ECE 09.303 Fall 2018
Homework 2

1.

The electron and proton in a hydrogen atom are 52.9 pm apart. Find the magnitude of the electric force between them.

2.

A 68-nC charge experiences a 150-mN force in a certain electric field. Find (a) the field strength and (b) the force that a 35-μC charge would experience in the same field.

3.

In Fig. 20.28, point P is midway between the two charges. Find the electric field in the plane of the page (a) 5.0 cm to the left of P, (b) 5.0 cm directly above P, and (c) at P.

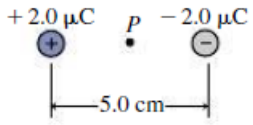

FIGURE 20.28 Exercise 29

4.

Show that the field on the x-axis for the dipole of Example 20.5 is given by

$$\vec{E} = \frac{2kp}{|x|^3}\hat{\imath} \qquad \begin{pmatrix} \text{dipole field} \\ \text{for } |x| \gg a, \text{ on axis} \end{pmatrix}$$