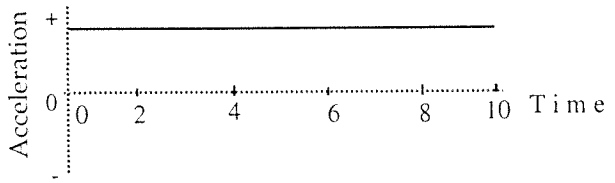
Name_____Date_____ ____ V-52

HOMEWORK FOR LAB 2: CHANGING MOTION



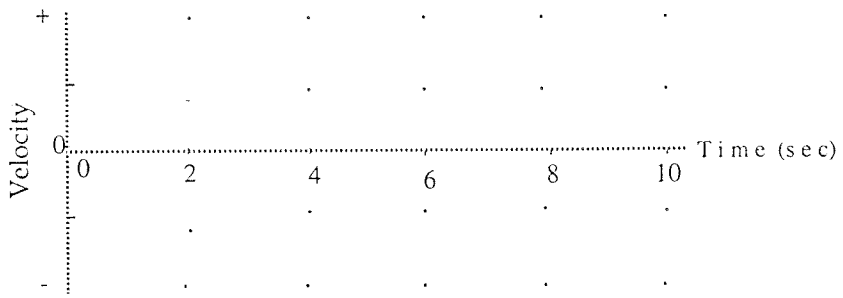
1. An object moving along a line (the + position axis) has the acceleration-time graph above.

   a. Describe how the object might move to create this graph if it is moving away from the origin.

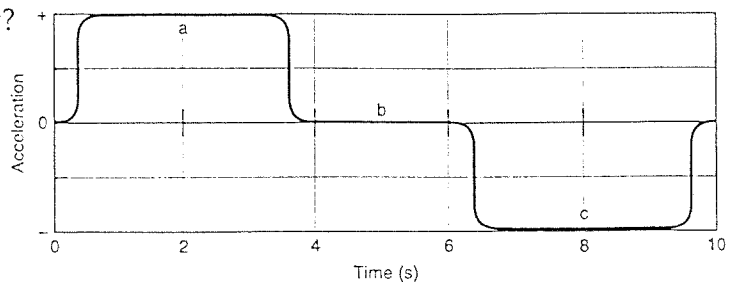
   b. Describe how the object might move to create this graph if it is moving toward the origin.

   c. Sketch with a solid line on the axes below a velocity-time graph that goes with the motion described in (a).

   d. Sketch with a dashed line on the axes below a velocity-time graph that goes with the motion described in (b).



2. How would an object move to create each of the three labeled parts of the acceleration-time graph shown below?

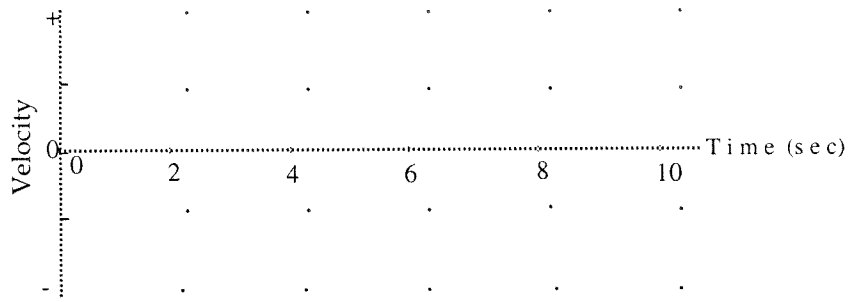


a:

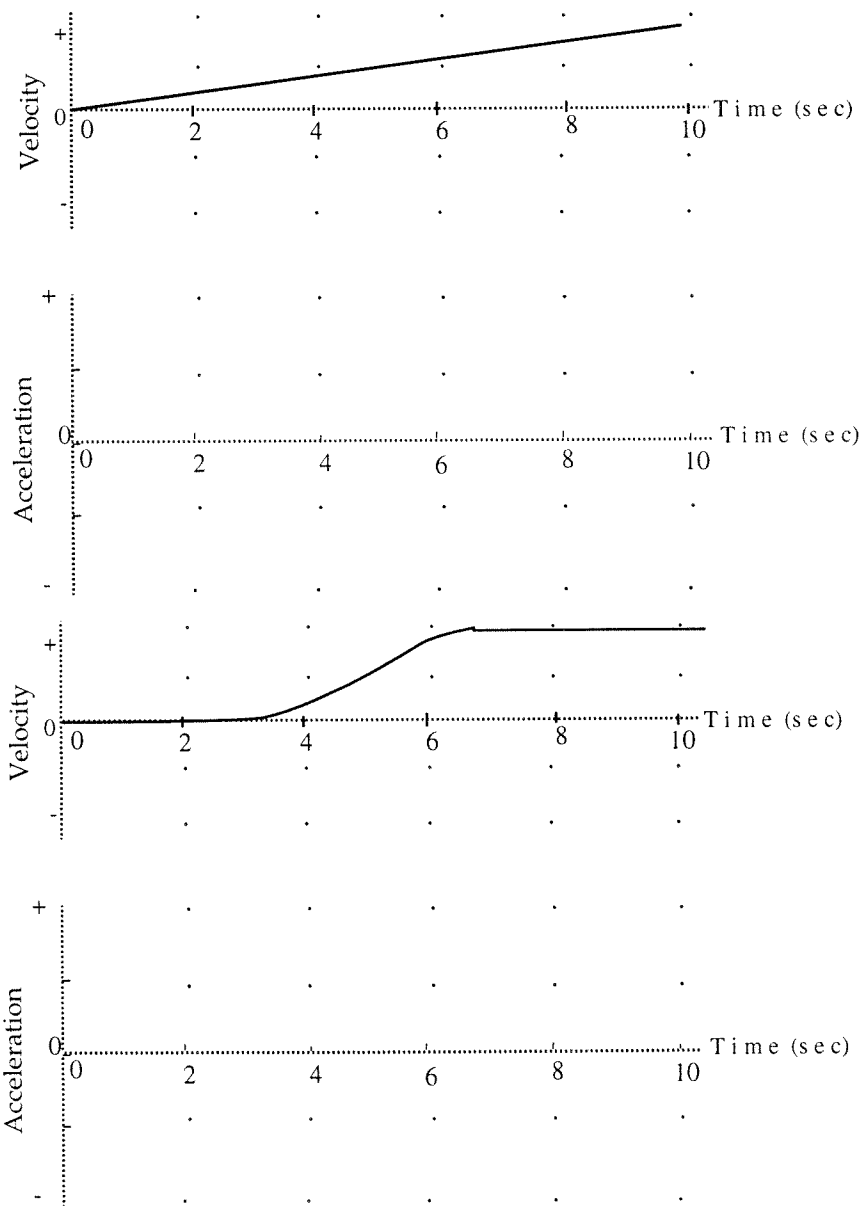
b:

c:

3. Sketch below a velocity-time graph which might go with the acceleration-time graph in question (2).



4. For each of the velocity-time graphs below, sketch the shape of the acceleration-time graph that goes with it.



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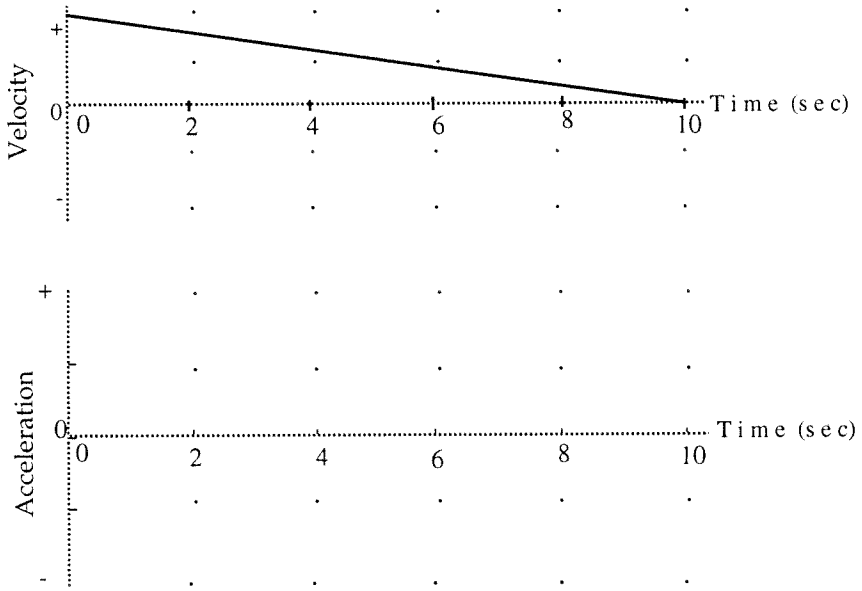
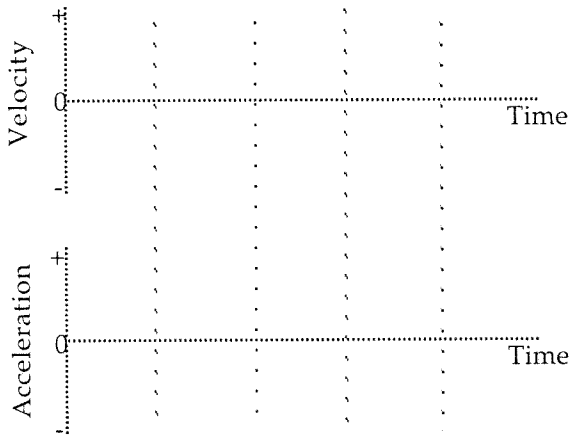
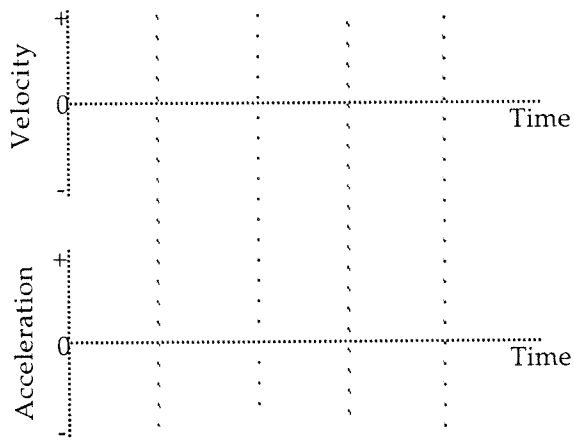


5. A car can move along a line (the + position axis). Sketch velocity-time and acceleration-time graphs which correspond to each of the following descriptions of the car's motion.

   a. The car starts from rest, and moves away from the origin increasing its speed at a steady rate.



   b. The car is moving away from the origin at a constant velocity.



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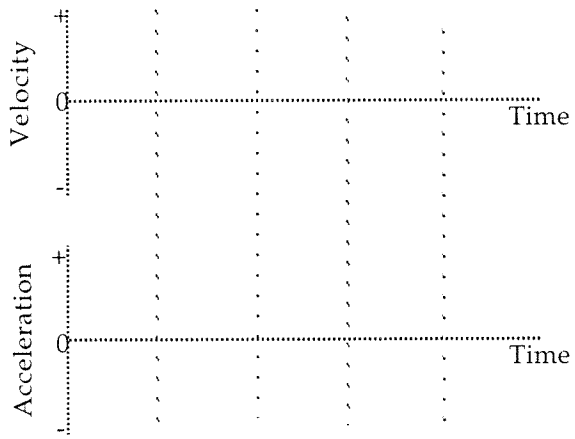
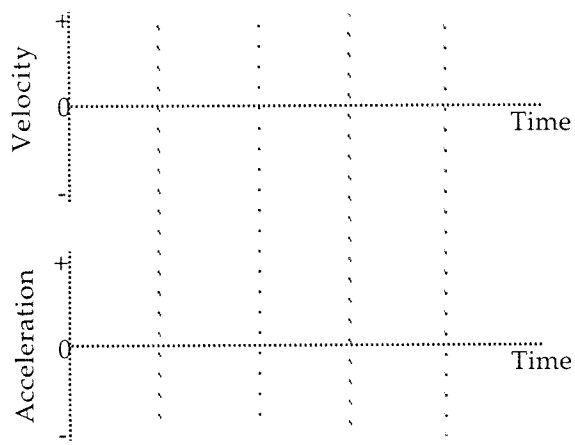
c. The car starts from rest, and moves away from the origin increasing its speed at a steady rate twice as large as in (a) above.

d. The car starts from rest, and moves toward the origin increasing its speed at a steady rate.



e. The car is moving toward the origin at a constant velocity.



