# Non-Degenerate Perturbation Theory

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# Notation

$$V_{00} = \langle \psi_0 | V | \psi_0 \rangle$$

$$E_{0\alpha} = E_0 - E_{\alpha}$$

$$\Sigma_{x_1 x_2 \cdots x_n} = \sum_{\alpha_1, \alpha_2, \cdots \alpha_n \neq 0} \frac{V_{0\alpha_1} V_{\alpha_1 \alpha_2} \cdots V_{\alpha_n 0}}{E_{0\alpha_1}^{x_1} E_{0\alpha_2}^{x_2} \cdots E_{0\alpha_n}^{x_n}}$$

#### Examples

$$\Sigma_1 = \sum_{\alpha \neq 0} \frac{\left|V_{0\alpha}\right|^2}{E_{0\alpha}}$$

$$\Sigma_{12} = \sum_{\alpha_1, \alpha_2 \neq 0} \frac{V_{0\alpha_1} V_{\alpha_1 \alpha_2} V_{\alpha_2 0}}{E_{0\alpha_1} E_{0\alpha_2}^2}$$

## **Energy Corrections**

$$\begin{split} & \operatorname{Tr}[\Delta_1] = V_{00} \\ & \operatorname{Tr}[\Delta_2] = \Sigma_1 \\ & \operatorname{Tr}[\Delta_3] = \sum_{1,1} \\ & - V_{00} \Sigma_2 \\ & \operatorname{Tr}[\Delta_4] = -\Sigma_1 \Sigma_2 + \Sigma_{1,1,1} \\ & - V_{00} (\Sigma_{1,2} + \Sigma_{2,1}) \\ & + V_{00}^2 \Sigma_3 \\ & \operatorname{Tr}[\Delta_5] = \Sigma_1 \Sigma_{1,2} + \Sigma_1 \Sigma_{2,1} + \Sigma_{1,1} \Sigma_2 - \Sigma_{1,1,1,1} \\ & - V_{00} (-2\Sigma_1 \Sigma_3 + \Sigma_{1,1,2} + \Sigma_{1,2,1} - \Sigma_2^2 + \Sigma_{2,1,1}) \\ & + V_{00}^2 (\Sigma_{1,3} + \Sigma_{2,2} + \Sigma_{3,1}) \\ & - V_{00}^3 \Sigma_4 \\ & \operatorname{Tr}[\Delta_6] = -\Sigma_1^2 \Sigma_3 + \Sigma_1 \Sigma_{1,2} + \Sigma_1 \Sigma_{1,2,1} - \Sigma_1 \Sigma_2^2 + \Sigma_1 \Sigma_{2,1,1} + \Sigma_{1,1} \Sigma_{1,2} + \Sigma_{1,1} \Sigma_{2,1} + \Sigma_{1,1,1} \Sigma_2 - \Sigma_{1,1,1,1,1} \\ & + V_{00} (2\Sigma_1 \Sigma_{1,3} + 2\Sigma_1 \Sigma_{2,2} + 2\Sigma_1 \Sigma_{3,1} + 2\Sigma_{1,1} \Sigma_3 - \Sigma_{1,1,1,2} - \Sigma_{1,1,2,1} + \Sigma_{1,2} \Sigma_2 - \Sigma_{1,2,1,1} + 2\Sigma_2 \Sigma_{2,1} - \Sigma_{2,1,1,1}) \\ & + V_{00}^3 (-3\Sigma_1 \Sigma_4 + \Sigma_{1,1,3} + \Sigma_{1,2,2} + \Sigma_{1,3,1} - 3\Sigma_2 \Sigma_3 + \Sigma_{2,1,2} + \Sigma_{2,2,1} + \Sigma_{3,1,1}) \\ & - V_{00}^3 (\Sigma_{1,4} + \Sigma_{2,3} + \Sigma_{3,2} + \Sigma_{4,1}) \\ & + V_{00}^4 \Sigma_5 \end{split}$$

$$\begin{split} \operatorname{Tr}[\Delta_{7}] &= -\Sigma_{1}^{2}\Sigma_{1,3} - \Sigma_{1}^{2}\Sigma_{2,2} - \Sigma_{1}^{2}\Sigma_{3,1} - 2\Sigma_{1}\Sigma_{1,1}\Sigma_{3} + \Sigma_{1}\Sigma_{1,1,1,2} + \Sigma_{1}\Sigma_{1,1,2,1} - 2\Sigma_{1}\Sigma_{1,2}\Sigma_{2} + \Sigma_{1}\Sigma_{1,2,1,1} - 2\Sigma_{1}\Sigma_{2}\Sigma_{2,1} \\ &+ \Sigma_{1}\Sigma_{2,1,1,1} + \Sigma_{1,1}\Sigma_{1,1,2} + \Sigma_{1,1}\Sigma_{1,2,1} - \Sigma_{1,1}\Sigma_{2}^{2} + \Sigma_{1,1}\Sigma_{2,1,1} + \Sigma_{1,1,1}\Sigma_{1,2} + \Sigma_{1,1,1}\Sigma_{2,1} + \Sigma_{1,1,1,1,1}\Sigma_{2} - \Sigma_{1,1,1,1,1} \\ &+ V_{00}(-3\Sigma_{1}^{2}\Sigma_{4} + 2\Sigma_{1}\Sigma_{1,1,3} + 2\Sigma_{1}\Sigma_{1,2,2} + 2\Sigma_{1}\Sigma_{1,3,1} - 6\Sigma_{1}\Sigma_{2}\Sigma_{3} + 2\Sigma_{1}\Sigma_{2,1,2} + 2\Sigma_{1}\Sigma_{2,2,1} + 2\Sigma_{1}\Sigma_{3,1,1} + 2\Sigma_{1,1}\Sigma_{1,3} \\ &+ 2\Sigma_{1,1}\Sigma_{2,2} + 2\Sigma_{1,1}\Sigma_{3,1} + 2\Sigma_{1,1,1}\Sigma_{3} - \Sigma_{1,1,1,2} - \Sigma_{1,1,1,2,1} + 2\Sigma_{1,1,2}\Sigma_{2} - \Sigma_{1,1,2,1,1} + \Sigma_{1,2}^{2} + 2\Sigma_{1,2}\Sigma_{2,1} + 2\Sigma_{1,2,1}\Sigma_{2} \\ &- \Sigma_{1,2,1,1,1} - \Sigma_{3}^{2} + 2\Sigma_{2}\Sigma_{2,1,1} + \Sigma_{2,1}^{2} - \Sigma_{2,1,1,1,1} ) \\ &+ V_{00}^{2}(-3\Sigma_{1}\Sigma_{1,4} - 3\Sigma_{1}\Sigma_{2,3} - 3\Sigma_{1}\Sigma_{3,2} - 3\Sigma_{1}\Sigma_{4,1} - 3\Sigma_{1,1}\Sigma_{4} + \Sigma_{1,1,1,3} + \Sigma_{1,1,2,2} + \Sigma_{1,1,3,1} - 3\Sigma_{1,2}\Sigma_{3} + \Sigma_{1,2,1,2} + \Sigma_{1,2,2,1} \\ &- 3\Sigma_{1,3}\Sigma_{2} + \Sigma_{1,3,1,1} - 3\Sigma_{2}\Sigma_{2,2} - 3\Sigma_{2}\Sigma_{3,1} - 3\Sigma_{2,1}\Sigma_{3} + \Sigma_{2,1,1,2} + \Sigma_{2,1,2,1} + \Sigma_{2,2,1,1} + \Sigma_{2,2,1,1} \\ &- V_{00}^{3}(-4\Sigma_{1}\Sigma_{5} + \Sigma_{1,1,4} + \Sigma_{1,2,3} + \Sigma_{1,3,2} + \Sigma_{1,4,1} - 4\Sigma_{2}\Sigma_{4} + \Sigma_{2,1,3} + \Sigma_{2,2,2} + \Sigma_{2,3,1} - 2\Sigma_{3}^{2} + \Sigma_{3,1,2} + \Sigma_{3,2,1} + \Sigma_{4,1,1}) \\ &+ V_{00}^{4}(\Sigma_{1,5} + \Sigma_{2,4} + \Sigma_{3,3} + \Sigma_{4,2} + \Sigma_{5,1}) \\ &- V_{00}^{5}\Sigma_{6} \end{split}$$

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Tr[\Delta_8] = -\Sigma_1^3 \Sigma_4 + \Sigma_1^2 \Sigma_{1,1,3} + \Sigma_1^2 \Sigma_{1,2,2} + \Sigma_1^2 \Sigma_{1,3,1} - 3\Sigma_1^2 \Sigma_2 \Sigma_3 + \Sigma_1^2 \Sigma_{2,1,2} + \Sigma_1^2 \Sigma_{2,1,1} + \Sigma_1^2 \Sigma_{3,1,1} + 2\Sigma_1 \Sigma_{1,1,2,3} + 2\Sigma_1 \Sigma_{1,1,2,2} + 2\Sigma_1 \Sigma_{1,1,2,3} + \Sigma_1^2 \Sigma_{2,1,2} + \Sigma_1^2 \Sigma_{2,1,2} + \Sigma_1^2 \Sigma_{2,1,2} + \Sigma_1^2 \Sigma_{3,1,1} + 2\Sigma_1 \Sigma_{1,1,2,3} + 2\Sigma_1 \Sigma_{1,1,2,2} + 2\Sigma_1 \Sigma_{1,1,2,3} + 
                                                                                                               +2\Sigma_{1}\Sigma_{1,1,1}\Sigma_{3}-\Sigma_{1}\Sigma_{1,1,1,1,2}-\Sigma_{1}\Sigma_{1,1,1,2,1}+2\Sigma_{1}\Sigma_{1,1,2}\Sigma_{2}-\Sigma_{1}\Sigma_{1,1,2,1,1}+\Sigma_{1}\Sigma_{1/2}^{2}+2\Sigma_{1}\Sigma_{1,2}\Sigma_{2/1}+2\Sigma_{1}\Sigma_{1/2,1}\Sigma_{2}-\Sigma_{1}\Sigma_{1/2,1/2}\Sigma_{2/2}+\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2,1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{1/2}\Sigma_{
                                                                                                               -\Sigma_{1}\Sigma_{2}^{3}+2\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{1}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}\Sigma_{2}+\Sigma_{1}\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma_{1}\Sigma_{2}+\Sigma
                                                                                                             -\Sigma_{1,1}\Sigma_{2,1,1,1}-\Sigma_{1,1,1}\Sigma_{1,1,2}-\Sigma_{1,1,1}\Sigma_{1,2,1}+\Sigma_{1,1,1}\Sigma_{2}^{2}-\Sigma_{1,1,1}\Sigma_{2,1,1}-\Sigma_{1,1,1,1}\Sigma_{1,2}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,2}+\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,
                                                                                                             +2\Sigma_{1}\Sigma_{1212}+2\Sigma_{1}\Sigma_{1221}-6\Sigma_{1}\Sigma_{13}\Sigma_{2}+2\Sigma_{1}\Sigma_{1311}-6\Sigma_{1}\Sigma_{2}\Sigma_{22}-6\Sigma_{1}\Sigma_{2}\Sigma_{31}-6\Sigma_{1}\Sigma_{21}\Sigma_{3}+2\Sigma_{1}\Sigma_{2112}+2\Sigma_{1}\Sigma_{2121}
                                                                                                                    +2\Sigma_{1}\Sigma_{2,2,1,1}+2\Sigma_{1}\Sigma_{3,1,1,1}+2\Sigma_{1,1}\Sigma_{1,1,3}+2\Sigma_{1,1}\Sigma_{1,2,2}+2\Sigma_{1,1}\Sigma_{1,3,1}-6\Sigma_{1,1}\Sigma_{2}\Sigma_{3}+2\Sigma_{1,1}\Sigma_{2,1,2}+2\Sigma_{1,1}\Sigma_{2,2,1}+2\Sigma_{1,1}\Sigma_{3,1,1}
                                                                                                                                                             +2\Sigma_{1,1,1}\Sigma_{1,3}+2\Sigma_{1,1,1}\Sigma_{2,2}+2\Sigma_{1,1,1}\Sigma_{3,1}+2\Sigma_{1,1,1,1}\Sigma_{3}-\Sigma_{1,1,1,1,1,2}-\Sigma_{1,1,1,1,2,1}+2\Sigma_{1,1,1,2}\Sigma_{2}-\Sigma_{1,1,1,2,1,1}+2\Sigma_{1,1,2}\Sigma_{1,2}
                                                                                                                                                                              +2\Sigma_{1,1,2}\Sigma_{2,1}+2\Sigma_{1,1,2,1}\Sigma_{2}-\Sigma_{1,1,2,1,1,1}+2\Sigma_{1,2}\Sigma_{1,2,1}-3\Sigma_{1,2}\Sigma_{2}^{2}+2\Sigma_{1,2}\Sigma_{2,1,1}+2\Sigma_{1,2,1}\Sigma_{2,1}+2\Sigma_{1,2,1,1}\Sigma_{2}-\Sigma_{1,2,1,1,1,1}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -3\Sigma_{2}^{2}\Sigma_{2,1}+2\Sigma_{2}\Sigma_{2,1,1,1}+2\Sigma_{2,1}\Sigma_{2,1,1}-\Sigma_{2,1,1,1,1,1}
                                                                                                               -V_{\text{on}}^2(-6\Sigma_{1}^{2}\Sigma_{5}+3\Sigma_{1}\Sigma_{1.1.4}+3\Sigma_{1}\Sigma_{1.2.3}+3\Sigma_{1}\Sigma_{1.3.2}+3\Sigma_{1}\Sigma_{1.4.1}-12\Sigma_{1}\Sigma_{2}\Sigma_{4}+3\Sigma_{1}\Sigma_{2.1.3}+3\Sigma_{1}\Sigma_{2.2.2}+3\Sigma_{1}\Sigma_{2.3.1}-6\Sigma_{1}\Sigma_{3}\Sigma_{2.2.2}+3\Sigma_{1}\Sigma_{2.3.1}-6\Sigma_{1}\Sigma_{3}\Sigma_{2.2.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma_{1}\Sigma_{2.3.2}+3\Sigma
                                                                                                                                                 +3\Sigma_{1}\Sigma_{3,1,2}+3\Sigma_{1}\Sigma_{3,2,1}+3\Sigma_{1}\Sigma_{4,1,1}+3\Sigma_{1,1}\Sigma_{1,4}+3\Sigma_{1,1}\Sigma_{2,3}+3\Sigma_{1,1}\Sigma_{3,2}+3\Sigma_{1,1}\Sigma_{4,1}+3\Sigma_{1,1,1,2}-\Sigma_{1,1,1,3}-\Sigma_{1,1,1,2,2}
                                                                                                                                                                            -\Sigma_{1,1,1,3,1} + 3\Sigma_{1,1,2}\Sigma_3 - \Sigma_{1,1,2,1,2} - \Sigma_{1,1,2,2,1} + 3\Sigma_{1,1,3}\Sigma_2 - \Sigma_{1,1,3,1,1} + 3\Sigma_{1,2}\Sigma_{1,3} + 3\Sigma_{1,2}\Sigma_{2,2} + 3\Sigma_{1,2}\Sigma_{3,1} + 3\Sigma_{1,2,1}\Sigma_3
                                                                                                                                                                                                         -\Sigma_{1\,2\,1\,1\,2}-\Sigma_{1\,2\,1\,2\,1}+3\Sigma_{1\,2\,2}\Sigma_{2}-\Sigma_{1\,2\,2\,1\,1}+3\Sigma_{1\,3}\Sigma_{2\,1}+3\Sigma_{1\,3\,1}\Sigma_{2}-\Sigma_{1\,3\,1\,1\,1}-6\Sigma_{2}^{2}\Sigma_{3}+3\Sigma_{2}\Sigma_{2\,1\,2}+3\Sigma_{2}\Sigma_{2\,2\,1}
                                                                                                                                                                                                                                                                                                                     +3\Sigma_{2}\Sigma_{3,1,1}+3\Sigma_{2,1}\Sigma_{2,2}+3\Sigma_{2,1}\Sigma_{3,1}+3\Sigma_{2,1,1}\Sigma_{3}-\Sigma_{2,1,1,1,2}-\Sigma_{2,1,1,2,1}-\Sigma_{2,1,2,1,1}-\Sigma_{2,2,1,1,1}-\Sigma_{3,1,1,1,1})
                                                                                                               -V_{00}^{3}(-4\Sigma_{1}\Sigma_{1.5}-4\Sigma_{1}\Sigma_{2.4}-4\Sigma_{1}\Sigma_{3.3}-4\Sigma_{1}\Sigma_{4.2}-4\Sigma_{1}\Sigma_{5.1}-4\Sigma_{1.1}\Sigma_{5}+\Sigma_{1.1.1.4}+\Sigma_{1.1.2.3}+\Sigma_{1.1,3.2}+\Sigma_{1.1,4.1}-4\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma_{4.2}+\Sigma_{1.2}\Sigma
                                                                                                                +\Sigma_{1,2,1,3}+\Sigma_{1,2,2,2}+\Sigma_{1,2,3,1}-4\Sigma_{1,3}\Sigma_{3}+\Sigma_{1,3,1,2}+\Sigma_{1,3,2,1}-4\Sigma_{1,4}\Sigma_{2}+\Sigma_{1,4,1,1}-4\Sigma_{2}\Sigma_{2,3}-4\Sigma_{2}\Sigma_{3,2}-4\Sigma_{2}\Sigma_{4,1}-4\Sigma_{2,1}\Sigma_{4,1}
                                                                                                                                                    +\Sigma_{2,1,1,3}+\Sigma_{2,1,2,2}+\Sigma_{2,1,3,1}-4\Sigma_{2,2}\Sigma_{3}+\Sigma_{2,2,1,2}+\Sigma_{2,2,2,1}+\Sigma_{2,3,1,1}-4\Sigma_{3}\Sigma_{3,1}+\Sigma_{3,1,1,2}+\Sigma_{3,1,2,1}+\Sigma_{3,2,1,1}+\Sigma_{4,1,1,1})
                                                                                                             +V_{00}^4(-5\Sigma_1\Sigma_6+\Sigma_{1.1.5}+\Sigma_{1.2.4}+\Sigma_{1.3.3}+\Sigma_{1.4.2}+\Sigma_{1.5.1}-5\Sigma_2\Sigma_5+\Sigma_{2.1.4}+\Sigma_{2.2.3}+\Sigma_{2.3.2}+\Sigma_{2.4.1}-5\Sigma_3\Sigma_4+\Sigma_{3.1.3}+\Sigma_{3.2.3}+\Sigma_{3.3.4}+\Sigma_{3.3.3}+\Sigma_{3.3.4}+\Sigma_{3.3.3}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.3}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}+\Sigma_{3.3.4}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               +\Sigma_{3,2,2}+\Sigma_{3,3,1}+\Sigma_{4,1,2}+\Sigma_{4,2,1}+\Sigma_{5,1,1}
                                                                                                             -V_{00}^{5}(\Sigma_{1.6}+\Sigma_{2.5}+\Sigma_{3.4}+\Sigma_{4.3}+\Sigma_{5.2}+\Sigma_{6.1})
                                                                                                             +V_{00}^{6}\Sigma_{7}
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Tr[\Delta_9] = -\Sigma_1^3 \Sigma_{1,4} - \Sigma_1^3 \Sigma_{2,3} - \Sigma_1^3 \Sigma_{3,2} - \Sigma_1^3 \Sigma_{4,1} - 3\Sigma_1^2 \Sigma_{1,1} \Sigma_4 + \Sigma_1^2 \Sigma_{1,1,1,3} + \Sigma_1^2 \Sigma_{1,1,2,2} + \Sigma_1^2 \Sigma_{1,1,3,1} - 3\Sigma_1^2 \Sigma_{1,2} \Sigma_3 + \Sigma_1^2 \Sigma_{1,2,1,2}
