AP Physics C Review 13 Name:

1. Two small spheres, one with a charge of +1.5 nC and the other –2.0 nC, are separated by 2 cm. Find the electric force between them.

2. If the distance between two positive point charges is tripled, what factor does the strength of the electrostatic repulsion between them decrease?

3. An object of charge +q feels an electric force $\mathbf{F_E}$ when placed at a particular location in an electric field, **E**. Therefore, if an object of charge *–2q* were placed at thee same location where the first charge was, it would feel what force?

4. Two pith balls of mass *m* are each given a charge of +q. They are hung side-by-side from two threads each of length *L*. find the equilibrium separation distance *x* in terms of *m, q,* and *L*.

5. A dipole is formed by two point charges, each of magnitude 6 nC, separated by a distance of 4.0 cm.
    a. What is the strength of the E-field at the point midway between them?

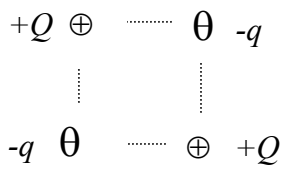
    b. If a charge of –5 pC were placed midway between the two other charges, describe the force it would feel.

6. A thin, non-conducting rod that carries a uniform linear charge density λ is bent into a semicircle of radius R. Find the electric force at the center of curvature of the semicircle.

7. The charge are at the corner of a square. If the net force on each charge $+Q$ is zero
    a. Express the magnitude of q in terms of Q.

    b. Is the net electric force on each charge $-q$ also equal to zero? Justify.

    c. Determine the electric field at the center of the square.



8. Two charges, $+Q$ and $+2Q$ are fixed in place along the y axis of an x-y coordinate system. $+Q$ is at (0,a) and $+2Q$ is at (0, $-2a$).
    a. Find the electric force (magnitude and direction) felt by $+Q$ due to the other charge.

    b. Find the electric field (magnitude and direction) at the origin created by both charges.

    c. Is there a point on the x-axis where the total electric field is zero? If so, where? If not, explain why.

    d. Is there a point on the y-axis where the total electric field is zero? If so, where? If not, explain why.

    e. If a small negative charge, -q, of mass m were placed at the origin, determine its initial acceleration (magnitude and direction).