Welcome Back to a SHOCKING 2nd Semester!

Start by telling someone around you how you coped with the lack of physics homework over our break!

Today's Agenda

- Lesson: Electric Forces
- HW: Pg. 575-577 #1, 2, 25, 7, 8a, 9, 12, 13, 15

Tomorrow is lab/work time. You can also peruse your final exams tomorrow if you wanna.

Electric Force Basics

Charge Basics:

* 2 kinds (+ & -)
* S.I. Unit: Coulomb (C)
* Opp charges attract, like repel
* Charge is quantized ($e = 1.6 \times 10^{-19} C$)

Coulomb's Law:

mag. of 2 charges

$$F_{elec} = \left(\frac{1}{4\pi\varepsilon_0}\right)\left(\frac{q_1 q_2}{r^2}\right) = \frac{k q_1 q_2}{r^2}$$

$k = 8.99 \times 10^9 \frac{N m^2}{C^2}$

Ex. #1

3.5×10^{10} electrons are transferred from one object to another. If the objects are 0.42cm apart from one another, calculate the electric force between the two objects after the electron transfer.

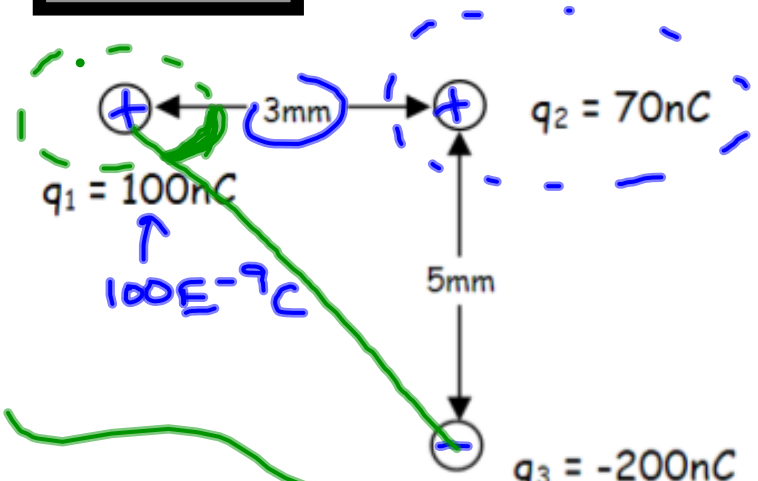
$q_1 = (3.5 \times 10^{10})(1.6E^{-19}) = 5.6nC$

$F = \frac{kq_1 q_2}{r^2} = \frac{(8.99E^9)(5.6E^{-9})(5.6E^{-9})}{(.0042)^2}$

$= .016N$ attractive

Ex. #2

Use the diagram to find the magnitude and direction of the net electric force acting on q_2 and q_1.



$F_{2,1} = 6.99N \rightarrow$

$F_{2,3} = 5.03N \downarrow$

$\Sigma F_2 = \sqrt{\quad}$

$= 8.61N$

$\theta = 35.7°$

$F_{1,2} = 6.99 \leftarrow$

$F_{1,3} = \dfrac{k(100E^{-9})(200E^{-9})}{(.00583)^2}$

$= 5.29N \searrow 59.0°$

$F_{1,3x} = 2.72 \rightarrow$

$F_{1,3y} = 4.53 \downarrow$

$\Sigma F_1 = 6.23N \ @ 46.7° \ \theta_C$