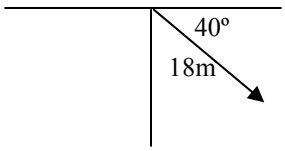
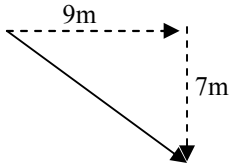
A-day: Due Wed., Sept 15
B-day: Due Thurs., Sept 16

# 2010-11 PreAP Linear Motion 8

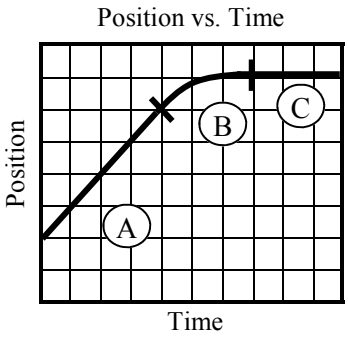


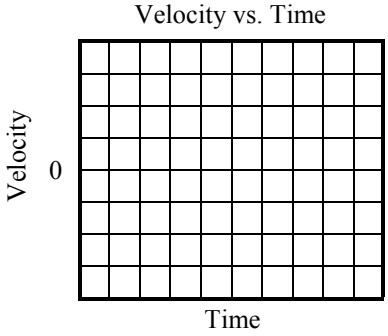

1. A. What direction will you use for the 18m displacement?
   B. Calculate its x and y components.

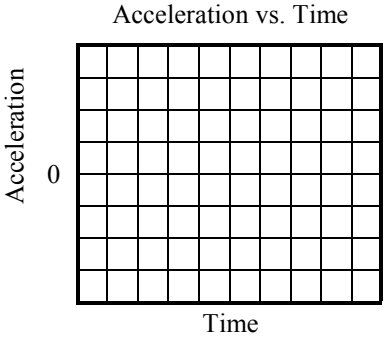


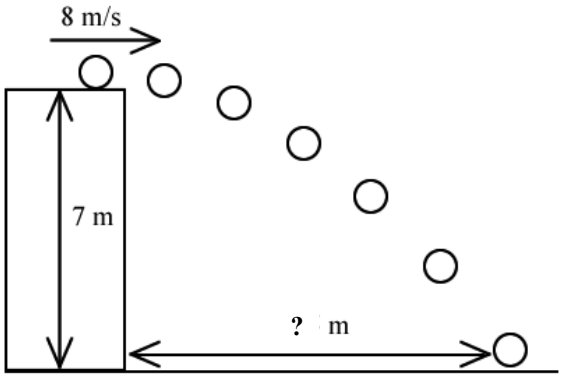

2. Calculate the length of the non-dashed arrow.

3. Transfer the graph at the left. Assume each square is 1 m by 1 sec.




4. *An object is thrown 8 m/s from the top of a 7 m tall ledge. Let me talk you thru this. In the y-direction, since it moving exactly horizontal its initial y-velocity is 0 m/s ($Vy_i$ =0 m/s) .*
   A. what is its initial vertical velocity? $Vy_i$ =
   B. What is its change of vertical position? $\Delta y$ =
   C. What is its acceleration in the y-direction? $a_y$ =

   D. Solve for the time it takes to drop to the ground.

   *In the x-direction the acceleration is 0 m/s$^2$. $a_x$ = 0 m/s$^2$.*
   E. Since it hits the ground in both the x and y directions at the same timeF $t_y = t_x$. So, for how much time is the ball in the air (see D)?