                               +\Sigma_{1}^{2}\Sigma_{1,2,2,1}-3\Sigma_{1}^{2}\Sigma_{1,3}\Sigma_{2}+\Sigma_{1}^{2}\Sigma_{1,3,1,1}-3\Sigma_{1}^{2}\Sigma_{2}\Sigma_{2,2}-3\Sigma_{1}^{2}\Sigma_{2}\Sigma_{3,1}-3\Sigma_{1}^{2}\Sigma_{2,1,2}\Sigma_{3}+\Sigma_{1}^{2}\Sigma_{2,1,1,2}+\Sigma_{1}^{2}\Sigma_{2,1,2,1}+\Sigma_{1}^{2}\Sigma_{2,2,1,1}+\Sigma_{1}^{2}\Sigma_{3,1,1,1}
                              +2\Sigma_{1}\Sigma_{1.1}\Sigma_{1.1.3}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{1.2.2}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{1.3.1}-6\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.3}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.1.2}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{3.1.1}+2\Sigma_{1}\Sigma_{1.1.1}\Sigma_{1.3.2}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{1.2.2}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1.1}\Sigma_{2.2.1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma_{1}+2\Sigma_{1}\Sigma
                               +2\Sigma_{1}\Sigma_{1,1,1}\Sigma_{2,2}+2\Sigma_{1}\Sigma_{1,1,1}\Sigma_{3,1}+2\Sigma_{1}\Sigma_{1,1,1,1}\Sigma_{3}-\Sigma_{1}\Sigma_{1,1,1,1,1,2}-\Sigma_{1}\Sigma_{1,1,1,1,2,1}+2\Sigma_{1}\Sigma_{1,1,1,2}\Sigma_{2}-\Sigma_{1}\Sigma_{1,1,1,2,1,1}+2\Sigma_{1}\Sigma_{1,1,2}\Sigma_{1,2}
                              +2\Sigma_{1}\Sigma_{1,1,2}\Sigma_{2,1}+2\Sigma_{1}\Sigma_{1,1,2,1}\Sigma_{2}-\Sigma_{1}\Sigma_{1,1,2,1,1,1}+2\Sigma_{1}\Sigma_{1,2}\Sigma_{1,2,1}-3\Sigma_{1}\Sigma_{1,2}\Sigma_{2}^{2}+2\Sigma_{1}\Sigma_{1,2}\Sigma_{2,1,1}+2\Sigma_{1}\Sigma_{1,2,1}\Sigma_{2,1}+2\Sigma_{1}\Sigma_{1,2,1,1}\Sigma_{2}
                               -\Sigma_{1}\Sigma_{1,2,1,1,1,1} - 3\Sigma_{1}\Sigma_{2}^{2}\Sigma_{2,1} + 2\Sigma_{1}\Sigma_{2}\Sigma_{2,1,1,1} + 2\Sigma_{1}\Sigma_{2,1}\Sigma_{2,1,1} - \Sigma_{1}\Sigma_{2,1,1,1,1,1} + \Sigma_{1,1}^{2}\Sigma_{1,3} + \Sigma_{1,1}^{2}\Sigma_{2,2} + \Sigma_{1,1}^{2}\Sigma_{3,1} + 2\Sigma_{1,1}\Sigma_{1,1,1}\Sigma_{3,1} + \Sigma_{1,1}^{2}\Sigma_{3,1} + \Sigma_{1,
                               -\Sigma_{1,1}\Sigma_{1,1,1,1,2} - \Sigma_{1,1}\Sigma_{1,1,1,2,1} + 2\Sigma_{1,1}\Sigma_{1,1,2}\Sigma_{2} - \Sigma_{1,1}\Sigma_{1,1,2,1,1} + \Sigma_{1,1}\Sigma_{1,2}^{2} + 2\Sigma_{1,1}\Sigma_{1,2}\Sigma_{2,1} + 2\Sigma_{1,1}\Sigma_{1,2,1}\Sigma_{2} - \Sigma_{1,1}\Sigma_{1,2,1,1,1}
                               -\Sigma_{1.1}\Sigma_{2}^{3}+2\Sigma_{1.1}\Sigma_{2}\Sigma_{2.1.1}+\Sigma_{1.1}\Sigma_{2.1}^{2}-\Sigma_{1.1}\Sigma_{2.1.1.1.1}-\Sigma_{1.1.1}\Sigma_{1.1.1.2}-\Sigma_{1.1.1}\Sigma_{1.1.2.1}+2\Sigma_{1.1.1}\Sigma_{1.2.2}-\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1}+2\Sigma_{1.1.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma_{1.2.1}\Sigma_{1.2.1}+2\Sigma
                               -\Sigma_{1,1,1}\Sigma_{2,1,1,1}-\Sigma_{1,1,1,1}\Sigma_{1,1,2}-\Sigma_{1,1,1,1}\Sigma_{1,2,1}+\Sigma_{1,1,1,1}\Sigma_{2}^{2}-\Sigma_{1,1,1,1}\Sigma_{2,1,1}-\Sigma_{1,1,1,1,1}\Sigma_{1,2}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,1}\Sigma_{2,1}-\Sigma_{1,1,
                               +V_{00}(4\Sigma_{1}^{3}\Sigma_{5}-3\Sigma_{1}^{2}\Sigma_{1,1,4}-3\Sigma_{1}^{2}\Sigma_{1,2,3}-3\Sigma_{1}^{2}\Sigma_{1,3,2}-3\Sigma_{1}^{2}\Sigma_{1,4,1}+12\Sigma_{1}^{2}\Sigma_{2}\Sigma_{4}-3\Sigma_{1}^{2}\Sigma_{2,1,3}-3\Sigma_{1}^{2}\Sigma_{2,2,2}-3\Sigma_{1}^{2}\Sigma_{2,3,1}+6\Sigma_{1}^{2}\Sigma_{3}^{2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2}-3\Sigma_{1}^{2}\Sigma_{3,1,2
                                -3\Sigma_{1}^{2}\Sigma_{3|2,1}-3\Sigma_{1}^{2}\Sigma_{4|1,1}-6\Sigma_{1}\Sigma_{1,1}\Sigma_{1,4}-6\Sigma_{1}\Sigma_{1,1}\Sigma_{2,3}-6\Sigma_{1}\Sigma_{1,1}\Sigma_{3|2}-6\Sigma_{1}\Sigma_{1,1}\Sigma_{4,1}-6\Sigma_{1}\Sigma_{1,1,1}\Sigma_{4}+2\Sigma_{1}\Sigma_{1,1,1,1,3}+2\Sigma_{1}\Sigma_{1,1,1,2,2}
                                                                                                   +2\Sigma_{1}\Sigma_{1,1,1,3,1}-6\Sigma_{1}\Sigma_{1,1,2}\Sigma_{3}+2\Sigma_{1}\Sigma_{1,1,2,1,2}+2\Sigma_{1}\Sigma_{1,1,2,2,1}-6\Sigma_{1}\Sigma_{1,1,3}\Sigma_{2}+2\Sigma_{1}\Sigma_{1,1,3,1,1}-6\Sigma_{1}\Sigma_{1,2}\Sigma_{1,3}-6\Sigma_{1}\Sigma_{1,2}\Sigma_{2,2}
                                                                                                   -6\Sigma_{1}\Sigma_{1,2}\Sigma_{3,1} - 6\Sigma_{1}\Sigma_{1,2,1}\Sigma_{3} + 2\Sigma_{1}\Sigma_{1,2,1,1,2} + 2\Sigma_{1}\Sigma_{1,2,1,2,1} - 6\Sigma_{1}\Sigma_{1,2,2}\Sigma_{2} + 2\Sigma_{1}\Sigma_{1,2,2,1,1} - 6\Sigma_{1}\Sigma_{1,3}\Sigma_{2,1} - 6\Sigma_{1}\Sigma_{1,3,1}\Sigma_{2,1} + 2\Sigma_{1}\Sigma_{1,2,2,2,1} - 6\Sigma_{1}\Sigma_{1,2,2,2,1} - 6\Sigma_{1}\Sigma_{1,2,2,2,2} - 6\Sigma_{1}\Sigma_{1,2,2,2,2} - 6\Sigma_{1}\Sigma_{1,2,2,2,2} - 6\Sigma_{1}\Sigma_{1,2,2,2,2} - 6\Sigma_{1}\Sigma_{1,2,2,2,2} - 6\Sigma_{1}\Sigma_{1,2,2,2} - 6\Sigma_{1}\Sigma_{1,2,2} - 6\Sigma_{1}\Sigma_{1
                                +2\Sigma_{1}\Sigma_{1,3,1,1,1}+12\Sigma_{1}\Sigma_{2}^{2}\Sigma_{3}-6\Sigma_{1}\Sigma_{2}\Sigma_{2,1,2}-6\Sigma_{1}\Sigma_{2}\Sigma_{2,2,1}-6\Sigma_{1}\Sigma_{2}\Sigma_{3,1,1}-6\Sigma_{1}\Sigma_{2,1}\Sigma_{2,2}-6\Sigma_{1}\Sigma_{2,1}\Sigma_{3,1}-6\Sigma_{1}\Sigma_{2,1,1,1,2}
                                +2\Sigma_{1}\Sigma_{2,1,1,2,1}+2\Sigma_{1}\Sigma_{2,1,2,1,1}+2\Sigma_{1}\Sigma_{2,2,1,1,1}+2\Sigma_{1}\Sigma_{3,1,1,1,1}-3\Sigma_{1,1}^{2}\Sigma_{4}+2\Sigma_{1,1}\Sigma_{1,1,1,3}+2\Sigma_{1,1}\Sigma_{1,1,2,2}+2\Sigma_{1,1}\Sigma_{1,1,3,1}-6\Sigma_{1,1}\Sigma_{1,2}\Sigma_{3,1,1,1,1}
                                                                                                   +2\Sigma_{1.1}\Sigma_{1.2.1.2}+2\Sigma_{1.1}\Sigma_{1.2.2.1}-6\Sigma_{1.1}\Sigma_{1.3}\Sigma_{2}+2\Sigma_{1.1}\Sigma_{1.3.1.1}-6\Sigma_{1.1}\Sigma_{2}\Sigma_{2.2}-6\Sigma_{1.1}\Sigma_{2}\Sigma_{3.1}-6\Sigma_{1.1}\Sigma_{2.1}\Sigma_{3}+2\Sigma_{1.1}\Sigma_{2.1.1.2}
                                +2\Sigma_{1,1}\Sigma_{2,1,2,1}+2\Sigma_{1,1}\Sigma_{2,2,1,1}+2\Sigma_{1,1}\Sigma_{3,1,1,1}+2\Sigma_{1,1,1}\Sigma_{1,1,3}+2\Sigma_{1,1,1}\Sigma_{1,2,2}+2\Sigma_{1,1,1}\Sigma_{1,3,1}-6\Sigma_{1,1,1}\Sigma_{2}\Sigma_{3}+2\Sigma_{1,1,1}\Sigma_{2,1,2}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,1,2}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,2,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma_{1,1,1}\Sigma_{2,1,1}+2\Sigma