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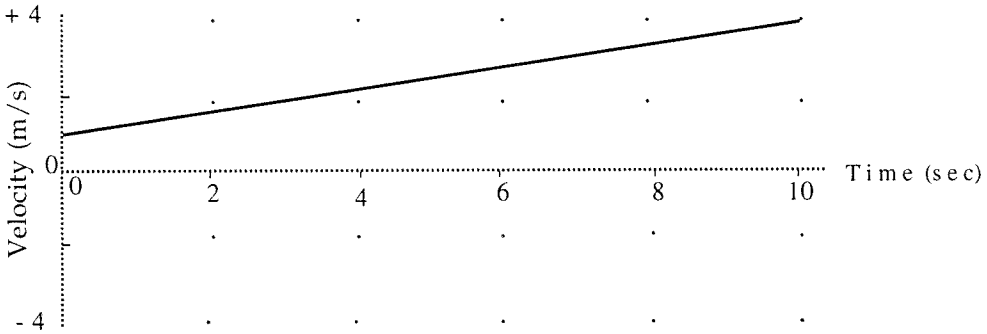
6. The following is a velocity-time graph for a car.

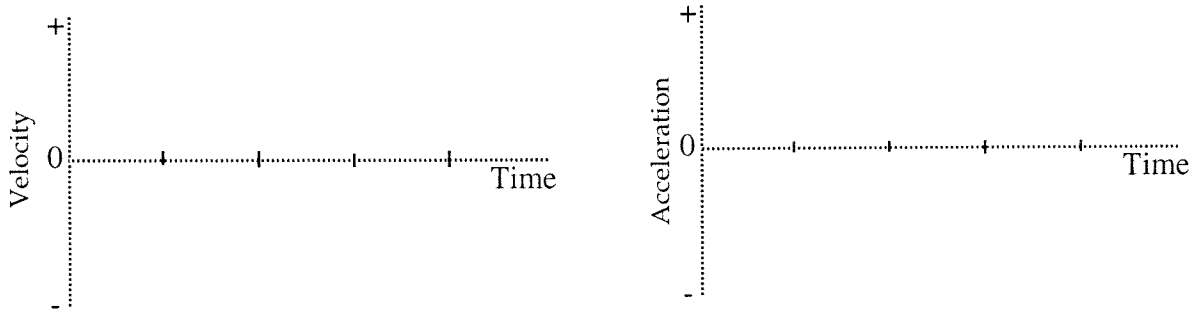


What is the average acceleration of the car? Show your work below.

7. A car moves along a line (the + position axis). Fill in the table below with the sign (+ or -) of the velocity and acceleration of the car for each of the motions described.

	Position	Velocity	Acceleration Speeding Up	Acceleration Slowing Down
Car moves away from the origin	+			
Car moves toward the origin	+			

8. A ball is tossed in the air. It moves upward, reaches its highest point and falls back downward. Sketch a velocity-time and an acceleration-time graph for the ball from the moment it leaves the thrower's hand until the moment just before it reaches her hand again. Consider the positive direction to be upward.



