\[ a) \begin{aligned} \langle T=0 \mid S=1 \mid T=0 \rangle &= 1 \langle S_2^+ \rangle \\ &= \delta_{S_0} S_1^+ (-1) \left( 3 \langle \sigma^2 \rangle + S_3^+ (S_1^2 - 1) \right) - 1 \end{aligned} \]

\[ b) \begin{aligned} \langle T=1 \mid S=0 \mid T=1 \rangle &= 1 \\ &= \delta_{T_1} T_2 (1 - 3 + 3) = 0 \end{aligned} \]

In the lecture we argued that the tensor force is a \( \gamma \) operation → therefore the spin should be completed to obtain a scalar \( \gamma \) so it should be zero.