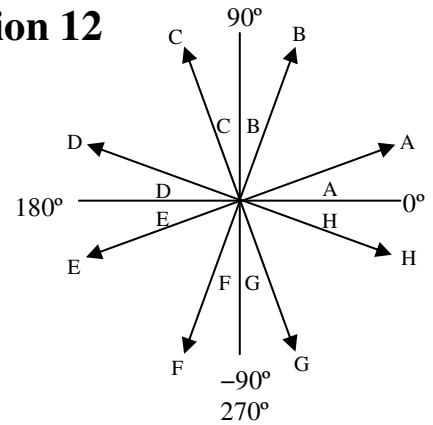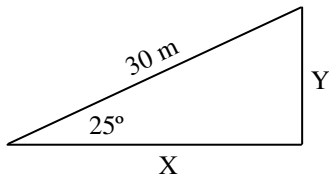# 2012 PreAP Linear Motion 12

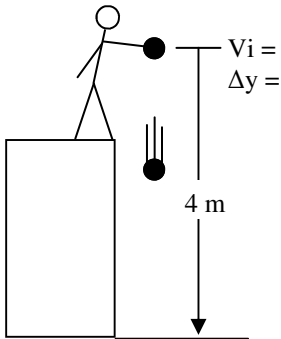*To make things easier, we will always measure our angles from the + x—axis.*
OR— 0° will be to the right.

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.

30 m
Y
25°
X

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.
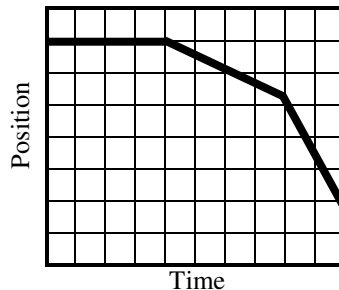*If your change of position is +, your velocity is +, etc.*

8. Label each of the following line segments (three per graph) as: rest, + slow, + fast, − slow, − fast.
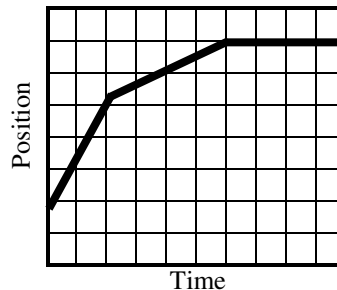
Ⓐ Position vs. Time   Ⓑ Position vs. Time   Ⓒ Position vs. Time   Ⓓ Position vs. Time
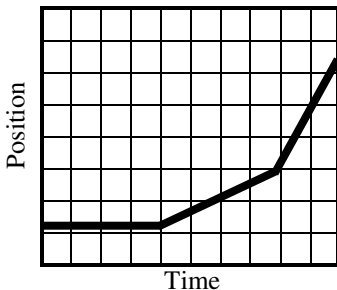
    A. The velocities are   B. The velocities are   C. The velocities are   D. The velocities are
        becoming more ____,   becoming more ____,   becoming less ____,   becoming less ____
        or less ____.   or less ____.   or more ____.   or more ___.

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