                                +2\Sigma_{1,1,1}\Sigma_{3,1,1}+2\Sigma_{1,1,1,1}\Sigma_{1,3}+2\Sigma_{1,1,1,1}\Sigma_{2,2}+2\Sigma_{1,1,1,1}\Sigma_{3,1}+2\Sigma_{1,1,1,1,1}\Sigma_{3}-\Sigma_{1,1,1,1,1,1,2}-\Sigma_{1,1,1,1,1,2,1}+2\Sigma_{1,1,1,1,2}\Sigma_{2}-\Sigma_{1,1,1,1,2,1,1}
                                                                   +2\Sigma_{1,1,1,2}\Sigma_{1,2}+2\Sigma_{1,1,1,2}\Sigma_{2,1}+2\Sigma_{1,1,1,2,1}\Sigma_{2}-\Sigma_{1,1,1,2,1,1,1}+\Sigma_{1,1,2}^{2}+2\Sigma_{1,1,2}\Sigma_{1,2,1}-3\Sigma_{1,1,2}\Sigma_{2}^{2}+2\Sigma_{1,1,2}\Sigma_{2,1,1}+2\Sigma_{1,1,2,1}\Sigma_{1,2}
                                +2\Sigma_{1,1,2,1}\Sigma_{2,1}+2\Sigma_{1,1,2,1,1}\Sigma_{2}-\Sigma_{1,1,2,1,1,1,1}-3\Sigma_{1,2}^{2}\Sigma_{2}+2\Sigma_{1,2}\Sigma_{1,2,1,1}-6\Sigma_{1,2}\Sigma_{2}\Sigma_{2,1}+2\Sigma_{1,2}\Sigma_{2,1,1,1}+\Sigma_{1,2,1}^{2}-3\Sigma_{1,2,1}\Sigma_{2}^{2}+2\Sigma_{1,2,1}\Sigma_{2,1,1}
                                                        +2\Sigma_{1,2,1,1}\Sigma_{2,1}+2\Sigma_{1,2,1,1,1}\Sigma_{2}-\Sigma_{1,2,1,1,1,1,1}+\Sigma_{2}^{4}-3\Sigma_{2}^{2}\Sigma_{2,1,1}-3\Sigma_{2}\Sigma_{2,1}^{2}+2\Sigma_{2}\Sigma_{2,1,1,1,1}+2\Sigma_{2,1}\Sigma_{2,1,1,1}+\Sigma_{2,1,1}^{2}-\Sigma_{2,1,1,1,1,1,1})
                               -V_{00}^{2}(-6\Sigma_{1}^{2}\Sigma_{1.5}-6\Sigma_{1}^{2}\Sigma_{2.4}-6\Sigma_{1}^{2}\Sigma_{3.3}-6\Sigma_{1}^{2}\Sigma_{4.2}-6\Sigma_{1}^{2}\Sigma_{5.1}-12\Sigma_{1}\Sigma_{1.1}\Sigma_{5}+3\Sigma_{1}\Sigma_{1.1.4}+3\Sigma_{1}\Sigma_{1.1.2.3}+3\Sigma_{1}\Sigma_{1.1.3.2}+3\Sigma_{1}\Sigma_{1.1.4.1}
                                                   -12\Sigma_{1}\Sigma_{1,2}\Sigma_{4} + 3\Sigma_{1}\Sigma_{1,2,1,3} + 3\Sigma_{1}\Sigma_{1,2,2,2} + 3\Sigma_{1}\Sigma_{1,2,3,1} - 12\Sigma_{1}\Sigma_{1,3}\Sigma_{3} + 3\Sigma_{1}\Sigma_{1,3,1,2} + 3\Sigma_{1}\Sigma_{1,3,2,1} - 12\Sigma_{1}\Sigma_{1,4}\Sigma_{2} + 3\Sigma_{1}\Sigma_{1,4,1,1}
                                              -12\Sigma_{1}\Sigma_{2}\Sigma_{2,3}-12\Sigma_{1}\Sigma_{2}\Sigma_{3,2}-12\Sigma_{1}\Sigma_{2}\Sigma_{4,1}-12\Sigma_{1}\Sigma_{2,1}\Sigma_{4}+3\Sigma_{1}\Sigma_{2,1,1,3}+3\Sigma_{1}\Sigma_{2,1,2,2}+3\Sigma_{1}\Sigma_{2,1,3,1}-12\Sigma_{1}\Sigma_{2,2}\Sigma_{3}+3\Sigma_{1}\Sigma_{2,2,1,2}
                                                                      +3\Sigma_{1}\Sigma_{2,2,2,1}+3\Sigma_{1}\Sigma_{2,3,1,1}-12\Sigma_{1}\Sigma_{3}\Sigma_{3,1}+3\Sigma_{1}\Sigma_{3,1,1,2}+3\Sigma_{1}\Sigma_{3,1,2,1}+3\Sigma_{1}\Sigma_{3,2,1,1}+3\Sigma_{1}\Sigma_{4,1,1,1}+3\Sigma_{1,1}\Sigma_{1,1,4}+3\Sigma_{1,1}\Sigma_{1,2,3}
                                                                                          +3\Sigma_{1.1}\Sigma_{1.3.2}+3\Sigma_{1.1}\Sigma_{1.4.1}-12\Sigma_{1.1}\Sigma_{2}\Sigma_{4}+3\Sigma_{1.1}\Sigma_{2.1.3}+3\Sigma_{1.1}\Sigma_{2.2.2}+3\Sigma_{1.1}\Sigma_{2.3.1}-6\Sigma_{1.1}\Sigma_{3}^{2}+3\Sigma_{1.1}\Sigma_{3.1.2}+3\Sigma_{1.1}\Sigma_{3.2.1}
