

## Principles of Physics: Problem Set #2

**Using graphs and equations; Describing motion**

straight line:  $y = mx + b$ ,  $m = \frac{\Delta y}{\Delta x}$ ; right triangle:  $H^2 = O^2 + A^2$ ,  $\sin \theta = O/H$ ,  $\cos \theta = A/H$ ,  $\tan \theta = O/A$

force laws:  $F_g = G \frac{m_1 m_2}{r^2}$  (near earth surface  $F_g = mg$ );  $F_e = k \frac{q_1 q_2}{r^2}$

$v = \frac{\Delta x}{\Delta t}$  or  $\frac{dx}{dt}$ ; constant velocity:  $x = vt + x_o$

**Due: Friday Sept. 7 in class**

Notes: 1) No Class on Monday (9/3).

2) Lab starts on Tuesday (9/4). Be sure to bring a quadrille-ruled lab notebook to lab.

Also, if you have Excel on a *laptop* (not ipad), please bring it to lab.

Reading assignment:

for Wed, Ch 2 (pp 25-28) [right triangles, trig, and force laws]

Ch 3 (pp 33-36) [using vectors and graphs to describe motion]

for Fri, Ch 3 (pp 36-40) [constant velocity motion]

Problem assignment:

(WARNING - The problem naming/numbering scheme in the text is confusing, so ALWAYS double check whether a problem is guided review (**GR**), skill building (**SB**), **Synthesis**, etc.)

## CHAPTER 2

**GR-9** (pg 29 ... graphing water consumption)

**GR-11** (pg 29 ... graphing lemonade sales)

**GR-12** (pg 29 ... shadow cast by a flagpole)

**SB-6** (pg 30 ... modeling gerbil reproduction rate)

**SB-11** (pg 31 ... weight of a rock on the moon)

## CHAPTER 3

**GR-1** (pg 49 ... Cindy's bike trip I)

**GR-2** (pg 49 ... Cindy's bike trip II)

**GR-4** (pg 50 ... Cindy takes another bike trip)