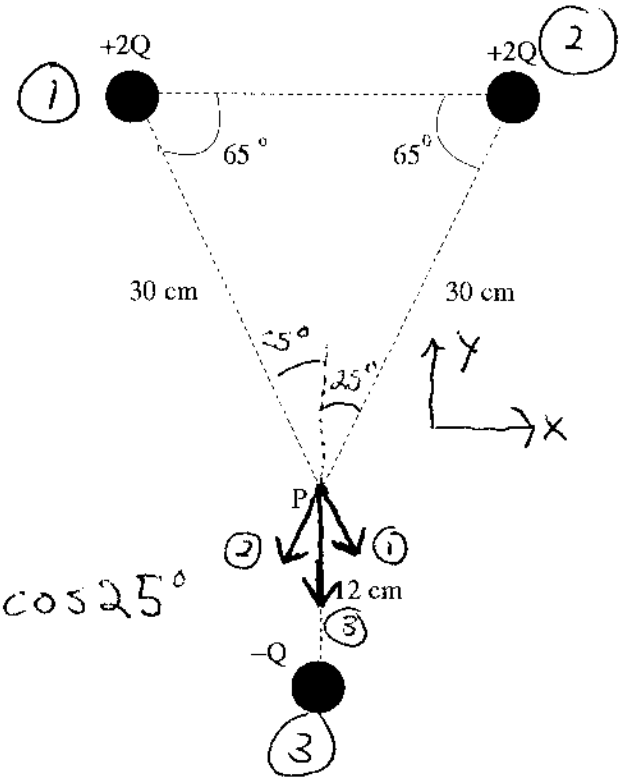
Quiz 3 – PH242 **Name**_____ ☐ **Pledged**

There are three charges as depicted in the figure. What is the electric field at point P if $Q = 1 \times 10^{-3}C = 1mC$? Please show all work but feel free to make symmetry arguments to make your work easier.

Equations

$|\vec{E}| = \frac{k_0 Q}{r^2}$ for a point charge $\quad k_0 = \frac{1}{4\pi\epsilon_0} = 8.987 \times 10^9 \frac{Nm^2}{C^2}$



$E_{1x} = -E_{2x} \quad E_{3x} = 0$

so No x components

only neg. y

$$E_y = -\frac{1}{4\pi\epsilon_0}\left(\frac{2\times10^{-3}C}{(.30m)^2}\cos25^\circ + \frac{2\times10^{-3}C}{(.30m)^2}\cos25^\circ + \frac{1\times10^{-3}C}{(.12m)^2}\right) = -\frac{1}{4\pi\epsilon_0}(.1097C/m^2)$$

$$= -9.86\times10^8\ N/C \text{ (downward)}$$