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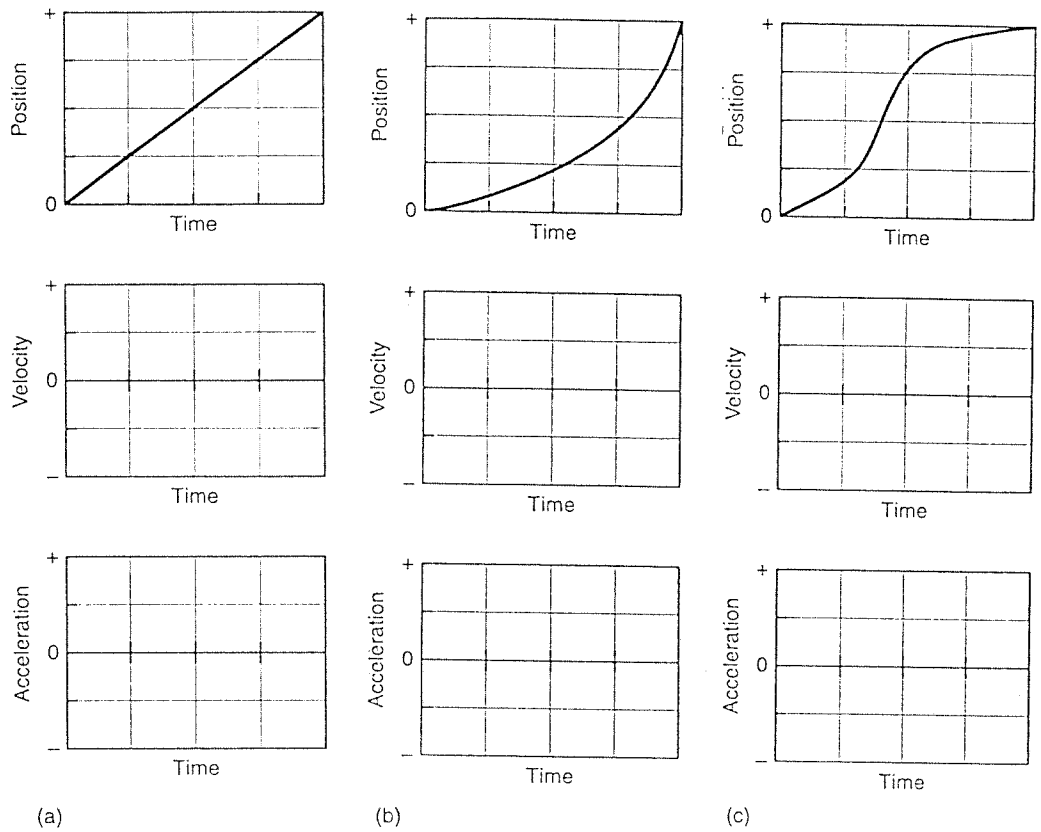
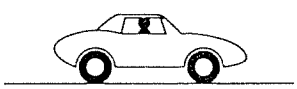
9. For each of the position–time graphs shown, sketch below it the corresponding velocity–time and acceleration–time graphs.

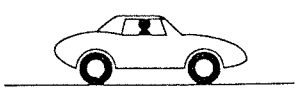


10. Each of the pictures below represents a car moving down a road. The motion of the car is described. In each case, draw velocity and acceleration vectors above the car that might represent the described motion. Label the vectors. Also specify the sign of the velocity and the sign of the acceleration. (The positive position direction is toward the right.)

a. 

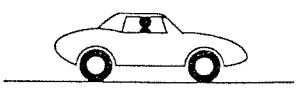
The driver has stepped on the accelerator, and the car is just starting to move forward.

Sign of velocity: Sign of acceleration:

b. 

The car is moving forward. The brakes have been applied. The car is slowing down, but has not yet come to rest.

Sign of velocity: Sign of acceleration:

c. 

The car is moving backward. The brakes have been applied. The car is slowing down, but has not yet come to rest.

Sign of velocity: Sign of acceleration:

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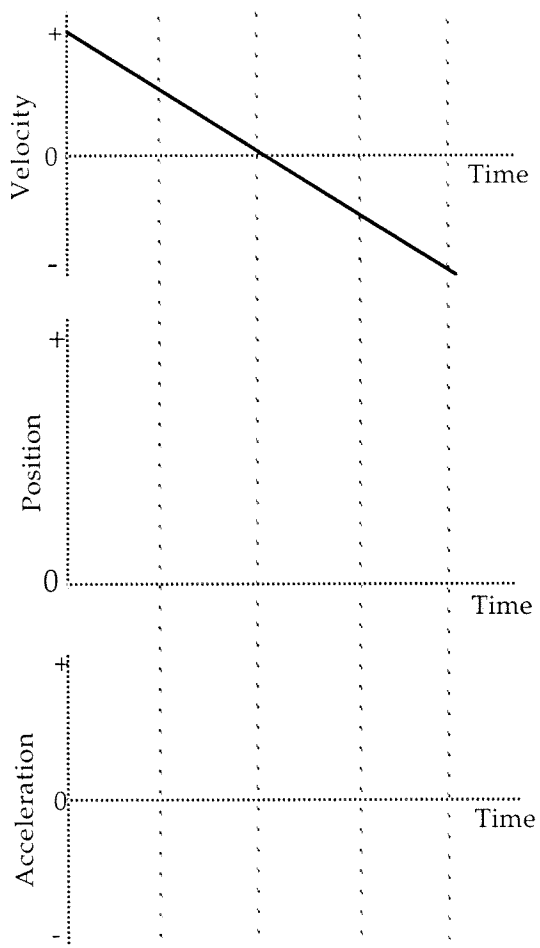
11. Consider the velocity-time graph on the right.

