Unit - 3: Linear Motion Study Guide

1. Know your key terms! Distance, Displacement, Speed, Instantaneous Speed, Velocity, Acceleration, Deceleration, Free Fall, Rate, Vector, Reference Point, Slope.

2. Look over your Linear Motion Notes and know how to use the kinematics equations! I will supply these on the test for you so just understand which equation you would use and how to use it.

Horizontal Motion: $v = \frac{d}{t}$ $d = vt$ $t = \frac{d}{v}$ $\Delta v = v_f - v_o$ $a = \frac{\Delta v}{t}$

Vertical Motion: $v = at$ $v = gt$ $d = \frac{1}{2}gt^2$ $t = \sqrt{\frac{2d}{g}}$

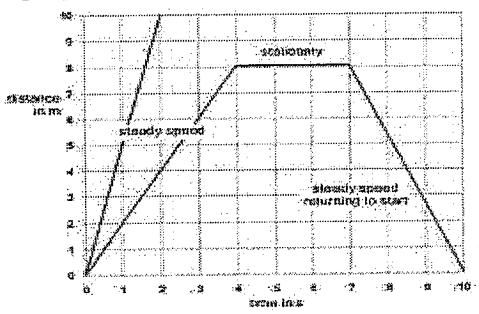
3. What is the average speed of a dog that runs 50m in 10s?

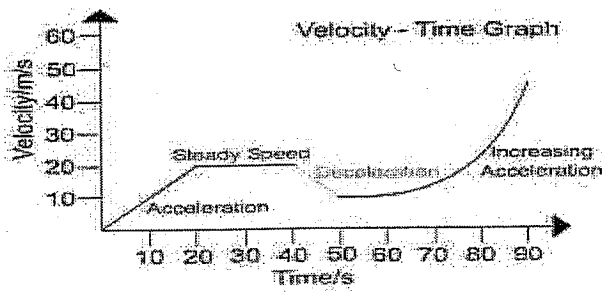
4. A skateboarder traveling 2m/s increases to 4m/s in 4s. What is the skateboarder's acceleration?

5. An apple falls from a tree a distance of 30m. How long does it take to reach the ground?

6. A ball is dropped from rest, after 4s how far has it fallen?

7. How are distance - time graphs different from velocity - time graphs? What does the slope of a line on each graph tell you? What does a horizontal line on each graph tell you? Be able to read the graphs and determine the slopes of the lines. Some sample graphs are below:





8. If you are accelerating, you must be doing one of what three things?

9. How can you determine if something is in motion?

10. Objects on Earth fall at a rate of what? What are the units? What does this mean the object is doing as it falls?

11. Of the following, which items represent speed and which ones represent velocity?

5 mph: _____ 5 mph east: _____ 10 m/s: _____

12. If someone walks 10m north and 10 m south, what is their distance? What is their displacement?

13. A bird flies 2 miles north and then turns and flies 2 miles west. What is their displacement?

14. If you are playing catch with a friend, the ball falls with what type of motion? When you throw the ball, should you aim at, above, or below your friend who is standing on level ground?

15. Ignoring air resistance, if a feather and a bowling ball are dropped, which object hits the ground first?

16. A place or object used for comparison to determine if something is in motion is called
    A. A position.
    B. A reference point.
    C. A constant.
    D. Velocity.

17. Suppose you are in a car that is going around a curve. The speedometer reads a constant 20 miles per hour. Which of the following is NOT true?
    A. You and the car are accelerating.
    B. Your speed is constant.
    C. Your velocity is constant.
    D. Your acceleration is constant.