

P #23

Ch 16 - Pg 525

$$d = 800 \text{ m}$$

$$A = 1.0 \times 10^6 \text{ m}^2$$

$$\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2/\text{N} \cdot \text{m}^2$$

$$a) \quad C = \frac{\epsilon_0 \cdot A}{d} = \frac{(8.85 \times 10^{-12} \text{ C}^2/\text{N} \cdot \text{m}^2)(1.0 \times 10^6 \text{ m}^2)}{(800 \text{ m})}$$

$$C = 1.1 \times 10^{-8} \text{ F}$$

$$b) \quad E = 3.0 \times 10^6 \text{ N/C}$$

$$E = \frac{V}{d} \quad (3.0 \times 10^6 \text{ N/C}) = \frac{V}{800 \text{ m}}$$

$$V = 2.4 \times 10^9 \text{ V}$$

$$C = \frac{Q}{V} \quad (1.1 \times 10^{-8} \text{ F}) = \frac{Q}{2.4 \times 10^9 \text{ V}}$$

$$Q = 26.6 \text{ C}$$