

Beverly Hills High School -- Physics -- Unit 2 -- One-Dimensional Motion -- 100 points

Throughout this test, be as clear and neat as possible; if I cannot read it, you don't score. Also, show all your work. Partial credit for partial performance. Be sure to give units on all answers needing them. Use 10 m/s/s for g. PENCILS ONLY. Minus five for using a pen. Perfect score wins gold!

Multiple Choice. Write the letter that **best** answers each example. Three points each.

_____ 1) You shoot an arrow straight up into the air at 50 m/s. In how many seconds does it run out of speed?

- a) 500 s b) 50 s c) 5.0 s d) 0.5 s

_____ 2) You are driving on the freeway at 60 miles per hour. You evenly apply your brakes and slow to 20 mph in 5 seconds. Your average acceleration is

- a) 80 mph/s b) 8 mph/s c) -200 mph/s d) -8 mph/s

_____ 3) An upward-sloping straight line on a position vs. time graph means

- a) you have a constant positive velocity. b) you have a constant negative velocity.
c) you are accelerating. d) you are decelerating. e) none of these.

_____ 4) When we describe an object as being "at rest," we mean that the object

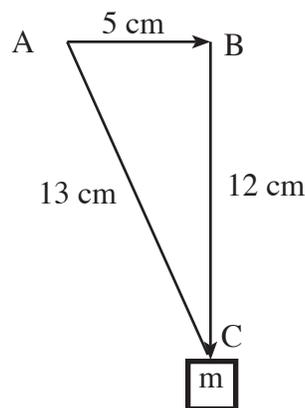
- a) is not moving. b) is moving at a constant speed.
c) is falling at a constant rate. d) none of these.

_____ 5) A reasonable reaction time for a typical Beverly High School student is about

- a) 2 seconds b) 1 second c) 0.5 seconds d) 0.2 seconds e) 0.01 seconds

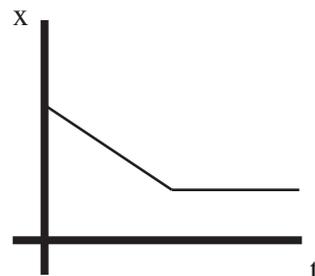
_____ 6) Look at the diagram at the right. Mass m has moved from A to B to C as shown by the arrows. Which is true about the mass's distance traveled and magnitude of its displacement?

- a) Distance = 17 cm and displacement = 30 cm
b) Distance = 30 cm and displacement = 13 cm
c) Distance = 17 cm and displacement = 13 cm
d) Distance = 13 cm and displacement = 17 cm



_____ 7) Look at the position vs. time graph at the right. Which is true?

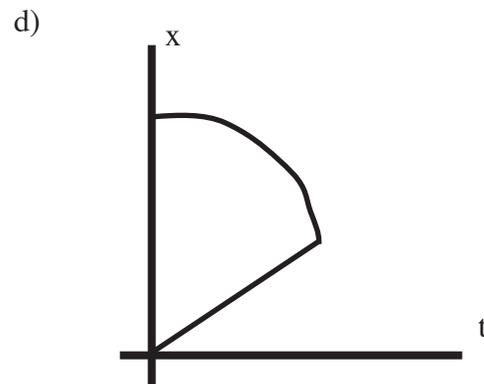
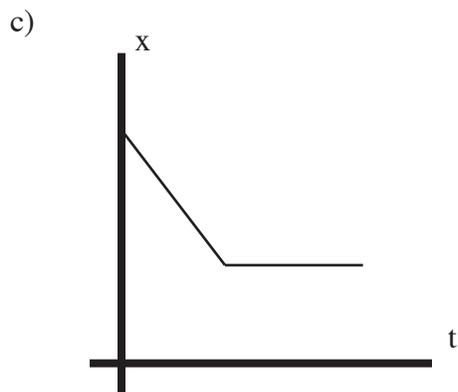
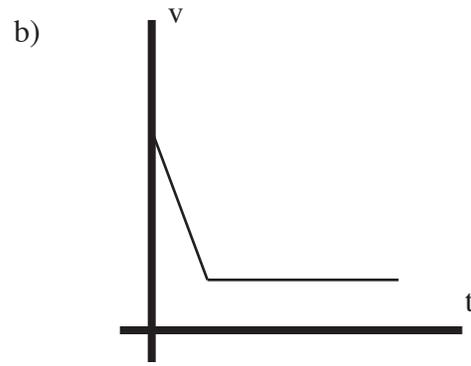
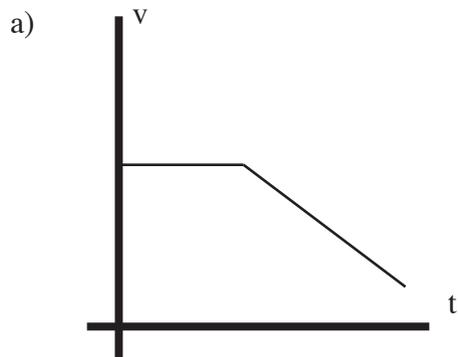
- a) It started positive, went backwards a bit, then stayed motionless.
b) Its acceleration was negative, then maintained its speed.
c) Its original velocity was negative, then become positive.
d) You cannot tell from the information given.



_____ 8) When looking at a position vs. time graph, you noticed the line describing the motion curves.
That means

- a) the object travels in a curved path.
- b) the object has a constant speed.
- c) the object must have collided with another object.
- d) the object must be accelerating in some way.

_____ 9) Which graph corresponds to negative acceleration followed by constant velocity?



_____ 10) A bicyclist goes from 5 m/s to 25 m/s in 10 seconds. Then he travels another 10 seconds at 25 m/s. How far has he traveled throughout the motion?

