




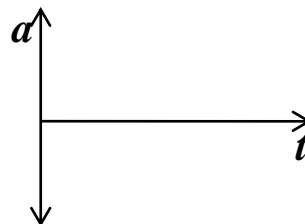
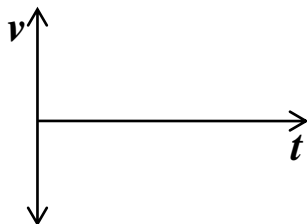
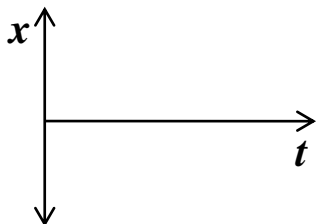
PhET INTRODUCTION TO MOTION
Preparation:

1. Log on to a computer using your student username and password.
2. Go to <https://phet.colorado.edu/en/simulation/moving-man> .
3. Click on the play button to start the simulation.
4. Click on the “Charts” tab and check the boxes next to “vectors”.
5. Take 5 minutes to familiarize yourself with the controls by moving the man back and forth and by selecting different values of position, velocity, and acceleration and then selecting the  button. Select both positive and negative values for each of these.
6. Use your mouse to move the man left and right and note the change in the position of the sliders.
7. Select the  button.

Procedure:


1. Set 1

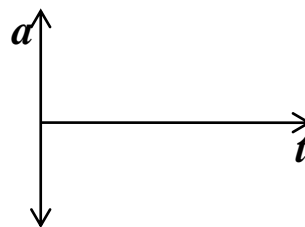
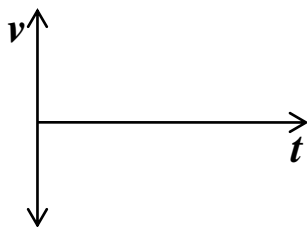
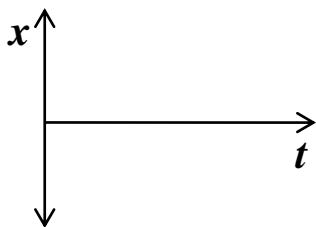
- a. Set velocity to 5 m/s and press .
- b. Sketch the graph of the position, velocity, and acceleration below. *For all graphs, you only need to graph the motion until the object stops.*



- c. Select .


2. Set 2

- a. Set velocity to -5 m/s and press .
- b. Sketch the graph of the position, velocity, and acceleration below.



- c. Select .


3. Set 3

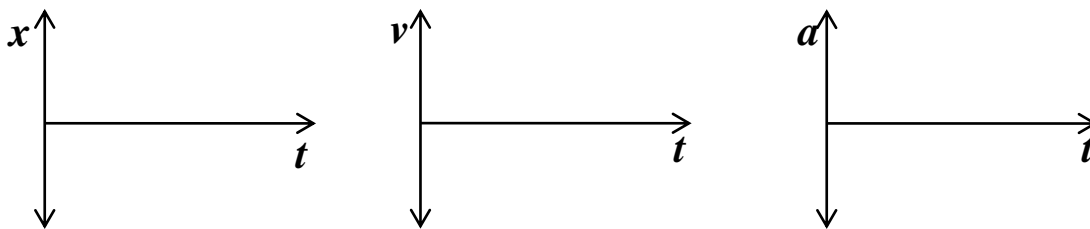
- Set acceleration to 2 m/s^2 and press .
- Sketch the graph of the position, velocity, and acceleration below.



c. Select .


4. Set 4

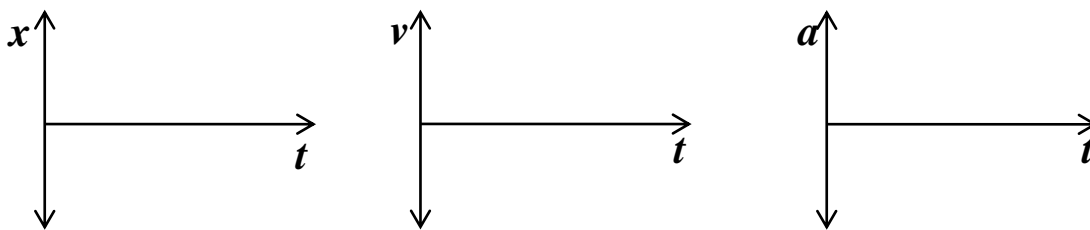
- Set acceleration to -2 m/s^2 and press .
- Sketch the graph of the position, velocity, and acceleration below.



c. Select .


5. Set 5

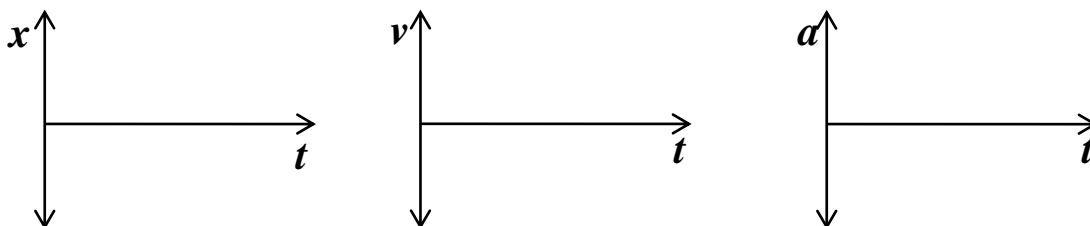
- Set Position to -10m , velocity to 5 m/s , and acceleration to 2 m/s^2 and press .
- Sketch the graph of the position, velocity, and acceleration below.



c. Select .


6. Set 6

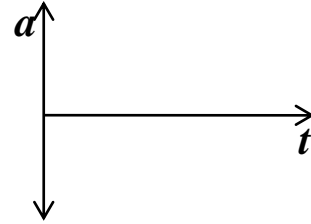
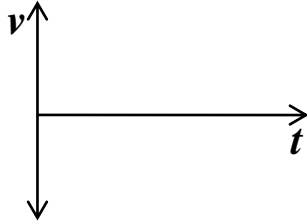
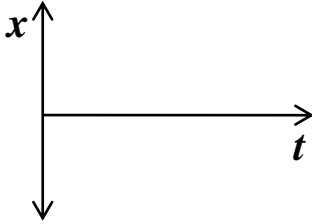
- Set Position to -10m , velocity to 5 m/s , and acceleration to -2 m/s^2 and press .
- Sketch the graph of the position, velocity, and acceleration below.



c. Select .


7. Set 7

- Set Position to -10m, velocity to 8.5 m/s, and acceleration to -2 m/s^2 and press .
- Sketch the graph of the position, velocity, and acceleration below. You only need to graph the motion until the stopping point.



c. Select .

8. Set 8

- Set Position to -10m, velocity to 8.5 m/s, and acceleration to -2 m/s^2 . Select (check) the two boxes marked "Show Vector," and press .
- Describe the relative size of each vector (velocity and acceleration), how and when (or if) they changed in relation to each other, and when each changed direction.

c. Select .

9. Set 9

- Calculate the distance required to stop a man travelling at 12 m/s using a deceleration rate of 4 m/s^2 .

b. Verify your calculations using the simulator. Were your calculations correct? _____

10. Set 10

- Calculate the deceleration required to stop a man travelling at 25 m/s in 20m.

b. Verify your calculations using the simulator. Were your calculations correct? _____

11. Answer the following questions. Use the simulator as necessary to help you.

- Describe a situation in the simulator when the man has negative position and positive velocity.

- b. Describe a situation in the simulator when the man has positive position, positive velocity and negative acceleration.

- c. What is the trend of the velocity of the man in b. above?

- d. The man has negative position, positive velocity and negative acceleration. If the walls in the simulator are removed, what will be the direction of the man's final velocity regardless of the values selected? Use the simulator to confirm your answer.

The answers on this lab are a product of my own work and effort. Though I may have received some help in understanding the concepts and/or requirements, I did the work myself.

Student Signature

(for electronic submission, type student number in lieu of signature)

ROOM FOR IMPROVEMENT

APPLICABILITY:

In terms of the material covered thus far, this lab was given:

- too late in the course at the right time in the course too late in the course

In terms of degree of difficulty, this lab was:

- too easy just about right too hard

In terms of helping you understand the material, this lab was:

- not helpful somewhat helpful very helpful

COMMENTS:

IMPROVEMENT: This lab can be improved by: