Position, Velocity and Acceleration

Lab 2 Procedure – Provide written answers to the questions in red.

1. Download and run the "Moving Man" Java app moving-man_en.jar. This is the same simulation you used in Lab 1. Re-familiarize yourself with the "Moving Man" app by having the man move using the sliders. Look at the introduction tab, but use the "charts" tab to check graphs and look at actual data. You can set position, velocity and/or acceleration on the charts tab, then press play to execute a given scenario. You can also just manually drag the man around to mimic a described scenario.

You can use the playback features to look again at graphs you generate. While you make observations, think about the reasons the graphs look the way they do.

You will not turn in any drawings you make. Just draw the charts on your own to analyze.

2. Look at the chart below. Without using Moving Man, sketch what you think the graph would look like for the following scenario and explain your reasoning. You do not need to turn in the drawing.

Scenario: The man starts near the tree and moves toward the house with constant acceleration.
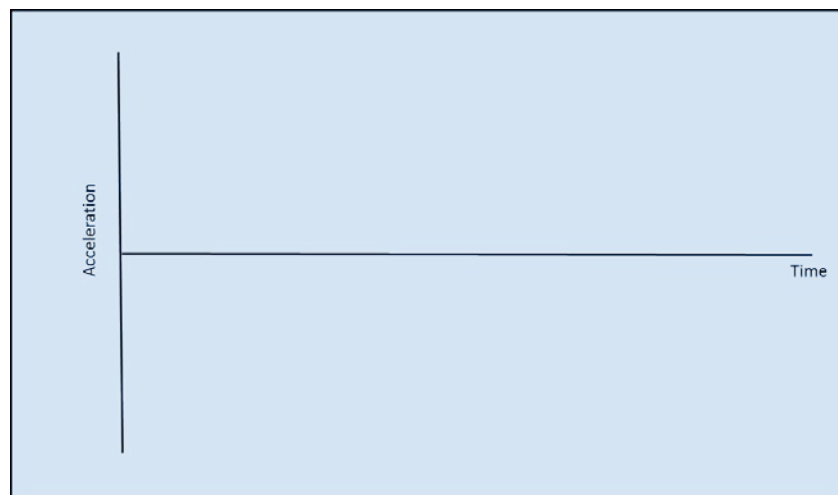

a) Describe the appearance of your chart.

b) Use moving man to try and mimic this scenario. Try to drag the man with a constant acceleration as best you can (it is not that easy!). How does it look?

3. Fill in the charts for each of the following three scenarios. Use moving man to generate the charts.

a. The man starts at -7m, accelerates to the right with constant acceleration for 2 sec, then continues to move at constant velocity until reaching the house.
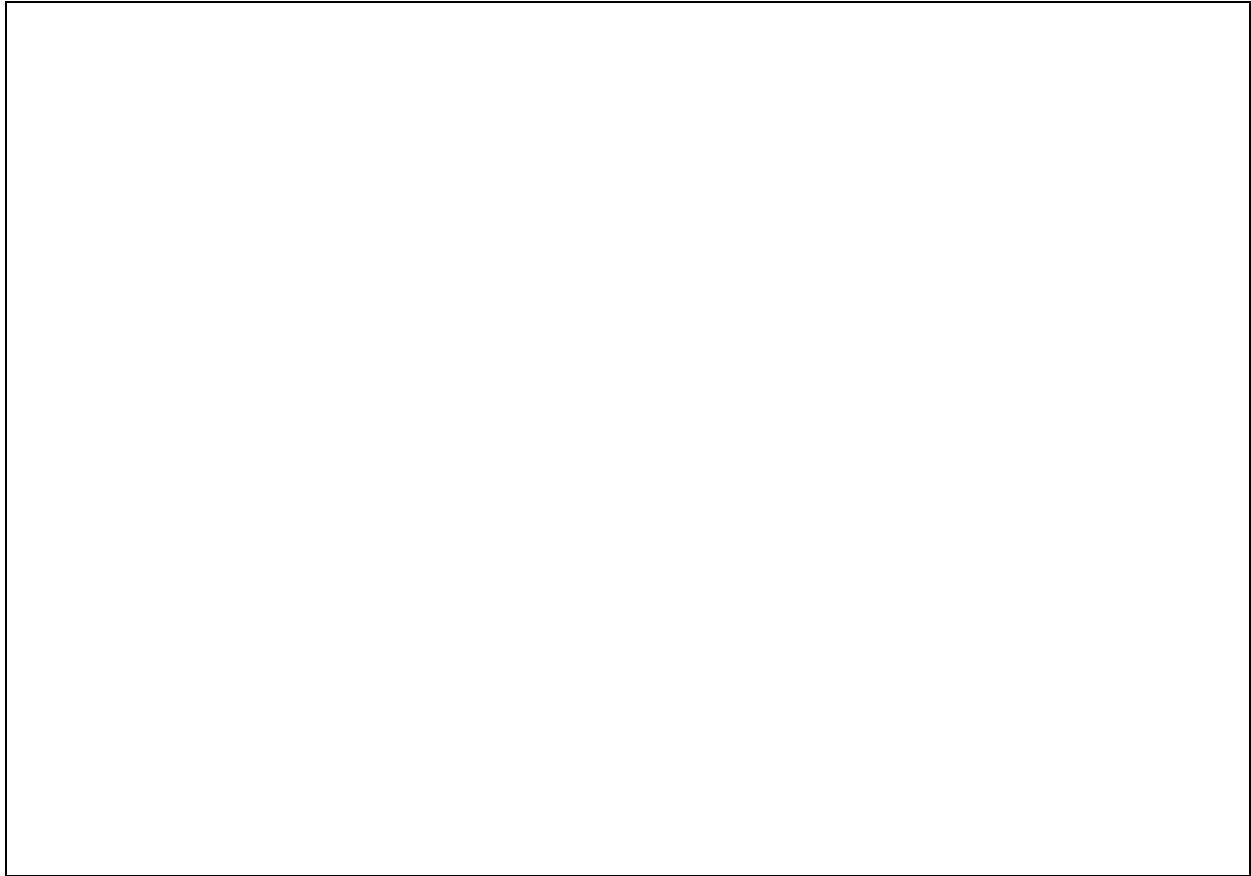
Position

Time

Velocity

Time

Acceleration

Time

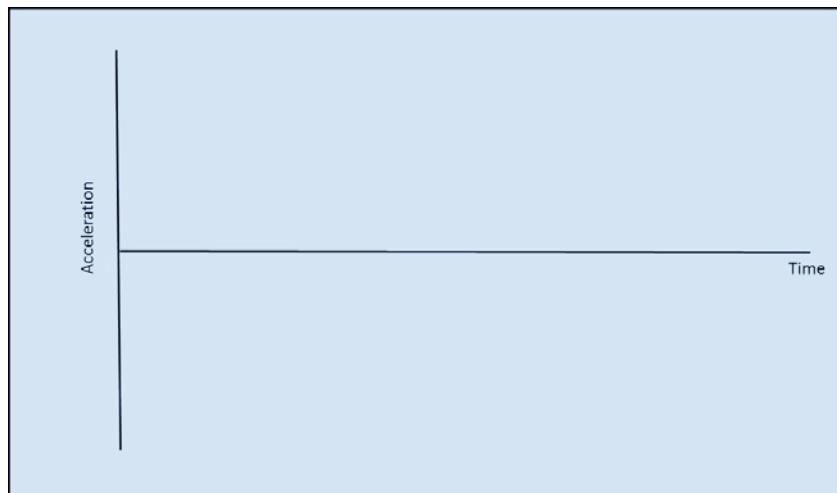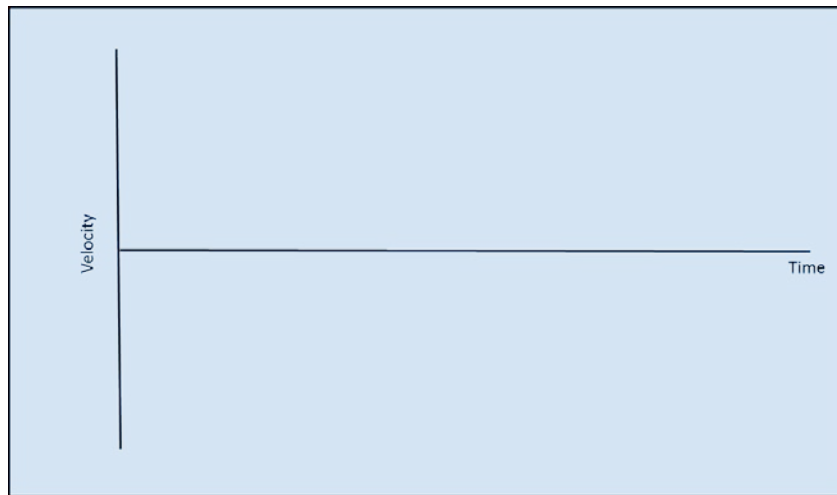Describe the appearance of your position, velocity, and acceleration graphs. Are they what you expected?