- a) 550 m b) 400 m c) 300 m d) 250 m

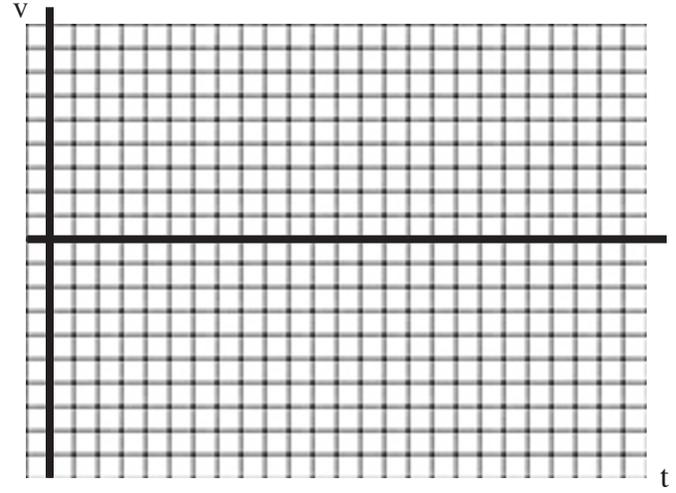
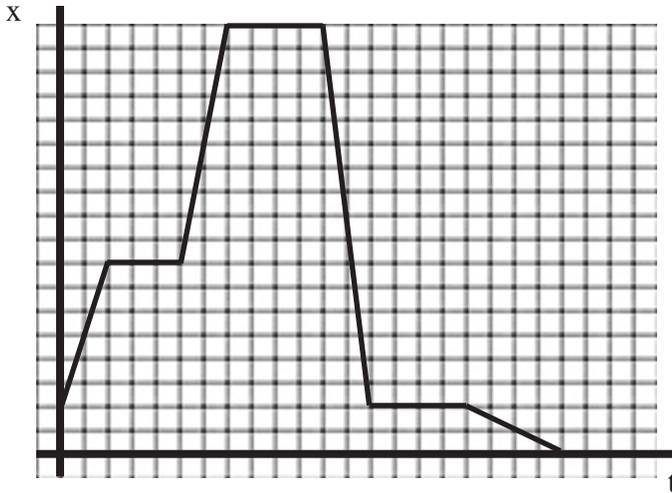
Short answer/Fill-in. Be complete and neat here too. Three points.

11) Velocity is speed in a particular _____.

12) The _____ of the tangent line to the graph of position gives an object's speed.

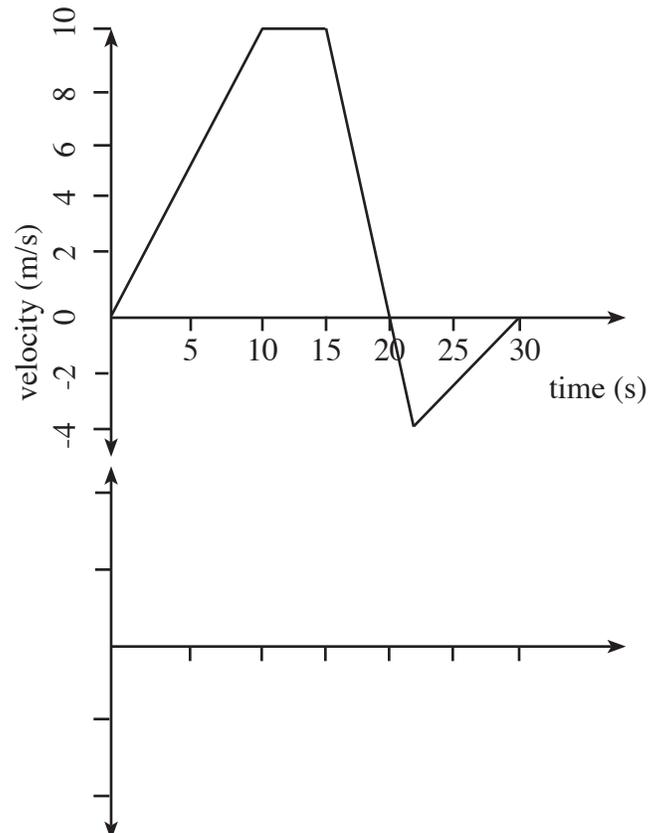
13) Can an object have a positive position and a negative velocity? Yes or no. If yes, describe. If not, say why.

14) Given the position vs. time graph below, sketch the corresponding velocity vs. time at the right. Position is one meter per box and time is one second per box. Five points for the graph; one point per question.



- Where is the object at $t = 0$? _____
- In what time interval is the velocity the greatest? _____
- In what time interval is the speed the greatest? _____
- What is the overall distance covered by the object? _____
- What is the object's overall displacement? _____

15) Refer to the chart at the right. For five points, sketch the corresponding acceleration vs. time graph below it. Add what points and labels are appropriate as well. This doesn't have to be a Rembrandt; just a careful sketch will do. Now answer these three-point questions.



- How much distance is covered in the first 15 seconds?
- What is the overall average acceleration for the entire motion?

- 16) Here's the story -- you create the graph -- add EVERYTHING that needs to go on it...labels, units, numbers, everything...twenty points...(I'd plan it out on the sixth page first!)

Jeff told his mom he would do some chores for her. He leaves home on his skateboard and rides east for five minutes and covers 1500 m to the grocery store. He buys some milk and it takes him three minutes. Then he continues east, taking it slower, covering the next 1200 m in six minutes. He deposits his mom's paycheck in the bank which takes him two more minutes. Then he starts going home, by going west, traveling at 250 m/min and rides ten minutes. He meets a girl and talks with her for five minutes and she walks home with him in another four minutes.

