

### Special Problem 6-4.3

Consider a **conducting sphere**, radius 1 m. Also consider a **conducting cube**, with edge lengths (e.g, height, width, depth) of 1 m.

The **electric potential** difference between these two conductors is **10 V**.

The **surface charge density** on the **sphere** is:

$$\rho_{s+}(\bar{r}) = \frac{1}{2\pi} \left[ \frac{C}{m^2} \right]$$

While the **surface charge density** on the **cube** is:

$$\rho_{s-}(\bar{r}) = \frac{-1}{3} \left[ \frac{C}{m^2} \right]$$

Determine:

- 1) the capacitance of these two conductors
- 2) the amount of work done by the voltage source in creating these charge distributions.

