Tuesday, December 16/14
Physics 122/121

1. Check - > Text: Page 608, #1-4
   Page 623, #23-27, 30] Mass on Spring.
2. Pendulum
3. Text: Page 614, #5-8
   Page 623, #28, 29] Pendulum.
4. Assessment - Unit 2 → Quiz ⇒ Heavenly Bodies / SHM.
5. Unit 3

Assessment: ICA
quiz. ✳

Test - ~~Unit~~ 2.

Unit 3 → ① Static Electricity
② Moving Charges

Types of Charge

- positively charged — ie/ proton, eg/ p^+
- negatively charged — ie/ electron, eg/ e^-

(eg = example)

In an atom, $\#p^+ = \#e^-$

In an ion, $\#p^+ \neq \#e^-$

charge on proton = charge on electron = e → elementary charge

$e = 1.60 \times 10^{-19}$ C → Coulomb ← SI unit charge

$$q = Ne$$

q → charge (C)
$e = 1.60 \times 10^{-19}$ C
$N = \#$

[$1e = 1.60 \times 10^{-19}$ C] conversion factor

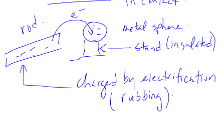
ie/ How much charge do $2e^-$ have?

$q = 2(1.60 \times 10^{-19}$ C$)$

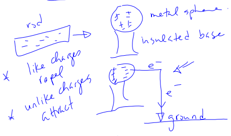
$q = 3.20 \times 10^{-19}$ C

Charging Objects

1. Conduction – two objects placed in contact

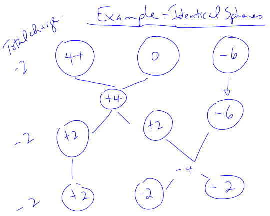


2. induction → no contact



* like charges repel
* unlike charges attract

Example – Identical Spheres



The Law of Conservation of Charge

Charge cannot be created nor destroyed.

Coulomb's Law

Observation #1: $F \propto q_1 q_2$ — directly

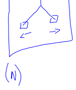
Observation #2: $F \propto \frac{1}{r^2}$ — indirectly (inversely)

q_1 —r— q_2

$$F = \frac{k q_1 q_2}{r^2}$$ Coulomb's Law

$F = \frac{G m_1 m_2}{r^2}$ Newton

electroscope:



F → (magnitude) electric force (N)
electrostatic force
↓ charges are stationary
↓
electrostatics

q_1, q_2] charge (C)] do not include signs for type of charge

r → distance between charges (m)

k → constant $k = 9.0 \times 10^9 \frac{Nm^2}{C^2}$

NOTE: 2.0 μC (μ ↑ mu) [1.0 μC = 10^{-6} C]

2.0 μC × 10^{-6} ⇒ 2.0×10^{-6} C

12 μC × 10^{-6} ⇒ 12×10^{-6} C

NOTE: proton, electron > 1.60×10^{-19} C