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SymmetryFactor[l_List] := Module[{ll = l, sf = 1},
  While[{ll = RotateLeft[ll]} != l, ++sf];
  sf];
SymmetryFactor[{1, 1, 1, 2, 1, 1, 1, 2}]
4
γs[xs___] :=
  γs[xs] = If[{xs} === RotateLeft@{xs}, 0, SymmetryFactor[{xs}]] * xs[xs];
γ = CWS[{x, y}, γs];
γ@{6}
CWS[0, - $\frac{\overline{xy}}{48}$ , 0,  $\frac{\overline{xxx\overline{y}}}{2880} + \frac{\overline{xy\overline{y}}}{2880} + \frac{\overline{xy\overline{xy}}}{5760} + \frac{\overline{xy\overline{yy}}}{2880}$ , 0, - $\frac{\overline{xxxx\overline{y}}}{120960} - \frac{\overline{xxxx\overline{yy}}}{120960} - \frac{\overline{xxx\overline{xy}}}{120960} - \frac{\overline{xxx\overline{yy}}}{120960} - \frac{\overline{xy\overline{xy}}}{241920} - \frac{\overline{xy\overline{yy}}}{120960} - \frac{\overline{xy\overline{xy}}}{120960} - \frac{\overline{xy\overline{yy}}}{120960} - \frac{\overline{xy\overline{xy}}}{362880} - \frac{\overline{xy\overline{yy}}}{120960} - \frac{\overline{xy\overline{xy}}}{241920} - \frac{\overline{xy\overline{yy}}}{120960}, \dots]$ 
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α = LS[{x, y}, αs]; β = LS[{x, y}, βs];
V0 = Es[⟨x → α, y → β⟩, γ];
βs["x"] = 1/4; βs["y"] = 0;
SeriesSolve[{α, β}, (ħ-1 R4Eqn[V0]) ∧ UnitarityEqn[V0] ∧ CapEqn[V0, Cap0]];
V0@{8} // Timing
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SeriesSolve::ArbitrarilySetting : In degree 8 arbitrarily setting {αs[x, x, x, y, x, y, y] → 0}.

$$\left\{ \overline{x} \rightarrow \text{LS} \left[ -\frac{\overline{y}}{4}, -\frac{\overline{x\overline{y}}}{96}, \frac{1}{128} \overline{x\overline{x\overline{y}}} - \frac{1}{256} \overline{x\overline{y\overline{y}}}, \frac{7}{92160} \overline{x\overline{x\overline{x\overline{y}}}} - \frac{7}{92160} \overline{x\overline{x\overline{y\overline{y}}}} + \frac{11}{23040} \overline{x\overline{y\overline{y}}\overline{y}} - \frac{5}{24576} \overline{x\overline{x\overline{x\overline{x\overline{y}}}} + \frac{5}{16384} \overline{x\overline{x\overline{x\overline{y\overline{y}}}} - \frac{67}{245760} \overline{x\overline{x\overline{y\overline{y}}\overline{y}} - \frac{77}{552960} \overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}}} - \frac{5}{49152} \overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y}}}} + \frac{7}{81920} \overline{x\overline{y\overline{y}}\overline{y\overline{y}}}, -\frac{31}{61931520} \overline{x\overline{x\overline{x\overline{x\overline{x\overline{y}}}} + \frac{31}{30965760} \overline{x\overline{x\overline{x\overline{x\overline{y\overline{y}}}} - \frac{121}{4587520} \overline{x\overline{x\overline{x\overline{y\overline{y}}\overline{y}} - \frac{377}{92897280} \overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}}} - \frac{31}{41287680} \overline{x\overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y}}}} + \frac{641}{24772608} \overline{x\overline{x\overline{y\overline{y}}\overline{y\overline{y}} + \frac{793}{18579456} \overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}\overline{y}} + \frac{5219}{92897280} \overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y}}}} - \frac{131}{10321920} \overline{x\overline{y\overline{y}}\overline{y\overline{y\overline{y}}}} + \frac{61}{11796480} \overline{x\overline{x\overline{x\overline{x\overline{x\overline{y}}}} - \frac{61}{4718592} \overline{x\overline{x\overline{x\overline{x\overline{y\overline{y}}}} + \frac{5417}{247726080} \overline{x\overline{x\overline{x\overline{x\overline{y\overline{y}}\overline{y}} + \frac{3217}{371589120} \overline{x\overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}}} + \frac{61}{3932160} \overline{x\overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y}}}} - \frac{547}{27525120} \overline{x\overline{x\overline{y\overline{y}}\overline{y\overline{y}} - \frac{13687}{495452160} \overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}\overline{y}} - \frac{8561}{212336640} \overline{x\overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y}}}} + \frac{4901}{495452160} \overline{x\overline{x\overline{y\overline{y}}\overline{y\overline{y\overline{y}}}} - \frac{1537}{99090432} \overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}}} + \frac{2209}{148635648} \overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}\overline{y\overline{y}} - \frac{545}{74317824} \overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}}} - \frac{61}{23592960} \overline{x\overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y}}}} + \frac{7453}{743178240} \overline{x\overline{x\overline{y\overline{y}}\overline{x\overline{y\overline{y}}}} + \right.$$

