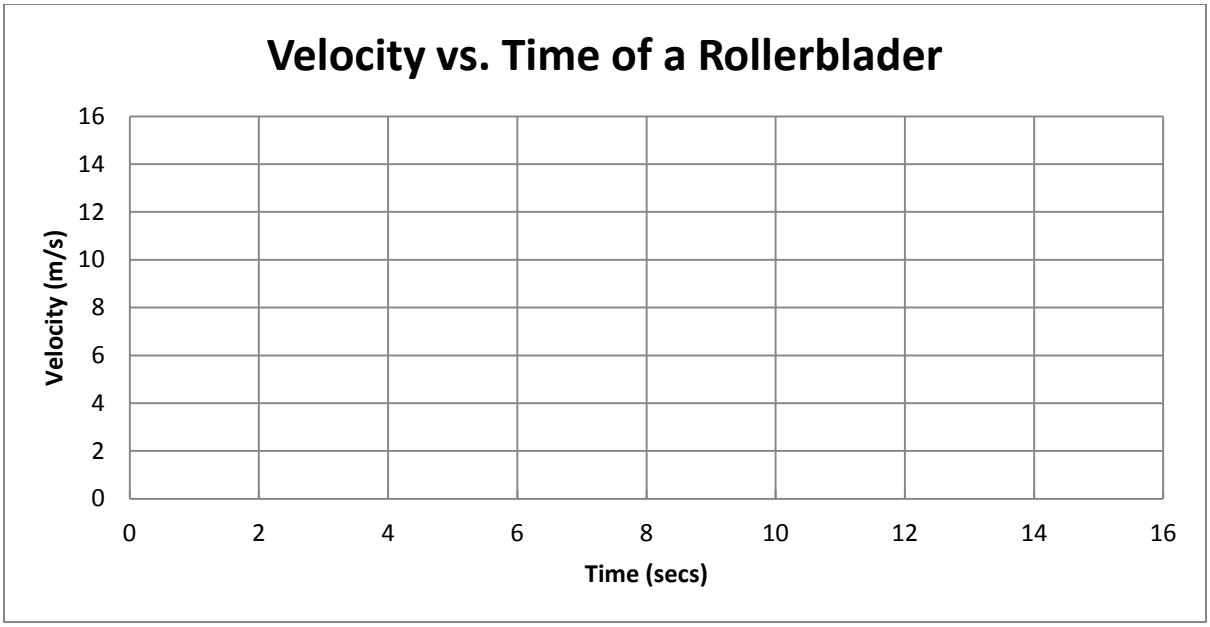
Physics 432 Name _____

1 D Motion Practice Packet
Graphing

Directions: A particular type of motion is discussed below. You are going to graph the motion and then use the graph to answer the questions that follow. Be careful to watch what type of graph you are making. Velocity vs time is very different from distance vs time.

Graph: Draw the velocity vs. time graph of a rollerblader who does the following:

1. She accelerates at a constant rate from a stop to a speed of 5 m/s and does this in 2 s.
2. She keeps this constant speech for 2 s.
3. She accelerates again at a constant rate up to her top speed of 14 m/s and gets to this speed in 3 s.
4. She starts a slowdown that lasts for a second bringing her speed to a 12 m/s.
5. She stays at this speed for 4 s.
6. Finally she slows from this speed to a stop in 4 s.



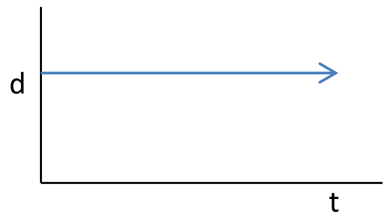
Questions: Using the graph, answer the following questions

1. What is the rate of acceleration of the blader during the interval from 0 s to 2 s?
2. What is the rate of acceleration of the blader during the interval from 2 s to 4 s?
3. What is the rate of acceleration of the blader during the interval from 4 s to 7 s?
4. What is the rate of acceleration of the blader during the interval from 7 s to 8 s?
5. What is the rate of acceleration of the blader during the interval from 8 s to 12 s?
6. What is the rate of acceleration of the blader during the interval from 12 s to 16 s?
7. When did the blader have the greatest positive acceleration?
8. When did the blader have the greatest negative acceleration?
9. How do these two accelerations compare in terms of what the blader felt as she accelerated?
10. During which one second time period shown on the graph did the blader go the furthest distance?
11. During which one second time period shown on the graph did the blader go the least distance?

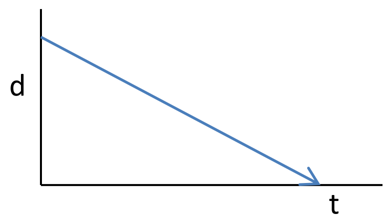
Non Blader Questions: This next set of questions does not have to do with the rollerblader situation but does pertain to graphing. As you answer the following questions, carefully examine the type of graph you are given and ask yourself the following questions:

- Is the slope positive or negative?
- Is the slope steep (big), gentle (small) or flat (zero)?
- Is the slope constant (a straight line) or changing (a curved line)?
- If it is changing, does it get steeper as time goes on or flatter as time goes on?

Distance versus Time Graphs:



Is this a speeder or accelerator?
Is it not moving, moving forward or backward?
Is it accelerating, decelerating or staying constant?



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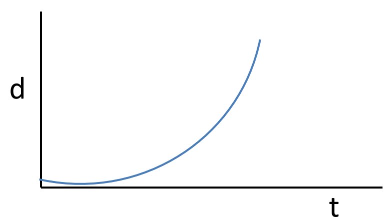

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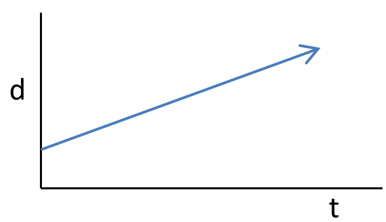

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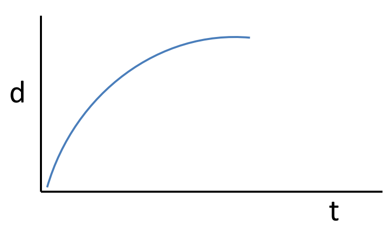

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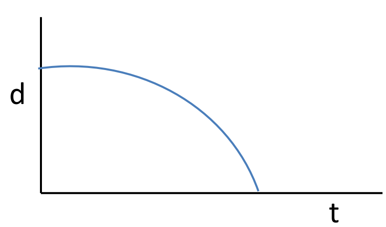

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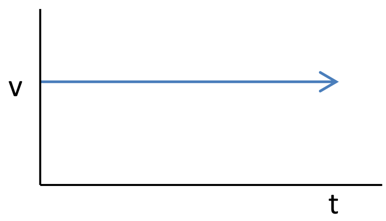
Velocity versus Time graphs:

*** Velocity graphs get a little trickier. Remember that it is showing you what is happening to the speed. Ask yourself the same question as above but add in these as well:

- Does the speed start high or low?
- Does it get higher or does it go to zero?
- Is it positive or negative? What does that mean about which direction it is moving?



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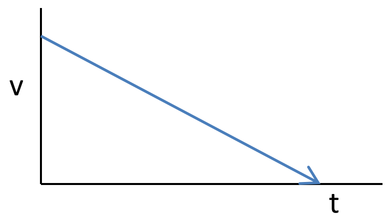

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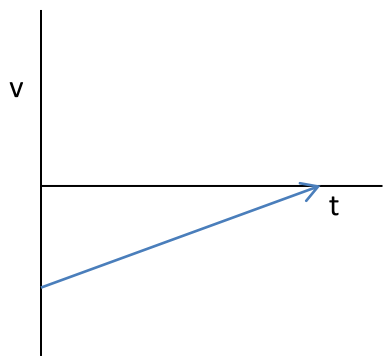

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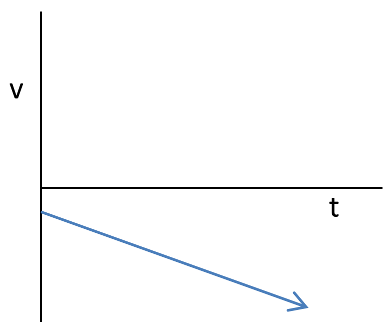

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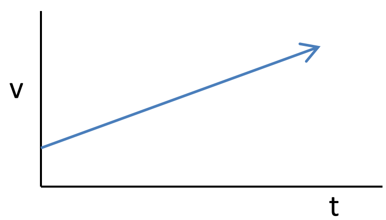

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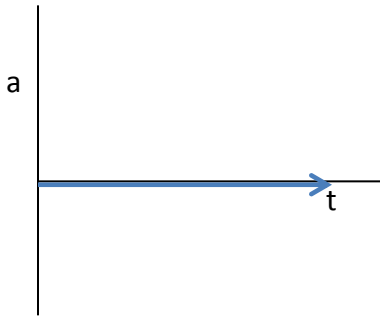
Acceleration vs. Time Graphs:



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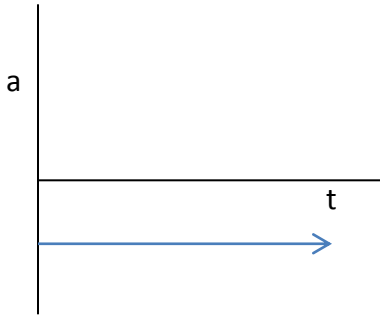

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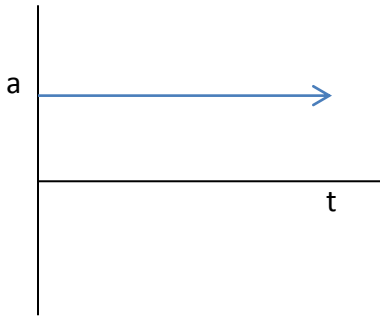

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** Check your answers to these questions before moving on!**

Using the information that you got from above, sketch the distance versus time and the acceleration versus time graphs for the rollerblader. The acceleration vs. time graph might be easier to start with. Ask yourself for each segment if the rollerblader is a speeder, accelerating or decelerating and make the appropriate type of graph. For the distance versus time graph you want to remember that since the velocity is always positive, the rollerblader is always moving away from her starting point. Then ask yourself if she is doing that at a constant speed or as an accelerator. Good luck!