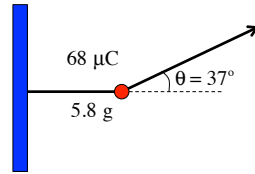
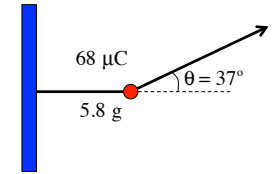
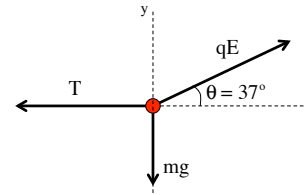


Problem 15.22

Determine the E-fld and the tension if the charge is $68 \mu\text{C}$ the mass is 5.8 grams and the angle is $\theta = 37^\circ$.



1.)



Summing appropriately:

$\sum F_y :$

$$qE \sin \theta - mg = m\alpha^{=0}$$

$$\Rightarrow E = \frac{mg}{q \sin \theta}$$

$$= \frac{(5.8 \times 10^{-3} \text{ kg})(9.8 \text{ m/s}^2)}{(68 \times 10^{-6} \text{ C}) \sin 37^\circ}$$

$$= 1.39 \times 10^4 \text{ N/C}$$

$\sum F_x :$

$$qE \cos \theta - T = m\alpha^{=0}$$

$$\Rightarrow T = qE \cos \theta$$

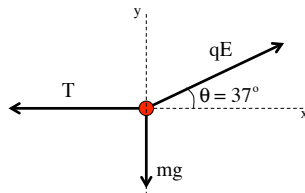
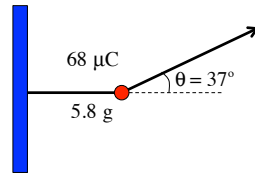
$$= (68 \times 10^{-6} \text{ C})(1.39 \times 10^4 \text{ N/C})(\cos 37^\circ)$$

$$= .75 \text{ N}$$

3.)

Determine the E-fld and the tension if the charge is $68 \mu\text{C}$ the mass is 5.8 grams and the angle is $\theta = 37^\circ$.

This is a Newton's Second Law problem. Starting with a f.b.d., we get:



2.)