b. The man starts at +7m, moves to the left with a small constant acceleration until reaching -7m, then abruptly turns around and moves back to the right with a constant small acceleration until reaching his starting point (+7m).
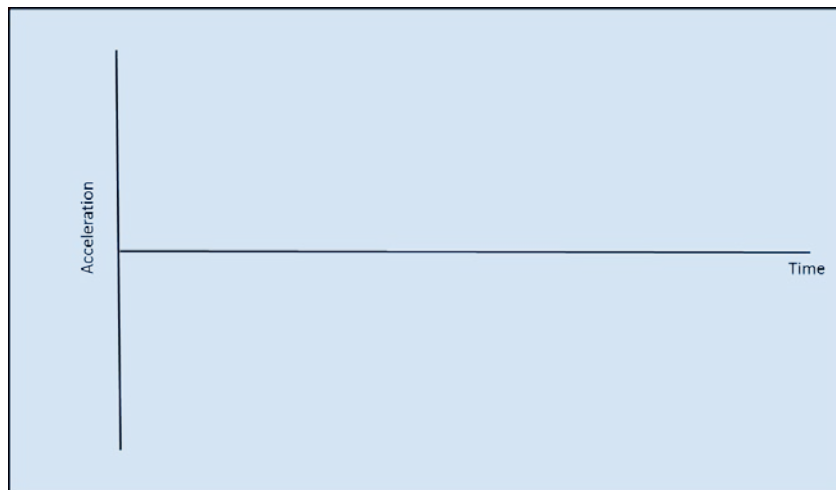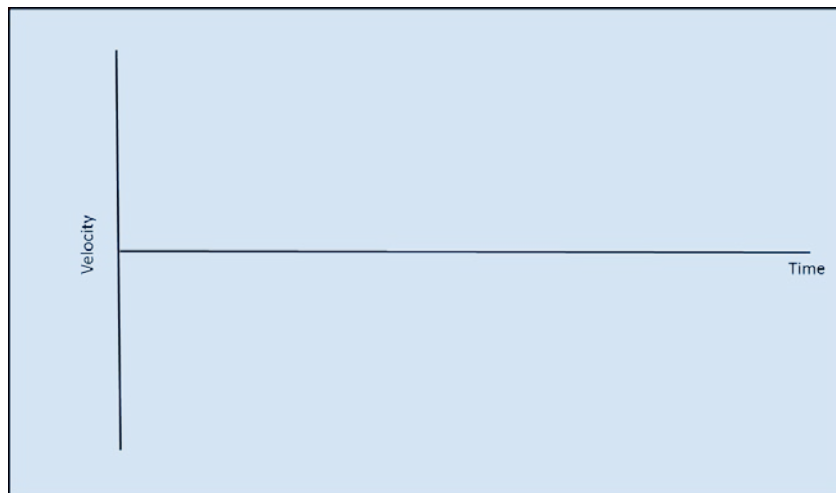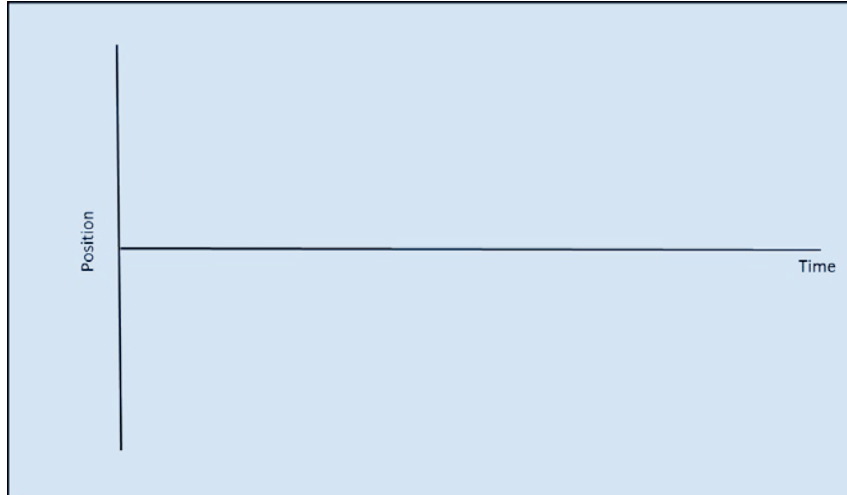
Position | Time