                                                                                                       +3\Sigma_{1,1}\Sigma_{4,1,1}+3\Sigma_{1,1,1}\Sigma_{1,4}+3\Sigma_{1,1,1}\Sigma_{2,3}+3\Sigma_{1,1,1}\Sigma_{3,2}+3\Sigma_{1,1,1}\Sigma_{4,1}+3\Sigma_{1,1,1,1}\Sigma_{4}-\Sigma_{1,1,1,1,1,3}-\Sigma_{1,1,1,1,2,2}-\Sigma_{1,1,1,1,3,1}
                                                                                                         +3\Sigma_{1,1,1,2}\Sigma_3-\Sigma_{1,1,1,2,1,2}-\Sigma_{1,1,1,2,2,1}+3\Sigma_{1,1,1,3}\Sigma_2-\Sigma_{1,1,1,3,1,1}+3\Sigma_{1,1,2}\Sigma_{1,3}+3\Sigma_{1,1,2}\Sigma_{2,2}+3\Sigma_{1,1,2}\Sigma_{3,1}+3\Sigma_{1,1,2,1}\Sigma_3
                                             -\Sigma_{1,1,2,1,1,2}-\Sigma_{1,1,2,1,2,1}+3\Sigma_{1,1,2,2}\Sigma_{2}-\Sigma_{1,1,2,2,1,1}+3\Sigma_{1,1,3}\Sigma_{1,2}+3\Sigma_{1,1,3}\Sigma_{2,1}+3\Sigma_{1,1,3,1}\Sigma_{2}-\Sigma_{1,1,3,1,1,1}+3\Sigma_{1,2}\Sigma_{1,2,2}+3\Sigma_{1,2}\Sigma_{1,3,1}\Sigma_{2,1}+3\Sigma_{1,2,2}\Sigma_{2,1,2,1}+3\Sigma_{1,2,2}\Sigma_{2,1,2,1}+3\Sigma_{1,2,2}\Sigma_{2,1,2,1}+3\Sigma_{1,2,2}\Sigma_{2,1,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{1,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,2,2}+3\Sigma_{2,
                                                                                -12\Sigma_{1,2}\Sigma_{2}\Sigma_{3} + 3\Sigma_{1,2}\Sigma_{2,1,2} + 3\Sigma_{1,2}\Sigma_{2,2,1} + 3\Sigma_{1,2}\Sigma_{3,1,1} + 3\Sigma_{1,2,1}\Sigma_{1,3} + 3\Sigma_{1,2,1}\Sigma_{2,2} + 3\Sigma_{1,2,1}\Sigma_{3,1} + 3\Sigma_{1,2,1,1,1,2}
                                              -\Sigma_{1,2,1,1,2,1} + 3\Sigma_{1,2,1,2}\Sigma_2 - \Sigma_{1,2,1,2,1,1} + 3\Sigma_{1,2,2}\Sigma_{2,1} + 3\Sigma_{1,2,2,1}\Sigma_2 - \Sigma_{1,2,2,1,1,1} - 6\Sigma_{1,3}\Sigma_2^2 + 3\Sigma_{1,3}\Sigma_{2,1,1} + 3\Sigma_{1,3,1}\Sigma_{2,1} + 3\Sigma_{1,3,1,1}\Sigma_2
                                             -\Sigma_{1.3.1.1.1.1} - 6\Sigma_{2}^{2}\Sigma_{2.2} - 6\Sigma_{2}^{2}\Sigma_{3.1} - 12\Sigma_{2}\Sigma_{2.1}\Sigma_{3} + 3\Sigma_{2}\Sigma_{2.1.1.2} + 3\Sigma_{2}\Sigma_{2.1.2.1} + 3\Sigma_{2}\Sigma_{2.2.1.1} + 3\Sigma_{2}\Sigma_{3.1.1.1} + 3\Sigma_{2.1}\Sigma_{2.1.2} + 3\Sigma_{2.1}\Sigma_{2.2.1}
                                            +3\Sigma_{2,1}\Sigma_{3,1,1}+3\Sigma_{2,1,1}\Sigma_{2,2}+3\Sigma_{2,1,1}\Sigma_{3,1}+3\Sigma_{2,1,1,1}\Sigma_{3}-\Sigma_{2,1,1,1,1,2}-\Sigma_{2,1,1,1,2,1}-\Sigma_{2,1,1,2,1,1}-\Sigma_{2,1,2,1,1,1}-\Sigma_{2,2,1,1,1,1}-\Sigma_{3,1,1,1,1,1})
                                            +V_{00}^{3}(-10\Sigma_{1}^{2}\Sigma_{6}+4\Sigma_{1}\Sigma_{1.1.5}+4\Sigma_{1}\Sigma_{1.2.4}+4\Sigma_{1}\Sigma_{1.3.3}+4\Sigma_{1}\Sigma_{1.4.2}+4\Sigma_{1}\Sigma_{1.5.1}-20\Sigma_{1}\Sigma_{2}\Sigma_{5}+4\Sigma_{1}\Sigma_{2.1.4}+4\Sigma_{1}\Sigma_{2.2.3}+4\Sigma_{1}\Sigma_{2.3.2}
                                                                       +4\Sigma_{1}\Sigma_{2}A_{1}-20\Sigma_{1}\Sigma_{2}\Sigma_{4}+4\Sigma_{1}\Sigma_{2}A_{2}+4\Sigma_{1}\Sigma_{2}A_{2}+4\Sigma_{1}\Sigma_{2}A_{2}+4\Sigma_{1}\Sigma_{4}A_{1}+4\Sigma_{1}\Sigma_{4}A_{1}+4\Sigma_{1}X_{2}A_{1}+4\Sigma_{1}X_{2}A_{2}
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