P3323 Reading Quiz 3-1 September 7, 2016 Go to Blackboard \gg Content to take the quiz

- 1. A spherical conducting shell, radius R, is centered at the origin, and a charge Q is placed at distance a from the origin with a > R. The shell is grounded at potential zero. What is the direction of the force on the charge.
 - A) Towards the shell?
 - B) Away from the shell?
 - C) There is no force

The energy stored in a parallel plate capacitor is $W = \frac{1}{2}CV^2$. The capacitor is connected to a battery with voltage V_0 . If the gap between the plates is increased from d to 2d and the voltage is held constant at V_0 , the stored energy

- A) Decreases
- B) Increases
- C) Stays the same

- 2. Consider again a parallel plate capacitor. But this time with no battery, but charge $\pm q$ on each plate. If the gap between the plates is increased from d to 2d and the charge on each plate $\pm q$ does not change, the stored energy
 - A) Increases
 - B) Decreases
 - C) Stays the same

- 3. A hollow conducting sphere with radius R is centered at the origin. A charge +q is placed inside the sphere at \mathbf{r}_1 . ($|\mathbf{r}_1| < R$). What is the field outside the sphere at \mathbf{r} ?
 - A)

zero

B)

$$\mathbf{E} = \frac{q}{4\pi\epsilon_0} \frac{\mathbf{\hat{r}}}{r^2}$$

C)

$$\mathbf{E} = \frac{q}{4\pi\epsilon_0} \frac{\mathbf{r} - \mathbf{r_1}}{|\mathbf{r} - \mathbf{r_1}|^3}$$