5.1 (Griffiths 2.1; Relative strengths of gravity and electromagnetism)
Calculate the ratio of the gravitational attraction to the electrical repulsion between two stationary electrons. Do you need to know how far apart they are?

5.2 (Griffiths 2.3; 4th order Compton scattering)
Draw all the fourth-order (four vertex) diagrams for Compton scattering \( e + \gamma \rightarrow e + \gamma \). There are 17 of them; disconnected diagrams don’t count. (The Physics Department website’s banner displays the lowest-order two-vertex Feynman diagram for Compton scattering. The probability amplitude for Compton scattering is the sum of the amplitudes represented by all possible diagrams. Fortunately, each vertex pair within a diagram introduces a factor of \( \alpha \sim 1/137 \ll 1 \) to the amplitude, so that diagrams with more vertices contribute less and less to the final result.)

5.3 (Griffiths 2.6; Creating weakons with a positron-electron collider)
Draw all the lowest-order diagrams contributing to the process \( e^+ + e^- \rightarrow W^+ + W^- \). (One of them involves direct coupling of \( Z \) to \( W \)s and another the coupling of \( \gamma \) to \( W \)s.)

5.4 (Griffiths 2.8; Possible Feynman diagrams)
Some decays involve two (or even three) different forces. Draw possible Feynman diagrams for the following processes:
   (a) \( K^+ \rightarrow \mu^+ + \nu_\mu + \gamma \)
   (b) \( \Sigma^+ \rightarrow p + \gamma \)
What interactions are involved?