(3) Coulomb's law = $F_0 = \left| k\frac{q_0 q_1}{r_1^2} + k\frac{q_0 q_2}{r_2^2} \right|$

$K = 9\times10^9\ N\cdot m^2/C^2$ $r_1 = 0.5m$ $r_2 = 1m$

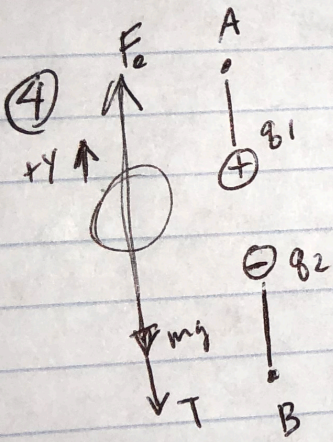
$q_0 = 2\times10^{-6}C$ $q_1 = -2\times10^{-6}C$ $q_2 = 4\times10^{-6}C$

origin $X = 50cm$ $X = 100cm$

$$F_0 = \left| 9\times10^9 \frac{N\cdot m^2}{C^2}\left(\frac{2\times10^{-6}C\cdot(-2\times10^{-6}C)}{(0.5)_m^2} + \frac{2\times10^{-6}C\cdot(4\times10^{-6})}{1m^2}\right)\right|$$

$= .072\ N$ Positive

(4)



q_2 has three forces: electric force from q_1, tension, and gravity.

$F_e - T - mg = 0$

$T = k\frac{|q_1||q_2|}{(15)^2} - mg$

$T = 9\times10^9\ N\cdot M^2/C^2\left(\frac{(2\times10^{-6})(2\times10^{-6})}{.15_m^2}\right) - (0.040\times9.8)$

$= 1.208\ N$