Answer on Question #42906, Physics, Other

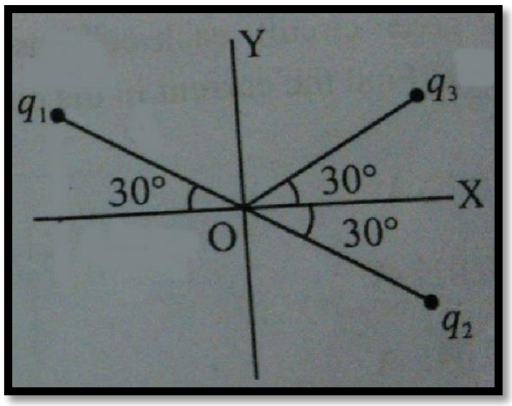
Task: Figure shows three particles with charges q_1=+2Q, q_2=-2Q, q_3=-4Q, each a distance *d* from the origin. Find the net electric field $\vec{E}$ at the origin:

(a) $\frac{2.56 \cdot Q}{4\pi\varepsilon_0 d^2} towards + ve$ x-axis

(b) $\frac{6.93 \cdot Q}{4\pi\varepsilon_0 d^2} towards + ve$ x-axis

(c) $\frac{6.93 \cdot Q}{4\pi\varepsilon_0 d^2} towards - ve$ x-axis

(d) Zero



Solution:

$$\vec{E} = \vec{E}_1 + \vec{E}_2 + \vec{E}_3 = \frac{1}{4\pi\varepsilon_0} \left| \left(\frac{2Q}{(d \sin 30^0)^2} - \frac{2Q}{(d \sin 30^0)^2} - \frac{4Q}{(d \sin 30^0)^2} \right) \right| \approx \frac{1}{4\pi\varepsilon_0} \frac{8Q}{d^2} \approx$$

$$\approx \frac{6.93 \cdot Q}{4\pi\varepsilon_0} toward + ve \ldots x - axis$$

Answer: (b)