$$\begin{aligned}
 & \frac{53 \overline{x \overline{xy} y \overline{xy}}}{2580480} + \frac{2323 \overline{\overline{xy} \overline{xy} y}}{297271296} + \frac{439 \overline{x \overline{xy} \overline{xy} \overline{xy}}}{82575360} - \frac{341 \overline{\overline{xy} y \overline{xy} y}}{165150720}, \\
 & \frac{127 \overline{xxxx \overline{xy}}}{39636172800} - \frac{127 \overline{xxxx \overline{xy} y}}{13212057600} + \frac{117379 \overline{xxxx \overline{xy} y}}{118908518400} + \frac{127 \overline{xxx \overline{xy} \overline{xy}}}{7927234560} - \\
 & \frac{232853 \overline{xxx \overline{xy} y}}{118908518400} - \frac{1181287 \overline{xx \overline{xy} \overline{xy} y}}{356725555200} - \frac{38663 \overline{xxx \overline{xy} \overline{xy}}}{8493465600} + \\
 & \frac{127117 \overline{xx \overline{xy} y \overline{xy}}}{59454259200} - \frac{1007519 \overline{x \overline{xy} \overline{xy} \overline{xy} y}}{356725555200} + \frac{53627 \overline{x \overline{xy} \overline{xy} y \overline{xy}}}{10192158720} - \\
 & \frac{21467 \overline{xx \overline{xy} x \overline{xy}}}{25480396800} - \frac{127 \overline{xx \overline{xy} x \overline{xy}}}{19818086400} + \frac{946013 \overline{xx \overline{xy} \overline{xy} y}}{356725555200} + \\
 & \frac{2288033 \overline{xx \overline{xy} y \overline{xy}}}{356725555200} + \frac{56207 \overline{x \overline{xy} \overline{xy} y}}{50960793600} + \frac{199 \overline{xx \overline{xy} \overline{xy} \overline{xy}}}{235929600} - \\
 & \frac{9857 \overline{x \overline{xy} y \overline{xy} y}}{8493465600} + \frac{40597 \overline{\overline{xy} \overline{xy} \overline{xy} y}}{4246732800} - \frac{4583 \overline{\overline{xy} \overline{xy} y \overline{xy} y}}{1189085184} + \frac{454583 \overline{xx \overline{xy} x \overline{xy} y}}{118908518400} + \\
 & \frac{3293 \overline{xx \overline{xy} x \overline{xy} \overline{xy}}}{4954521600} + \frac{260353 \overline{xx \overline{xy} x \overline{xy}}}{89181388800} + \frac{575287 \overline{x \overline{xy} \overline{xy} \overline{xy}}}{356725555200} - \\
 & \frac{131893 \overline{x \overline{xy} y \overline{xy}}}{16986931200} - \frac{56071 \overline{x \overline{xy} y \overline{xy} \overline{xy}}}{10192158720} - \frac{121393 \overline{\overline{xy} \overline{xy} y \overline{xy}}}{25480396800} - \\
 & \frac{238561 \overline{\overline{xy} \overline{xy} \overline{xy}}}{50960793600} - \frac{189451 \overline{x \overline{xy} \overline{xy} \overline{xy}}}{59454259200} + \frac{1601 \overline{\overline{xy} y \overline{xy} y}}{4954521600}, \dots \Big], \\
 \overline{y} \rightarrow \text{LS} & \left[ \frac{\overline{x}}{4}, \frac{\overline{xy}}{96}, \frac{1}{256} \overline{xx \overline{xy}} - \frac{1}{128} \overline{\overline{xy} y}, -\frac{11 \overline{xx \overline{xy}}}{23040} + \frac{7 \overline{x \overline{xy} y}}{92160} - \frac{7 \overline{\overline{xy} y}}{92160}, \right. \\
 & - \frac{7 \overline{xx \overline{xy}}}{81920} + \frac{67 \overline{xx \overline{xy} y}}{245760} - \frac{5 \overline{x \overline{xy} y}}{16384} - \frac{5 \overline{\overline{xy} \overline{xy}}}{24576} - \frac{59 \overline{xx \overline{xy} \overline{xy}}}{442368} + \frac{5 \overline{\overline{xy} y \overline{xy}}}{24576}, \\
 & \frac{131 \overline{xxx \overline{xy}}}{10321920} - \frac{641 \overline{xxx \overline{xy} y}}{24772608} + \frac{121 \overline{xx \overline{xy} y}}{4587520} + \frac{377 \overline{x \overline{xy} \overline{xy}}}{92897280} + \\
 & \frac{337 \overline{x \overline{xy} \overline{xy}}}{37158912} - \frac{31 \overline{x \overline{xy} y \overline{xy}}}{30965760} - \frac{31 \overline{\overline{xy} \overline{xy} y}}{24772608} - \frac{1837 \overline{x \overline{xy} \overline{xy}}}{123863040} + \frac{31 \overline{\overline{xy} y \overline{xy}}}{61931520}, \\
 & \frac{341 \overline{xxxx \overline{xy}}}{165150720} - \frac{4901 \overline{xxxx \overline{xy} y}}{495452160} + \frac{547 \overline{xxx \overline{xy} y}}{27525120} + \frac{3841 \overline{xx \overline{xy} \overline{xy}}}{495452160} +
 \end{aligned}$$



