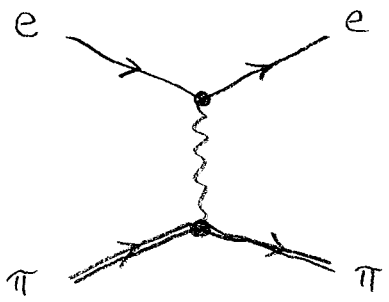
Physics 56400 Assignment #4 – Due November 30th

1. Show that the reduced matrix element for unpolarized electron-pion scattering is

$$|\bar{\mathcal{M}}|^2 = \frac{4e^4}{t^2}((s-M^2)^2 + st)$$

where M is the pion mass and the electron mass has been ignored. Do this by evaluating the Feynman diagram:



2. Show that the reduced matrix element for unpolarized electron-muon scattering is

$$|\bar{\mathcal{M}}|^2 = \frac{4e^4}{t^2}\left((s-M^2)^2 + st + \frac{t^2}{2}\right)$$

where now M is the muon mass, by evaluating the Feynman diagram: