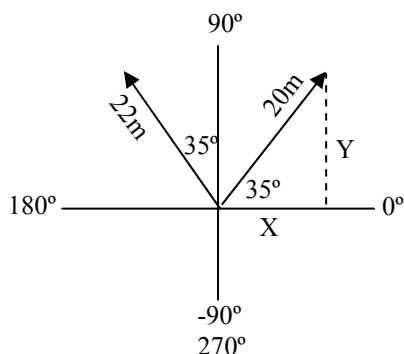


## 2010-11 PreAP Linear Motion 5



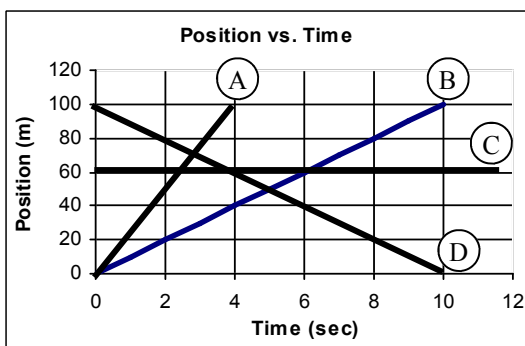
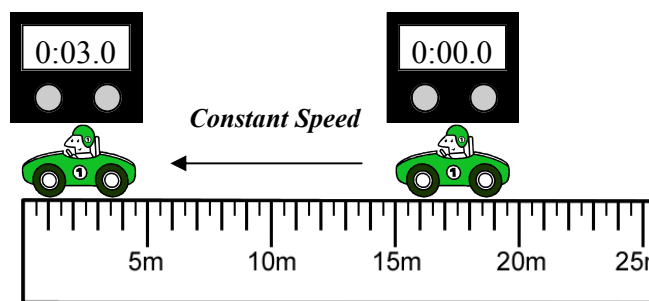
1. What is the correct direction for the 22 m arrow shown at the left?
2. Use the 20m long arrow to answer the following. We will start by drawing a vertical line from the tip of the arrow to the x-axis to create a right triangle. Find the x and y components of the 20 m long arrow.

3. An object accelerates at  $6 \text{ m/s}^2$  for 3 seconds. During this time it travels 40 m to the right.
  - A. Since the object moves to the right is the displacement + or -?
  - B. Solve for the initial velocity of the object. (*Use the kinematic equations. Show variables and equation.*)

Variables:                      Equation:                      Solve:

4.
  - A. Is the car at the right moving left or right?
  - B. Is this the + or - x direction?
  - C. What is the  $\Delta D$  for the object?
  - D. What is the  $\Delta T$ ?
  - E. What is the speed of the object?

F. (Careful) What is the velocity of the object?



5. Assuming right is positive, which line segment or line segments...
  - A. Shows the fastest speed?
  - B. Shows an object moving to the right?
  - C. Shows an object moving to the left?
  - D. Shows an object at rest?
  - E. Shows positive velocity?
  - F. Shows negative velocity?

From the "Acceleration" Notes:

6. What are the two ways you know an object is accelerating?
7. How can an object not change speed, but be accelerating?
 

*The symbol "Δ" is delta and means "change of". Δ always equals final - initial. So,  $\Delta x = x_f - x_i$  and  $\Delta v = v_f - v_i$ . Also, remember that left is negative and right is positive for velocity and position.*
8. An object is moving 30 m/s to the right. After 5 seconds it is moving 10 m/s to the left. Find the acceleration of the object.
 

Variables:                      Equation:                      Solve:
9. An object is moving 45 m/s to the left. After 7 seconds it is moving at only 10 m/s to the left. Find acceleration.
 

Variables:                      Equation:                      Solve:
10. +, -, or 0?
 

A. ___ Velocity when moving to the right.	D. ___ Velocity if moving to the left.
B. ___ Acceleration if moving left and slowing down (see Q9).	E. ___ Acceleration if the speed doesn't change.
C. ___ Acceleration if moving to the right an speeding up.	F. ___ Velocity if the position doesn't change.
	G. ___ Horizontal position if to the right of the origin.

$$\vec{V}_{ave} = \frac{\Delta x}{\Delta t}$$

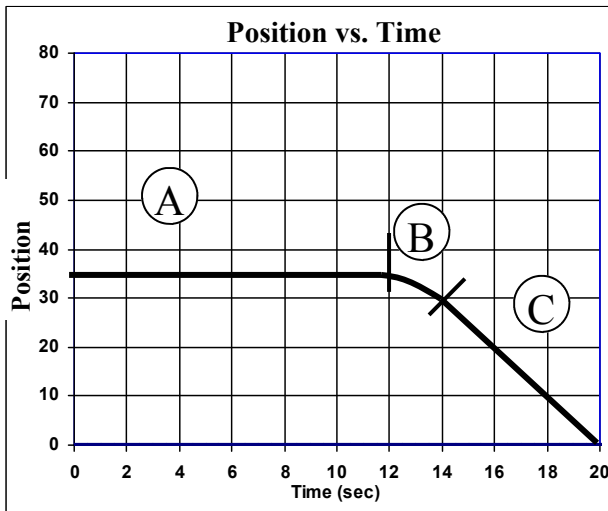
← Displacement,  
not distance

$$S_{ave} = \frac{D_{total}}{t_{total}}$$

$$S = \frac{\Delta D}{\Delta t}$$

Instantaneous speed is at a particular moment.  
Your speedometer shows instantaneous speed.

11. An object moves 24 m to the right in 6 seconds and then 10 m to the left in 2 seconds.
- What is the total distance traveled?
  - Calculate the average speed of the object.
  - What is the total displacement of the object?
  - Calculate the average velocity of the object.
  - What is the instantaneous speed 3 seconds into the journey?

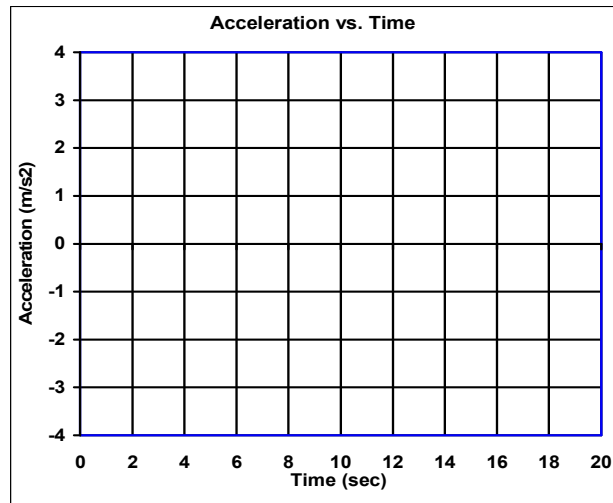
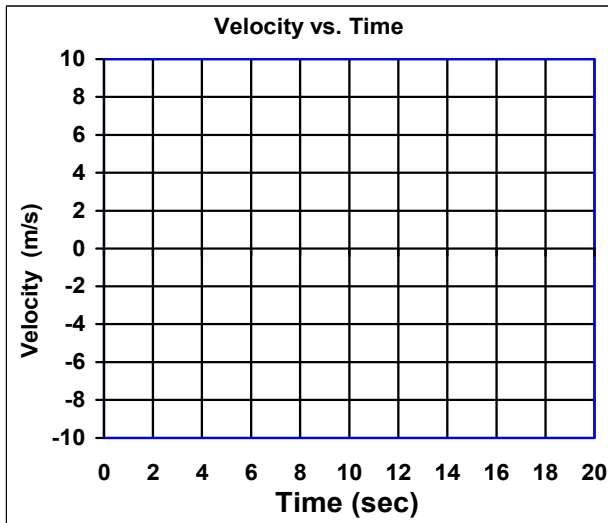


12. Imagine you have a half of a pie and a fourth of a pie.
- How much pie do you have, total?

B. Now, show the math:  $\frac{1}{2} + \frac{1}{4} =$

13. Do it with variables:  $\frac{1}{r} + \frac{1}{t} =$

14. Transfer the position vs. time graph to the velocity and acceleration graphs below.



15. Finish your first graph of the data that was given on the last homework.
- Use the “Common Graphing Mistakes” notes to ensure you don’t lose points for silly mistakes.
  - Tell me what function it is/
  - Straighten the graph on the back of the graph paper (new graph).
  - Calculate the slope of the straightened graph.