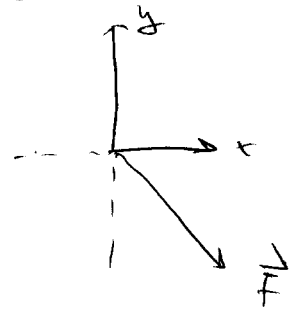


Solution # 2 Cheng Yu



$$\begin{aligned}
 a) \quad \vec{F} &= \vec{F}_1 + \vec{F}_2 + \vec{F}_3 \\
 &= \frac{k q_1 q}{a^2} (-\vec{j}) + \frac{k q_2 q}{(2a)^2} (\vec{i}) + \frac{k q_1 q}{a^2} \vec{i} \\
 &= -\frac{0.0432}{a^2} \vec{j} + \frac{0.0078}{a^2} \vec{i} + \frac{0.054}{a^2} \vec{i} \\
 &= \frac{0.04612}{a^2} \vec{i} - \frac{0.0432}{a^2} \vec{j} \quad \dots \dots \dots (+5)
 \end{aligned}$$

$$|\vec{F}| = \sqrt{F_x^2 + F_y^2} = \sqrt{\frac{(0.046)^2 + (0.0432)^2}{(a^2)^2}} = \frac{0.0632}{a^2} \quad \dots \dots \dots (+5)$$

$$\theta = \arctan \frac{y}{x} = \arctan \frac{-0.0432}{0.04612} = -43.12^\circ \quad \dots \dots \dots (+5)$$

$$b) \quad \vec{E} = \frac{\vec{F}}{q} = \frac{2.15 \times 10^4}{a^2} \vec{i} - \frac{2.15 \times 10^4}{a^2} \vec{j} \quad \dots$$

$$|\vec{E}| = \frac{3.15 \times 10^4}{a^2} \quad \dots \dots \dots (+5)$$

$\theta = -43.1^\circ$ is as before $\dots \dots \dots (+5)$