Circular Motion and Gravity
Orbital Simulation
PHYS 442

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Date Performed:	September 18, 2015
Partners:	Whole class
Instructor:	Me

1 Formulas

Electric field

$$E = -\Delta V/\Delta X$$

$$C = Q/V$$

$$I = \Delta Q/\Delta T$$

$$V = IR$$

$$P = IV$$

Individual Charge

$$F = q * v * B$$

Wire Charge

$$F = I * L * B$$

In series of resistances
I1 = I2 = I3
V(total)=V1 + V2 + V3
In parallel resistances
I1 + I2 + I3 = I(total)
V(total)= V1 = V2 = V3

$$Torque = r * F$$

Torque net= I times initial acceleration Electricity
Point charges:

$$F = qQK/r^2$$

$$E = QK/r^2$$

$$PE = qQk/r$$

$$V = QK/r$$

General

$$E = -\Delta v/\Delta x$$

$$F = Eq$$

$$PE = qV$$

CAPACITOR

$$I = \Delta Q/\Delta t$$

Circular motion:
Angular velocity

$$w = \Delta teta/\Delta t$$

Angular acceleration

$$\alpha = \Delta w/\Delta t$$

Centripetal acceleration

$$Q = V^2/r$$

Tangential speed

$$V = Wr$$

Gravity

$$-F = mMG/r^2$$

$$-PE = -mMG/r$$

$$F = qVB$$

$$F = ILB$$

$$Bwire = \mu I/2\pi r$$

$$Ihoop = MR^2$$

$$Idisk = MR^2/2$$

2 Facts

- E fields are strong when lines of equal potential are close.
- By increasing the area or decreasing d, the more capacitance we will have.
- Electric field is in the same direction as current and applies force and moves the particles.
- Increase voltage = Increase E field = Increase Fe = Increase drift = Increase current
- One ampere is the magnitude of the current which, when flowing in each of two long parallel wires one meter apart, results in a force between the wires of exactly 2×10^{-7}N per meter of length.