Ch 20
Sec 20.2

HW: Rev Con 4,7,9,11,13

obj: Summarize the relationship between force and charges.

Charges + Forces

- Charges exert Long Range forces.
  * Either attractive or repulsive forces.
  * any charge w/ a neutral object the force is always attractive

Feb 4 - 10:06 AM

- Opposite charges have attractive forces.
- Like charges have repulsive forces.
- Force depends on 2 Things.
  1) Size of the charges. (q)
     - The Larger the charges the Larger the force.
       * Direct Relationship btw charges + force.

$$F \propto q_1 q_2$$

Feb 4 - 12:56 PM

2) Distance btw the Charges.

- The force is related to an inverse square Law w/ distance.

Electrical $F \propto \frac{1}{d^2} \Rightarrow F \propto \frac{q_1 q_2}{d^2}$

Gravitational $F \propto \frac{m_1 m_2}{d^2}$ $F = G\frac{m_1 m_2}{d^2}$

$F = K\frac{q_1 q_1}{d^2}$ $K = 9.0 \times 10^9 \, N m^2/C^2$

- 1 coulomb is the charge on 6.25×10^{18} e^-.

* The charge of $1e^-$ is 1.60×10^{-19} C

elementary Charge.

Feb 4 - 1:01 PM

Ways to Separate Charges

1) Friction - Transfer of Electrons

1 object will be negative the other positive.

2) Charging by Conduction

- Uses a charge object to charge a neutral object.

- The neutral object gains the same charge.

Feb 4 - 1:05 PM

3) Charging by Induction

- Induce a charge into neutral object.
- Ends up w/ the opposite charge.

* Electroscope

Feb 4 - 1:13 PM

Feb 8-10:37 AM