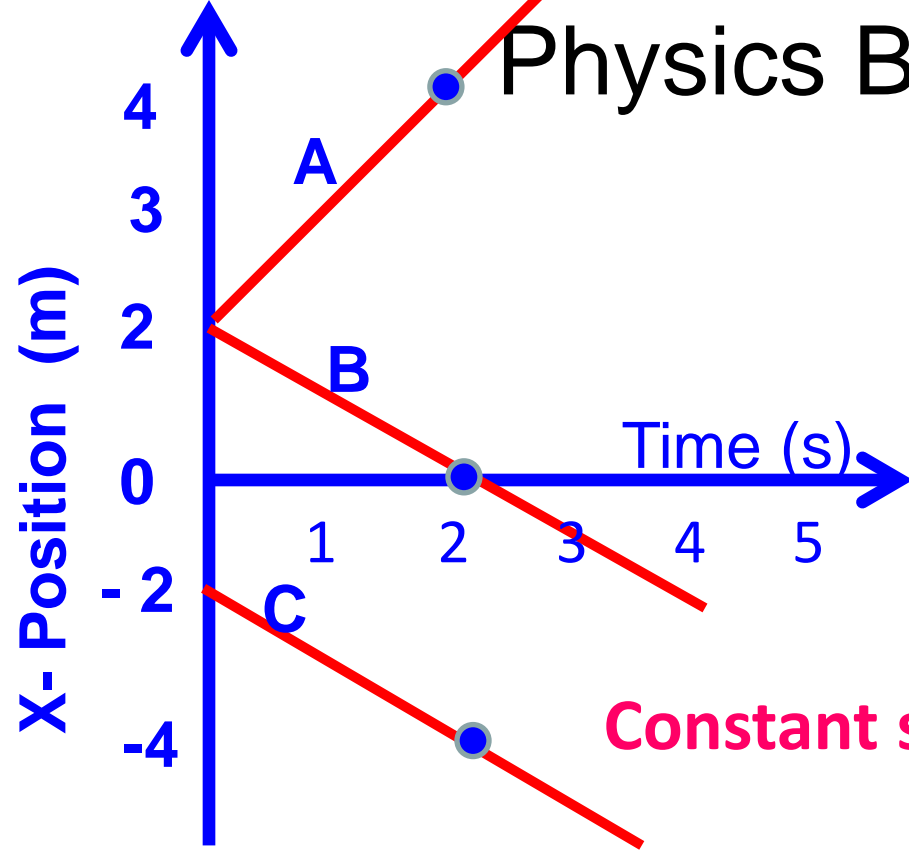


# Bell Work, Feb 2 - 5, 2015

Physics: Constant Velocity, x-t graph, v-t graph, motion map, distance, displacement, speed, path length, particle model

# Physics Bell Work, Monday, Feb 2

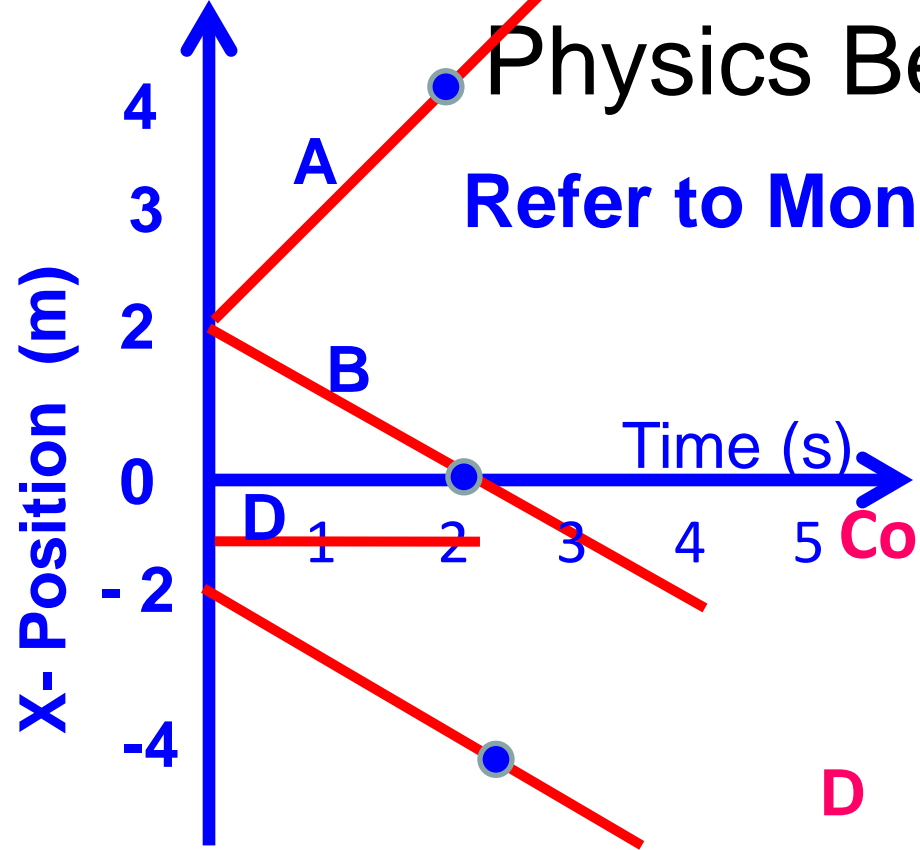


1. How many slopes does line A have? **One slope.**
2. What is the slope of A? **1 m/s**
3. Is the slope of line A changing or constant?  
**Constant. Its always 1 m/s**
4. Is the slope of line B or C changing or constant? Why?  
**Constant slopes because they are linear (lines).**
5. What is the slope of line B & C  
**-1 m/s**
6. Name some physical quantities:  
**Mass, distance, time, speed, volume, density.**
7. Which physical quantity does the slope of lines A, B, & C represent?

$$\text{Slope} = \frac{\Delta \text{rise}}{\Delta \text{run}} = \frac{\Delta x\text{-position}}{\Delta \text{time}} = \text{velocity (average velocity)}$$

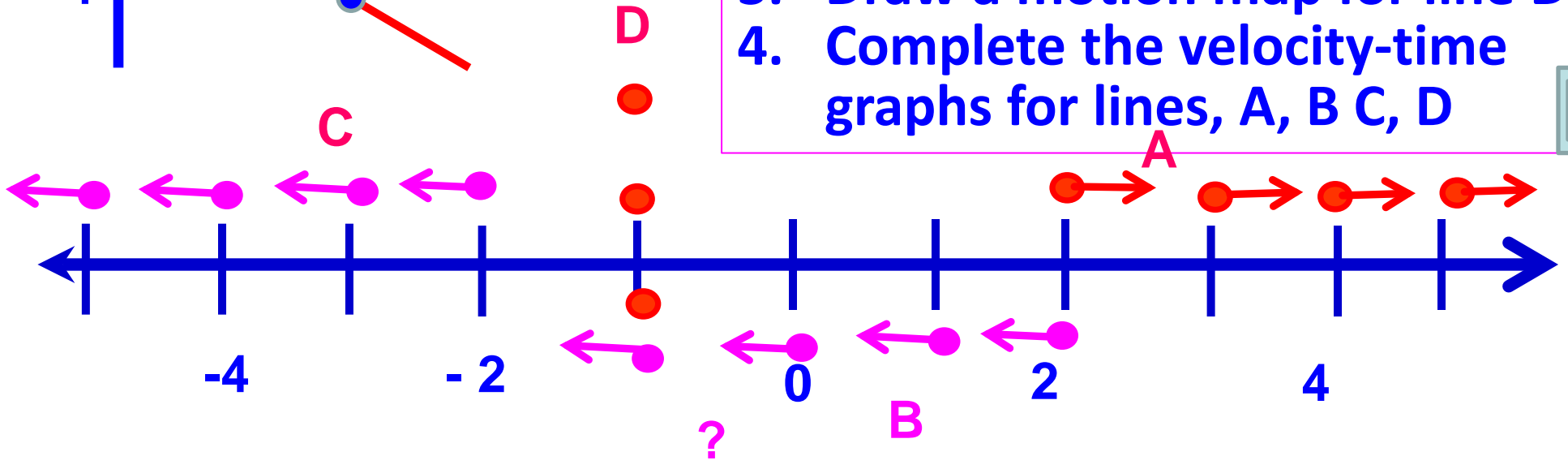
# Physics Bell Work, Tuesday, Feb 3

Refer to Monday's graph, add line D



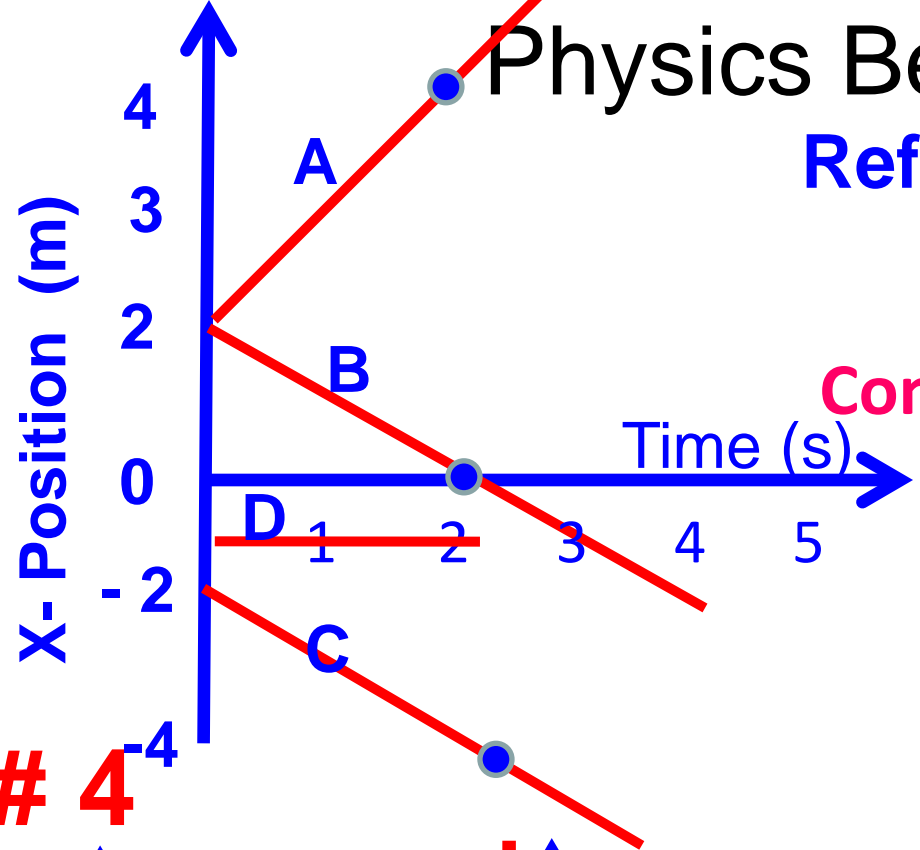
1. Is the slope of line A, B or C changing or constant? Why?
2. Draw motion maps (diagrams) for lines A, B, C
3. Draw a motion map for line D
4. Complete the velocity-time graphs for lines, A, B C, D

Constant slopes because they are linear.



# Physics Bell Work, Tuesday, Feb 3

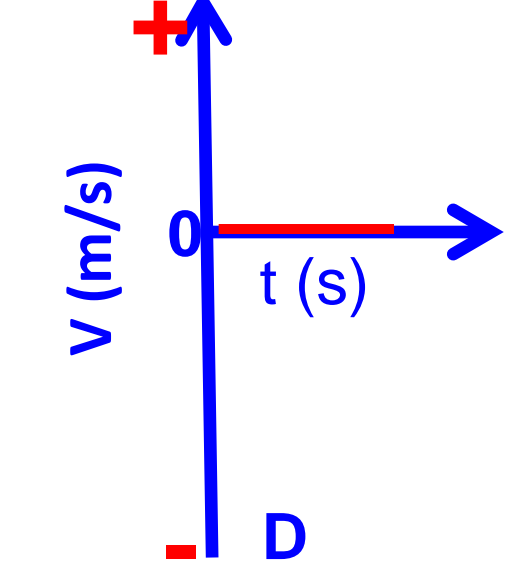
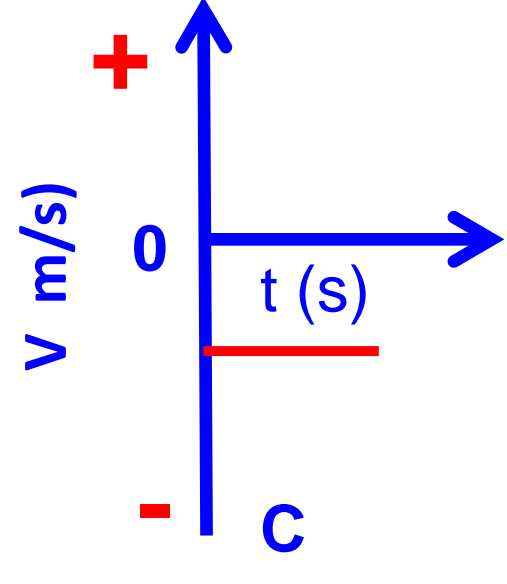
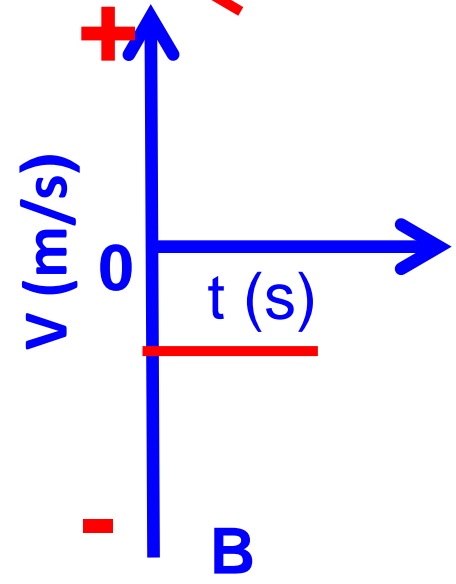
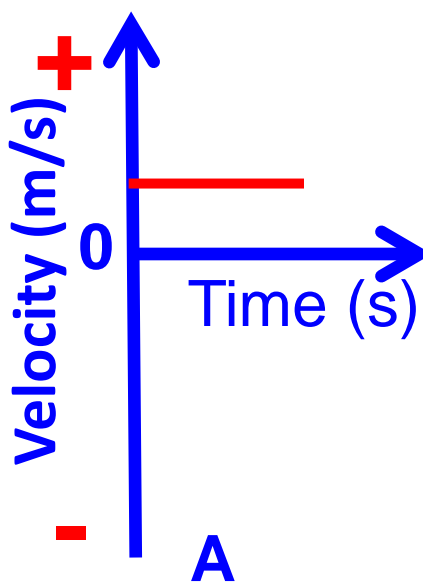
Refer to Monday's graph



1. Is the slope of line A, B or C changing or constant? Why?
4. Complete the velocity-time graphs for lines, A, B C, D

Constant slopes because they are linear.

# 4



# Physics Bell Work, Wednesday, Feb 4

## 1. Compare and contrast distance and displacement.

Both distance and displacement are lengths.

Distance is the length from a reference point or an origin.

Distance, by definition, is always a positive number and has no information about direction.

Displacement is the straight-line distance between the initial and final positions. Displacement is a vector; thus it conveys information about the direction of motion.  $\Delta x = x_f - x_i$

## 2. What is Path length?

*Path length = total distance traveled along a path to move from the starting position to the ending position.*

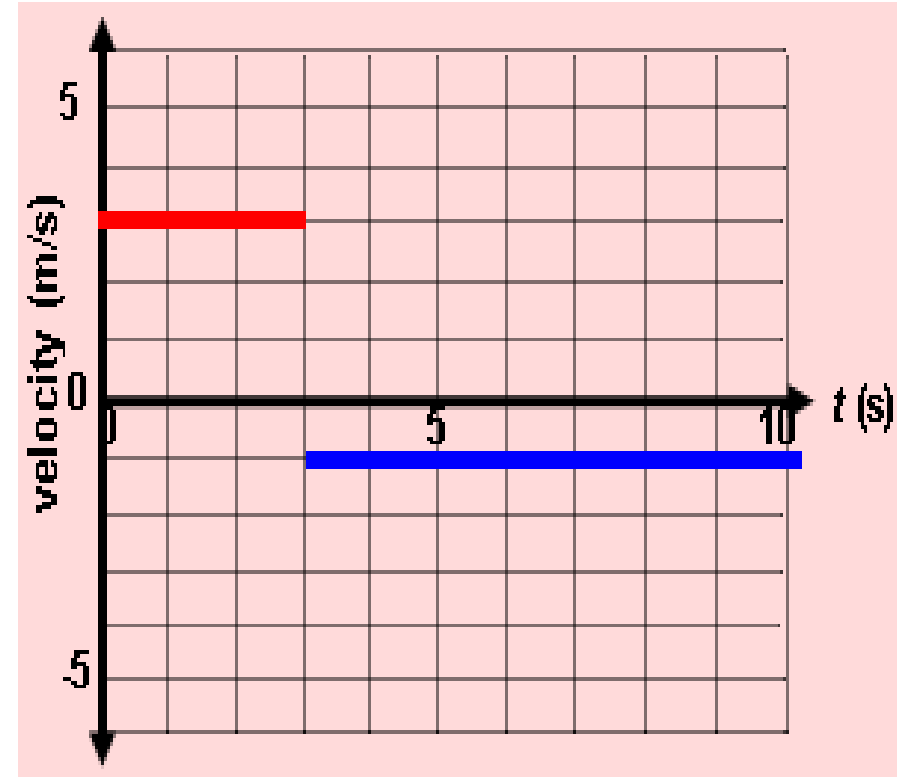
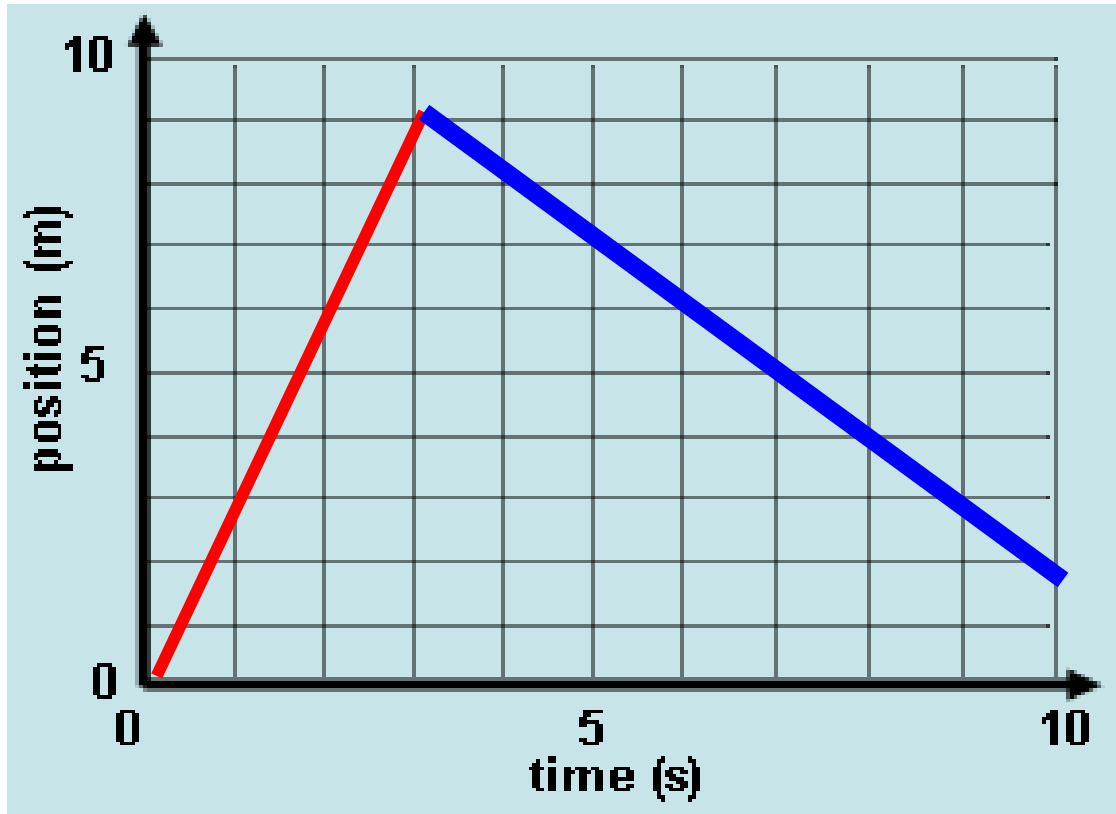
## 3. What is Average Speed

