Name _____

Constant Velocity with Toy Cars

Introduction: In this lab you will collect data for constant velocity of a toy car.

Part I: You will set distance markers on the ground at .5m increments and record times as the car rolls over each marker (note: It is important that the car is already traveling at a constant velocity *before* it reaches the zero marker) With this data you can construct a distance/time graph and calculate the slope.
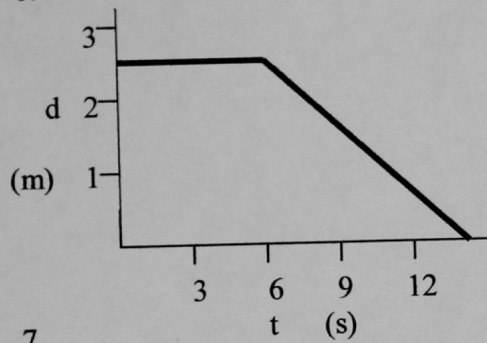
Part II: Using your data you will calculate the velocity during each interval and plot this on a velocity/time graph and find the slope.

Pre-Lab Questions: If all of the carts are taken do the pre-lab questions while you are waiting.
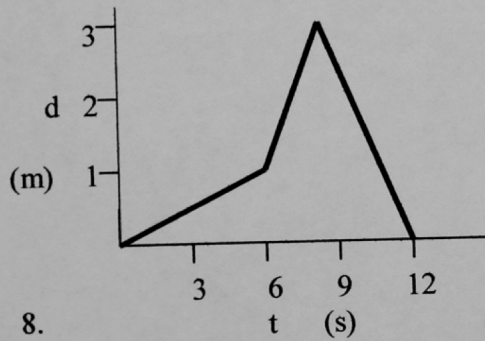
1. What is the significance of the slope of a distance vs. time graph?

2. What is the significance of the slope of a velocity vs. time graph?

3. You have been commissioned by the New York State Troopers to develop a method for determining the speed of cars on a section of the Thruway to test if their radar equipment is accurate. Due to budget cuts you have been supplied with only a meter-stick, stopwatch, and a can of spray paint. Describe in detail your method, any conversions needed, and the calculations you will need to do.

#6-8 Below are three graphs of a person walking in a straight line. Next to each graph describe the motion of the person. Be sure to indicate the rate of speed (slow, medium, fast) and the direction (right or left)
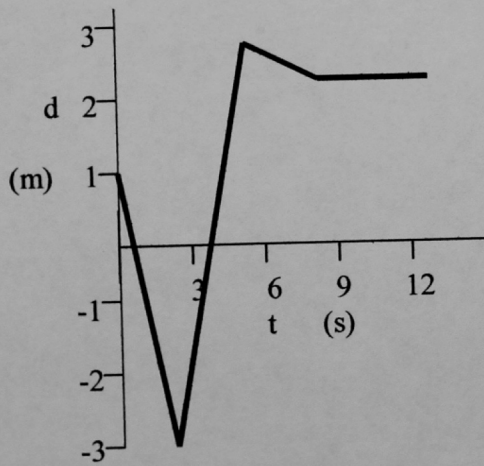
6.

7.

8.

Distance (m)	Time (s)	Δ Distance (m)	Δ Time (s)	ΔDistance / Δ Time (m/s)
d_1	t_1	XXXX	XXXX	XXXX
d_2	t_2	d_2-d_1	t_2-t_1	
d_3	t_3	d_3-d_2	t_3-t_2	
d_4	t_4	d_4-d_3	t_4-t_3	
d_5	t_5	d_5-d_4	t_5-t_4	
d_6	t_6	d_6-d_5	t_6-t_5	
d_7	t_7	d_7-d_6	t_7-t_6	

Graphs: Now that you have calculated your averages its time to plot the data. On the front of a piece of graph paper plot distance vs. time and on the back side plot velocity vs. time. **IMPORTANT NOTE: Your range for velocity should begin at Zero and use most of the height of the graph!** Next to the graph calculate the slope (**SHOW ALL WORK: Slope formula, substitution with units, and a slope with a unit!**)

Conclusion Question: Describe a minimum of three sources of error and ways in which you might be able to reduce the error if you were able to repeat the lab with a $1,000 budget.