2011 PreAP Linear Motion 9
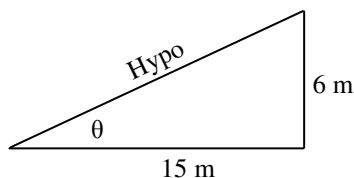
You already know that sin30° = 0.5 (if you are in degrees). Let's learn inverse functions. Sin^{-1} is inverse sin. You push "Inv" or "2nd" and sin. Try it by putting in $Sin^{-1}(0.5)$ and you should get "30".

1. Given the following, find θ. A. * Sinθ = 0.8660; θ =   B. * Tanθ = 4/5; θ =   C. Tanθ = 6/8; θ = _____

2. * A. Calculate the length of the hypotenuse.

   * B. Calculate the angle (do not use the hypo for this):

Hypo   6 m

θ

15 m

3. An object accelerates at 6 m/s² 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. * 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:

5. A ball is thrown 35 m/s into the air. How far up does it go? (*Use the "Freefall" notes if you need help*.)
   * Variables: Equation: * Solve:

6. An object moves 4.5 m/s for 6 seconds without accelerating. How far did it move in that time?
   Variables: Equation: * Solve:

7.   +, −, or 0?

   A.   ___ Velocity when moving to the right.
   B.   ___ Acceleration if moving left and slowing down
   C.   ___ Acceleration if moving to the right an speeding up.
   D.   ____ Velocity if falling.

   E.   ____Acceleration if the speed doesn't change.
   F.   ____Velocity if the position doesn't change.
   G.   ____Horizontal position if to the right of the origin.
   H.   ____Displacement if moving to the left.

8. Transfer the Position vs. Time graph to the velocity and acceleration graphs below.
   You can assume that each vertical square is 1 m and each horizontal square is 1 sec.

Position vs. Time

Position

Time

Velocity vs. Time

Velocity

0

Time

Acceleration vs. Time

Acceleration

0

Time
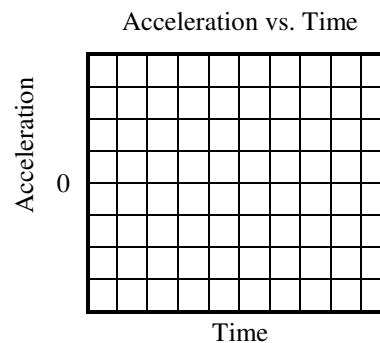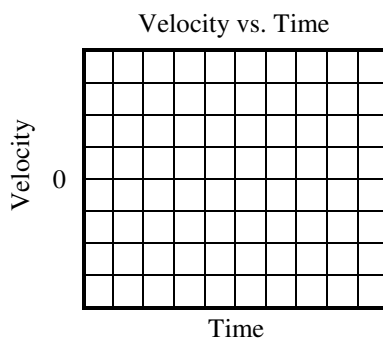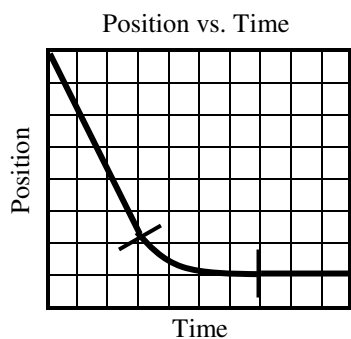
1A) 60° 1B) 38.7° 2A) 16.2 m (pyth theorem) 2B) 21.8°

3) 4.33 m/s 4) remember that Vf is neg (moving left), so a = −8 m/s^2

5) 62.5 m (remember that Vf = 0 m/s and a = −9.8 m/s^2 6) 27 m