Velocity | Time

Acceleration | Time

Describe the appearance of your position, velocity, and acceleration graphs. Are they what you expected?

c. This one may be a bit tricky to produce dragging the man along the graph. Starting at zero, the man "oscillates" back and forth at constant velocity to the +4 and -4 m marks on the graph. He does this for approximately 15-20 sec.
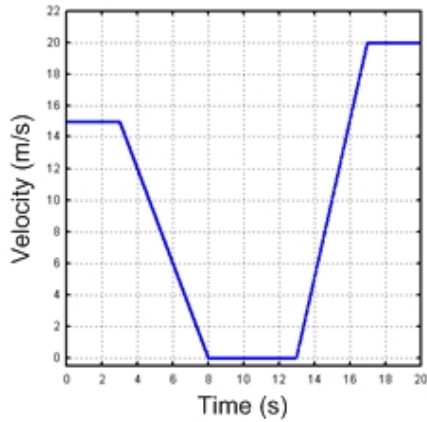
Position | Time

Velocity | Time

Acceleration | Time

Describe the appearance of your position, velocity, and acceleration graphs. Are they what you expected?
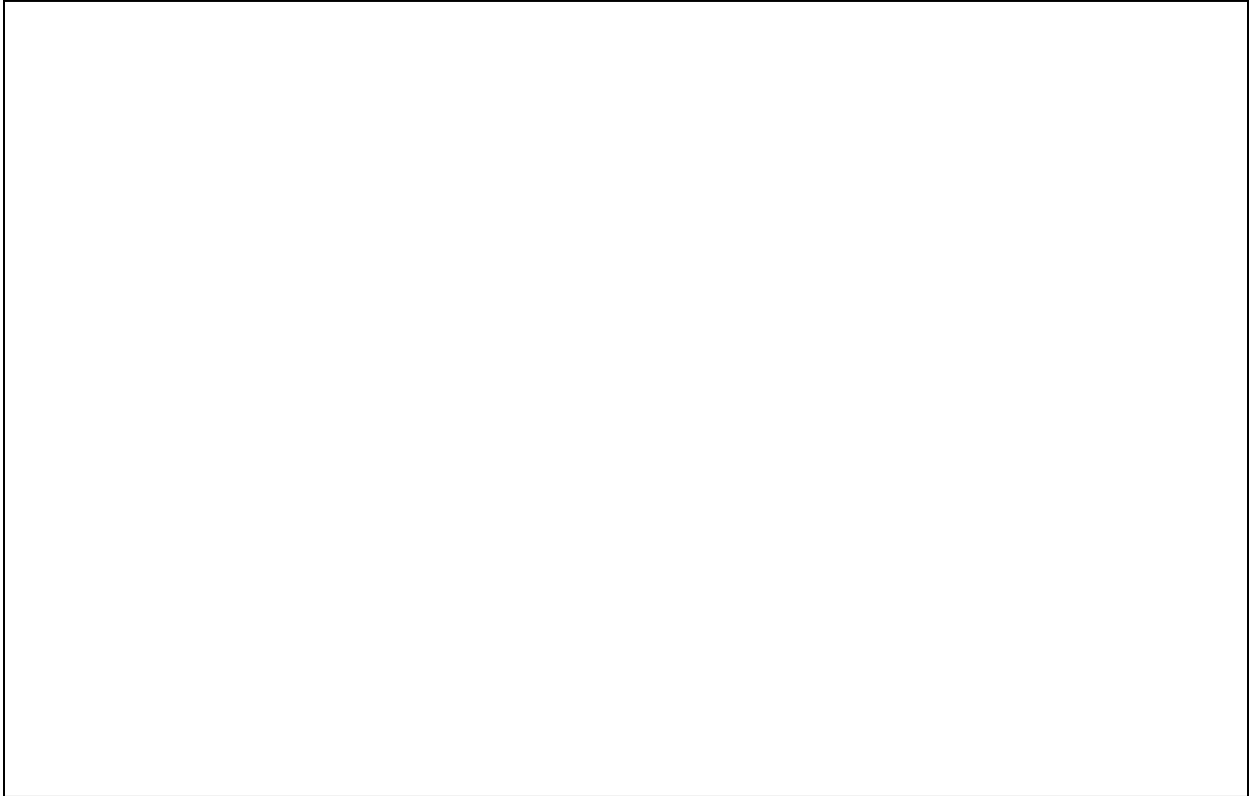
4. A car is traveling along a road. Its velocity is recorded as a function of time and is shown in the graph below.

During which intervals is the car accelerating? Choose all the answers that apply.

a. between 0 and 3 seconds
b. for a brief instant at 3,8,13 and 17 seconds
c. between 3 and 8 seconds
d. between 8 and 13 seconds
e. between 13 and 17 seconds
f. between 17 and 20 seconds

5. Which of the following *position-time* graphs would be most consistent with the motion of the car in question #4?
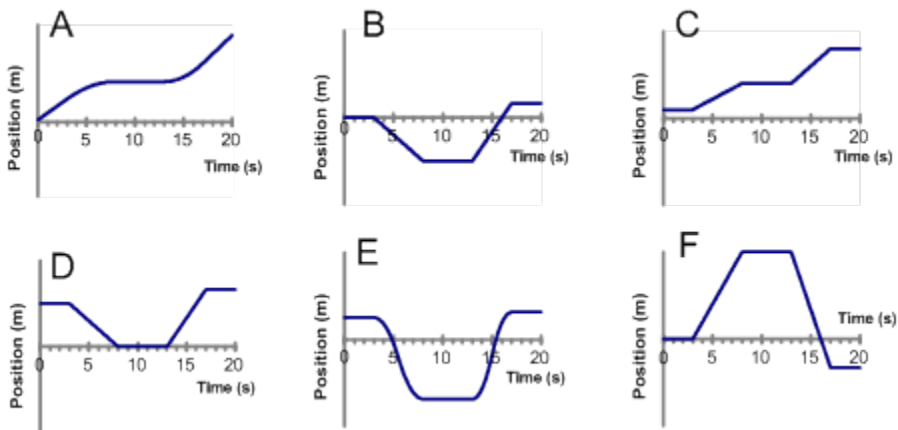
6. A car is moving forward and applying the break. Which *position-time* graph best depicts this motion?

A	B	C	D	E
Time	Time	Time	Time	Time

F	G	H	I	J
Time	Time	Time	Time	Time