

Name: _____

Period: _____

PhET Simulation – “The Moving Man”

Describe (**with detail, using complete sentences**) the motion of the man when you play the simulation starting with the conditions below. Some helpful phrases:

to the right, to the left, comes to a stop, slows down, speeds up, starts, ends, at rest, constant speed

Position	Velocity	Acceleration	Description
0.0 m	1.0 m/s	- 0.1 m/s ²	Slowing Down to east
- 10.0 m	5.0 m/s	- 1.0 m/s ²	Speeding up in east
8.0 m	0.0 m/s	-3.0 m/s ²	slowing down in west
- 4.0 m	- 2.0 m/s	1.5 m/s ²	slowing down in east
- 9.0 m	2.5 m/s	0.0 m/s ²	uniform motion, no change in acceleration

Questions (answer using complete sentences):

1.) When the acceleration is zero, what can you say about the velocity of an object?

uniform motion, no change in acceleration

2.) Is it possible to have negative velocity but positive acceleration? If so, what would this mean?

slow down in west

Fill in the blank:

1.) If the man is moving from a position of 0 m to 6 m in 3 seconds he will move faster than he would have if he moved from a position of - 4 m to 0 m in 3 seconds.

Answer choices: slower, faster, the same speed as

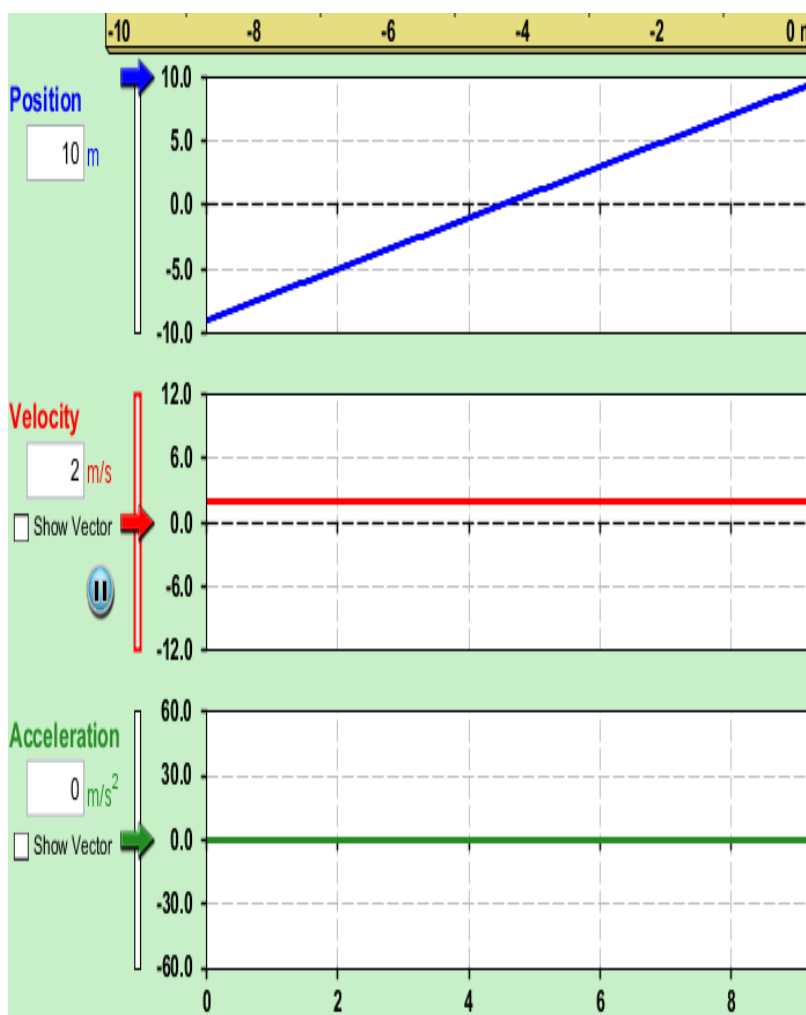
2.) Looking at the position of the house and the tree, if the man ran starting from the house going to the tree in 8 seconds, the average velocity would be -2.5 m/s.

3.) Starting at a position of 0 m, if the man is moving at a constant velocity of 2 m/s, it will take 6s seconds for him to reach a position of 12 m.

Now, switch to the “charts” tab at the top of the window.