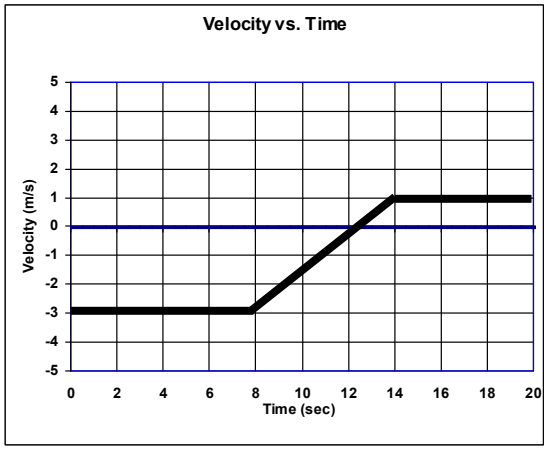
   Since it has no acceleration you can just use S = D/T.
   F. Calculate how far it travels in the x-direction.

5. A car going 45 m/s stops in 8 seconds. Calculate its acceleration.
   Variables: Equation: Solve:

*Use your "Freefall" notes for the next two problems.*

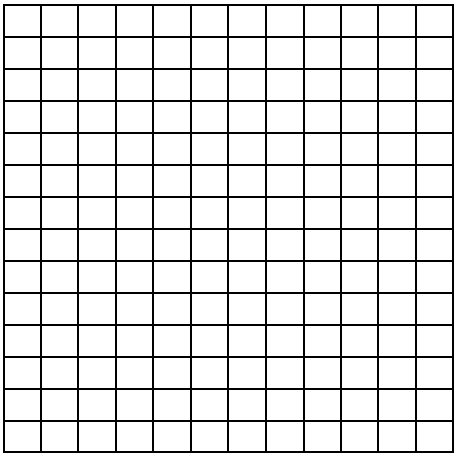
6. An object is thrown into the air going 15 m/s. You want to know how high up it goes.
   A. Is its displacement going to be + or −?
   B. What will be its final velocity at the very top?
   C. How high does it go?

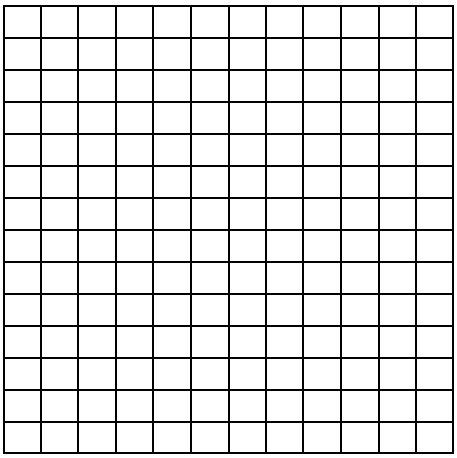
7. An object is thrown 12 m/s into the air from the ground. If it lands back on the ground, calculate the time it was in the air.




*See the "Integration" notes on the website.*

8. A. Break up the graph into 3 "areas": 0-8 sec; 8 –12 sec; 12-14 sec; 14 -20 sec.
   B. For the first 8 seconds, calculate the area of the graph from the x-axis to the line (it will be negative).
   C. What is the displacement of the object for the first 8 seconds?
   D. For the time 8–12 seconds, calculate the area from the x-axis to the line (it will also be negative).
   E. What is the TOTAL displacement for the first 12 seconds?
   F. Calculate the displacements for 12-14 sec.
   G. Calculate the displacements for 14-20 sec.
   H. What is the total displacement for the whole graph (add 'em)?
   I. Make position and acceleration graphs below.





*Review*:

9. How many sig figs?
   A. 3050 meters
   B. 0.002500 seconds
   C. $6.02\times10^{-2}$ meters
   D. 402000.00 m/s
   E. 5.030 seconds
   F. 9.8 $m/s^2$

10. Do the following math operations, giving your answers with the correct number of sig figs.
    I. B + E
    II. F × B
    III. A + E.
    IV. A × C
    V. C ÷ B

11. Three lengths end up equaling 1.25 m. Length I = $1.203\times10^{2}$ mm; Length II = 56.28 cm.
    A. Convert all of them to meters and take them out of sci notation (so you can compare decimal).

    Length I = _____; Length II = _____; Total = _____

    C. Calculate the third length. Give your answers with the correct # of sig figs.