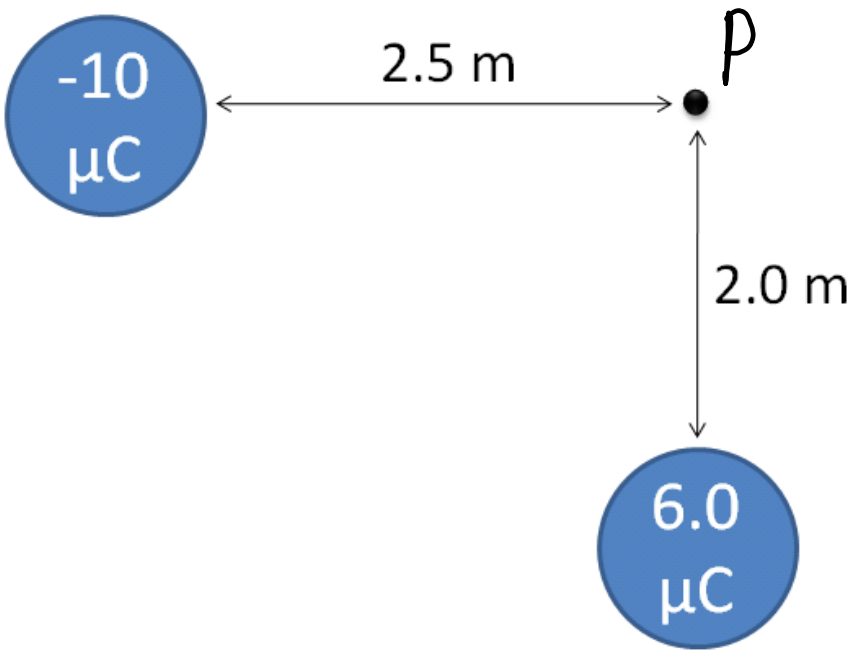
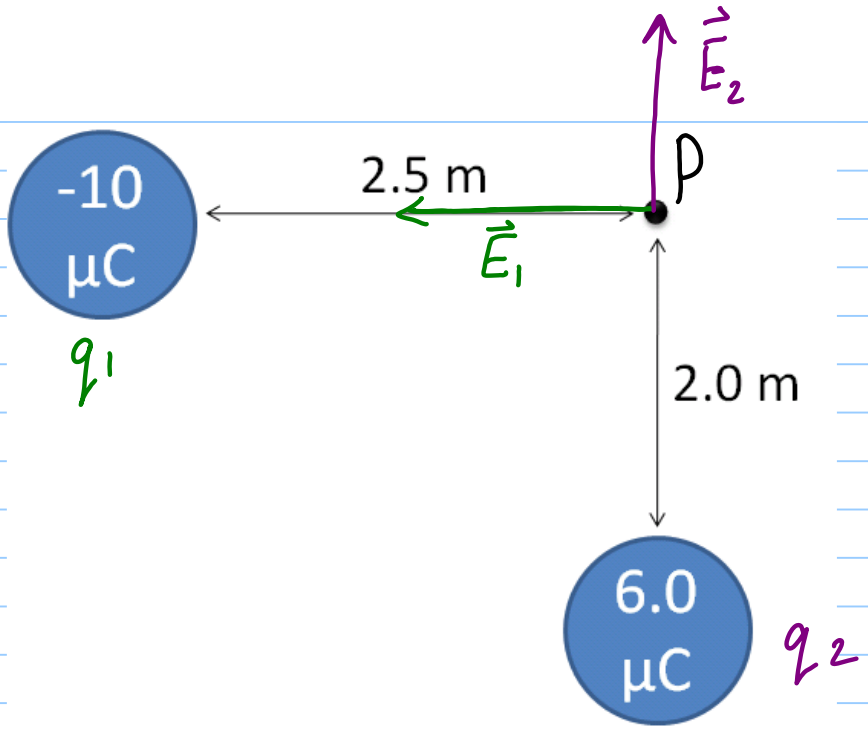
Note Title 28/03/2011

1) Find the magnitude and direction of the electric field at the point P.
2) Determine the force that would act on an electron placed at point P.

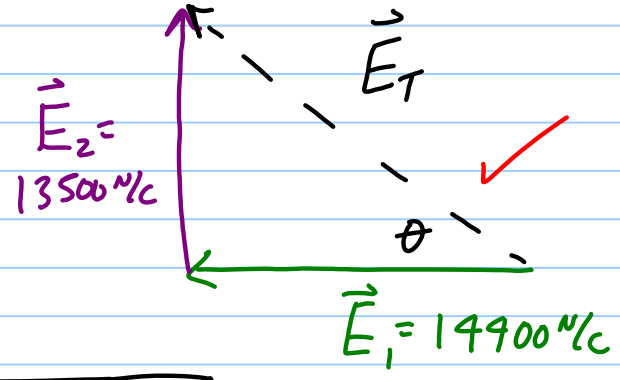


1.)



$$\vec{E}_1 = \frac{kq_1}{r_1^2} = \frac{(9\times10^9)(10\times10^{-6})}{(2.5)^2} = 14400\ N/C$$ ✓

$$\vec{E}_2 = \frac{kq_2}{r_2^2} = \frac{(9\times10^9)(6\times10^{-6})}{(2.0)^2} = 13500\ N/C$$



$$E_T = \sqrt{14900^2 + 13500^2} = 19700\ N/C$$ ✓

$$\theta = \tan^{-1}\left(\frac{13500}{14900}\right) = 43°$$ ✓

2.) $$F_E = \vec{E}q = (19700\ N/C)(1.6\times10^{-19}\ C)$$

$$= 3.15\times10^{-15}\ N$$ ✓