Name _____ Hour _____

Review for One-Dimensional Motion Test

Use the GUE format on this review and on the test where applicable.

Make sure you understand everything from:
* Motion Graphing Lab (know what the graphs mean)
* One-Dimensional Motion Problems (Level 1 and 2)
* Fun with our One-Dimensional Motion Equations Lab

| _____ +	_____ =	_____
5	10	15
p. 1	p. 2-3	TOTAL
DUE TUES	WED	

1. Show how the units cancel out when you multiply speed by time. What unit do you end up with?

DISTANCE VS. TIME GRAPHS

2. a. For a distance vs. time graph the slope is in units of _____, so it represents the object's _____.

   b. A horizontal line on a distance vs. time graph tells you that the object is

   _____.

   c. If the line is curved on a distance vs. time graph this tells you that the object is

   _____.

VELOCITY VS. TIME GRAPHS

3. a. For a velocity vs. time graph the slope is in units of _____, so it represents the object's _____.

   b. For a velocity vs. time graph the area under the line is in units of _____, so it represents the object's _____.

   c. A horizontal line on a velocity vs. time graph tells you that the object is:

   _____

4. Ms. Martinson is chasing after a student in the academic wing. Use her **velocity vs. time** graph to answer the questions below.
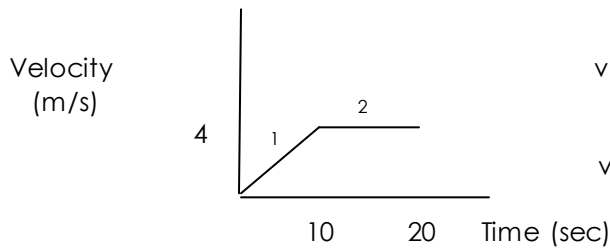
Segment 1:
vi = ___, vf = ___, a = ____, Δt = ____

Segment 2:
vi = ___, vf = ___, a = ____, Δt = ____

   a. Describe what Ms. Martinson is doing the first 10 sec. Calculate the slope.

   b. Describe what Ms. Martinson is doing from 10-20 sec. Calculate the slope?

   c. Calculate how far Ms. Martinson traveled during the chase using the area under the line. (Turn it into a triangle and a rectangle) *(60 m)*

   d. Calculate how far Ms. Martinson traveled during the chase using 1-D Motion equations. (Use $\Delta x = v_i \Delta t + \frac{1}{2}a\Delta t^2$ and do each segment separately) *(60 m)*

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ONE-DIMENSIONAL MOTION PROBLEMS   **Make sure to use the format!**

5. Calculate how long (Δt) it would take a rock to fall 1.0 meter. **_(0.45 sec.)_**

6. How fast would a rock be traveling after falling for 1.85 sec? **(-18.13 m/s)**

7. Scooby Doo is moving with an initial velocity of 2.10 m/s.
   a. If he accelerates at a rate of 0.440 m/s^2, what is his velocity after 3.01 seconds? **_(3.42 m/s)_**

   b. How far did he travel in this time? Solve this using <u>two different equations</u>. **_(8.28 m if you use v$_f$= 3.42 m/s, if you round that your answer will be slightly different)_**
   EQUATION 1   **EQUATION 2**

8. Bart Simpson is in Homer's sports car. If he goes from 0 to 80.0 **miles per hour** in 8.21 seconds, how far will he travel? **_(≈147 m) (Find a first!)_**

9. A proton is accelerated at a rate of 4.0×10^{12} m/sec^2 from rest to a speed of 3.50×10^7 m/s. How long (Δt) did it take to attain that final speed? *(ans. 8.75 x 10⁻⁶ s)*

10. Tom throws Jerry straight up in the air. Jerry is in the air for 4.8 seconds total, (You can assume he leaves and comes back down to the same height.)
    a. Calculate Jerry's maximum height above Tom's hand. *(±28.2 m)*

    b. Calculate the speed he was thrown with in **miles per hour**. *(52.6 mph)*
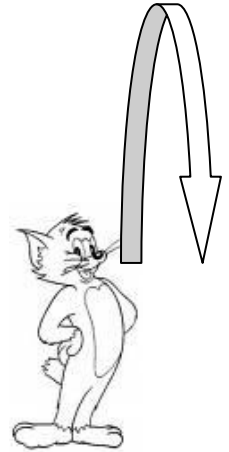
11. Marvin the Martian drops a ball off the rim of a 35-m high cliff on Mars, where the acceleration due to gravity is -3.7 m/s^2. *(We will learn how to calculate accelerations due to gravity later in the year. It is lower on Mars than the earth because Mars has less mass.)*
    a. Find the time it will take to hit the surface of Mars. *(4.35 sec.)*

    b. If instead of dropping it, he threw it upward and it took 1.3 seconds to reach its peak, then how fast would it be traveling when it hit the ground at the **BOTTOM** of the cliff? NEED THE TOTAL DISTANCE FROM PEAK TO BOTTOM! *(-16.8 m/s)*

THIS IS THE END OF THE REGULAR ASSIGNMENT.

Name _____ Hour _____

EXTRA OPTIONAL PROBLEMS: WORTH 1 STICKER THE DAY OF THE TEST

1. A bus traveling 30.0 km/hr accelerates at 1.5 m/s^2. What is its velocity 6.8 seconds later? *(ans. 18.5 m/s)*

2. The airplane starts from rest and accelerates at 3.00 m/s^2 for 30.0 s before leaving the ground.
   a. How far did the plane travel? *(1,350 m)*

   b. How fast was the airplane going when it took off? *(90 m/s)* **Solve this using <u>two</u> different equations.**

   EQUATION 1:   **EQUATION 2:**

3. A student drops a ball from a window that is 3.5 m above the sidewalk. How fast is it moving when it hits the sidewalk? *(≈8.3 m/s)*

4. A car accelerates from 15 m/s to 25 m/s while it travels a distance of 125 m. How long does it take to achieve the final speed? *(≈ 6.3 sec.)* *(Hint, this is a **2-step problem**. You will need to find the acceleration first.)*