Name: _____

Class Period: _____

Honors Physics: Extra Credit Problems

Mass of a proton = 1.7×10^{-27} kg

Mass of an electron = 9.11×10^{-31} kg

*Set calculator to degrees

1. Calculate the magnitude of the electric field at the center of a square measuring 60.0 cm on each side if one corner is occupied by a +45.0 μC charge and the other three are occupied by – 31.0 μC charges.

2. A point charge (mass = 0.001 kg) is tied to an insulated string and placed in an electric field (E = 9,200 N/C). Once in the field, the charge is swung outwards to the right by the string until it reaches a state of equilibrium as shown below in Figure 1. The resulting free body diagram for the charge is shown in Figure 2. The string makes an angle θ = 11.5° with the vertical. Under these conditions, what is the magnitude and sign of the point charge?

   *Include gravitational forces in this calculation

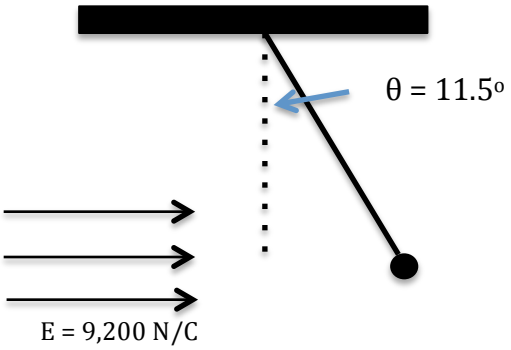

Figure 1

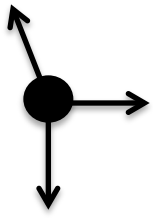

Figure 2