Name:

# Linear Motion Test, Physics Spring 2013

<u>Short Answer</u>

1.	What is the typical meaning of an algebraic sign (+ or -) in physics?

2.	What's the difference between speed and velocity?

3.	How does one define acceleration? (Write a sentence using words—not an equation. Be specific!)

4.	Complete the table with either the words "increasing speed" or "decreasing speed:"

Velocity Direction	Acceleration Direction	Object is…
(+)	(+)	
North	South	
Down	Down	
(-)	(+)	

5.	A ball is thrown upward with some speed. At the top of its path the velocity of the ball is

At the top of its path, the acceleration of the ball is

At the top of its path, the acceleration vector points   (what direction if any)

On the way up and on the way down, the acceleration vector direction *changes / remains the same.* (circle one)

6.   Below is a velocity-time graph for a dynamics cart that is moving along an inclined plane (ramp).

Lab Dyanmics Cart on Inclined Plane
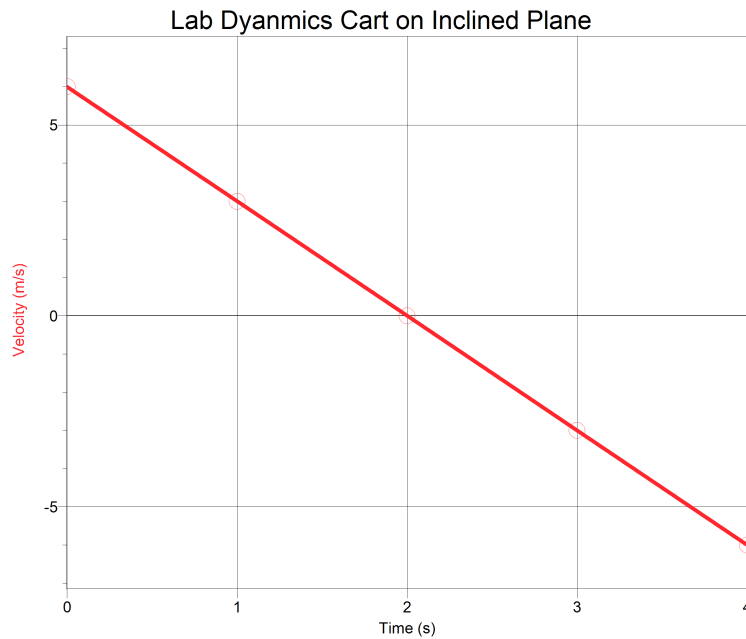
a. At time = 0s, what is the cart's velocity?

b. At time = 4s, what is the cart's velocity?

c. Does the cart ever change direction? When?

d. What is the cart's velocity at 1.0 second?

e. What is the cart's *acceleration* at 2.0 seconds?

f. Assuming it started from a position of zero, find the cart's displacement after 2.0 seconds.

Puzzles

7. An automobile cruising at 10.0 m/s accelerates uniformly at 2.50 m/s². What is the final speed after 3.75 seconds?

                                                                                        Speed:

8. A radio blaring *Lady Gaga* is dropped from a balcony 32.5 meters above the sidewalk. How fast is the radio traveling when it hits the ground and how much time elapses before the *Lady* is silenced?

Speed at impact:

Time:

9. An airplane has a liftoff speed of 30.5 m/s. What minimum acceleration does this require if the airplane starts at rest and is airborne after a takeoff run of 250m?

Acceleration:

10. A Piper Tomahawk two-seater plane lands at 64 m/s and accelerates uniformly as it comes to rest. If the plane takes 8.0 s to stop, what is the plane's average speed, and how far does it travel as it stops?

Average Speed:

Distance: