

Homework 7

1. (20 points) Calculate the total cross section of $e^- e^+ \rightarrow \mu^- \mu^+$ reaction

2. (10 points) Using above result calculate the total cross section of $e^- e^+ \rightarrow \bar{q} q$ reaction and estimate the ratio of the total cross sections of $e^- e^+ \rightarrow \mu^- \mu^+$ and $e^- e^+ \rightarrow \bar{q} q$ reactions

3. (10 points) Express Q^2 through the initial and final electron energy and scattered angle.

4. (10 points) Show that for elastic electron - proton scattering, $x = 1$. What will be the x for elastic electron nucleus scattering with mass number A ?

5. (10 points) Calculate the energy of the scattered electron at the given scattered angle for elastic electron - proton scattering.