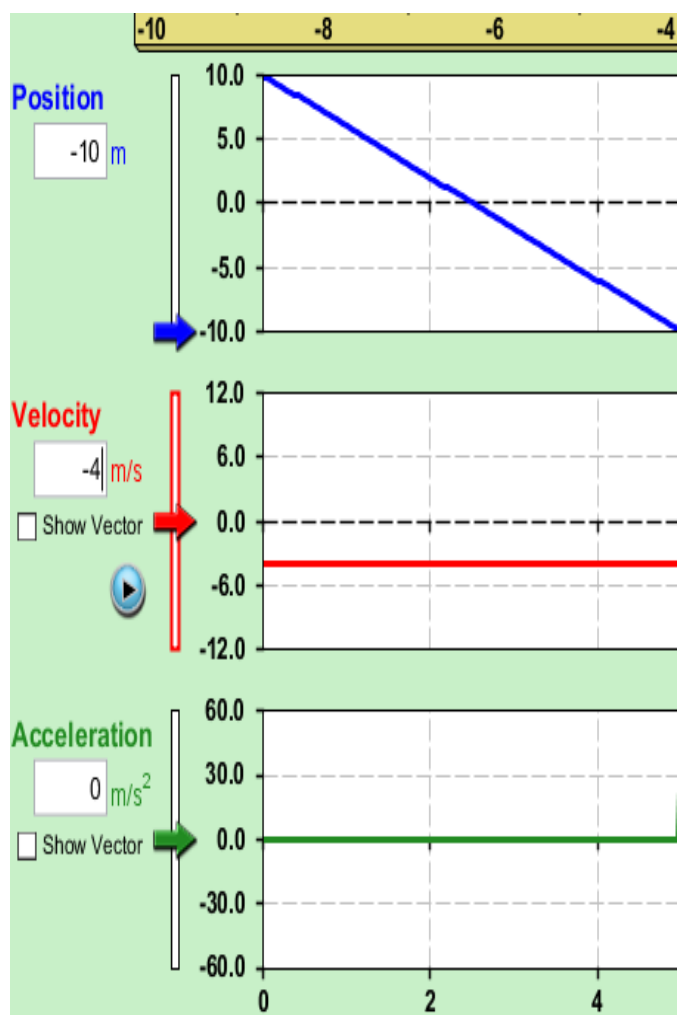
For the following starting conditions, draw the graphs that are obtained, and describe the motion **with detail**. Only draw the graph up to the point when the man crashes into the wall; don't include the crash.

