

14. (a) The area of a sphere may be written $4\pi R^2 = \pi D^2$. Thus,

$$\sigma = \frac{q}{\pi D^2} = \frac{2.4 \times 10^{-6} \text{ C}}{\pi (1.3 \text{ m})^2} = 4.5 \times 10^{-7} \text{ C/m}^2 .$$

- (b) Eq. 24-11 gives

$$E = \frac{\sigma}{\varepsilon_o} = \frac{4.5 \times 10^{-7} \text{ C/m}^2}{8.85 \times 10^{-12} \text{ C}^2/\text{N}\cdot\text{m}^2} = 5.1 \times 10^4 \text{ N/C} .$$