*Average Speed = path length / change in time*

*Speed is a scalar quantity and is always a positive number*

# Physics Bell Work, Monday, Thur, Feb4 (4 questions)

1. Sketch the graphs.



1. Place the correct velocity lines on the velocity-time (v-t) graph.

$$v = \frac{\Delta x}{\Delta t} = \text{slope}, \quad \text{red: } \frac{\Delta x}{\Delta t} = 3, \quad \text{blue: } \frac{\Delta x}{\Delta t} = -1,$$

# Physics Bell Work, Thurs, Feb 5

**2. What is a particle model?**

**A particle model is a simplified version of a motion diagram that represents the object in motion by a series of single points.**

**3. What represents the motion of an object?**

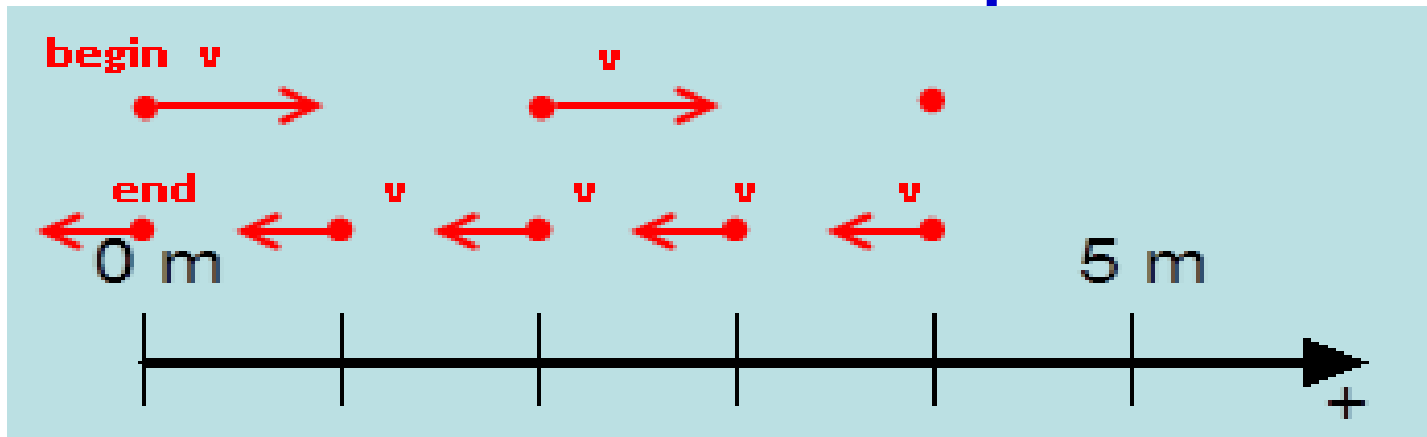
**A motion diagram (motion map).**

**4. What is an example of a motion diagram where the object is replaced by a series of single points?**

**Particle model.**

# Physics Bell Work, Thur, Feb 5

## 5. Explain how to draw a motion map



- A pair of time dots is one time interval (defined by you).
- An arrow represents the velocity and shows the direction of motion. Arrows should not be drawn all the way to a dot.
- To show an object is moving twice as fast, double the size of the arrow.
- A dot with no arrow means the object is not moving.
- The “x” graph shows the position (meters) of a time dots.

## 6. Describe the motion in the above motion map ( $\Delta t = 1\text{ s}$ )

- The object starts at 0, moves in the + direction at 2 m/s for 2 s, then stops for 1 s, then moves in the negative direction at  $\frac{1}{2}$  the original velocity, which is 1 m/s, for 4 s.