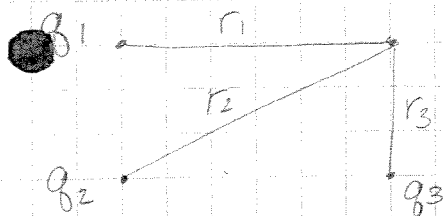


P #13

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$$q_1 = 8.0 \mu\text{C} = 8.0 \times 10^{-6} \text{C}$$

$$q_2 = 2.0 \mu\text{C} = 2.0 \times 10^{-6} \text{C}$$

$$q_3 = 4.0 \mu\text{C} = 4.0 \times 10^{-6} \text{C}$$

$$r_1 = 6.0 \text{ cm} = .06 \text{ m}$$

$$r_3 = 3.0 \text{ cm} = .03 \text{ m}$$

$$r_2 = \sqrt{r_1^2 + r_3^2} = \sqrt{(.06 \text{ m})^2 + (.03 \text{ m})^2}$$

$$r_2 = .067 \text{ m}$$

a) $V = k_e \cdot \sum \frac{Q}{r}$

$$= (9.0 \times 10^9 \text{ N} \cdot \text{m}^2/\text{C}^2) \left(\frac{8 \times 10^{-6} \text{C}}{.06 \text{ m}} + \frac{2 \times 10^{-6} \text{C}}{.067 \text{ m}} + \frac{4 \times 10^{-6} \text{C}}{.03 \text{ m}} \right)$$

$$V = 2.7 \times 10^6 \text{ V}$$

b) $q_1 = 8.0 \times 10^{-6} \text{C}$
 $q_2 = -2.0 \times 10^{-6} \text{C}$
 $q_3 = 4.0 \times 10^{-6} \text{C}$

$r_1 = .06 \text{ m}$
 $r_2 = .067 \text{ m}$
 $r_3 = .03 \text{ m}$

$$V = k_e \cdot \sum \frac{Q}{r}$$

$$= (9.0 \times 10^9 \text{ N} \cdot \text{m}^2/\text{C}^2) \left(\frac{8 \times 10^{-6} \text{C}}{.06 \text{ m}} + \frac{-2 \times 10^{-6} \text{C}}{.067 \text{ m}} + \frac{4 \times 10^{-6} \text{C}}{.03 \text{ m}} \right)$$

$$V = 2.1 \times 10^6 \text{ V}$$