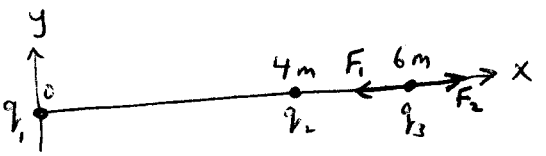
Phys102 (Sec # ~~40~~) Quiz # 6 (Ch.21&22)

Name: (Key) ID #

1- Consider three charges on the x-axis: q_1= 2.0 μC located at x_1 = 0.0 m, q_2 located at x_2 = 4.0 m and q_3 = – 1.0 μC located at x_3= 6.0 m. What is the value of q_2 such that the force on q_3 is zero? (Ans: q2 = - 0.22 μC.)

$F_{net} = 0$

q_2 should be (-ve)



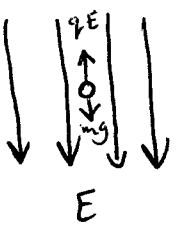
$|F_1| = |F_2|$

$$k\frac{q_1 q_3}{6^2} = k\frac{q_2 q_3}{2^2}$$

$$q_2 = -\frac{4 q_1}{36} = -0.22 * 10^{-6}\ C$$

2- A charged particle with a mass of $2x10^{-4}$ kg is held suspended (stationary) by a downward electric field of 300 N/C. What is the charge on the particle? (Ans: – 6.5 x 10-6 C)

The charge should be -ve.



$$qE = mg$$

$$q = \frac{-mg}{E} = \frac{-(2*10^{-4})(9.8)}{300}$$

$$= \boxed{-6.5 * 10^{-6}}\ C$$