HW 1 (due 1/29

1. Compute the masses of electron, proton, neutron and alpha particles in GeV/c^2 starting from the SI mass (kg).

2. Compute the gravitational and the Coulomb force for a Hydrogen atom with the electron and proton separated by 5×10^{-11}m and calculate the ratio Fcoul/Fgrav.
3. Derive the following equations in your book:
   - Eq. # 1.3, 1.17, 1.32
   - Show detailed work and any necessary explanation
4. Is there a higher probability of an alpha particle scattering off a foil if there were no Coulomb force? What if there were no strong force?
5. Calculate the wavelength of an electron with velocity a) 1×10^6 m/sec b)1×10^8 m/sec