



$$\alpha = \text{LS}[\{\mathbf{x}, \mathbf{y}\}, \alpha\mathbf{s}]; \quad \beta = \text{LS}[\{\mathbf{x}, \mathbf{y}\}, \beta\mathbf{s}];$$

$$\gamma = \text{CWS}[\{\mathbf{x}, \mathbf{y}\}, \gamma\mathbf{s}];$$

$$\mathbf{V} = \text{Es}[\langle \mathbf{x} \rightarrow \alpha, \mathbf{y} \rightarrow \beta \rangle, \gamma];$$

$$\kappa = \text{CWS}[\{\mathbf{x}\}, \kappa\mathbf{s}]; \quad \text{Cap} = \text{Es}[\langle \mathbf{x} \rightarrow \text{LS}[0] \rangle, \kappa];$$

$$\text{Rs}[a_, b_] := \text{Es}[\langle a \rightarrow \text{LS}[0], b \rightarrow \text{LS}[\text{LW}@a] \rangle, \text{CWS}[0]];$$

$$\text{R4Eqn} = \mathbf{V} ** (\text{Rs}[\mathbf{x}, \mathbf{z}] // \text{d}\Delta[\mathbf{x}, \mathbf{x}, \mathbf{y}]) \equiv \text{Rs}[\mathbf{y}, \mathbf{z}] ** \text{Rs}[\mathbf{x}, \mathbf{z}] ** \mathbf{V};$$

$$\text{UnitarityEqn} =$$

$$(\mathbf{V} ** (\mathbf{V} // \text{d}\mathbf{A}) \equiv \text{Es}[\langle \mathbf{x} \rightarrow \text{LS}[0], \mathbf{y} \rightarrow \text{LS}[0] \rangle, \text{CWS}[0]]);$$

$$\text{CapEqn} = ((\mathbf{V} ** (\text{Cap} // \text{d}\Delta[\mathbf{x}, \mathbf{x}, \mathbf{y}]) // \text{dc}[\mathbf{x}] // \text{dc}[\mathbf{y}]) \equiv$$

$$(\text{Cap} (\text{Cap} // \text{d}\sigma[\mathbf{x}, \mathbf{y}]) // \text{dc}[\mathbf{x}] // \text{dc}[\mathbf{y}]));$$

$$\beta\mathbf{s}["\mathbf{x}"] = 1/2; \quad \beta\mathbf{s}["\mathbf{y}"] = 0;$$

$$\text{SeriesSolve}[\{\alpha, \beta, \gamma, \kappa\},$$

$$(\hbar^{-1} \text{R4Eqn}) \wedge \text{UnitarityEqn} \wedge \text{CapEqn];$$

$$\{\mathbf{V}, \kappa\}$$

SeriesSolve::ArbitrarilySetting: In degree 1 arbitrarily setting  $\{\kappa\mathbf{s}[\mathbf{x}] \rightarrow 0\}$ .

SeriesSolve::ArbitrarilySetting: In degree 3 arbitrarily setting  $\{\alpha\mathbf{s}[\mathbf{x}, \mathbf{y}, \mathbf{y}] \rightarrow 0\}$ .

SeriesSolve::ArbitrarilySetting: In degree 5 arbitrarily setting  $\{\alpha\mathbf{s}[\mathbf{x}, \mathbf{x}, \mathbf{x}, \mathbf{y}, \mathbf{y}] \rightarrow 0\}$ .

General::stop:

Further output of SeriesSolve::ArbitrarilySetting will be suppressed during this calculation. >

$$\left\{ \text{Es} \left[ \left\langle \overline{\mathbf{x}} \rightarrow \text{LS} \left[ 0, -\frac{\overline{\mathbf{x}\mathbf{y}}}{24}, 0, \frac{7 \overline{\mathbf{x}\mathbf{x}\mathbf{y}}}{5760} - \frac{7 \overline{\mathbf{x}\mathbf{y}\mathbf{y}}}{5760} + \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}}}{1440}, 0, \right. \right. \right. \\ \left. \left. \left. - \frac{31 \overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{y}}}{967680} + \frac{31 \overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}}}{483840} - \frac{83 \overline{\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}}}{967680} - \frac{31 \overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{725760} - \frac{31 \overline{\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{645120} + \right. \right. \\ \left. \left. \frac{13 \overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{241920} + \frac{101 \overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{1451520} + \frac{527 \overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{5806080} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{60480}, \dots \right] \right\}, \\ \overline{\mathbf{y}} \rightarrow \text{LS} \left[ \frac{\overline{\mathbf{x}}}{2}, -\frac{\overline{\mathbf{x}\mathbf{y}}}{12}, 0, \frac{\overline{\mathbf{x}\mathbf{x}\mathbf{y}}}{5760} - \frac{1}{720} \overline{\mathbf{x}\mathbf{y}\mathbf{y}} + \frac{1}{720} \overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}}, -\frac{\overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{y}}}{7680} + \right. \\ \left. \frac{\overline{\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}}}{3840} - \frac{\overline{\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}}}{6912}, -\frac{\overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{y}}}{645120} + \frac{23 \overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}}}{483840} - \frac{13 \overline{\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}}}{161280} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{22680} - \right. \\ \left. \frac{41 \overline{\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{580608} + \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{15120} + \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{12096} + \frac{71 \overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{483840} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{30240}, \dots \right] \left. \right\}, \\ \text{CWS} \left[ 0, -\frac{\overline{\mathbf{x}\mathbf{y}}}{48}, 0, \frac{\overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{y}}}{2880} + \frac{\overline{\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}}}{2880} + \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{x}\mathbf{y}}}{5760} + \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}}}{2880}, 0, \right. \\ \left. -\frac{\overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{y}}}{120960} - \frac{\overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}}}{120960} - \frac{\overline{\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{x}\mathbf{y}}}{120960} - \frac{\overline{\mathbf{x}\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}}}{120960} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{x}\mathbf{x}\mathbf{y}}}{241920} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{x}\mathbf{y}\mathbf{y}}}{120960} - \right. \\ \left. \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{x}\mathbf{y}}}{120960} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{120960} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{x}\mathbf{y}\mathbf{y}}}{362880} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{120960} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}}}{241920} - \frac{\overline{\mathbf{x}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}\mathbf{y}}}{120960}, \dots \right] \left. \right\}, \\ \text{CWS} \left[ 0, -\frac{\overline{\mathbf{x}\mathbf{x}}}{96}, 0, \frac{\overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{x}}}{11520}, 0, -\frac{\overline{\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{x}\mathbf{x}}}{725760}, \dots \right] \left. \right\}$$