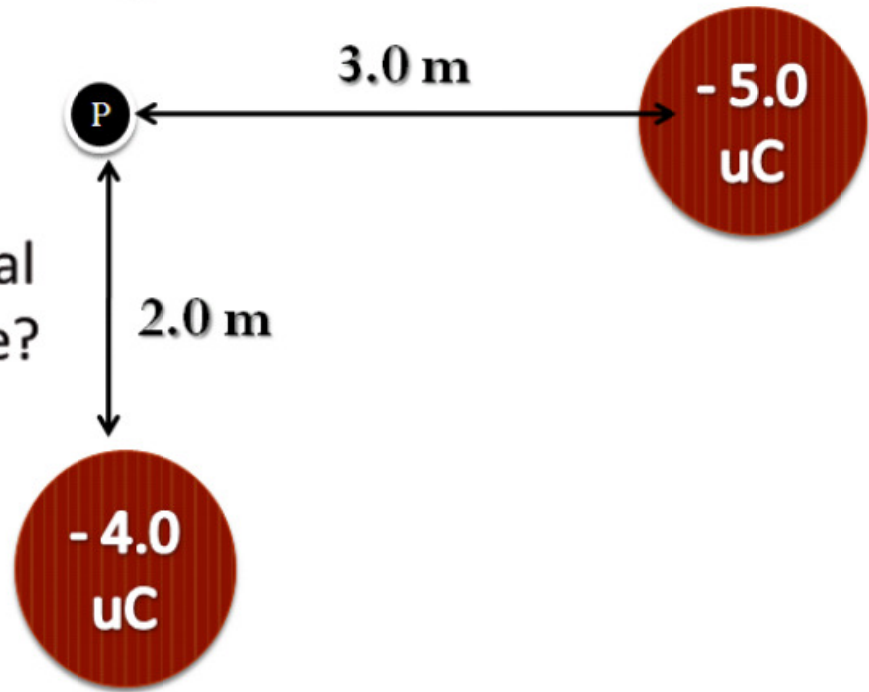
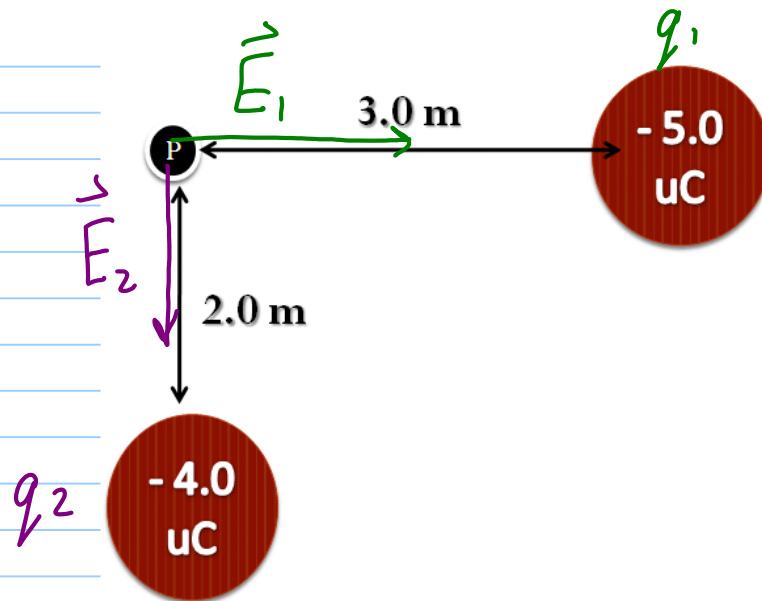


1) Find the magnitude and direction of the electric field at the point P due to the charges shown.

2) If a proton is placed at point P, what is the magnitude of the initial force will it experience?

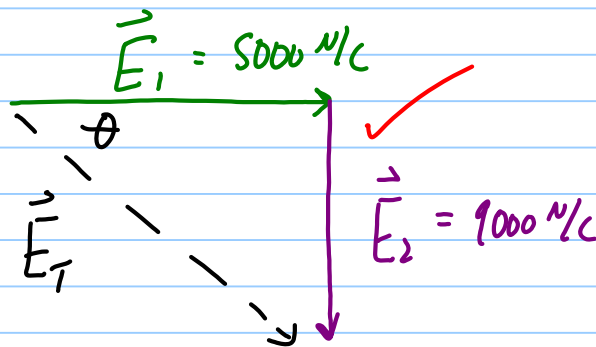


1.)



$$\vec{E}_1 = \frac{kq_1}{r_1^2} = \frac{(9.0 \times 10^9)(5.0 \times 10^{-6})}{(3.0)^2} = 5000 \text{ N/C} \quad \checkmark$$

$$\vec{E}_2 = \frac{kq_2}{r_2^2} = \frac{(9.0 \times 10^9)(4.0 \times 10^{-6})}{(2.0)^2} = 9000 \text{ N/C}$$



$$\vec{E}_T = \sqrt{9000^2 + 5000^2} = 10300 \text{ N/C} \quad \checkmark$$

$$\theta = \tan^{-1}\left(\frac{9000}{5000}\right) = 61^\circ \quad \checkmark$$

$$\begin{aligned} 2.) \quad F_E = \vec{E}q &= (10300 \text{ N/C})(1.6 \times 10^{-19} \text{ C}) \\ &= 1.6 \times 10^{-15} \text{ N} \quad \checkmark \end{aligned}$$