2008 PreAP Linear Motion 2

1. *Do the following math problems, giving the answers with the correct number of Sig. Figs.*

    A. 0.0003040 x 925.33=   B. 18.113 - 3.51 =

2. A. Convert 3,050,100 cm to Gigameters.

3. Give the standard units for velocity, acceleration, displacement, and time.

4. An object moves 135 cm in 4 seconds.   Calculate its velocity (remembering the answer must be in standard units).

5. Speed or velocity:
    A. A person walks 1 m/s to the left?   B. A car drives 35 mph?

6. Object A is moving 15 m/s horizontally. Object B is moving –35 m/s horizontally.
    A. Which one is moving to the right?
    B. Which one has the greater positive velocity?
    C. Which one has the greatest magnitude?

7. A cart drives 3 times around a circular track that has a radius of 80 meters.
    A. How much distance did the cart travel?

    B. Calculate the displacement of the cart.

8. The square at the right is 60 m on a side. An object moves from A to B to C.
    A. Calculate the distance it traveled.

    B. Calculate its displacement.

Square with corners labeled D (top left), C (top right), A (bottom left), B (bottom right). 60 meters along bottom side.

9. An object is moving 4 m/s to the right. After 3 sec it is moving 18 m/s to the right.   Calculate its acceleration.

10. An object is moving 60 m/s to the left. After 10 seconds it comes to rest. Calculate its acceleration.

11. Positive or Negative?
    A. _____ Displacement for an object moving to the right.
    B. _____ Velocity for an object moving to the left.
    C. _____ Acceleration for an object moving to the left and slowing down.
    D. _____ Displacement for an object that falls off a table.
    E. _____ Acceleration for an object moving right that stops.

12. An object has a positive velocity and a positive acceleration.
    A. Is it moving to the left or right?
    B. Is its displacement increasing each second or decreasing each second?
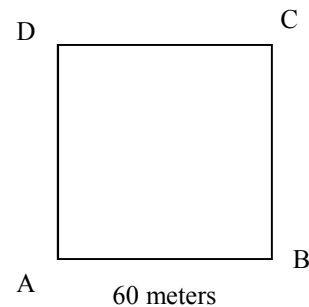
13. An object is thrown into the air.
    A. As it is moving up, is its velocity increasing or decreasing in the positive direction?
    B. As it is moving up, is its displacement increasing or decreasing each second?
    C. As it is moving up, is its acceleration +, -, or 0?
    D. At the very top, is its velocity +, -, or 0?
    E. At the very top, is its acceleration +, -, or 0?
    F. As it falls, is its velocity increasing or decreasing in the negative direction?
    G. As it falls, is its displacement increasing or decreasing each second?
    H. As it falls is its acceleration +, -, or 0?

14. *On your equation sheet, write the formulas and variables given at the bottom of this page. Put all of the equations in the left most column. Also, write "Kinematics" on your sheet, like I did. For the test you will have to memorize the kinematic equations.*

15. Using these formulas (especially the kinematics), do questions 20, 21, and 24 on page 71 in your book.

Variable	Units	Variable Name	Notes:
Δ	(no units)	Delta	Change of (always final – initial)
x	m	position	Where you are from a certain place
Δx	m	Displacement	Dist. from original position (can be 0)
D (or d)	m	Distance	How far you travel (total)
t	Sec	Time	Elapsed time
v	m/s	velocity	How fast you are moving with dir.
a	m/s^2	acceleration	How fast U change v
Δy	m	Vertical Displ.	Change of verti. distance

Equation
$\Delta = final - initial$
$\Delta x = x_f - x_i$
$v = \dfrac{\Delta x}{t} \qquad S = \dfrac{D}{T}$
$a = \dfrac{\Delta v}{t} = \dfrac{v_f - v_i}{t}$
$y = mx + b \qquad m = \dfrac{\Delta y}{\Delta x}$

Kinematics

$$\Delta x = \frac{1}{2}(v_i + v_f)t$$

$$v_f = v_i + at$$

$$\Delta x = v_i t + \frac{1}{2}at^2$$

$$v_f^2 = v_i^2 + 2a\Delta x$$

$$\Delta x = v_f t - \frac{1}{2}at^2$$