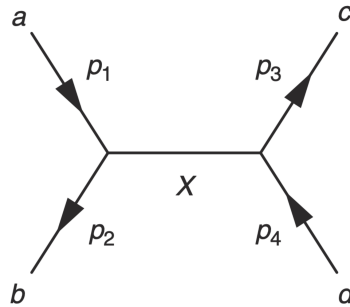


PARTICLE PHYSICS 1 : EXERCISE 8

1) S-channel propagator

Draw the two time-ordered diagrams for the s-channel process shown in the figure below. Show that the propagator has the same form as obtained for the t-channel process.

Hint : one of the time-ordered diagrams is non-intuitive. In the second-order perturbation theory the intermediate state does not conserve energy.



2) Compton scattering

Draw the lowest order Feynman diagrams for the Compton scattering $\gamma e^- \rightarrow \gamma e^-$.

3) QED Feynman rules

Draw the lowest order t-channel and u-channel Feynman diagrams for $e^+e^- \rightarrow \gamma\gamma$ and use the Feynman rules for QED to write down the corresponding matrix elements.