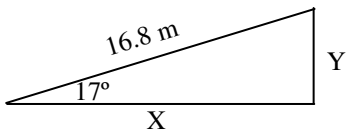
Due Fri., Sept 2

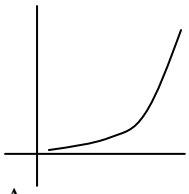
2011 PreAP Linear Motion 7

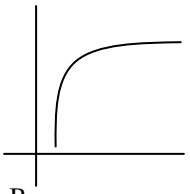


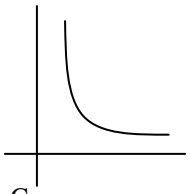
1. Use the triangle at the left to answer the following:
   A. opposite =
   B. Adjacent =
   C. Hypotenuse =
   D. θ =
   E. * Following the example at the bottom of the "Trig Basics" notes, calculate x and y.

HINT: Make sure you are in degrees, not rad. The notes show you how to do this and to put θ into your calculator.

2. From the "How to Straighten Graphs" notes, give the basic function for each of the graphs at the right:


A. y =

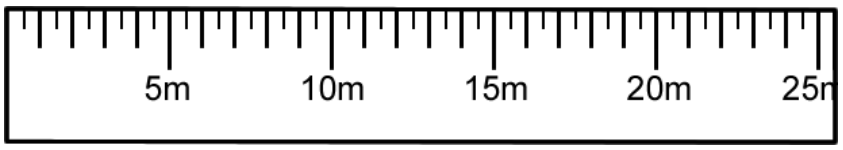

B. y =


C. y =

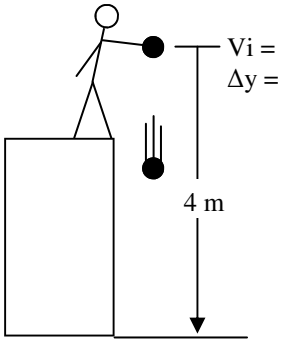
3. An object is originally at rest. It then undergoes an acceleration of 10 m/s^2.
   A. * Calculate how far it travels in one second.

   B. * Calculate how far it travels in 2 seconds.

   C. On the ruler at the right, label how far it went in one second as "1 sec". Do the same for how far it went in 2 seconds.
   Between the 1 sec and 2 sec marks on the ruler, you should see that the object went 15 m.



   D. How far is 15 m compared with the original 5 m?
   E. So, in the second second of time, an accelerating object goes _____ times as far as in the first second.
   F. In the full two seconds of time, an accelerated object goes _____ times as far as in the first second.
   This is because t is squared in the equation.



4. Slim Jim drops a ball from 4 m up. (*Use the "Freefall" notes.*)
   A. Jim is holding onto the ball to begin with, so what is its initial velocity?
   B. * Since the ball is DROPPED, what is Δy for the ball?
   C. What is the acceleration of a dropped ball?
   D. * Use a kinematic equation to solve for the time the ball is in the air.

5. Freefall: yes or no?
   A. _____A balloon is filled with air and you drop it.
   B._____A bowling ball rolls off of a desk to the floor below.

6. What is a vacuum?

7. In a vacuum, which would fall faster: a brick or a leaf?

8. *(The kinematics work even with big and small numbers.)* * A beetle walking 0.015 m/s is startled. It ends up walking 0.85m in 0.35seconds. Calculate the beetle's acceleration.

1E) y= 4.9 m (since sin17 = .29); x = 16.1 (since cos17 = .96) 3A) 5 m 3B) 20 m
4B) −4m (down) 4D) 0.9 sec 8) use $\Delta x = v_i t + \frac{1}{2}at^2$, so a = 13.8 m/s^2