a. Describe how you would move to produce this graph.

b. Sketch a position-time graph graph for this motion on the axes on the right.

c. Sketch an acceleration-time graph for this motion on the axes on the right.



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The graphs on this page represent the motion of objects along a line which is the positive position axis. Notice that the motion of objects is represented by position, velocity, or acceleration graphs.

Answer the following questions. You may use a graph more than once or not at all, and there may be more correct choices than blanks. If none of the graphs is correct, answer J.

____12. Pick one graph that gives enough information to indicate that the velocity is always negative.

Pick three graphs that represent the motion of an object whose velocity is constant (not changing).

____13. ____14. ____15.

____16. Pick one graph that <u>definitely indicates</u> an object has reversed direction.

____17. Pick one graph that might possibly be that of an object standing still.

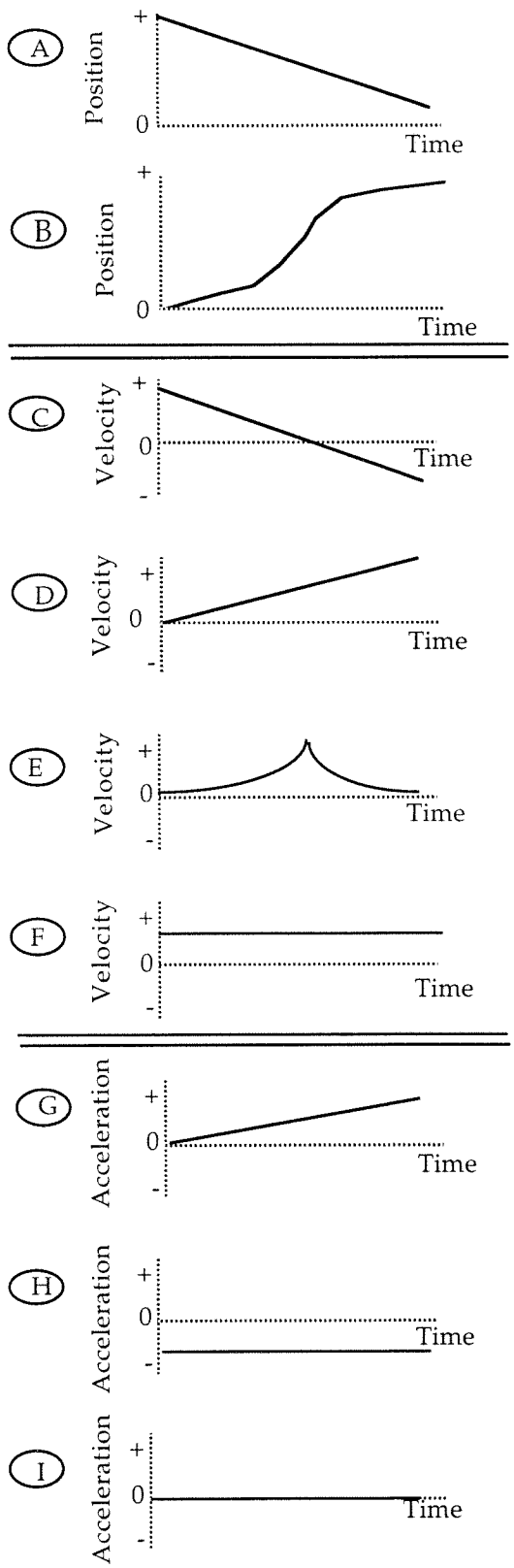
Pick 3 graphs that represent the motion of objects whose acceleration is changing.

____18. ____19. ____20.

Pick a velocity graph and an acceleration graph that could describe the motion of the same object during the time shown.

____21. Velocity graph.

____22. Acceleration graph.



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