frac{58\,651}{3\,344\,302\,080},$$
$$\alpha s[9, 50] \to 0, \alpha s[9, 22] \to 0, \alpha s[9, 21] \to 0, \alpha s[9, 25] \to 0, \alpha s[9, 23] \to 0,$$
$$\beta s[9, 12] \to \frac{389}{44\,236\,800}, \beta s[9, 13] \to -\frac{40\,511}{5\,573\,836\,800}, \alpha s[9, 27] \to 0, \alpha s[9, 46] \to 0,$$
$$\alpha s[9, 24] \to 0, \alpha s[9, 26] \to 0, \beta s[9, 14] \to \frac{173}{22\,118\,400}, \alpha s[9, 29] \to 0, \alpha s[9, 33] \to 0,$$
$$\beta s[9, 15] \to \frac{22\,289}{2\,786\,918\,400}, \alpha s[9, 28] \to 0, \beta s[9, 16] \to -\frac{1}{1\,105\,920}, \alpha s[9, 45] \to 0,$$
$$\beta s[9, 17] \to -\frac{127}{557\,383\,680}, \alpha s[9, 51] \to 0, \beta s[9, 18] \to \frac{158\,057}{16\,721\,510\,400}, \alpha s[9, 31] \to 0,$$
$$\alpha s[9, 32] \to 0, \beta s[9, 19] \to -\frac{5483}{928\,972\,800}, \alpha s[9, 34] \to 0, \beta s[9, 20] \to \frac{221}{1\,672\,151\,040},$$
$$\alpha s[9, 52] \to 0, \alpha s[9, 36] \to 0, \beta s[9, 21] \to -\frac{41}{5\,529\,600}, \alpha s[9, 38] \to 0,$$
$$\beta s[9, 22] \to -\frac{4979}{418\,037\,760}, \alpha s[9, 37] \to 0, \beta s[9, 23] \to -\frac{1}{102\,400}, \alpha s[9, 40] \to 0,$$
$$\beta s[9, 24] \to \frac{11}{398\,131\,200}, \alpha s[9, 44] \to 0, \beta s[9, 25] \to -\frac{79\,081}{2\,786\,918\,400}, \alpha s[9, 41] \to 0,$$
$$\alpha s[9, 42] \to 0, \beta s[9, 26] \to -\frac{43}{49\,766\,400}, \beta s[9, 27] \to \frac{143}{348\,364\,800}, \beta s[9, 28] \to \frac{1217}{49\,766\,400},$$
$$\beta s[9, 29] \to \frac{2113}{348\,364\,800}, \beta s[9, 30] \to \frac{1}{2\,764\,800}, \beta s[9, 31] \to -\frac{1}{6\,531\,840},$$
$$\beta s[9, 32] \to \frac{5}{13\,934\,592}, \beta s[9, 33] \to \frac{1}{4\,354\,560}, \beta s[9, 34] \to -\frac{1}{13\,271\,040},$$
$$\alpha s[9, 49] \to 0, \beta s[9, 35] \to \frac{7}{238\,878\,720}, \beta s[9, 36] \to -\frac{1217}{69\,672\,960}, \beta s[9, 37] \to \frac{1}{61\,440},$$
$$\beta s[9, 38] \to \frac{1}{3\,483\,648}, \beta s[9, 39] \to \frac{1217}{174\,182\,400}, \beta s[9, 40] \to -\frac{1}{12\,441\,600}, \beta s[9, 41] \to 0,$$
$$\beta s[9, 42] \to 0, \beta s[9, 43] \to \frac{1}{61\,440}, \beta s[9, 44] \to 0, \beta s[9, 45] \to -\frac{1}{24\,883\,200},$$
$$\beta s[9, 46] \to 0, \beta s[9, 47] \to -\frac{1}{8\,709\,120}, \beta s[9, 48] \to 0, \beta s[9, 49] \to 0, \beta s[9, 50] \to 0,$$
$$\beta s[9, 51] \to 0, \beta s[9, 52] \to 0, \beta s[9, 53] \to 0, \beta s[9, 54] \to 0, \beta s[9, 55] \to 0,$$
$$\beta s[9, 56] \to 0, \gamma s[9, 1] \to 0, \gamma s[9, 2] \to 0, \gamma s[9, 3] \to 0, \gamma s[9, 4] \to 0, \gamma s[9, 5] \to 0,$$
$$\gamma s[9, 6] \to 0, \gamma s[9, 7] \to 0, \gamma s[9, 8] \to 0, \gamma s[9, 9] \to 0, \gamma s[9, 10] \to 0, \gamma s[9, 11] \to 0,$$
$$\gamma s[9, 12] \to 0, \gamma s[9, 13] \to 0, \gamma s[9, 14] \to 0, \gamma s[9, 15] \to 0, \gamma s[9, 16] \to 0, \gamma s[9, 17] \to 0,$$
$$\gamma s[9, 18] \to 0, \gamma s[9, 19] \to 0, \gamma s[9, 20] \to 0, \gamma s[9, 21] \to 0, \gamma s[9, 22] \to 0, \gamma s[9, 23] \to 0,$$
$$\gamma s[9, 24] \to 0, \gamma s[9, 25] \to 0, \gamma s[9, 26] \to 0, \gamma s[9, 27] \to 0, \gamma s[9, 28] \to 0, \gamma s[9, 29] \to 0,$$
$$\gamma s[9, 30] \to 0, \gamma s[9, 31] \to 0, \gamma s[9, 32] \to 0, \gamma s[9, 33] \to 0, \gamma s[9, 34] \to 0, \gamma s[9, 35] \to 0,$$
$$\gamma s[9, 36] \to 0, \gamma s[9, 37] \to 0, \gamma s[9, 38] \to 0, \gamma s[9, 39] \to 0, \gamma s[9, 40] \to 0,$$
$$\gamma s[9, 41] \to 0, \gamma s[9, 42] \to 0, \gamma s[9, 43] \to 0, \gamma s[9, 44] \to 0, \gamma s[9, 45] \to 0,$$
$$\gamma s[9, 46] \to 0, \gamma s[9, 47] \to 0, \gamma s[9, 48] \to 0, \gamma s[9, 49] \to 0, \gamma s[9, 50] \to 0,$$
$$\gamma s[9, 51] \to 0, \gamma s[9, 52] \to 0, \gamma s[9, 53] \to 0, \gamma s[9, 54] \to 0, \gamma s[9, 55] \to 0,$$

$\gamma s[9, 56] \to 0, \gamma s[9, 57] \to 0, \gamma s[9, 58] \to 0, \gamma s[9, 59] \to 0, \gamma s[9, 60] \to 0\Big\}\Big\}$

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sol9 /. Rule → Set; $SeriesShowDegree = 9; {V, C}
```

$$\Big\{M\Big[\Big\{1 \to LS\Big[0, -\frac{\overline{12}}{24}, 0, \frac{7\,\overline{1\,\overline{1\,\overline{12}}}}{5760} - \frac{7\,\overline{1\,\overline{12}\,\overline{2}}}{5760} + \frac{\overline{1\,\overline{2}\,\overline{2}\,\overline{2}}}{1440}, 0,$$

$$-\frac{31\,\overline{1\,\overline{1\,\overline{1\,\overline{12}}}}}{967\,680} + \frac{31\,\overline{1\,\overline{1\,\overline{1\,\overline{2}\,\overline{2}}}}}{483\,840} - \frac{83\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}\,\overline{2}}}{967\,680} - \frac{31\,\overline{1\,\overline{12}\,\overline{12}\,\overline{2}}}{725\,760} - \frac{31\,\overline{1\,\overline{1\,\overline{12}\,\overline{12}}}}{645\,120} +$$

$$\frac{13\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}\,\overline{2}}}{241\,920} + \frac{101\,\overline{1\,\overline{2}\,\overline{1}\,\overline{2}\,\overline{2}\,\overline{2}}}{1\,451\,520} + \frac{527\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}\,\overline{12}}}{5\,806\,080} - \frac{\overline{1}\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}}{60\,480}, 0,$$

$$\frac{127\,\overline{1\,\overline{1\,\overline{1\,\overline{1\,\overline{1\,\overline{12}}}}}}}{154\,828\,800} - \frac{127\,\overline{1\,\overline{1\,\overline{1\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}}}}}}{51\,609\,600} + \frac{2399\,\overline{1\,\overline{1\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}\,\overline{2}}}}}{464\,486\,400} + \frac{4589\,\overline{1\,\overline{1\,\overline{1\,\overline{12}\,\overline{12}}}}}{348\,364\,800} +$$

$$\frac{127\,\overline{1\,\overline{1\,\overline{1\,\overline{12}\,\overline{12}}}}}{30\,965\,760} - \frac{2893\,\overline{1\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}\,\overline{2}}}}{464\,486\,400} - \frac{25\,399\,\overline{1\,\overline{1\,\overline{12}\,\overline{12}\,\overline{2}\,\overline{2}}}}{1\,393\,459\,200} + \frac{5783\,\overline{1\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}\,\overline{12}}}}{696\,729\,600} +$$

$$\frac{271\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}}}{58\,060\,800} + \frac{3239\,\overline{1}\,\overline{2}\,\overline{1}\,\overline{2}\,\overline{1}\,\overline{2}\,\overline{2}}{174\,182\,400} + \frac{1661\,\overline{1\,\overline{1}\,\overline{2}\,\overline{1}\,\overline{2}\,\overline{2}\,\overline{2}}}{87\,091\,200} + \frac{19\,\overline{1\,\overline{1}\,\overline{2}\,\overline{1}\,\overline{1}\,\overline{2}\,\overline{2}}}{9\,289\,728} -$$

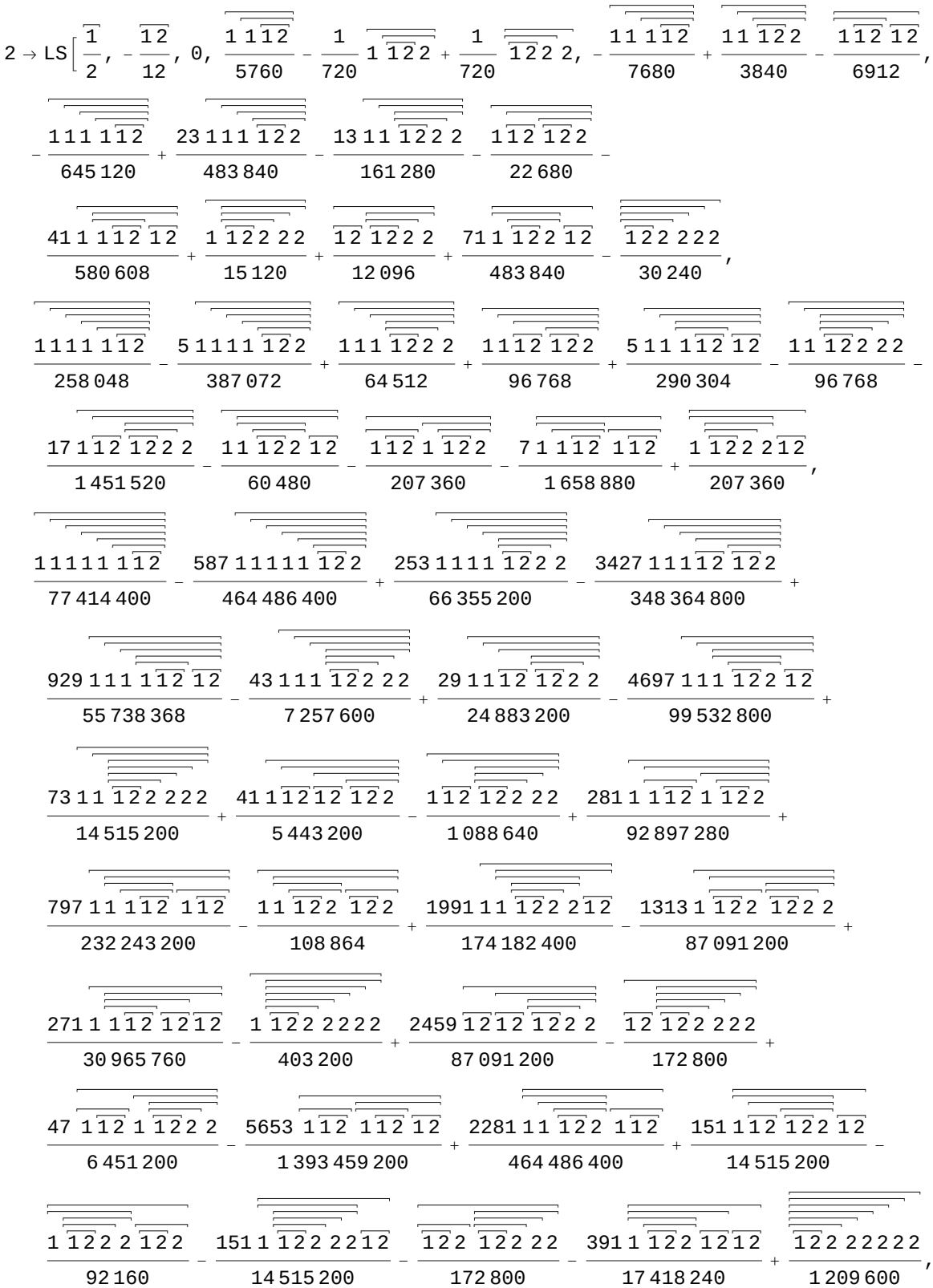
$$\frac{127\,\overline{1\,\overline{1}\,\overline{1\,\overline{2}}\,\overline{1\,\overline{1}\,\overline{2}}}}{77\,414\,400} - \frac{14\,099\,\overline{1\,\overline{1}\,\overline{1\,\overline{2}\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{2}}}}{696\,729\,600} - \frac{16\,483\,\overline{1\,\overline{1}\,\overline{1\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{1}\,\overline{2}}}}{1\,393\,459\,200} -$$

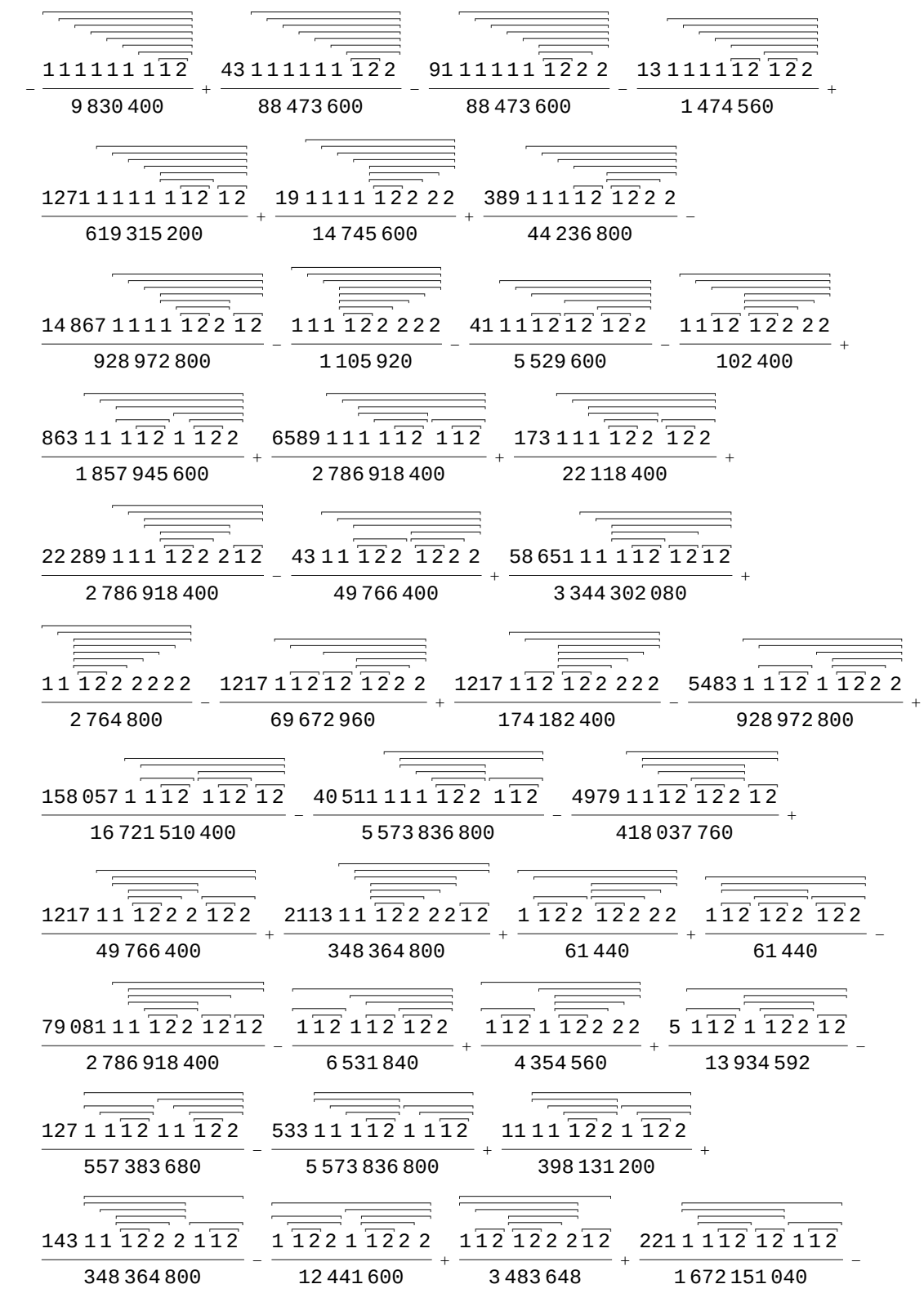
$$\frac{1933\,\overline{1}\,\overline{1\,\overline{2}\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{2}\,\overline{2}}}{348\,364\,800} - \frac{733\,\overline{1}\,\overline{1\,\overline{1}\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{1}\,\overline{2}}}{23\,224\,320} - \frac{19\,\overline{1}\,\overline{1\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}}}{9\,676\,800} + \frac{629\,\overline{1}\,\overline{2}\,\overline{1}\,\overline{2}\,\overline{1\,\overline{2}\,\overline{2}\,\overline{2}}}{12\,902\,400} -$$

$$\frac{493\,\overline{1\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}}}{29\,030\,400} + \frac{6857\,\overline{1}\,\overline{1\,\overline{2}}\,\overline{1}\,\overline{1\,\overline{2}\,\overline{2}\,\overline{2}}}{464\,486\,400} - \frac{7549\,\overline{1}\,\overline{1\,\overline{2}}\,\overline{1}\,\overline{1\,\overline{2}}\,\overline{1\,\overline{2}}}{348\,364\,800} +$$

$$\frac{3733\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}}\,\overline{1\,\overline{1}\,\overline{2}\,\overline{2}}}{232\,243\,200} + \frac{9907\,\overline{1}\,\overline{1\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{2}}}{348\,364\,800} - \frac{299\,\overline{1}\,\overline{1\,\overline{2}\,\overline{2}\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{2}}}{5\,529\,600} - \frac{121\,\overline{1}\,\overline{1\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}}}{7\,257\,600} -$$

$$\frac{49\,\overline{1\,\overline{2}\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}}}{1\,382\,400} - \frac{\overline{1\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{2}}}{30\,720} + \frac{449\,\overline{1}\,\overline{1\,\overline{2}\,\overline{2}}\,\overline{1\,\overline{2}\,\overline{1\,\overline{2}}}}{9\,676\,800} + \frac{\overline{1\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}\,\overline{2}}}{2\,419\,200}, 0\Big],$$





$$\frac{\overline{1\,\overline{1\,2}\,2\,2\,\overline{1\,2\,2}\,2}}{24\,883\,200}-\frac{\overline{1\,\overline{1\,2\,2\,2\,2\,2}\,\overline{1\,2}}}{8\,709\,120}-\frac{\overline{1\,\overline{1\,2}\,\overline{1\,2}\,\overline{1\,\overline{1\,2}\,2}}}{13\,271\,040}+\frac{\overline{7\,\overline{1\,\overline{1\,2}}\,\overline{1\,2}\,\overline{1\,2}\,\overline{1\,2}}}{238\,878\,720}\Big]\Big\},$$

$$\text{CWS}\Big[0,-\frac{\widehat{12}}{48},0,\frac{\widehat{1112}}{2880}+\frac{\widehat{1122}}{2880}+\frac{\widehat{1212}}{5760}+\frac{\widehat{1222}}{2880},0,$$

$$-\frac{\widehat{111112}}{120\,960}-\frac{\widehat{111122}}{120\,960}-\frac{\widehat{111212}}{120\,960}-\frac{\widehat{111222}}{120\,960}-\frac{\widehat{112112}}{241\,920}-\frac{\widehat{112122}}{120\,960}-$$

$$\frac{\widehat{112212}}{120\,960}-\frac{\widehat{112222}}{120\,960}-\frac{\widehat{121212}}{362\,880}-\frac{\widehat{121222}}{120\,960}-\frac{\widehat{122122}}{241\,920}-\frac{\widehat{122222}}{120\,960},$$

$$0,\frac{\widehat{11111112}}{4\,838\,400}+\frac{\widehat{11111122}}{4\,838\,400}+\frac{\widehat{11111212}}{4\,838\,400}+\frac{\widehat{11111222}}{4\,838\,400}+\frac{\widehat{11112112}}{4\,838\,400}+$$

$$\frac{\widehat{11112122}}{4\,838\,400}+\frac{\widehat{11112212}}{4\,838\,400}+\frac{\widehat{11112222}}{4\,838\,400}+\frac{\widehat{11121112}}{9\,676\,800}+\frac{\widehat{11121122}}{4\,838\,400}+$$

$$\frac{\widehat{11121212}}{4\,838\,400}+\frac{\widehat{11121222}}{4\,838\,400}+\frac{\widehat{11122112}}{4\,838\,400}+\frac{\widehat{11122122}}{4\,838\,400}+\frac{\widehat{11122212}}{4\,838\,400}+$$

$$\frac{\widehat{11122222}}{4\,838\,400}+\frac{\widehat{11211212}}{4\,838\,400}+\frac{\widehat{11211222}}{4\,838\,400}+\frac{\widehat{11212122}}{4\,838\,400}+\frac{\widehat{11212212}}{4\,838\,400}+$$

$$\frac{\widehat{11212222}}{4\,838\,400}+\frac{\widehat{11221122}}{9\,676\,800}+\frac{\widehat{11221212}}{4\,838\,400}+\frac{\widehat{11221222}}{4\,838\,400}+\frac{\widehat{11222122}}{4\,838\,400}+$$

$$\frac{\widehat{11222212}}{4\,838\,400}+\frac{\widehat{11222222}}{4\,838\,400}+\frac{\widehat{12121212}}{19\,353\,600}+\frac{\widehat{12121222}}{4\,838\,400}+\frac{\widehat{12122122}}{4\,838\,400}+$$

$$\frac{\widehat{12122222}}{4\,838\,400}+\frac{\widehat{12212222}}{4\,838\,400}+\frac{\widehat{12221222}}{9\,676\,800}+\frac{\widehat{12222222}}{4\,838\,400},0\Big]\Big],$$

$$\text{M}\Big[\{1\to\text{LS}[0,0,0,0,0,0,0,0,0]\},$$

$$\text{CWS}\Big[0,-\frac{\widehat{11}}{96},0,\frac{\widehat{1111}}{11\,520},0,$$

$$-\frac{\widehat{111111}}{725\,760},0,\frac{\widehat{11111111}}{38\,707\,200},0\Big]\Big]\}$$

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VerticalFlipEq[9, V]
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{0, 0, 0}
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sol10 = Solve[(# == 0) & /@ Union[μCoefficients[{
      HardR4[11, V], TwistEq[10, V], UnitarityEq[10, V], CapEq[10, V, C]
     }]]]
```

$$\Big\{\Big\{\alpha s[10,1]\to-\frac{73}{3\,503\,554\,560},\alpha s[10,9]\to-\frac{73}{1\,401\,421\,824},\beta s[10,1]\to-\frac{1}{9\,809\,952\,768},$$

$$\alpha s[10,3]\to-\frac{511}{2\,335\,703\,040},\alpha s[10,99]\to-\frac{1}{95\,800\,320},\alpha s[10,2]\to\frac{73}{875\,888\,640},$$

$$\alpha s[10,5]\to\frac{73}{350\,355\,456},\beta s[10,2]\to\frac{1129}{35\,035\,545\,600},\alpha s[10,88]\to\frac{5}{76\,640\,256},$$

$$\alpha s[10,4] \to -\frac{1621}{6\,812\,467\,200},\ \alpha s[10,11] \to \frac{617\,777}{49\,049\,763\,840}+10\,\beta s[10,96],$$

$$\beta s[10,3] \to -\frac{1\,698\,659}{735\,746\,457\,600}-2\,\beta s[10,96],\ \alpha s[10,6] \to -\frac{18\,539}{6\,569\,164\,800}-2\,\beta s[10,96],$$

$$\alpha s[10,95] \to \frac{10\,013}{3\,832\,012\,800}+2\,\beta s[10,96],\ \alpha s[10,7] \to -\frac{471\,703}{105\,106\,636\,800}-4\,\beta s[10,96],$$

$$\alpha s[10,8] \to \frac{12\,941}{30\,656\,102\,400},\ \beta s[10,4] \to -\frac{34\,747}{245\,248\,819\,200},\ \alpha s[10,57] \to -\frac{59}{283\,852\,800},$$

$$\alpha s[10,97] \to \frac{1679}{191\,600\,640}+7\,\beta s[10,96],\ \beta s[10,5] \to \frac{194\,479}{122\,624\,409\,600}+\beta s[10,96],$$

$$\alpha s[10,10] \to \frac{45\,121}{35\,035\,545\,600}+\beta s[10,96],\ \alpha s[10,13] \to \frac{34\,229}{35\,035\,545\,600}+2\,\beta s[10,96],$$

$$\alpha s[10,34] \to \frac{1\,280\,467}{367\,873\,228\,800}+3\,\beta s[10,96],\ \alpha s[10,73] \to -\frac{4883}{1\,149\,603\,840}-\frac{5}{2}\,\beta s[10,96],$$

$$\beta s[10,6] \to \frac{116\,761}{61\,312\,204\,800}+\frac{5}{2}\,\beta s[10,96],\ \alpha s[10,12] \to \frac{383}{87\,091\,200}+\frac{5}{2}\,\beta s[10,96],$$

$$\alpha s[10,87] \to \frac{52\,807}{15\,328\,051\,200}+\frac{5}{2}\,\beta s[10,96],\ \beta s[10,7] \to \frac{25\,271}{3\,344\,302\,080}+\frac{15}{2}\,\beta s[10,96],$$

$$\alpha s[10,15] \to \frac{6\,461\,969}{735\,746\,457\,600}+\frac{15}{2}\,\beta s[10,96],\ \alpha s[10,14] \to \frac{65\,459}{6\,569\,164\,800}+\frac{15}{2}\,\beta s[10,96],$$

$$\alpha s[10,31] \to \frac{6103}{15\,328\,051\,200},\ \beta s[10,8] \to \frac{3349}{10\,218\,700\,800},\ \alpha s[10,16] \to -\frac{2281}{4\,541\,644\,800},$$

$$\beta s[10,9] \to \frac{270\,493}{245\,248\,819\,200}+\beta s[10,96],\ \alpha s[10,20] \to -\frac{2\,666\,999}{122\,624\,409\,600}-19\,\beta s[10,96],$$

$$\alpha s[10,18] \to \frac{4\,751\,993}{735\,746\,457\,600}+5\,\beta s[10,96],\ \alpha s[10,98] \to \frac{16\,699}{1\,916\,006\,400}+7\,\beta s[10,96],$$

$$\alpha s[10,24] \to \frac{2689}{1\,061\,683\,200}+2\,\beta s[10,96],\ \alpha s[10,17] \to \frac{16\,927}{17\,517\,772\,800}+\beta s[10,96],$$

$$\alpha s[10,32] \to -\frac{34\,997}{7\,664\,025\,600}-4\,\beta s[10,96],\ \alpha s[10,80] \to -\frac{7039}{851\,558\,400}-\frac{9}{2}\,\beta s[10,96],$$

$$\beta s[10,10] \to -\frac{1873}{3\,269\,984\,256}-\frac{1}{2}\,\beta s[10,96],\ \alpha s[10,19] \to -\frac{152\,807}{81\,749\,606\,400}-\frac{1}{2}\,\beta s[10,96],$$

$$\alpha s[10,39] \to \frac{317\,831}{16\,349\,921\,280}+15\,\beta s[10,96],\ \beta s[10,11] \to -\frac{2\,551\,573}{735\,746\,457\,600}-5\,\beta s[10,96],$$

$$\alpha s[10,91] \to -\frac{904\,049}{45\,984\,153\,600}-15\,\beta s[10,96],\ \alpha s[10,22] \to -\frac{35\,347}{973\,209\,600}-\frac{51}{2}\,\beta s[10,96],$$

$$\alpha s[10,26] \to -\frac{21\,706\,621}{367\,873\,228\,800}-45\,\beta s[10,96],$$

$$\alpha s[10,21] \to -\frac{1159}{82\,114\,560}-\frac{21}{2}\,\beta s[10,96],\ \alpha s[10,44] \to \frac{136\,127}{30\,656\,102\,400}+\frac{61}{32}\,\beta s[10,96],$$

$$\beta s[10,12] \to \frac{1}{20\,528\,640}-\frac{61}{32}\,\beta s[10,96],\ \alpha s[10,23] \to -\frac{30\,953}{7\,357\,464\,576}-\frac{61}{32}\,\beta s[10,96],$$

$$\alpha s[10,86] \to \frac{101\,197}{7\,664\,025\,600}+\frac{21}{2}\,\beta s[10,96],\ \beta s[10,13] \to -\frac{128\,077}{22\,295\,347\,200}-3\,\beta s[10,96],$$

$$\alpha s[10,28]\to -\frac{255\,307}{122\,624\,409\,600}-3\,\beta s[10,96],\ \alpha s[10,25]\to -\frac{24\,103}{8\,758\,886\,400}-3\,\beta s[10,96],$$
$$\alpha s[10,56]\to -\frac{47\,701}{22\,992\,076\,800}-\frac{3}{32}\,\beta s[10,96],$$
$$\alpha s[10,63]\to -\frac{4831}{1\,703\,116\,800}-\frac{61}{32}\,\beta s[10,96],\ \beta s[10,14]\to \frac{5837}{15\,328\,051\,200}-2\,\beta s[10,96],$$
$$\alpha s[10,27]\to -\frac{2\,119\,787}{367\,873\,228\,800}-\frac{125}{32}\,\beta s[10,96],$$
$$\beta s[10,15]\to -\frac{4493}{1\,513\,881\,600}-\frac{125}{32}\,\beta s[10,96],$$
$$\alpha s[10,29]\to -\frac{36\,703}{4\,541\,644\,800}-\frac{253}{32}\,\beta s[10,96],$$
$$\alpha s[10,30]\to -\frac{2\,094\,149}{735\,746\,457\,600}-\frac{125}{32}\,\beta s[10,96],\ \beta s[10,16]\to -\frac{4001}{8\,758\,886\,400},$$
$$\alpha s[10,83]\to -\frac{2501}{5\,748\,019\,200}+\beta s[10,96],\ \beta s[10,17]\to \frac{80\,447}{30\,656\,102\,400}+\frac{5}{2}\,\beta s[10,96],$$
$$\alpha s[10,33]\to \frac{161\,587}{49\,049\,763\,840}+\frac{5}{2}\,\beta s[10,96],\ \alpha s[10,92]\to -\frac{105\,233}{5\,109\,350\,400}-\frac{31}{2}\,\beta s[10,96],$$
$$\beta s[10,18]\to -\frac{1\,606\,277}{735\,746\,457\,600}-\frac{7}{2}\,\beta s[10,96],$$
$$\alpha s[10,35]\to -\frac{77\,969}{8\,758\,886\,400}-\frac{11}{2}\,\beta s[10,96],$$
$$\alpha s[10,36]\to -\frac{29\,767\,223}{735\,746\,457\,600}-\frac{67}{2}\,\beta s[10,96],$$
$$\alpha s[10,50]\to \frac{739\,763}{91\,968\,307\,200}+\frac{151}{32}\,\beta s[10,96],\ \beta s[10,19]\to -\frac{110\,491}{40\,874\,803\,200}-\beta s[10,96],$$
$$\alpha s[10,37]\to \frac{17\,827}{49\,049\,763\,840}-\beta s[10,96],\ \alpha s[10,94]\to \frac{14\,647}{383\,201\,280}+\frac{61}{2}\,\beta s[10,96],$$
$$\beta s[10,20]\to -\frac{7499}{3\,832\,012\,800}-\frac{5}{2}\,\beta s[10,96],\ \alpha s[10,41]\to \frac{48\,227}{5\,255\,331\,840}+\frac{15}{2}\,\beta s[10,96],$$
$$\alpha s[10,47]\to \frac{17\,586\,761}{735\,746\,457\,600}+21\,\beta s[10,96],\ \alpha s[10,38]\to \frac{50\,111}{13\,377\,208\,320}+\frac{5}{2}\,\beta s[10,96],$$
$$\alpha s[10,67]\to \frac{3557}{766\,402\,560}-\frac{1}{4}\,\beta s[10,96],\ \beta s[10,21]\to -\frac{69\,691}{30\,656\,102\,400}+\frac{49}{32}\,\beta s[10,96],$$
$$\alpha s[10,40]\to \frac{96\,577}{73\,574\,645\,760}+\frac{81}{32}\,\beta s[10,96],$$
$$\alpha s[10,72]\to -\frac{131\,413}{10\,218\,700\,800}-\frac{305}{32}\,\beta s[10,96],$$
$$\beta s[10,22]\to -\frac{103\,403}{10\,218\,700\,800}+\frac{5}{2}\,\beta s[10,96],\ \alpha s[10,42]\to$$
$$\frac{3937}{26\,276\,659\,200}-\frac{33}{32}\,\beta s[10,96],\ \alpha s[10,43]\to \frac{8\,792\,369}{735\,746\,457\,600}+\frac{231}{32}\,\beta s[10,96],$$
$$\beta s[10,23]\to -\frac{535}{919\,683\,072}+\frac{61}{32}\,\beta s[10,96],\ \alpha s[10,45]\to \frac{321\,179}{49\,049\,763\,840}+6\,\beta s[10,96],$$

$$\beta s[10, 24] \to \frac{9407}{61\,312\,204\,800},\ \alpha s[10, 85] \to \frac{44\,689}{2\,554\,675\,200} + 14\,\beta s[10, 96],$$
$$\alpha s[10, 55] \to -\frac{428\,251}{91\,968\,307\,200} - \frac{9}{32}\,\beta s[10, 96],\ \alpha s[10, 75] \to$$
$$-\frac{187\,391}{30\,656\,102\,400} - \frac{77}{16}\,\beta s[10, 96],\ \beta s[10, 25] \to \frac{863}{2\,554\,675\,200} - \frac{29}{32}\,\beta s[10, 96],$$
$$\alpha s[10, 46] \to -\frac{44\,771}{30\,656\,102\,400} - \frac{61}{32}\,\beta s[10, 96],\ \alpha s[10, 84] \to$$
$$\frac{20\,819}{8\,360\,755\,200} + \frac{23}{32}\,\beta s[10, 96],\ \beta s[10, 26] \to -\frac{1\,887\,947}{183\,936\,614\,400} + \frac{159}{32}\,\beta s[10, 96],$$
$$\alpha s[10, 49] \to \frac{7\,841\,569}{367\,873\,228\,800} + \frac{255}{16}\,\beta s[10, 96],\ \alpha s[10, 48] \to$$
$$\frac{147\,253}{15\,328\,051\,200} + \frac{105}{16}\,\beta s[10, 96],\ \alpha s[10, 52] \to \frac{2\,954\,569}{147\,149\,291\,520} + \frac{267}{16}\,\beta s[10, 96],$$
$$\beta s[10, 27] \to \frac{56\,099}{61\,312\,204\,800} + \frac{45}{16}\,\beta s[10, 96],\ \beta s[10, 28] \to \frac{5303}{61\,312\,204\,800} - \frac{61}{32}\,\beta s[10, 96],$$
$$\alpha s[10, 51] \to -\frac{582\,863}{122\,624\,409\,600} - \frac{119}{32}\,\beta s[10, 96],$$
$$\alpha s[10, 54] \to -\frac{45\,817}{16\,349\,921\,280} - \frac{61}{32}\,\beta s[10, 96],$$
$$\beta s[10, 29] \to -\frac{689}{61\,312\,204\,800} - \frac{3}{16}\,\beta s[10, 96],$$
$$\alpha s[10, 53] \to -\frac{19\,757}{6\,131\,220\,480} - \frac{3}{16}\,\beta s[10, 96],\ \beta s[10, 30] \to \frac{10\,859}{8\,360\,755\,200} - \frac{3}{32}\,\beta s[10, 96],$$
$$\beta s[10, 31] \to \frac{1571}{3\,832\,012\,800},\ \beta s[10, 32] \to -\frac{3047}{955\,514\,880} - \frac{5}{2}\,\beta s[10, 96],$$
$$\alpha s[10, 59] \to \frac{7\,677\,623}{367\,873\,228\,800} + 17\,\beta s[10, 96],\ \alpha s[10, 93] \to \frac{1\,031\,363}{45\,984\,153\,600} + 18\,\beta s[10, 96],$$
$$\beta s[10, 33] \to \frac{15\,269}{40\,874\,803\,200},\ \beta s[10, 34] \to \frac{2143}{2\,874\,009\,600} + \beta s[10, 96],$$
$$\alpha s[10, 96] \to -\frac{233}{10\,948\,608} - 17\,\beta s[10, 96],\ \alpha s[10, 58] \to -\frac{119\,033}{16\,721\,510\,400} - \frac{13}{2}\,\beta s[10, 96],$$
$$\alpha s[10, 70] \to \frac{23}{31\,539\,200},\ \beta s[10, 35] \to -\frac{4723}{1\,437\,004\,800} + \frac{61}{32}\,\beta s[10, 96],$$
$$\alpha s[10, 60] \to \frac{7\,345\,673}{735\,746\,457\,600} + \frac{61}{8}\,\beta s[10, 96],$$
$$\alpha s[10, 79] \to -\frac{75\,823}{8\,360\,755\,200} - \frac{251}{32}\,\beta s[10, 96],$$
$$\beta s[10, 36] \to -\frac{267\,661}{40\,874\,803\,200} - \frac{11}{8}\,\beta s[10, 96],$$
$$\alpha s[10, 61] \to \frac{101\,681}{40\,874\,803\,200} + \frac{21}{8}\,\beta s[10, 96],$$
$$\alpha s[10, 62] \to \frac{132\,101}{22\,992\,076\,800} + \frac{209}{32}\,\beta s[10, 96],$$

$$\beta s[10,37] \to -\frac{323}{12\,262\,440\,960} - \frac{61}{32}\beta s[10,96],$$
$$\alpha s[10,71] \to -\frac{260\,731}{13\,138\,329\,600} - \frac{275}{32}\beta s[10,96],$$
$$\alpha s[10,77] \to -\frac{20\,501}{2\,090\,188\,800} - \frac{257}{32}\beta s[10,96],$$
$$\beta s[10,38] \to \frac{360\,779}{367\,873\,228\,800} - \frac{17}{32}\beta s[10,96],$$
$$\alpha s[10,64] \to \frac{53\,533}{49\,049\,763\,840} + \frac{47}{32}\beta s[10,96],\ \beta s[10,39] \to \frac{160\,531}{31\,531\,991\,040},$$
$$\alpha s[10,89] \to \frac{250\,403}{19\,707\,494\,400} + 8\,\beta s[10,96],\ \alpha s[10,65] \to \frac{3007}{328\,458\,240} + \frac{27}{4}\beta s[10,96],$$
$$\alpha s[10,76] \to -\frac{24\,806\,053}{2\,207\,239\,372\,800} - \frac{159}{16}\beta s[10,96],$$
$$\alpha s[10,66] \to \frac{1087}{5\,109\,350\,400} - \frac{27}{32}\beta s[10,96],$$
$$\alpha s[10,69] \to -\frac{3\,462\,461}{551\,809\,843\,200} - \frac{177}{32}\beta s[10,96],$$
$$\beta s[10,40] \to -\frac{32\,339}{26\,276\,659\,200} - \frac{11}{32}\beta s[10,96],$$
$$\beta s[10,41] \to \frac{239}{66\,355\,200} + \frac{61}{32}\beta s[10,96],\ \alpha s[10,68] \to -\frac{9709}{3\,284\,582\,400} - \frac{75}{32}\beta s[10,96],$$
$$\beta s[10,42] \to -\frac{3943}{2\,874\,009\,600} - \frac{79}{32}\beta s[10,96],$$
$$\beta s[10,43] \to \frac{337\,973}{183\,936\,614\,400} - \frac{61}{16}\beta s[10,96],\ \beta s[10,44] \to \frac{1}{7\,983\,360} - \frac{5}{2}\beta s[10,96],$$
$$\beta s[10,45] \to -\frac{1\,420\,889}{367\,873\,228\,800} - \frac{61}{32}\beta s[10,96],$$
$$\alpha s[10,81] \to \frac{19\,669}{5\,748\,019\,200} + \frac{17}{8}\beta s[10,96],\ \alpha s[10,82] \to \frac{112\,943}{11\,496\,038\,400} + \frac{37}{8}\beta s[10,96],$$
$$\alpha s[10,74] \to -\frac{4\,111\,993}{735\,746\,457\,600} - \frac{33}{8}\beta s[10,96],$$
$$\beta s[10,46] \to -\frac{1963}{875\,888\,640} - \frac{93}{32}\beta s[10,96],\ \beta s[10,47] \to \frac{33\,857}{13\,624\,934\,400} + 2\,\beta s[10,96],$$
$$\beta s[10,48] \to \frac{48\,911}{15\,328\,051\,200} - \frac{21}{16}\beta s[10,96],\ \beta s[10,49] \to \frac{453\,757}{45\,984\,153\,600} + \frac{51}{32}\beta s[10,96],$$
$$\alpha s[10,78] \to \frac{467}{185\,794\,560} + \frac{51}{32}\beta s[10,96],\ \beta s[10,50] \to \frac{14\,981}{11\,496\,038\,400} - 2\,\beta s[10,96],$$
$$\beta s[10,51] \to -\frac{12\,077}{30\,656\,102\,400},\ \beta s[10,52] \to \frac{91\,027}{20\,437\,401\,600} + \frac{17}{32}\beta s[10,96],$$
$$\beta s[10,53] \to -\frac{683}{425\,779\,200} + 3\,\beta s[10,96],\ \beta s[10,54] \to -\frac{41\,971}{61\,312\,204\,800},$$
$$\beta s[10,55] \to \frac{1811}{718\,502\,400} + 8\,\beta s[10,96],\ \beta s[10,56] \to \frac{6571}{22\,992\,076\,800} + \frac{5}{2}\beta s[10,96],$$

$$\beta s[10,57] \to -\frac{299}{1\,277\,337\,600},\ \beta s[10,58] \to \frac{8033}{2\,874\,009\,600}+\frac{29}{32}\beta s[10,96],$$

$$\beta s[10,59] \to \frac{2\,383\,991}{551\,809\,843\,200}+\frac{17}{32}\beta s[10,96],$$

$$\alpha s[10,90] \to -\frac{23\,899}{2\,043\,740\,160}-\frac{243}{32}\beta s[10,96],$$

$$\beta s[10,60] \to \frac{158\,003}{36\,787\,322\,880}+\frac{61}{32}\beta s[10,96],\ \beta s[10,61] \to \frac{313}{319\,334\,400}+\frac{29}{32}\beta s[10,96],$$

$$\beta s[10,62] \to -\frac{26\,513}{5\,748\,019\,200}-2\,\beta s[10,96],\ \beta s[10,63] \to -\frac{611}{851\,558\,400},$$

$$\beta s[10,64] \to -\frac{678\,851}{183\,936\,614\,400}-\frac{61}{32}\beta s[10,96],$$

$$\beta s[10,65] \to \frac{809}{143\,700\,480}+2\,\beta s[10,96],\ \beta s[10,66] \to \frac{607}{1\,703\,116\,800}-\frac{7}{16}\beta s[10,96],$$

$$\beta s[10,67] \to -\frac{41}{9\,580\,032}-10\,\beta s[10,96],\ \beta s[10,68] \to \frac{3101}{1\,459\,814\,400}+\frac{61}{32}\beta s[10,96],$$

$$\beta s[10,69] \to -\frac{163\,543}{55\,180\,984\,320}-\frac{61}{32}\beta s[10,96],\ \beta s[10,70] \to -\frac{1777}{522\,547\,200}-\frac{7}{2}\beta s[10,96],$$

$$\beta s[10,71] \to \frac{10\,673}{5\,748\,019\,200}+15\,\beta s[10,96],\ \beta s[10,72] \to -\frac{7549}{1\,277\,337\,600}-\frac{5}{2}\beta s[10,96],$$

$$\beta s[10,73] \to \frac{1}{2\,052\,864}+2\,\beta s[10,96],\ \beta s[10,74] \to -\frac{120\,259}{61\,312\,204\,800}-\frac{29}{32}\beta s[10,96],$$

$$\beta s[10,75] \to -\frac{821}{1\,916\,006\,400},\ \beta s[10,76] \to -\frac{358\,201}{183\,936\,614\,400}+\frac{17}{32}\beta s[10,96],$$

$$\beta s[10,77] \to \frac{1549}{547\,430\,400}+\frac{5}{2}\beta s[10,96],\ \beta s[10,78] \to -\frac{1}{2\,395\,008}-\beta s[10,96],$$

$$\beta s[10,79] \to \frac{6253}{7\,664\,025\,600}+\frac{1}{2}\beta s[10,96],\ \beta s[10,80] \to \frac{2159}{1\,916\,006\,400}+5\,\beta s[10,96],$$

$$\beta s[10,81] \to -\frac{145}{76\,640\,256}-\frac{5}{2}\beta s[10,96],\ \beta s[10,82] \to \frac{90\,313}{7\,664\,025\,600}+3\,\beta s[10,96],$$

$$\beta s[10,83] \to -\frac{389}{718\,502\,400}+2\,\beta s[10,96],\ \beta s[10,84] \to \frac{129\,673}{22\,992\,076\,800}+\frac{5}{2}\beta s[10,96],$$

$$\beta s[10,85] \to \frac{389}{383\,201\,280},\ \beta s[10,86] \to \frac{541}{638\,668\,800},\ \beta s[10,87] \to \frac{767}{1\,277\,337\,600},$$

$$\beta s[10,88] \to \frac{1}{11\,975\,040},\ \beta s[10,89] \to \frac{7621}{656\,916\,480}+5\,\beta s[10,96],$$

$$\beta s[10,90] \to -\frac{4877}{766\,402\,560}-\beta s[10,96],\ \beta s[10,91] \to -\frac{791}{149\,299\,200}-2\,\beta s[10,96],$$

$$\beta s[10,92] \to -\frac{1217}{153\,280\,512}-3\,\beta s[10,96],\ \beta s[10,93] \to \frac{9179}{3\,832\,012\,800}+\beta s[10,96],$$

$$\beta s[10,94] \to -\frac{1}{5\,987\,520}-2\,\beta s[10,96],\ \beta s[10,95] \to \frac{1}{3\,548\,160},\ \beta s[10,97] \to \frac{1}{1\,995\,840},$$

$$\beta s[10,98] \to \frac{1}{2\,280\,960},\ \beta s[10,99] \to -\frac{1}{47\,900\,160},\ \gamma s[10,1] \to 0,$$

$$\gamma s[10,2] \to -\frac{1}{191\,600\,640},\ \gamma s[10,3] \to -\frac{1}{191\,600\,640},\ \gamma s[10,4] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,5] \to -\frac{1}{191\,600\,640},\ \gamma s[10,6] \to -\frac{1}{191\,600\,640},\ \gamma s[10,7] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,8] \to -\frac{1}{191\,600\,640},\ \gamma s[10,9] \to -\frac{1}{191\,600\,640},\ \gamma s[10,10] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,11] \to -\frac{1}{191\,600\,640},\ \gamma s[10,12] \to -\frac{1}{191\,600\,640},\ \gamma s[10,13] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,14] \to -\frac{1}{191\,600\,640},\ \gamma s[10,15] \to -\frac{1}{191\,600\,640},\ \gamma s[10,16] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,17] \to -\frac{1}{191\,600\,640},\ \gamma s[10,18] \to -\frac{1}{383\,201\,280},\ \gamma s[10,19] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,20] \to -\frac{1}{191\,600\,640},\ \gamma s[10,21] \to -\frac{1}{191\,600\,640},\ \gamma s[10,22] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,23] \to -\frac{1}{191\,600\,640},\ \gamma s[10,24] \to -\frac{1}{191\,600\,640},\ \gamma s[10,25] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,26] \to -\frac{1}{191\,600\,640},\ \gamma s[10,27] \to -\frac{1}{191\,600\,640},\ \gamma s[10,28] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,29] \to -\frac{1}{191\,600\,640},\ \gamma s[10,30] \to -\frac{1}{191\,600\,640},\ \gamma s[10,31] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,32] \to -\frac{1}{191\,600\,640},\ \gamma s[10,33] \to -\frac{1}{191\,600\,640},\ \gamma s[10,34] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,35] \to -\frac{1}{191\,600\,640},\ \gamma s[10,36] \to -\frac{1}{191\,600\,640},\ \gamma s[10,37] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,38] \to -\frac{1}{191\,600\,640},\ \gamma s[10,39] \to -\frac{1}{191\,600\,640},\ \gamma s[10,40] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,41] \to -\frac{1}{191\,600\,640},\ \gamma s[10,42] \to -\frac{1}{191\,600\,640},\ \gamma s[10,43] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,44] \to -\frac{1}{191\,600\,640},\ \gamma s[10,45] \to -\frac{1}{191\,600\,640},\ \gamma s[10,46] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,47] \to -\frac{1}{383\,201\,280},\ \gamma s[10,48] \to -\frac{1}{191\,600\,640},\ \gamma s[10,49] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,50] \to -\frac{1}{191\,600\,640},\ \gamma s[10,51] \to -\frac{1}{191\,600\,640},\ \gamma s[10,52] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,53] \to -\frac{1}{191\,600\,640},\ \gamma s[10,54] \to -\frac{1}{191\,600\,640},\ \gamma s[10,55] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,56] \to -\frac{1}{191\,600\,640},\ \gamma s[10,57] \to -\frac{1}{191\,600\,640},\ \gamma s[10,58] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,59] \to -\frac{1}{191\,600\,640},\ \gamma s[10,60] \to -\frac{1}{191\,600\,640},\ \gamma s[10,61] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,62] \to -\frac{1}{191\,600\,640},\ \gamma s[10,63] \to -\frac{1}{191\,600\,640},\ \gamma s[10,64] \to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,65] \to -\frac{1}{191\,600\,640},\ \gamma s[10,66] \to -\frac{1}{191\,600\,640},\ \gamma s[10,67] \to -\frac{1}{383\,201\,280},$$

$$\gamma s[10,68]\to -\frac{1}{191\,600\,640},\ \gamma s[10,69]\to -\frac{1}{191\,600\,640},\ \gamma s[10,70]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,71]\to -\frac{1}{191\,600\,640},\ \gamma s[10,72]\to -\frac{1}{191\,600\,640},\ \gamma s[10,73]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,74]\to -\frac{1}{191\,600\,640},\ \gamma s[10,75]\to -\frac{1}{191\,600\,640},\ \gamma s[10,76]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,77]\to -\frac{1}{191\,600\,640},\ \gamma s[10,78]\to -\frac{1}{191\,600\,640},\ \gamma s[10,79]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,80]\to -\frac{1}{191\,600\,640},\ \gamma s[10,81]\to -\frac{1}{191\,600\,640},\ \gamma s[10,82]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,83]\to -\frac{1}{191\,600\,640},\ \gamma s[10,84]\to -\frac{1}{191\,600\,640},\ \gamma s[10,85]\to -\frac{1}{383\,201\,280},$$
$$\gamma s[10,86]\to -\frac{1}{191\,600\,640},\ \gamma s[10,87]\to -\frac{1}{191\,600\,640},\ \gamma s[10,88]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,89]\to -\frac{1}{191\,600\,640},\ \gamma s[10,90]\to -\frac{1}{191\,600\,640},\ \gamma s[10,91]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,92]\to -\frac{1}{191\,600\,640},\ \gamma s[10,93]\to -\frac{1}{191\,600\,640},\ \gamma s[10,94]\to -\frac{1}{958\,003\,200},$$
$$\gamma s[10,95]\to -\frac{1}{191\,600\,640},\ \gamma s[10,96]\to -\frac{1}{191\,600\,640},\ \gamma s[10,97]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,98]\to -\frac{1}{383\,201\,280},\ \gamma s[10,99]\to -\frac{1}{191\,600\,640},\ \gamma s[10,100]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,101]\to -\frac{1}{191\,600\,640},\ \gamma s[10,102]\to -\frac{1}{191\,600\,640},\ \gamma s[10,103]\to -\frac{1}{191\,600\,640},$$
$$\gamma s[10,104]\to -\frac{1}{191\,600\,640},\ \gamma s[10,105]\to -\frac{1}{191\,600\,640},\ \gamma s[10,106]\to -\frac{1}{383\,201\,280},$$
$$\gamma s[10,107]\to -\frac{1}{191\,600\,640},\ \gamma s[10,108]\to 0,\ \kappa s[10]\to -\frac{1}{1\,916\,006\,400}\Big\}\Big\}$$

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βs[10, 96] = 0; sol10 /. Rule → Set; $SeriesShowDegree = 10; {V, C}
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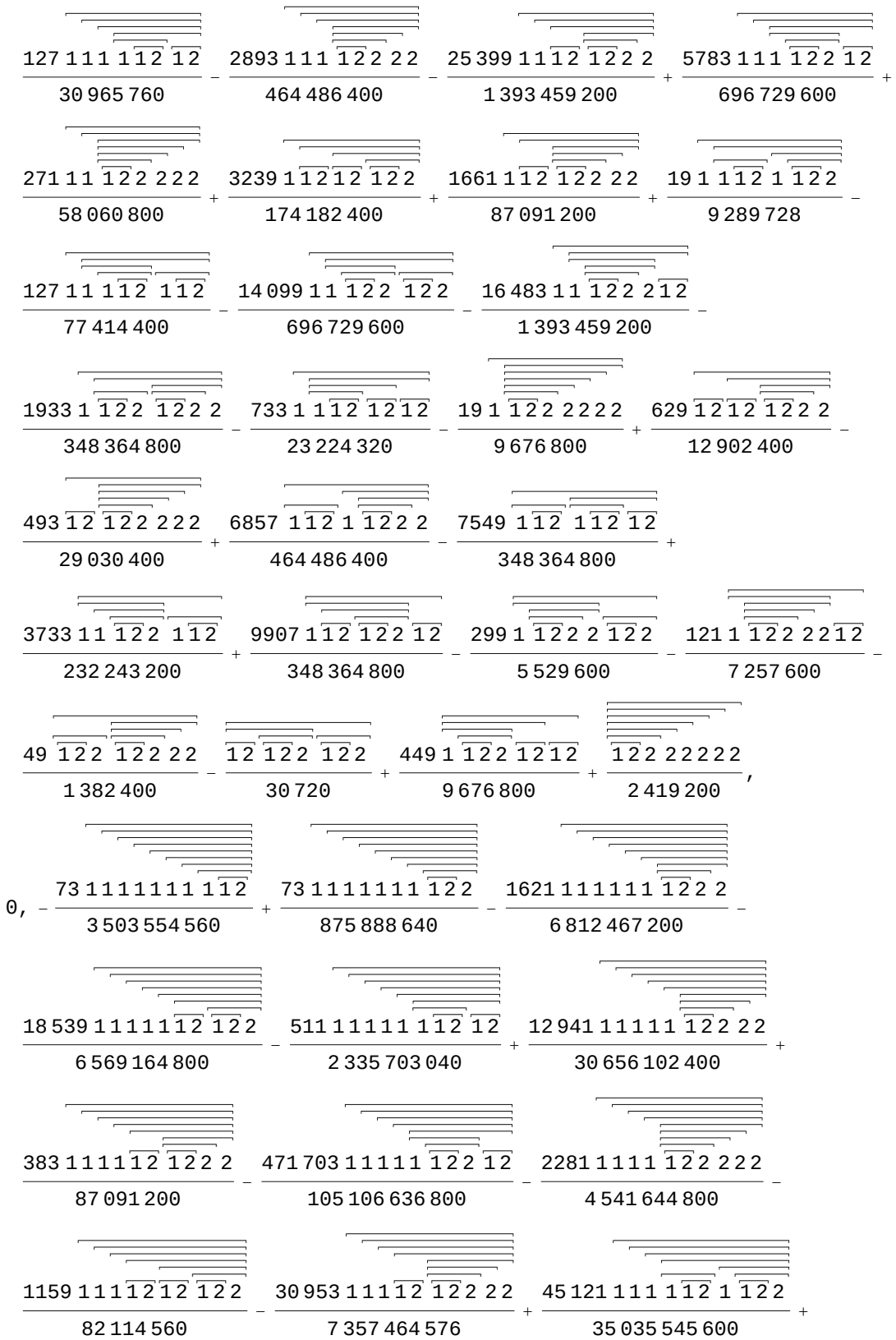
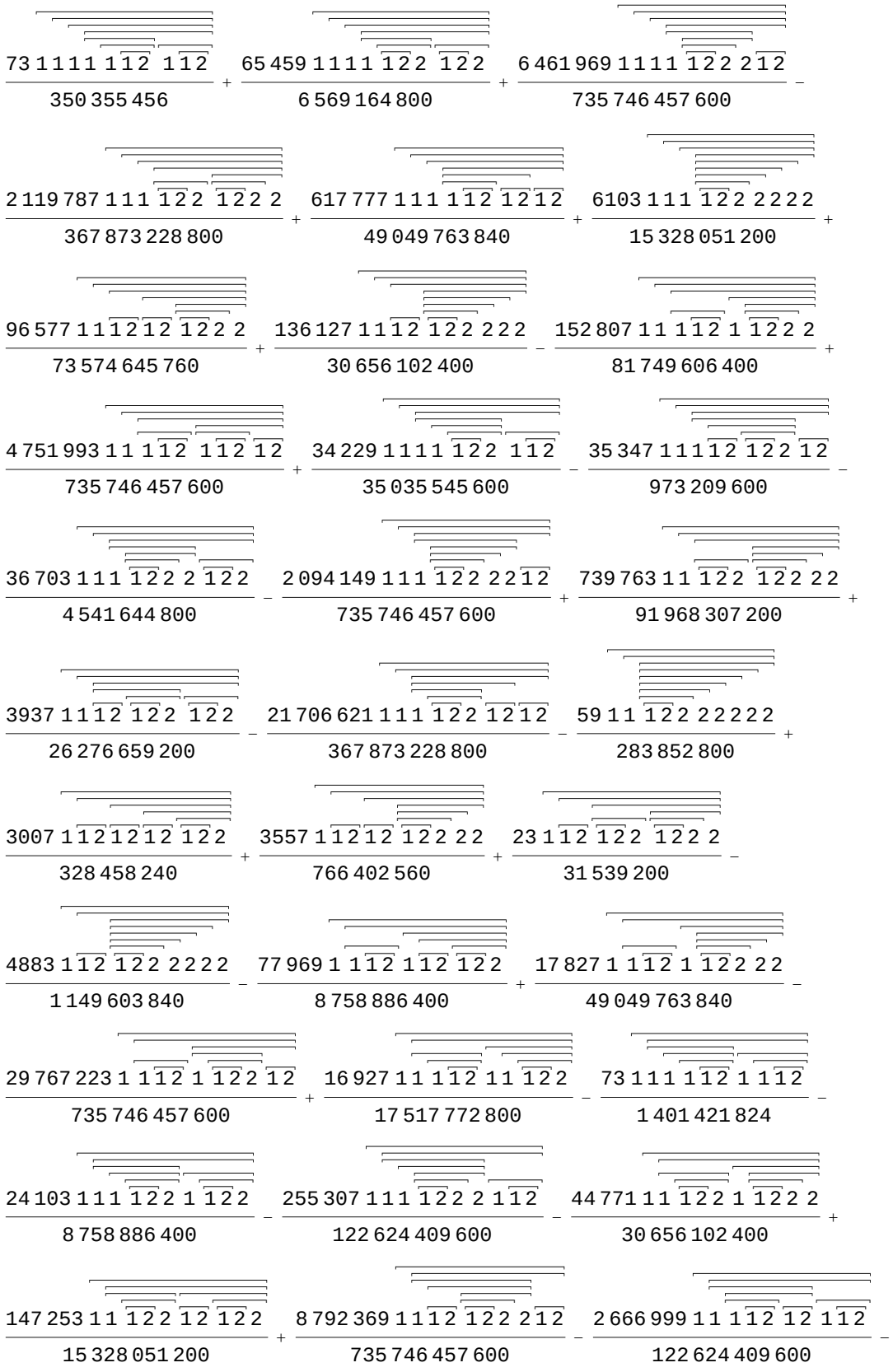
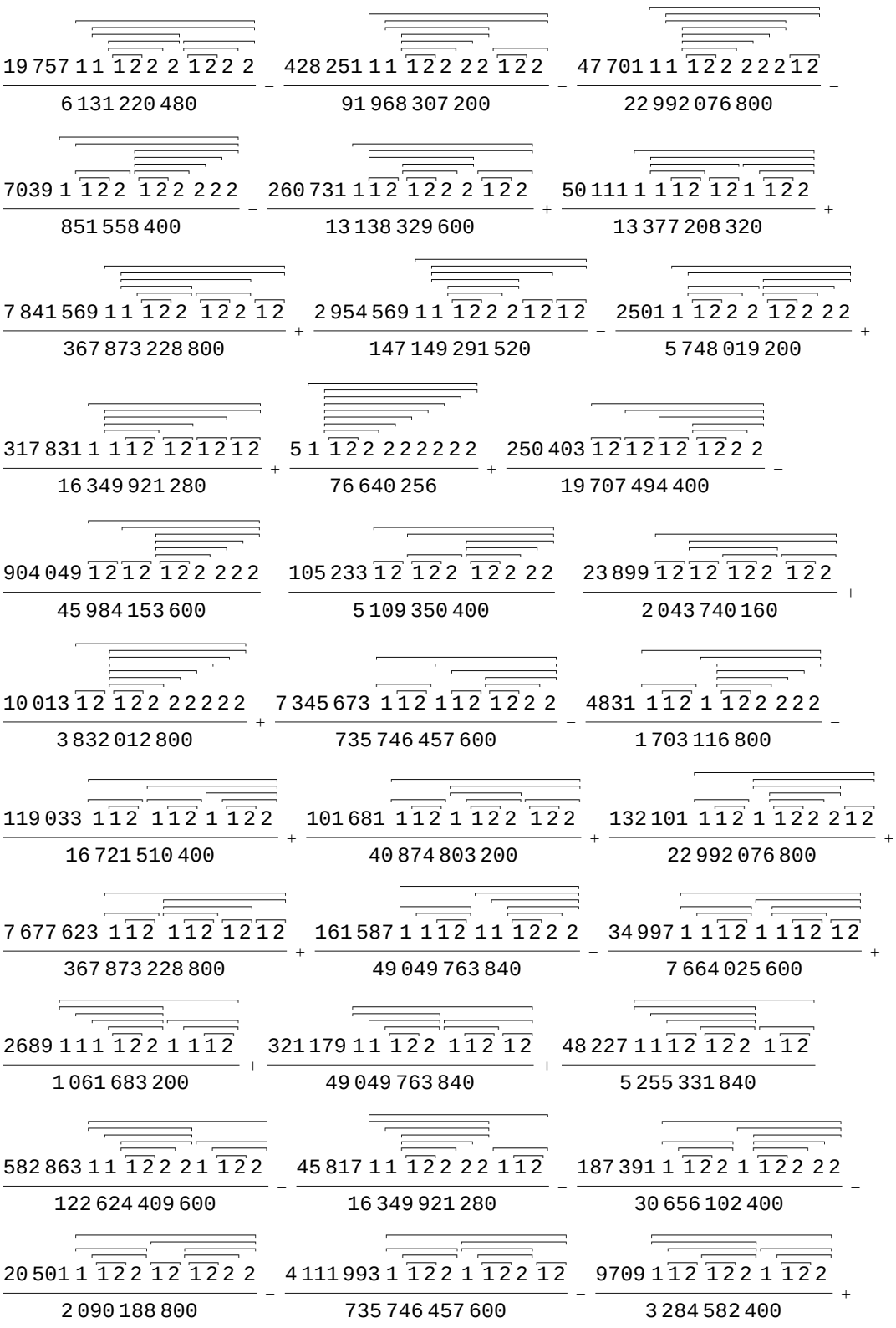
$$\Big\{M\Big[\Big\{1\to LS\Big[0,\ -\frac{\overline{12}}{24},\ 0,\ \frac{7\,\overline{1\,\overline{1\,\overline{12}}}}{5760}-\frac{7\,\overline{1\,\overline{12\,2}}}{5760}+\frac{\overline{\overline{12}\,2\,2}}{1440},\ 0,$$
$$-\frac{31\,\overline{1\,1\,1\,\overline{1\,\overline{12}}}}{967\,680}+\frac{31\,\overline{1\,1\,1\,\overline{12\,2}}}{483\,840}-\frac{83\,\overline{1\,1\,\overline{12\,2}\,2}}{967\,680}-\frac{31\,\overline{1\,\overline{12}\,\overline{12\,2}}}{725\,760}-\frac{31\,\overline{1\,1\,\overline{12}\,\overline{12}}}{645\,120}+$$
$$\frac{13\,\overline{1\,\overline{12\,2\,2}}}{241\,920}+\frac{101\,\overline{12}\,\overline{12\,2\,2}}{1\,451\,520}+\frac{527\,\overline{1\,\overline{12\,2}\,\overline{12}}}{5\,806\,080}-\frac{\overline{12\,2\,2\,2}}{60\,480},\ 0,$$
$$\frac{127\,\overline{1\,1\,1\,1\,\overline{1\,\overline{12}}}}{154\,828\,800}-\frac{127\,\overline{1\,1\,1\,1\,\overline{12\,2}}}{51\,609\,600}+\frac{2399\,\overline{1\,1\,1\,\overline{12}\,2\,2}}{464\,486\,400}+\frac{4589\,\overline{1\,1\,\overline{12}\,\overline{12\,2}}}{348\,364\,800}+$$