Position = - 10.0 m, Velocity = 2.0 m/s, Acceleration = 0.0 m/s²



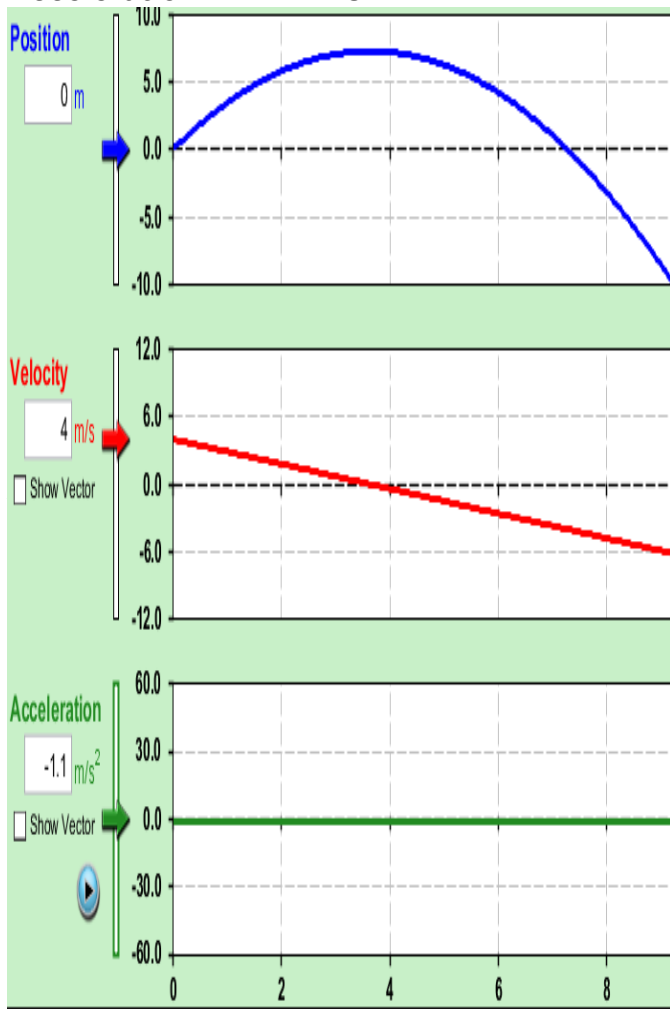
going to east, unifor motion

Position = 10.0 m, Velocity = - 4.0 m/s, Acceleration = 0.0 m/s²



going to west, unifor motion

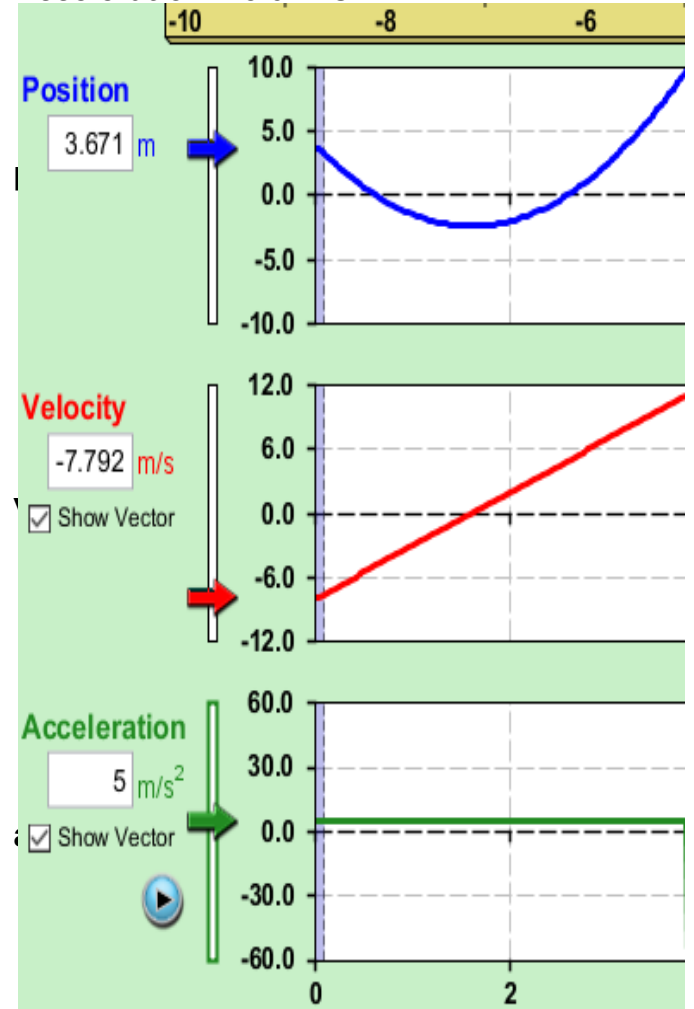
Position = 0.0 m, Velocity = 4.0 m/s,
Acceleration = - 1.1 m/s²



Description:

Object firsts going slowly to east and then speeding up to west

Position = 4.0 m, Velocity = - 8.0 m/s,
Acceleration = 5.0 m/s²



Description:

Object firsts going slowly to west and then speeding up to east

Questions:

1.) If the *position* graph is a flat line, what does that tell you about the motion? **Why?**

object is not moving

2.) If the *velocity* graph is a flat line, what does that tell you about the motion? **Why?**

uniform motion, object moving at the costant velocity

3.) If the *acceleration* graph is a flat line, what does that tell you about the motion? **Why?**

Object speed up or slowing down at the constant rate and velocity changes continuously

4.) If the *position* graph is a straight line sloping upward, what does that say about the motion? **Why?**

Object moves in uniform motion toward east.

5.) If the *position* graph is a straight line sloping down, what does that say about the motion? **Why?**

Object moves in uniform motion toward west

6.) If the *velocity* graph is a straight line sloping upward, what does that say about the motion? **Why?**

Object is either speeding up continuously at the constant rate in east or slowing down in west.

7.) If the *velocity* graph is a straight line sloping down, what does that say about the motion? **Why?**

Object is either slowing down in east or speeding up in west at the constant rate.

8.) If the *position* graph is a curved line, what does that tell us about the motion? **Why?**

Object is not moving at the constant velocity. velocity is changing at the constant rate. The object is either speeding up or slowing down at the constant rate.

9.) If the *velocity* graph is a curved line, what does that tell us about the motion? **Why?**

Object's acceleration is changing continuously.

10.) Now, drag the man yourself using the mouse cursor. Describe the motion that you created, and draw both a **position graph** and a **velocity graph** below: