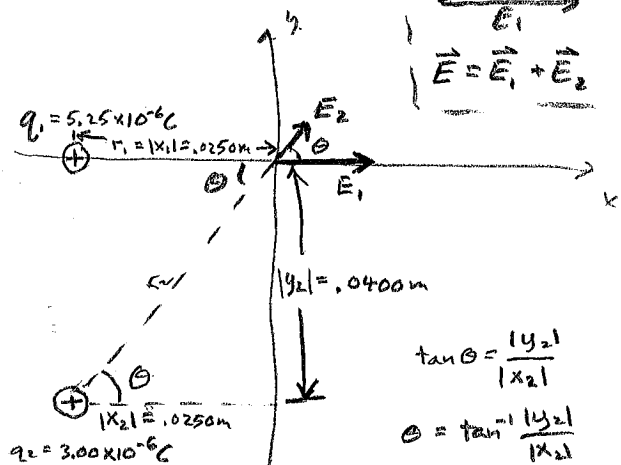


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$$\vec{E} = \vec{E}_1 + \vec{E}_2$$

$$\tan \theta = \frac{|y_2|}{|x_2|}$$

$$\theta = \tan^{-1} \frac{|y_2|}{|x_2|}$$

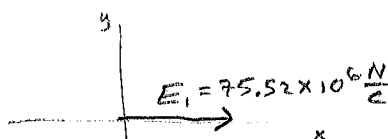
$$\theta = \tan^{-1} \frac{0.0400 \text{ m}}{0.0250 \text{ m}}$$

$$\theta = 57.99^\circ$$

$$E_1 = \frac{kq_1}{r_1^2}$$

$$= \frac{8.99 \times 10^9 \frac{\text{N} \cdot \text{m}^2}{\text{C}^2} (5.25 \times 10^{-6} \text{ C})}{(0.0250 \text{ m})^2}$$

$$E_1 = 75.52 \times 10^6 \frac{\text{N}}{\text{C}}$$



$$E_{1x} = 75.52 \times 10^6 \frac{\text{N}}{\text{C}}$$

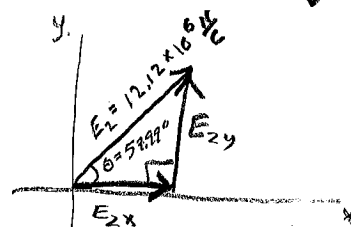
$$E_{1y} = 0$$

$$E_2 = \frac{kq_2}{r_2^2}$$

$$= \frac{kq_2}{|x_2|^2 + |y_2|^2} \quad (\text{Pythag. thm})$$

$$= \frac{8.99 \times 10^9 \frac{\text{N} \cdot \text{m}^2}{\text{C}^2} (3.00 \times 10^{-6} \text{ C})}{(0.0250 \text{ m})^2 + (0.0400 \text{ m})^2}$$

$$E_2 = 12.12 \times 10^6 \frac{\text{N}}{\text{C}}$$



$$E_{2x} = E_2 \cos \theta$$

$$E_{2x} = (12.12 \times 10^6 \frac{\text{N}}{\text{C}}) \cos 57.99^\circ$$

$$E_{2x} = 6.425 \times 10^6 \frac{\text{N}}{\text{C}}$$

$$E_{2y} = E_2 \sin \theta$$

$$= 12.12 \times 10^6 \frac{\text{N}}{\text{C}} \sin 57.99^\circ$$

$$E_{2y} = 10.277 \times 10^6 \frac{\text{N}}{\text{C}}$$

$$E_x = E_{1x} + E_{2x}$$

$$E_x = 75.52 \times 10^6 \frac{\text{N}}{\text{C}} + 6.425 \times 10^6 \frac{\text{N}}{\text{C}}$$

$$E_x = 81.9 \times 10^6 \frac{\text{N}}{\text{C}}$$

$$E_y = E_{1y} + E_{2y}$$

$$E_y = 0 + 10.277 \times 10^6 \frac{\text{N}}{\text{C}}$$

$$E_y = 10.3 \times 10^6 \frac{\text{N}}{\text{C}}$$

$$\vec{E} = 81.9 \times 10^6 \frac{\text{N}}{\text{C}} \hat{i} + 10.3 \times 10^6 \frac{\text{N}}{\text{C}} \hat{j}$$