23-36
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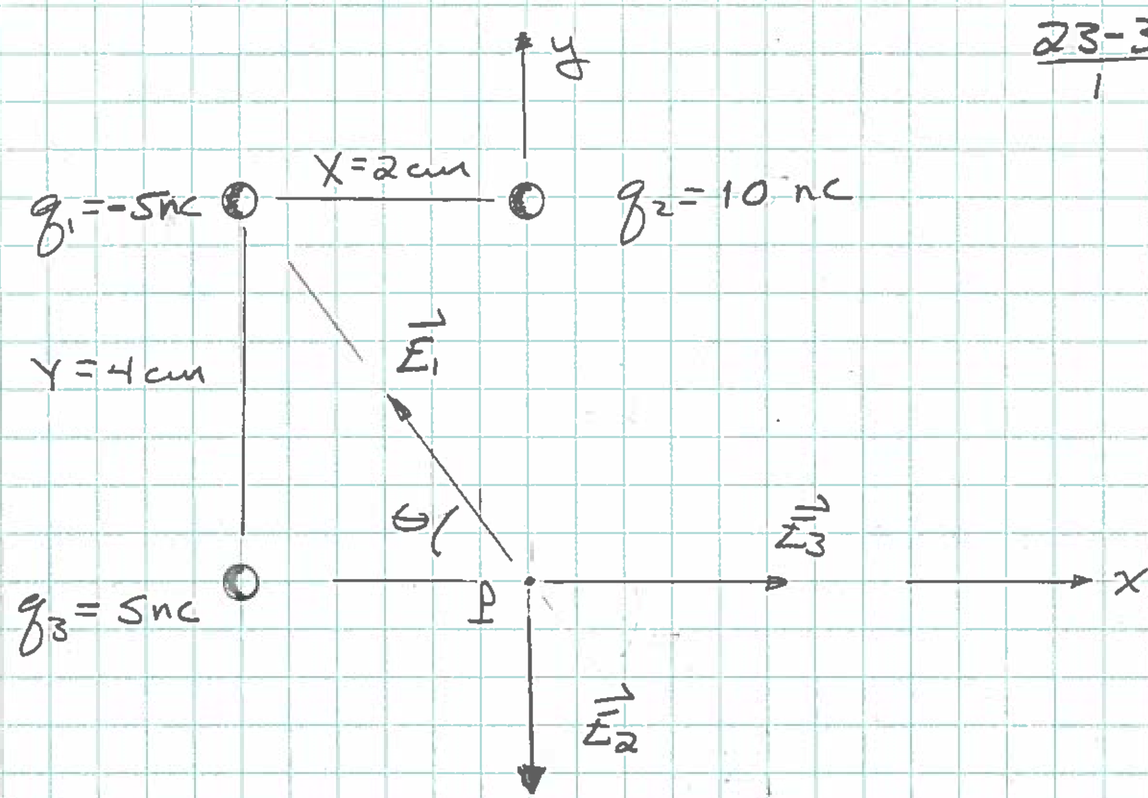

for q_1 $\quad r^2 = x^2 + y^2 \quad \hat{r} = -\cos\theta\,\hat{i} + \sin\theta\,\hat{j}$

$$\theta = \tan^{-1}\left(\frac{Y}{X}\right) = 63.43^\circ$$

$$\vec{E}_1 = \frac{K|q_1|}{(x^2+y^2)}(-\cos\theta\,\hat{i} + \sin\theta\,\hat{j})$$

$$= -1.005 \times 10^4\,\hat{i} + 2.01 \times 10^4\,\hat{j}\ \text{N/c}$$

for q_2 $\quad r = Y$

$$\vec{E}_2 = -\frac{K|q_2|}{Y^2}\hat{j} = -5.619 \times 10^4\,\hat{j}\ \text{N/c}$$

for q_3 $\quad r = X$

$$\vec{E}_3 = \frac{K|q_3|}{X^2}\hat{i} = 1.124 \times 10^5\,\hat{i}\ \text{N/c}$$

So $\vec{E} = \vec{E}_1 + \vec{E}_2 + \vec{E}_3 = 1.024 \times 10^5\,\hat{i} - 3.609 \times 10^4\,\hat{j}\ \frac{N}{C}$

$\therefore\ \vec{E} = \sqrt{E_x^2 + E_y^2} = 1.086 \times 10^5\ \frac{N}{C}$

$\phi = \tan^{-1}\left(\frac{|E_y|}{|E_x|}\right) = 19.41^\circ$ cw from +x axis.