

Ch 8 Prob. 20

$$V = 5.50 \text{ V}$$
$$C = 8.00 \text{ pF}$$

$$C = \frac{Q}{V} \rightarrow Q = V \cdot C$$
$$= (5.50 \text{ V}) (8.00 \times 10^{-12} \text{ F})$$
$$= 4.4 \times 10^{-11} \text{ C}$$

$$Q = 44 \text{ pC}$$

Ch. 8 Prob 29

$$\frac{C}{l} = \frac{20 \text{ pF}}{\text{m}}$$

From The Textbook

$$C = \frac{2\pi \epsilon_0 l}{\ln(R_2/R_1)}$$

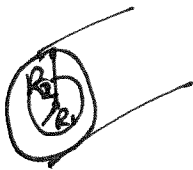
with algebra

$$\ln(R_2/R_1) = \frac{2\pi \epsilon_0 l}{C} = \frac{2\pi \epsilon_0}{C/l}$$

exponentiate both sides

$$\frac{R_2}{R_1} = e^{\frac{2\pi \epsilon_0}{C/l}}$$
$$\frac{R_2}{R_1} = e^{\left(\frac{2\pi (8.85 \times 10^{-12} \text{ C}^2/\text{Nm}^2)}{20 \times 10^{-12} \text{ F/m}} \right)} = e^{2.78}$$

$$\frac{R_2}{R_1} = \cancel{1.0226} 16.1$$



The outer shell's radius is 2.26% larger than the inner shell.

2nd radius is 16x that of the inner shell's radius.