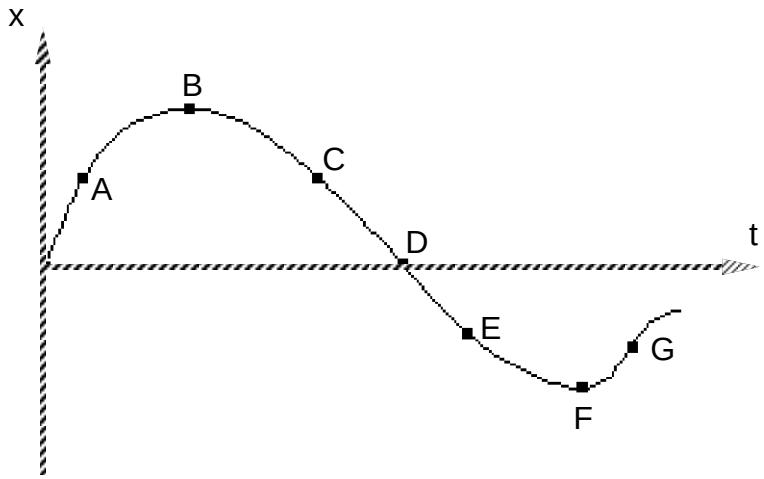
Name_____

Date_____ **Pd**____

UNIT I: Worksheet 3

1. The graph below represents the motion of an object.



a. At what point(s) on the graph above is the object moving most slowly? (How do you know?)

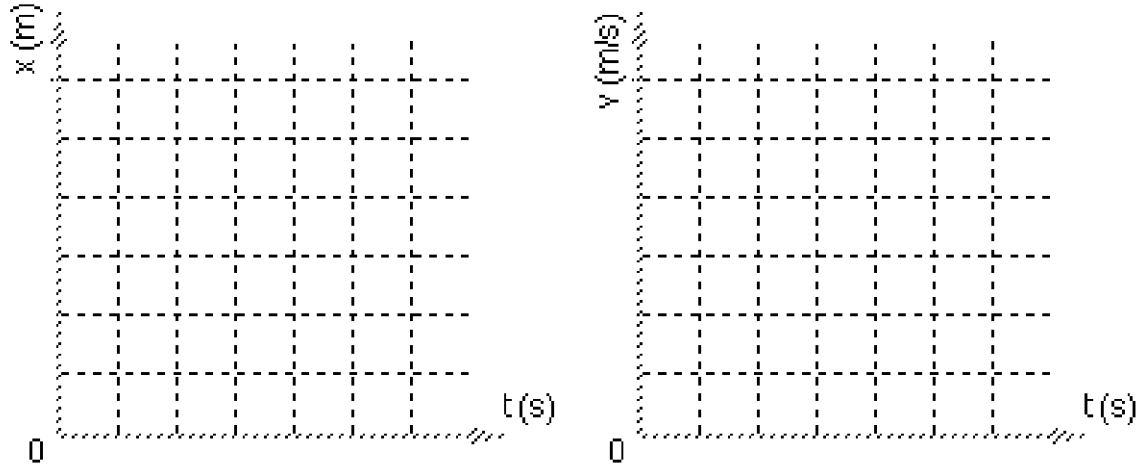
b. Over what intervals on the graph above is the object speeding up? (How do you know?)

c. Over what intervals on the graph above is the object slowing down? (How do you know?)

d. At what point(s) on the graph above is the object changing direction? (How do you know?)

2. A stunt car driver testing the use of air bags drives a car at a constant speed of 25 m/s for a total of 100 m. He applies his brakes and accelerates uniformly to a stop just as he reaches a wall 50 m away.

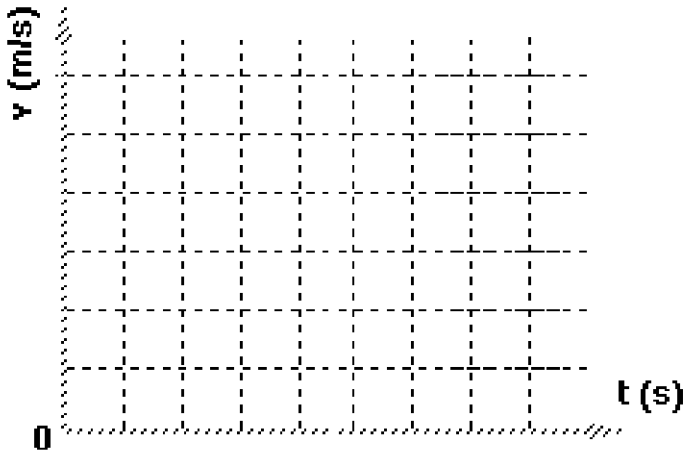
   a. Sketch qualitative position vs. time and velocity vs time graphs.



   b. Solve for how long it takes for the car to travel the first 100 m.

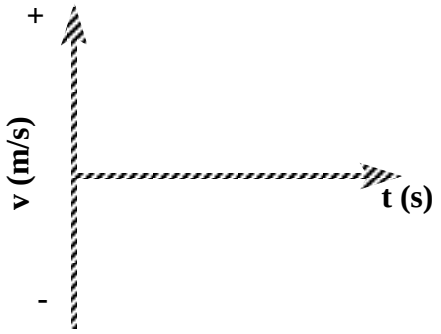
   c. Remember that the area under a velocity vs time graph equals the displacement of the car. Solve for how long the brakes must be applied for the car to come to a stop in 50 m.

   d. Now that you know the total time of travel, sketch a **quantitative** velocity vs. time graph.



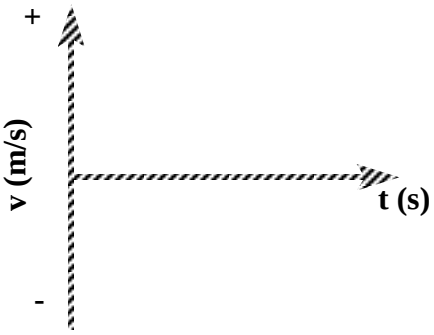
e. Calculate the acceleration provided by the brakes.

3. A bear spies some honey and takes off from rest, accelerating at a rate of 2.0 m/s^2. If the honey is 16 m away, calculate how fast his snout be going when it reaches the treat.



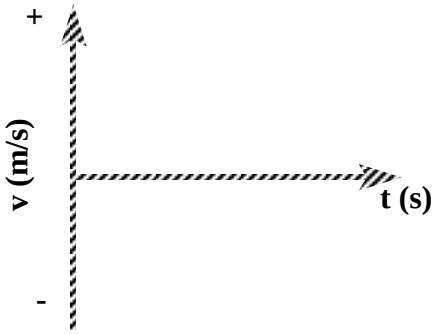
4. A bus moving at 20 m/s (t = 0) slows at a rate of 4 m/s each second.
   a. Calculate how long it takes the bus to come to a stop.

   b. Calculate how far it travels while braking.



5. A dog runs down his driveway with an initial speed of 5 m/s for 8 s, then uniformly increases his speed to 10 m/s in 5 s.
   a. Calculate his acceleration during the 2nd part of the motion.

   b. Calculate how long is the driveway if the dog started at one end and reached the other after the full 13s.



6. A car whose initial speed is 30 m/s slows uniformly to 10 m/s in 5 seconds.
   a. Calculate the acceleration of the car.

   b. Calculate the distance it travels in the 3rd second (t = 2s to t = 3s).