$$\frac{1087\,\overline{1\,\overline{1\,2}\,\overline{1\,2}}\,\overline{1\,\overline{2\,\overline{1\,2}}}}{5\,109\,350\,400}-\frac{131\,413\,\overline{1\,\overline{1\,2}}\,\overline{1\,\overline{2\,2}}\,\overline{2\,\overline{1\,2}}}{10\,218\,700\,800}+\frac{17\,586\,761\,\overline{1\,\overline{1\,\overline{1\,2}}}\,\overline{2\,\overline{1\,2}}\,\overline{1\,\overline{1\,2}}}{735\,746\,457\,600}+$$

$$\frac{19\,669\,\overline{1\,\overline{1\,2}}\,\overline{2\,\overline{2\,\overline{1\,2}}}\,\overline{1\,\overline{2\,2}}}{5\,748\,019\,200}-\frac{75\,823\,\overline{1\,\overline{1\,2}}\,\overline{2\,\overline{1\,2}}\,\overline{2\,\overline{1\,2}}}{8\,360\,755\,200}+\frac{44\,689\,\overline{1\,\overline{1\,2}}\,\overline{2\,\overline{2\,\overline{1\,2}}}\,\overline{2\,\overline{2\,2}}}{2\,554\,675\,200}+$$

$$\frac{101\,197\,\overline{1\,\overline{1\,2}}\,\overline{2\,\overline{2\,\overline{2\,\overline{1\,2}}}}}{7\,664\,025\,600}+\frac{52\,807\,\overline{1\,\overline{1\,2}}\,\overline{2\,\overline{2\,\overline{2\,\overline{2\,\overline{1\,2}}}}}}{15\,328\,051\,200}-\frac{233\,\overline{1\,\overline{2\,2}}\,\overline{1\,\overline{2\,2}}\,\overline{1\,\overline{2\,\overline{2\,2}}}}{10\,948\,608}+$$

$$\frac{1679\,\overline{1\,\overline{2\,2}}\,\overline{1\,\overline{2\,\overline{2\,\overline{2\,2}}}}}{191\,600\,640}+\frac{1\,031\,363\,\overline{1\,\overline{2}}\,\overline{1\,\overline{2\,\overline{2}}}\,\overline{2\,\overline{1\,\overline{2\,\overline{2}}}}}{45\,984\,153\,600}+\frac{14\,647\,\overline{1\,\overline{2}}\,\overline{1\,\overline{2\,\overline{2\,\overline{2}}}}\,\overline{2\,\overline{1\,\overline{2\,\overline{2}}}}}{383\,201\,280}+$$

$$\frac{53\,533\,\overline{1\,\overline{1\,2}}\,\overline{1\,\overline{2}}\,\overline{1\,\overline{1\,\overline{2\,\overline{2\,2}}}}}{49\,049\,763\,840}+\frac{1\,280\,467\,\overline{1\,\overline{1\,\overline{1\,2}}}\,\overline{1\,\overline{1\,2}}\,\overline{1\,\overline{1\,2}}}{367\,873\,228\,800}+\frac{467\,\overline{1\,\overline{1\,2}}\,\overline{2\,\overline{1\,\overline{2\,2}}}\,\overline{2\,\overline{1\,\overline{2\,2}}}}{185\,794\,560}-$$

$$\frac{3\,462\,461\,\overline{1\,\overline{1\,2}}\,\overline{1\,\overline{2\,\overline{1\,2}}}\,\overline{2\,\overline{1\,\overline{2\,\overline{1\,2}}}}}{551\,809\,843\,200}+\frac{112\,943\,\overline{1\,\overline{1\,2}}\,\overline{2\,\overline{2\,\overline{1\,2}}}\,\overline{2\,\overline{1\,\overline{2\,\overline{1\,2}}}}}{11\,496\,038\,400}+\frac{20\,819\,\overline{1\,\overline{1\,2}}\,\overline{2\,\overline{2\,\overline{2\,\overline{1\,2}}}}\,\overline{1\,\overline{2\,\overline{1\,2}}}}{8\,360\,755\,200}+$$

$$\frac{16\,699\,\overline{1\,\overline{2\,2}}\,\overline{2\,\overline{1\,\overline{2\,2}}}\,\overline{2\,\overline{2\,\overline{2}}}}{1\,916\,006\,400}-\frac{24\,806\,053\,\overline{1\,\overline{1\,2}}\,\overline{2\,\overline{1\,\overline{2\,\overline{1\,2}}}}\,\overline{1\,\overline{2\,\overline{1\,2}}}}{2\,207\,239\,372\,800}-\frac{\overline{1\,\overline{2\,2}}\,\overline{2\,\overline{2\,\overline{2\,\overline{2\,\overline{2\,\overline{2\,2}}}}}}}{95\,800\,320}\Big],$$

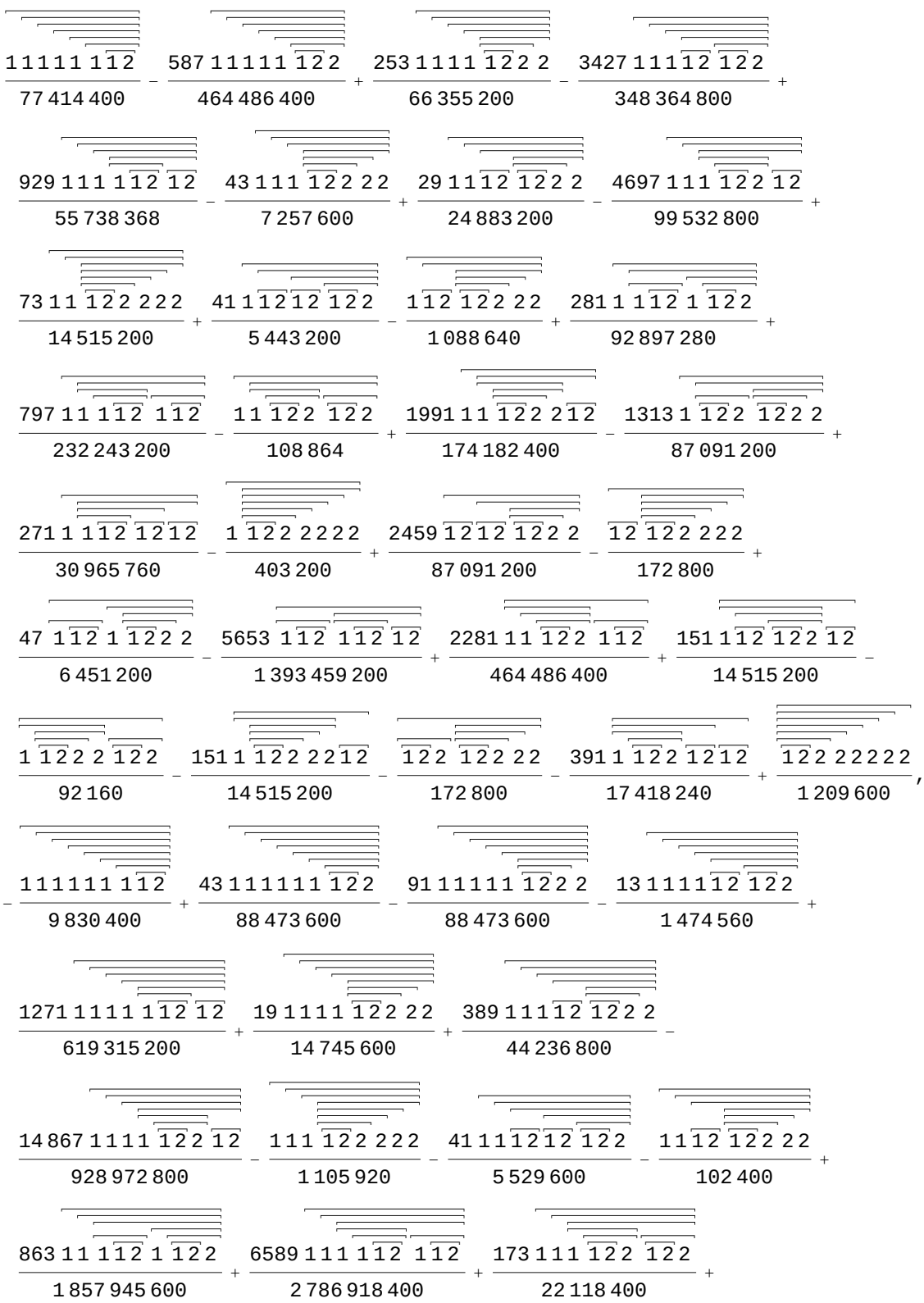
$$2\to \text{LS}\Big[\frac{\overline{1}}{2},-\frac{\overline{1\,2}}{12},0,\frac{\overline{1\,\overline{1\,\overline{1\,2}}}}{5760}-\frac{1}{720}\,\overline{1\,\overline{1\,\overline{2\,2}}}+\frac{1}{720}\,\overline{\overline{1\,\overline{2\,2}}\,2},-\frac{\overline{1\,\overline{1\,\overline{1\,\overline{1\,2}}}}}{7680}+\frac{\overline{1\,\overline{1\,\overline{1\,\overline{2\,2}}}}}{3840}-\frac{\overline{\overline{1\,\overline{1\,2}}\,\overline{1\,\overline{2}}}}{6912},$$

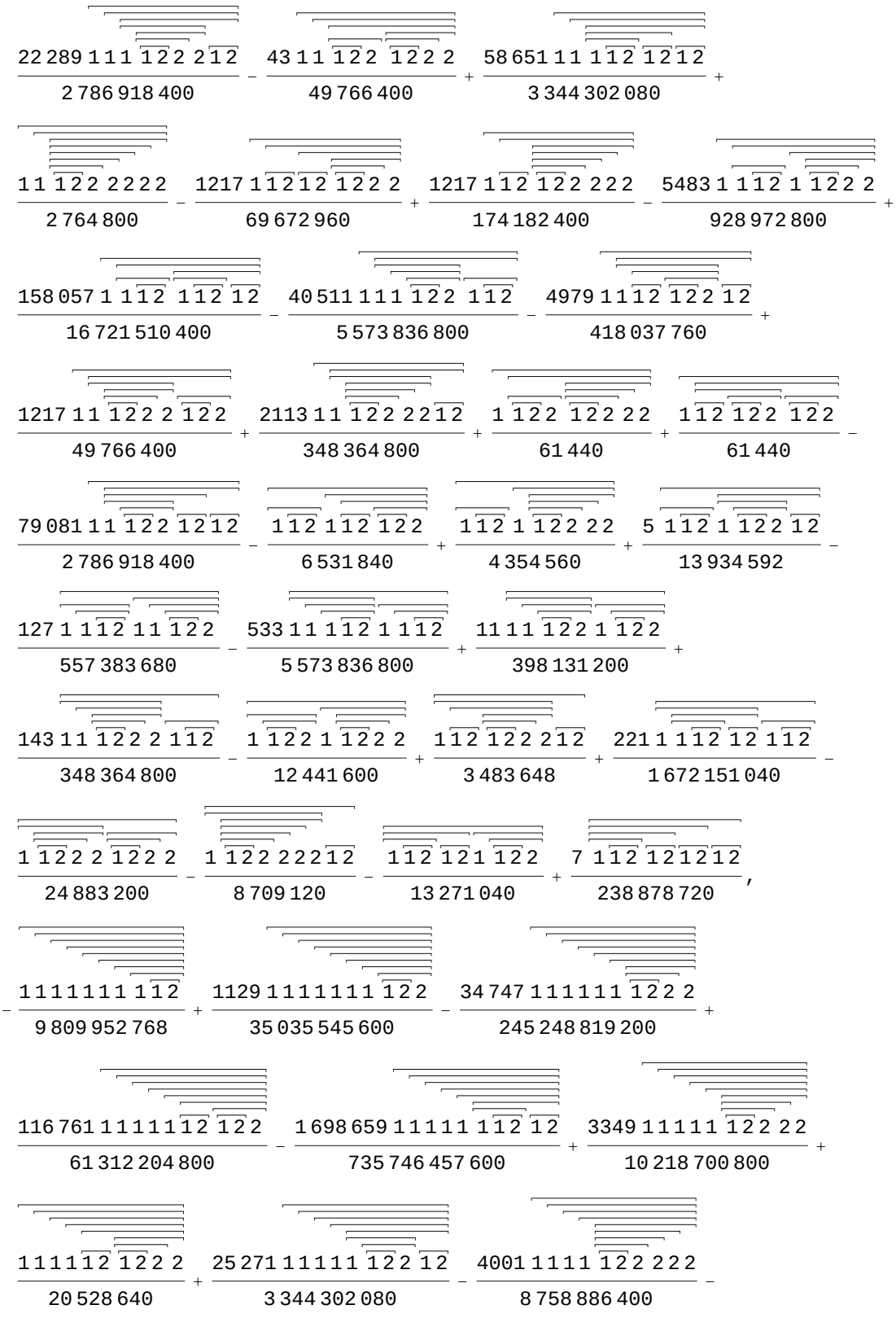
$$-\frac{\overline{1\,\overline{1\,\overline{1}}\,\overline{1\,\overline{1\,2}}}}{645\,120}+\frac{23\,\overline{1\,\overline{1\,\overline{1}}}\,\overline{1\,\overline{2\,\overline{2}}}}{483\,840}-\frac{13\,\overline{1\,\overline{1}}\,\overline{1\,\overline{2\,\overline{2\,2}}}}{161\,280}-\frac{\overline{1\,\overline{2}}\,\overline{1\,\overline{2\,\overline{2}}}}{22\,680}-$$

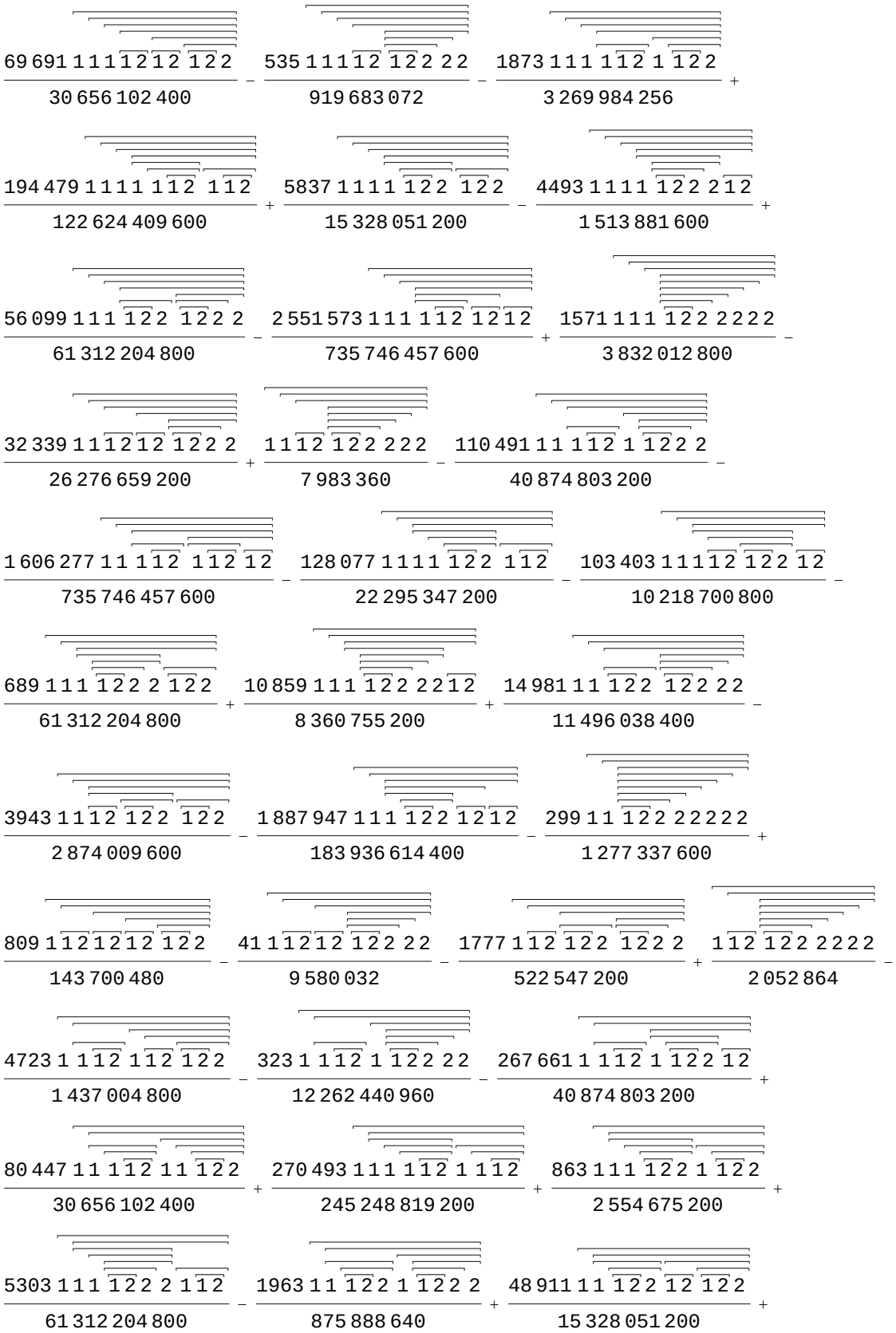
$$\frac{41\,\overline{1\,\overline{1\,\overline{1\,2}}}\,\overline{1\,\overline{2}}}{580\,608}+\frac{\overline{1\,\overline{1\,\overline{2\,2}}}\,\overline{2\,\overline{2}}}{15\,120}+\frac{\overline{1\,\overline{2}}\,\overline{1\,\overline{2\,\overline{2\,2}}}}{12\,096}+\frac{71\,\overline{1\,\overline{1\,\overline{2\,\overline{2}}}}\,\overline{1\,\overline{2}}}{483\,840}-\frac{\overline{1\,\overline{2\,\overline{2\,\overline{2\,2}}}}}{30\,240},$$

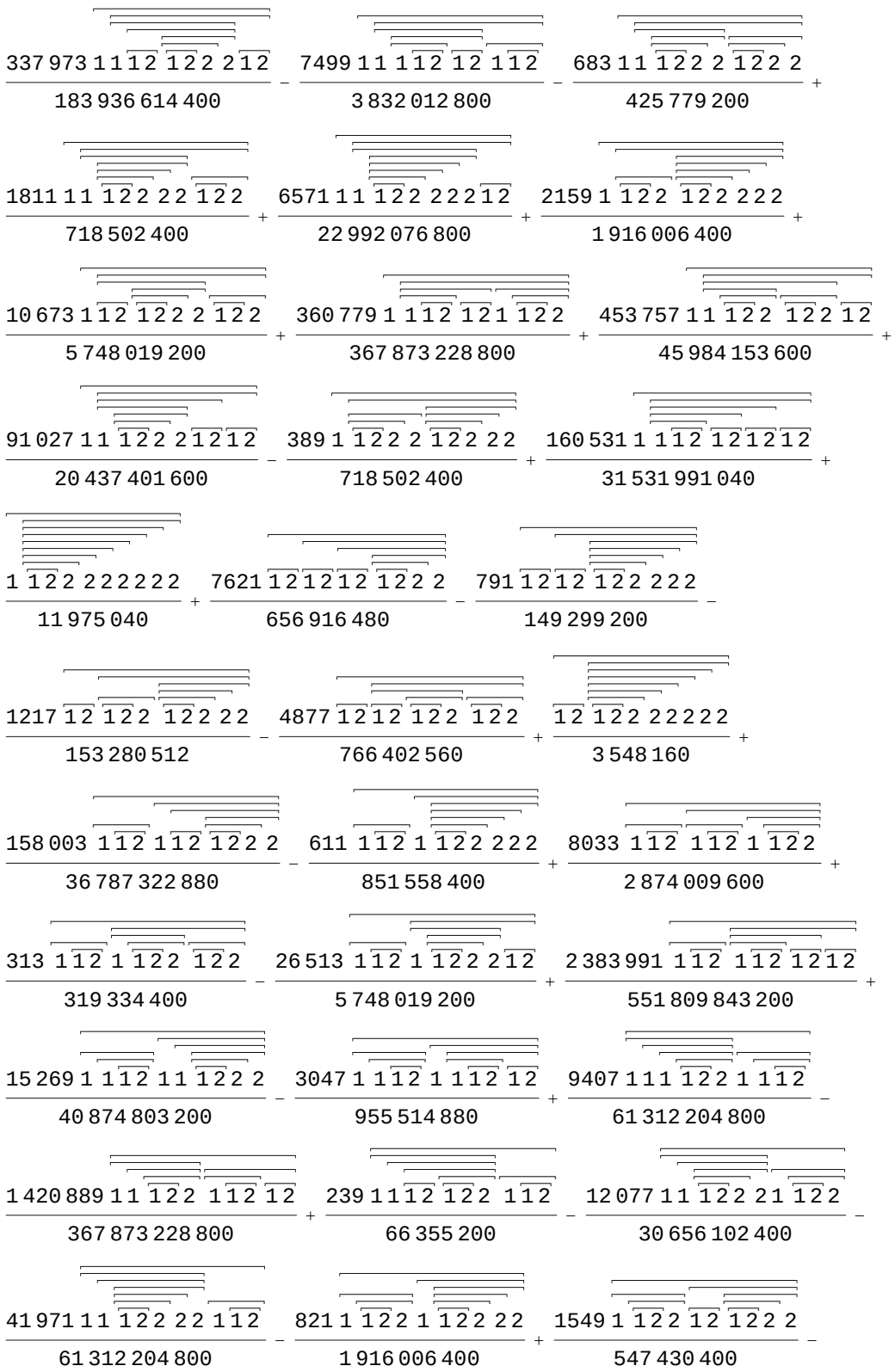
$$\frac{\overline{1\,\overline{1\,\overline{1\,\overline{1\,\overline{1\,2}}}}}}{258\,048}-\frac{5\,\overline{1\,\overline{1\,\overline{1\,\overline{1\,\overline{2\,2}}}}}}{387\,072}+\frac{\overline{1\,\overline{1\,\overline{1\,\overline{2\,\overline{2\,2}}}}}}{64\,512}+\frac{\overline{1\,\overline{1\,\overline{2}}\,\overline{1\,\overline{2\,\overline{2}}}}}{96\,768}+\frac{5\,\overline{1\,\overline{1}}\,\overline{1\,\overline{1\,\overline{2}}}\,\overline{1\,\overline{2}}}{290\,304}-\frac{\overline{1\,\overline{1}}\,\overline{1\,\overline{2\,\overline{2\,2}}}}{96\,768}-$$

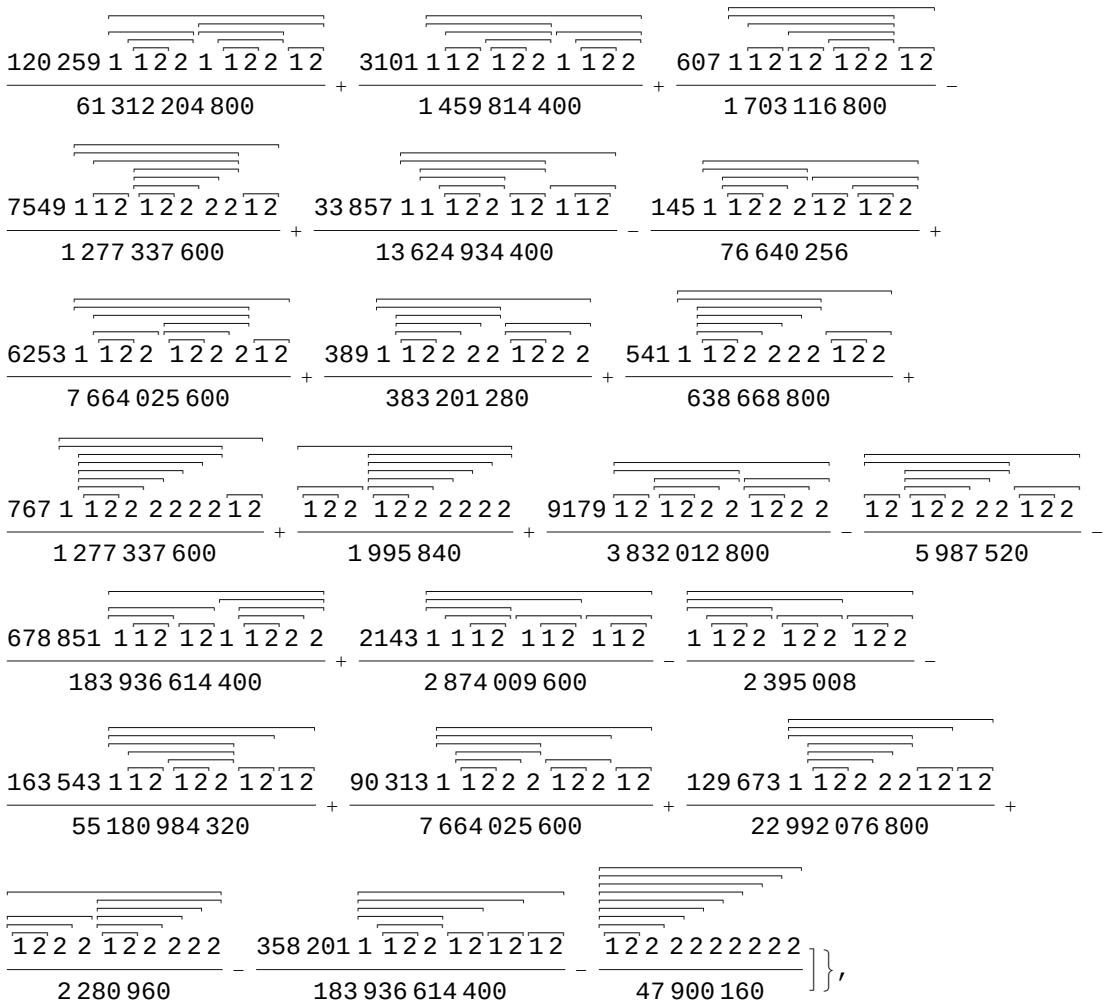
$$\frac{17\,\overline{1\,\overline{1\,\overline{2}}}\,\overline{1\,\overline{2\,\overline{2\,\overline{2}}}}}{1\,451\,520}-\frac{\overline{1\,\overline{1}}\,\overline{1\,\overline{2\,\overline{2}}}\,\overline{1\,\overline{2}}}{60\,480}-\frac{\overline{1\,\overline{1\,\overline{2}}}\,\overline{1\,\overline{1\,\overline{2\,\overline{2}}}}}{207\,360}-\frac{7\,\overline{1\,\overline{1\,\overline{1\,\overline{2}}}}\,\overline{1\,\overline{1\,\overline{2}}}}{1\,658\,880}+\frac{\overline{1\,\overline{1\,\overline{2\,\overline{2}}}}\,\overline{2\,\overline{1\,\overline{2}}}}{207\,360},$$











