

32. (a) Using Coulomb's law, we obtain

$$F = \frac{q_1 q_2}{4\pi\epsilon_0 r^2} = \frac{kq^2}{r^2} = \frac{\left(8.99 \times 10^9 \frac{\text{N}\cdot\text{m}^2}{\text{C}^2}\right) (1.00 \text{ C})^2}{(1.00 \text{ m})^2} = 8.99 \times 10^9 \text{ N} .$$

(b) If  $r = 1000 \text{ m}$ , then

$$F = \frac{q_1 q_2}{4\pi\epsilon_0 r^2} = \frac{kq^2}{r^2} = \frac{\left(8.99 \times 10^9 \frac{\text{N}\cdot\text{m}^2}{\text{C}^2}\right) (1.00 \text{ C})^2}{(1.00 \times 10^3 \text{ m})^2} = 8.99 \times 10^3 \text{ N} .$$