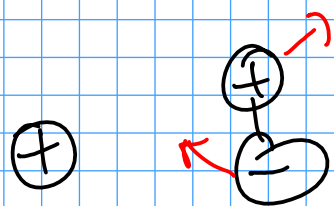


Learning objectives:

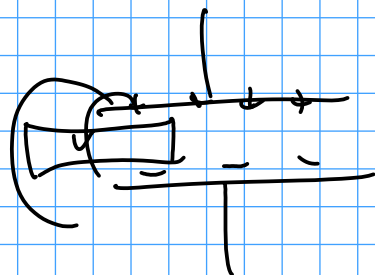
OBJECTIVE: understand how to calculate motion for a dipole in presence of static charge.



$$\Sigma \vec{F} = \Sigma q \vec{E} = m \vec{a}_{cm}$$

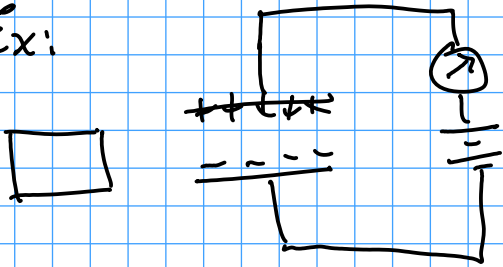
$$\Sigma \tau = I \alpha$$

OBJECTIVE: Forces on dielectrics - understand how to apply Newton's laws or work-energy theorem to calculate forces on dielectrics. Understand why one method may be much easier



OBJECTIVE: understand the similarity between $PV = nRT$ and $C = Q/V$ and how one variable being constant is important in solving the problem.

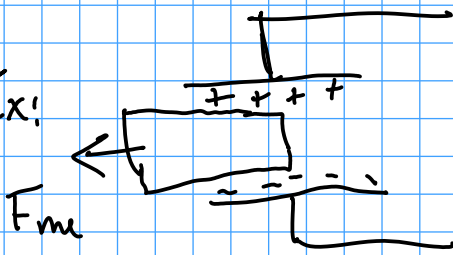
Ex:



how much free charge does the battery have to pump onto cap?

$$\Delta Q = \frac{\partial Q}{\partial C} \Delta C$$

Ex:



Work Energy

$$W_{me} = \Delta \left(\frac{1}{2} C V^2 \right) = W_{me} = \int_{me} \vec{F} \cdot d\vec{l}$$

$$dW_{me} = \vec{F}_{me} \cdot d\vec{l} = dPE$$

$$\Delta W_{me} = F \Delta l = \Delta PE$$

$$PE = \frac{1}{2} C V^2 = \frac{1}{2} \frac{Q^2}{C}$$

what's constant?

