# 2009 Linear Motion 1

Use your "Speed" notes and "Acceleration" notes to answer the following:

1. The dots at the right show the positions of four different objects each second.
    (*There can be more than one answer for each question*).
    - A. Which of the objects is at constant speed?
    - B. Which of the objects is speeding up to the right?
    - C. Which of the objects is slowing down to the right?
    - D. Which of the objects have a positive acceleration?
    - E. Which of the objects have zero acceleration?

a.

b.

c.

d.
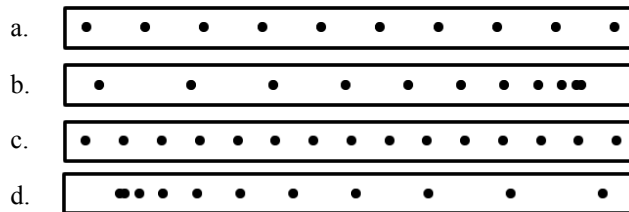
2. An object is moving at a constant velocity of 4 m/s and travels 120 m.
    - A. Since the object is at constant velocity, does the object change speed?
    - B. What is the final velocity of the object?
    - C. What is the acceleration of the object?
    - D. Calculate the time it took for the object to go 120m.

3. Use the position vs time graph at the right to answer the following.
    - A. Which segment has the fastest velocity?
    - B. Which segment shows the object at rest?
    - C. Give the letters from slowest to fastest:
    - D. What is the object doing (use the information from the above answers)?

**Position vs. Time**
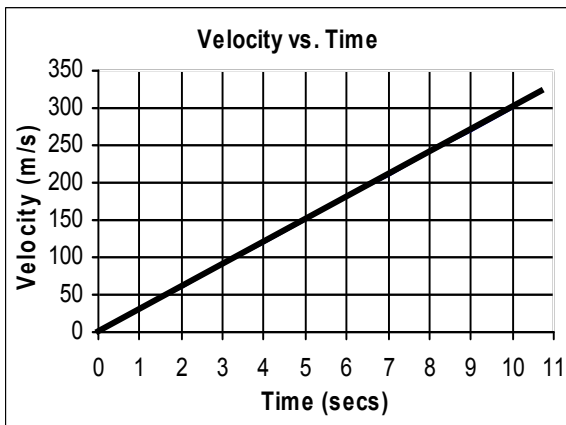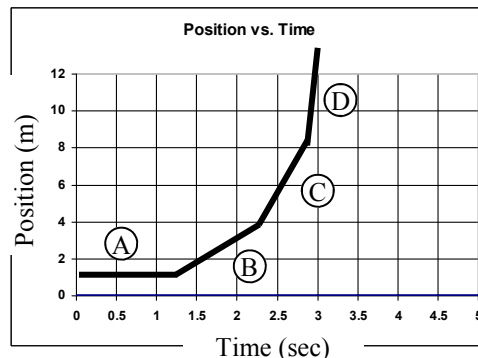
4. Use the graph at the left to answer the following.
    - A. What is the initial velocity of the object?
    - B. What is the velocity of the object after 10 sec?
    - C. So the object is changing:
    - D. Calculate the slope of the line.
    - E. What is the acceleration of the object?
    - F. Graph this acceleration on the graph at the lower left.

Velocity vs. Time

Acceleration vs. Time
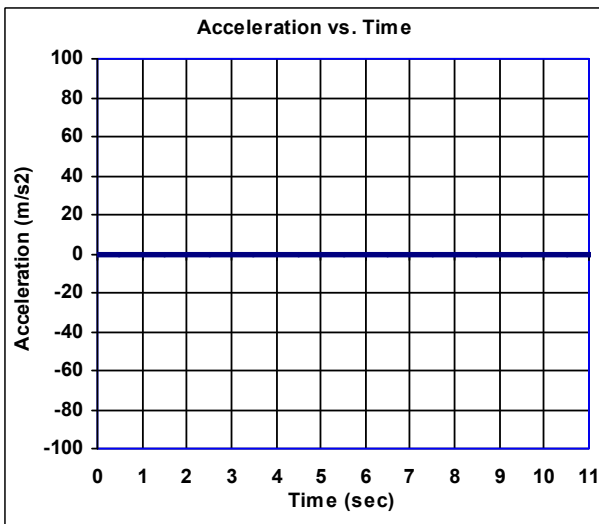
5. For the object below:
    - A. Vi =
    - B. Δx =
    - C. Δy =

8 m/s

7 m

9.5 m

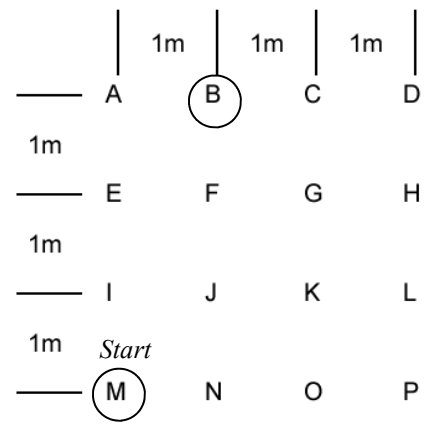|	1m		1m		1m	
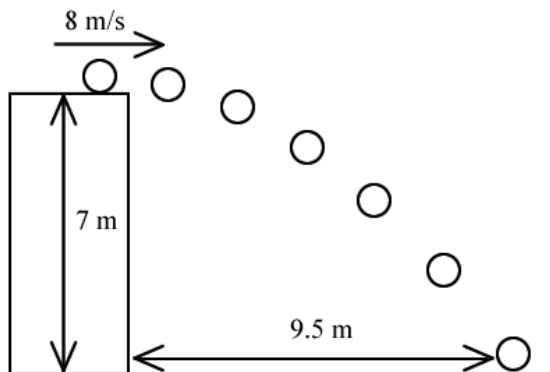
6. For the object at the right:
   A. $\Delta x =$
   B. $\Delta y =$

7. $-(-8) =$

8. A. An object is moving -10 m/s, then it accelerates for 3 seconds. Afterwards it is moving -40 m/s. Calculate the acceleration of the object.
   Variables: Equation: Solve:

A   B   C   D

1m

E   F   G   H

1m

I   J   K   L
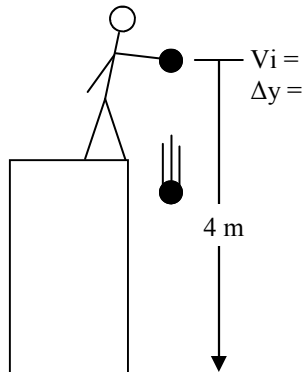
1m   *Start*

M   N   O   P

   B. So, is this object experiencing a positive or negative acceleration?

9. A. An object is moving -15 m/s. After 2 seconds it stops. Calculate its acceleration.
   Variables: Equation: Solve:

   B. Is this object experiencing a positive or negative acceleration?

Vi =
$\Delta y =$

4 m

Meet Slim Jim, he's very slim. Jim is going to help us understand physics, this year.

10. Slim Jim drops a ball from 4 m up.
    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?

11. A rock is sitting on the edge of a 12 m tall cliff. It is then bumped off and falls to the ground below.
    A. Vi =

    B. $\Delta y =$