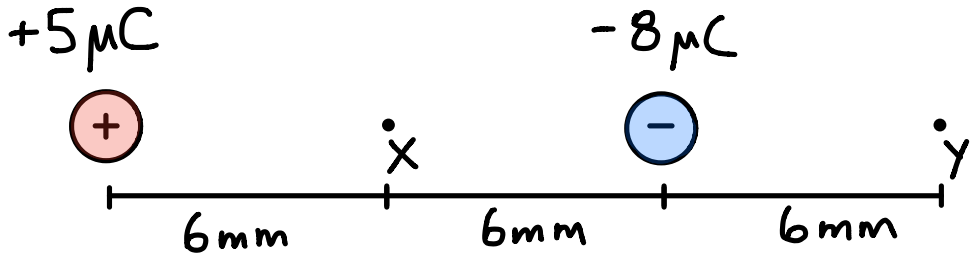
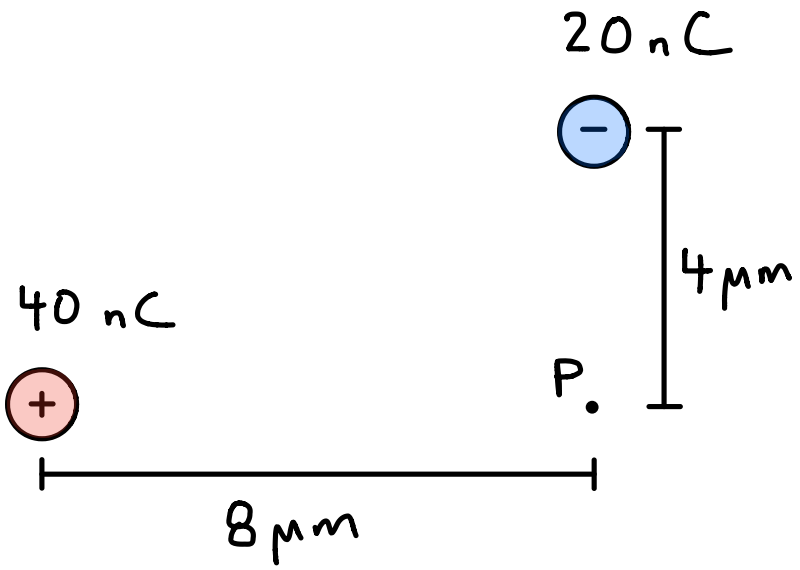
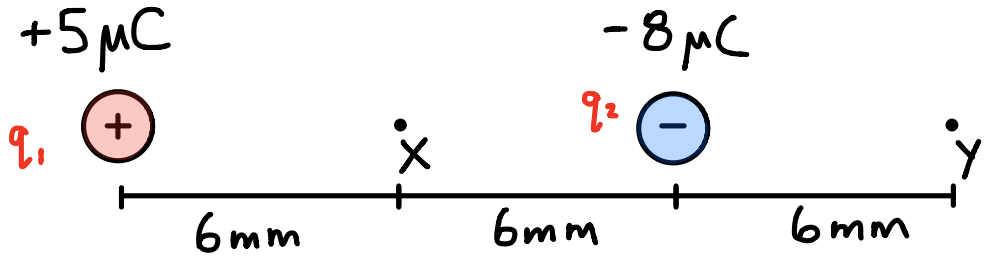
a) Determine the electric field at point X
b) Determine the electric field at point Y
c) Determine the force on an electron placed at point X
d) Determine the acceleration of a proton placed at point Y



a) Determine the electric field at point P
b) Determine the electric force on an electron placed at point P



a) Determine the electric field at point X
b) Determine the electric field at point Y
c) Determine the force on an electron placed at point X
d) Determine the acceleration of a proton placed at point Y



a) $E_1 = k\frac{q_1}{r^2} = (9.00\times10^9)\frac{(5\times10^{-6})}{0.006^2} = 1.25\times10^9 \frac{N}{C}$ RIGHT

$E_2 = k\frac{q_2}{r^2} = (9.00\times10^9)\frac{(8\times10^{-6})}{0.006^2} = 2.00\times10^9 \frac{N}{C}$ RIGHT

$\vec{E}_{TOT} = \vec{E}_1 + \vec{E}_2 = \boxed{3.25\times10^9 \frac{N}{C} \text{ RIGHT}}$

b) $E_1 = k\frac{q_1}{r^2} = (9.00\times10^9)\frac{(5\times10^{-6})}{0.018^2} = 1.38\times10^8 \frac{N}{C}$ RIGHT

$E_2 = k\frac{q_2}{r^2} = (9.00\times10^9)\frac{(8\times10^{-6})}{0.006^2} = 2.00\times10^9 \frac{N}{C}$ LEFT

$\vec{E}_{TOT} = \vec{E}_1 + \vec{E}_2 = \boxed{1.86\times10^9 \frac{N}{C} \text{ LEFT}}$

c) $F_e = qE$

$= (1.60\times10^{-19})(3.25\times10^9)$

$= \boxed{5.2\times10^{-10} \text{ N LEFT}}$

d)

$$F_{NET} = ma$$

$$F_e = ma$$

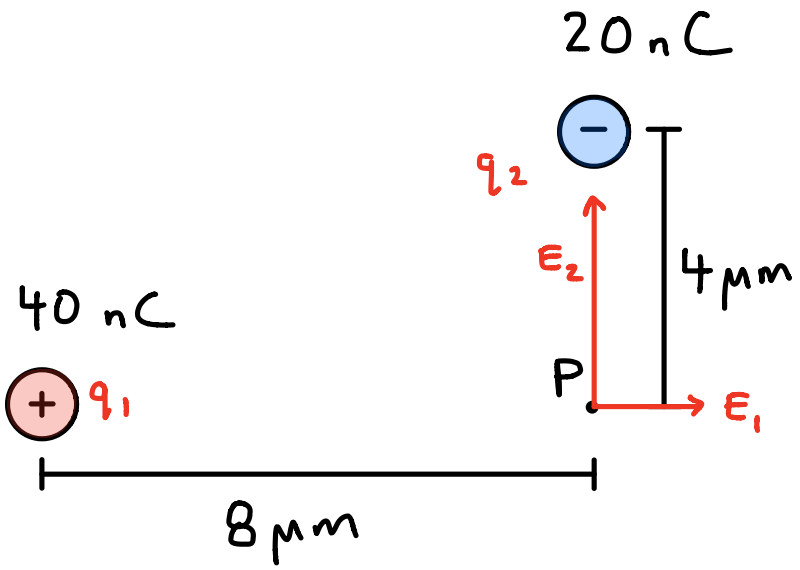
$$qE = ma$$

$$a = \frac{qE}{m}$$

$$= \frac{(1.60 \times 10^{-19})(1.86\overline{1} \times 10^{9})}{1.67 \times 10^{-27}}$$

$$= \boxed{1.78 \times 10^{17} \ \frac{m}{s^2} \quad \text{LEFT}}$$

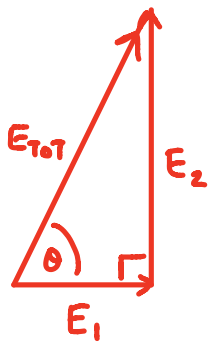
a) Determine the electric field at point P
b) Determine the electric force on an electron placed at point P



a) $E_1 = k\frac{q_1}{r^2} = (9.00\times10^9)\frac{(40\times10^{-9})}{(8\times10^{-6})^2} = 5.625\times10^{12}\ \frac{N}{C}$ RIGHT

$E_2 = k\frac{q_2}{r^2} = (9.00\times10^9)\frac{(20\times10^{-9})}{(4\times10^{-6})^2} = 1.125\times10^{13}\ \frac{N}{C}$ UP

$\vec{E}_{TOT} = \vec{E}_1 + \vec{E}_2$



$E_{TOT} = \sqrt{E_1^2 + E_2^2} = 1.26\times10^{13}\ \frac{N}{C}$

$\theta = \tan^{-1}\left(\frac{E_2}{E_1}\right) = 63.4°$

$1.26\times10^{13}\ \frac{N}{C}$ 26.6° E OF N

b) $F_e = qE = (1.60\times10^{-19})(1.26\times10^{13})$

$= 2.01\times10^{-6}$ N 26.6° W OF S