Homeowrk 2
Due: 2012 October 12

8. Problem 2.12
9. Problem 2.17
10. Problem 2.18
11. Problem 2.19
12. Problem 2.20
13. Two uniformly charged spheres, each of total charge Q and radius R, are separated by distance $r > 2R$. Show that the force between the two spheres is

$$\mathbf{F} = \frac{1}{4\pi\epsilon_\circ}\frac{QQ}{r^2}\hat{\mathcal{R}} \tag{1}$$

where $\mathcal{R}$ is the vector pointing from the source charge to the field charge.
14. The Yukawa potential is given by

$$V = \kappa\,\frac{e^{-\alpha r}}{r} \tag{2}$$

where κ and α are constants.

a. Find the electric field associated with the Yukawa potential.

b. Find the charge distribution that leads to the Yukawa potential.

c. Find the total charge of the system.