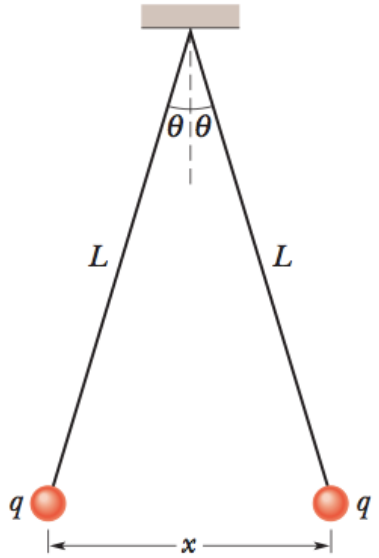
Homework #2

Due at 6pm on Friday, February 6th, 2015

Reading: Chap 22.

1. HRW Chap 21, Question 11.
2. HRW Chap 21, P20.

3. In the diagram at right, two tiny conducting balls of identical mass m and identical charge q hang from non-conducting threads of length L. Assume that θ is so small that $\tan\theta$ can be replaced by its approximate equal, $\sin\theta$.



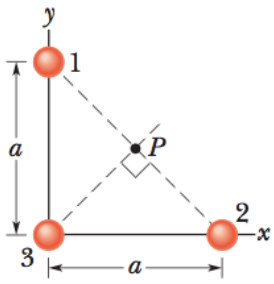
(a) Find the equilibrium separation of the balls. (b) If $L = 120$ cm, $m = 10$g, and $x = 5.0$ cm, what is $|q|$?

4. (a) Explain what happens to the balls of the last problem if one of them is discharged (loses its charge q to, say, the ground). (b) Find the new equilibrium separation x, using the given values of L and m and the computed value of $|q|$.

5. HRW Chap 22, Questions 6.

6. HRW Chap 22, P10.

7. In the triangle at right, the three particles are fixed in place and have charges $q_1 = q_2 = +e$ and $q_3 = +2e$. Distance $a = 6.00$ mm. What are the (a) magnitude and (b) direction of the net electric field at point P due to the particles?



8. HRW Chap 22, P18.