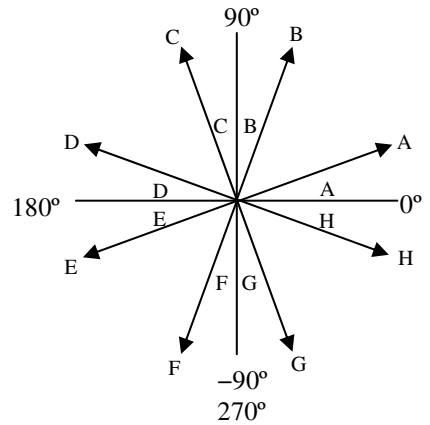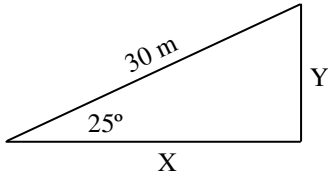# PreAP Linear Motion 12

To make things easier, we will always measure our angles from the + x—axis.
OR— 0° will be to the right.

1. Give the correct direction for the following. Each letter's angle is 10°.
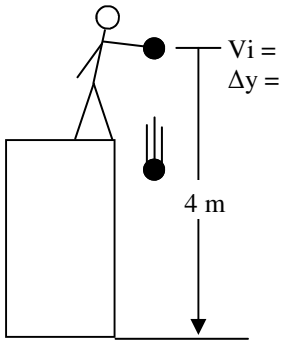
   A. * Arrow A =   C. Arrow D =   E. Arrow F =
   B. * Arrow B =   D. * Arrow E =   F. Arrow G =

2. * Being sure that your calculator is in degrees, calculate x and y.

3. 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. (*Show variables, etc*)

   Vi =
   Δy =
   4 m

4. 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.

5. What is a vacuum?

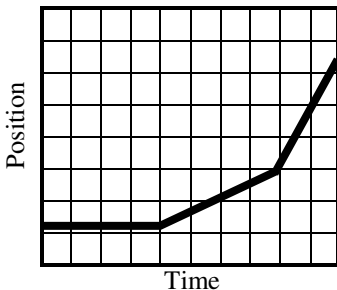6. In a vacuum, which would fall faster: a brick or a leaf?

7. An object is thrown into the air going 15 m/s. You want to know how high up it goes.
   A. Is its displacement going to be + or −?
   B. What will be its final velocity at the very top?
   C. * How high does it go?

   You should remember that the slope of a position vs time graph is velocity. Why? Because velocity is about change of position.
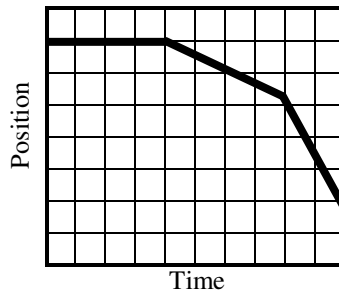   *If your change of position is +, your velocity is +, etc.*

8. Label each of the following line segments (three per graph) as: rest, + slow, + fast, − slow, − fast.
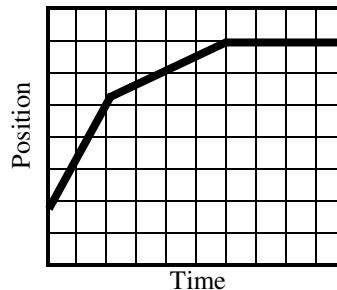
   Ⓐ Position vs. Time   Ⓑ Position vs. Time   Ⓒ Position vs. Time   Ⓓ Position vs. Time

   A. The velocities are becoming more ____, or less ____.
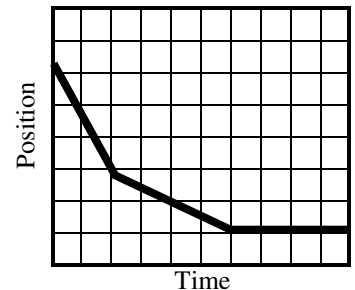   B. The velocities are becoming more ____, or less ____.
   C. The velocities are becoming less ____, or more ____.
   D. The velocities are becoming less ____ or more ___.

9. Which of the above graphs show positive acceleration?
10. Which of the above graphs show negative acceleration?