$$\begin{aligned}
& \frac{\overline{\overline{xyxyxy}}}{120\,960} - \frac{\overline{\overline{xyyyyy}}}{120\,960} - \frac{\overline{\overline{yxxyxy}}}{362\,880} - \frac{\overline{\overline{yxxyyy}}}{120\,960} - \frac{\overline{\overline{xyxyxy}}}{241\,920} - \frac{\overline{\overline{xyyyyy}}}{120\,960}, \\
& 0, \frac{\overline{\overline{xxxxxxxxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxxxxxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxxxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxxxyyy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxxxxy}}}{4\,838\,400} + \\
& \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxxyyyy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxxxxy}}}{9\,676\,800} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \\
& \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \\
& \frac{\overline{\overline{xxxxyyyyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \\
& \frac{\overline{\overline{xxxxyyyyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{9\,676\,800} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyxyxy}}}{4\,838\,400} + \\
& \frac{\overline{\overline{xxxxyyyyxy}}}{4\,838\,400} + \frac{\overline{\overline{xxxxyyyyxy}}}{4\,838\,400} + \frac{\overline{\overline{xyxyxyxyxy}}}{19\,353\,600} + \frac{\overline{\overline{xyxyxyxyxy}}}{4\,838\,400} + \frac{\overline{\overline{xyxyxyxyxy}}}{4\,838\,400} + \\
& \frac{\overline{\overline{xyxyyyyxy}}}{4\,838\,400} + \frac{\overline{\overline{xyxyyyyxy}}}{4\,838\,400} + \frac{\overline{\overline{xyxyyyyxy}}}{9\,676\,800} + \frac{\overline{\overline{xyxyyyyxy}}}{4\,838\,400}, \dots \}}
\end{aligned}$$

**Timing**[V<sub>0</sub>@{11};]

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