$$\mathrm{CWS}\Big[0,\ -\frac{\overline{12}}{48},\ 0,\ \frac{\overline{1112}}{2880}+\frac{\overline{1122}}{2880}+\frac{\overline{1212}}{5760}+\frac{\overline{1222}}{2880},\ 0,$$
$$-\frac{\overline{111112}}{120\,960}-\frac{\overline{111122}}{120\,960}-\frac{\overline{111212}}{120\,960}-\frac{\overline{111222}}{120\,960}-$$
$$\frac{\overline{112112}}{241\,920}-\frac{\overline{112122}}{120\,960}-\frac{\overline{112212}}{120\,960}-\frac{\overline{112222}}{120\,960}-$$
$$\frac{\overline{121212}}{362\,880}-\frac{\overline{121222}}{120\,960}-\frac{\overline{122122}}{241\,920}-\frac{\overline{122222}}{120\,960},\ 0,$$
$$\frac{\overline{11111112}}{4\,838\,400}+\frac{\overline{11111122}}{4\,838\,400}+\frac{\overline{11111212}}{4\,838\,400}+\frac{\overline{11111222}}{4\,838\,400}+\frac{\overline{11112112}}{4\,838\,400}+$$
$$\frac{\overline{11112122}}{4\,838\,400}+\frac{\overline{11112212}}{4\,838\,400}+\frac{\overline{11112222}}{4\,838\,400}+\frac{\overline{11121112}}{9\,676\,800}+$$
$$\frac{\overline{11121122}}{4\,838\,400}+\frac{\overline{11121212}}{4\,838\,400}+\frac{\overline{11121222}}{4\,838\,400}+\frac{\overline{11122112}}{4\,838\,400}+$$
$$\frac{\overline{11122122}}{4\,838\,400}+\frac{\overline{11122212}}{4\,838\,400}+\frac{\overline{11122222}}{4\,838\,400}+\frac{\overline{11211212}}{4\,838\,400}+$$

$$\frac{\widehat{11211222}}{4\,838\,400}+\frac{\widehat{11212122}}{4\,838\,400}+\frac{\widehat{11212212}}{4\,838\,400}+\frac{\widehat{11212222}}{4\,838\,400}+$$
$$\frac{\widehat{11221122}}{9\,676\,800}+\frac{\widehat{11221212}}{4\,838\,400}+\frac{\widehat{11221222}}{4\,838\,400}+\frac{\widehat{11222122}}{4\,838\,400}+$$
$$\frac{\widehat{11222212}}{4\,838\,400}+\frac{\widehat{11222222}}{4\,838\,400}+\frac{\widehat{12121212}}{19\,353\,600}+\frac{\widehat{12121222}}{4\,838\,400}+$$
$$\frac{\widehat{12122122}}{4\,838\,400}+\frac{\widehat{12122222}}{4\,838\,400}+\frac{\widehat{12212222}}{4\,838\,400}+\frac{\widehat{12221222}}{9\,676\,800}+\frac{\widehat{12222222}}{4\,838\,400},$$
$$0,-\frac{\widehat{1111111112}}{191\,600\,640}-\frac{\widehat{1111111122}}{191\,600\,640}-\frac{\widehat{1111111212}}{191\,600\,640}-\frac{\widehat{1111111222}}{191\,600\,640}-$$
$$\frac{\widehat{1111112112}}{191\,600\,640}-\frac{\widehat{1111112122}}{191\,600\,640}-\frac{\widehat{1111112212}}{191\,600\,640}-$$
$$\frac{\widehat{1111112222}}{191\,600\,640}-\frac{\widehat{1111121112}}{191\,600\,640}-\frac{\widehat{1111121122}}{191\,600\,640}-\frac{\widehat{1111121212}}{191\,600\,640}-$$
$$\frac{\widehat{1111121222}}{191\,600\,640}-\frac{\widehat{1111122112}}{191\,600\,640}-\frac{\widehat{1111122122}}{191\,600\,640}-\frac{\widehat{1111122212}}{191\,600\,640}-$$
$$\frac{\widehat{1111122222}}{191\,600\,640}-\frac{\widehat{1111211112}}{383\,201\,280}-\frac{\widehat{1111211122}}{191\,600\,640}-\frac{\widehat{1111211212}}{191\,600\,640}-$$
$$\frac{\widehat{1111211222}}{191\,600\,640}-\frac{\widehat{1111212112}}{191\,600\,640}-\frac{\widehat{1111212122}}{191\,600\,640}-\frac{\widehat{1111212212}}{191\,600\,640}-$$
$$\frac{\widehat{1111212222}}{191\,600\,640}-\frac{\widehat{1111221112}}{191\,600\,640}-\frac{\widehat{1111221122}}{191\,600\,640}-\frac{\widehat{1111221212}}{191\,600\,640}-$$
$$\frac{\widehat{1111221222}}{191\,600\,640}-\frac{\widehat{1111222112}}{191\,600\,640}-\frac{\widehat{1111222122}}{191\,600\,640}-\frac{\widehat{1111222212}}{191\,600\,640}-$$
$$\frac{\widehat{1111222222}}{191\,600\,640}-\frac{\widehat{1112111212}}{191\,600\,640}-\frac{\widehat{1112111222}}{191\,600\,640}-\frac{\widehat{1112112112}}{191\,600\,640}-$$
$$\frac{\widehat{1112112122}}{191\,600\,640}-\frac{\widehat{1112112212}}{191\,600\,640}-\frac{\widehat{1112112222}}{191\,600\,640}-\frac{\widehat{1112121122}}{191\,600\,640}-$$
$$\frac{\widehat{1112121212}}{191\,600\,640}-\frac{\widehat{1112121222}}{191\,600\,640}-\frac{\widehat{1112122112}}{191\,600\,640}-\frac{\widehat{1112122122}}{191\,600\,640}-$$
$$\frac{\widehat{1112122212}}{191\,600\,640}-\frac{\widehat{1112122222}}{191\,600\,640}-\frac{\widehat{1112211122}}{383\,201\,280}-\frac{\widehat{1112211212}}{191\,600\,640}-$$
$$\frac{\widehat{1112211222}}{191\,600\,640}-\frac{\widehat{1112212112}}{191\,600\,640}-\frac{\widehat{1112212122}}{191\,600\,640}-\frac{\widehat{1112212212}}{191\,600\,640}-$$
$$\frac{\widehat{1112212222}}{191\,600\,640}-\frac{\widehat{1112221122}}{191\,600\,640}-\frac{\widehat{1112221212}}{191\,600\,640}-\frac{\widehat{1112221222}}{191\,600\,640}-$$
$$\frac{\widehat{1112222112}}{191\,600\,640}-\frac{\widehat{1112222122}}{191\,600\,640}-\frac{\widehat{1112222212}}{191\,600\,640}-\frac{\widehat{1112222222}}{191\,600\,640}-$$
$$\frac{\widehat{1121121122}}{191\,600\,640}-\frac{\widehat{1121121212}}{191\,600\,640}-\frac{\widehat{1121121222}}{191\,600\,640}-\frac{\widehat{1121122122}}{191\,600\,640}-$$

$$\frac{\overbrace{1121122212}}{191\,600\,640}-\frac{\overbrace{1121122222}}{191\,600\,640}-\frac{\overbrace{1121211212}}{383\,201\,280}-\frac{\overbrace{1121211222}}{191\,600\,640}-$$
$$\frac{\overbrace{1121212122}}{191\,600\,640}-\frac{\overbrace{1121212212}}{191\,600\,640}-\frac{\overbrace{1121212222}}{191\,600\,640}-\frac{\overbrace{1121221122}}{191\,600\,640}-$$
$$\frac{\overbrace{1121221212}}{191\,600\,640}-\frac{\overbrace{1121221222}}{191\,600\,640}-\frac{\overbrace{1121222122}}{191\,600\,640}-\frac{\overbrace{1121222212}}{191\,600\,640}-$$
$$\frac{\overbrace{1121222222}}{191\,600\,640}-\frac{\overbrace{1122112212}}{191\,600\,640}-\frac{\overbrace{1122112222}}{191\,600\,640}-\frac{\overbrace{1122121212}}{191\,600\,640}-$$
$$\frac{\overbrace{1122121222}}{191\,600\,640}-\frac{\overbrace{1122122122}}{191\,600\,640}-\frac{\overbrace{1122122212}}{191\,600\,640}-\frac{\overbrace{1122122222}}{191\,600\,640}-$$
$$\frac{\overbrace{1122211222}}{383\,201\,280}-\frac{\overbrace{1122212122}}{191\,600\,640}-\frac{\overbrace{1122212212}}{191\,600\,640}-\frac{\overbrace{1122212222}}{191\,600\,640}-$$
$$\frac{\overbrace{1122221212}}{191\,600\,640}-\frac{\overbrace{1122221222}}{191\,600\,640}-\frac{\overbrace{1122222122}}{191\,600\,640}-\frac{\overbrace{1122222212}}{191\,600\,640}-$$
$$\frac{\overbrace{1122222222}}{191\,600\,640}-\frac{\overbrace{1212121212}}{958\,003\,200}-\frac{\overbrace{1212121222}}{191\,600\,640}-\frac{\overbrace{1212122122}}{191\,600\,640}-$$
$$\frac{\overbrace{1212122222}}{191\,600\,640}-\frac{\overbrace{1212212122}}{383\,201\,280}-\frac{\overbrace{1212212222}}{191\,600\,640}-\frac{\overbrace{1212221222}}{191\,600\,640}-$$
$$\frac{\overbrace{1212222122}}{191\,600\,640}-\frac{\overbrace{1212222222}}{191\,600\,640}-\frac{\overbrace{1221221222}}{191\,600\,640}-\frac{\overbrace{1221222222}}{191\,600\,640}-$$
$$\frac{\overbrace{1222122222}}{191\,600\,640}-\frac{\overbrace{1222212222}}{383\,201\,280}-\frac{\overbrace{1222222222}}{191\,600\,640}\Big]\Big],$$

```
M[{1 → LS[0, 0, 0, 0, 0, 0, 0, 0, 0, 0]},
  CWS[0, -1111/96, 0, 1111/11520,
    0, -111111/725760, 0, 11111111/38707200,
    0, -1111111111/1916006400]]}
```

```
Save["WKOSolution10.m", {αs, βs, γs, κs}]
```

C

```
M[{1 → LS[0, 0, 0, 0, 0, 0, 0, 0, 0, 0]},
  CWS[0, -11/96, 0, 1111/11520, 0, -111111/725760, 0, 11111111/38707200, 0, -1111111111/1916006400]]
```

```
Series[1/4 Log[(E^(x/2) - E^(-x/2))/x], {x, 0, 10}]
```

$$\frac{x^2}{96}-\frac{x^4}{11\,520}+\frac{x^6}{725\,760}-\frac{x^8}{38\,707\,200}+\frac{x^{10}}{1\,916\,006\,400}+O[x]^{11}$$

```
TimeUsed[]
```

```
6178.03
```

```
VerticalFlipEq[10, V] // Timing
```

```
{1360.250720, {0, 0, 0}}
```

```
sol11 = Solve[(# == 0) & /@ Union[μCoefficients[{
       HardR4[12, V], TwistEq[11, V], UnitarityEq[11, V], CapEq[11, V, C]
      }]]]
```

```
$Aborted
```

```
sol11 /. Rule → Set; $SeriesShowDegree = 11; {V, C}
```

```
C
```

```
Save["WKOSolution11.m", {αs, βs, γs, κs}]
```

```
VerticalFlipEq[11, V]
```

```
TimeUsed[] // Timing
```