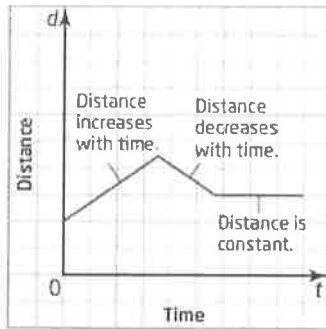
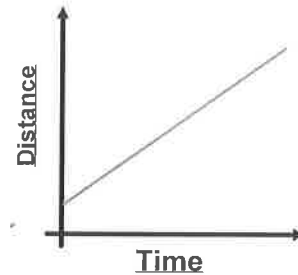


## 2.6 - Distance Time Graphs



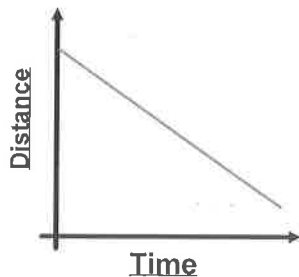
A distance-time graph shows an object's distance from a fixed point over a period of time.

A rising line shows that distance from a point increases as time increases.



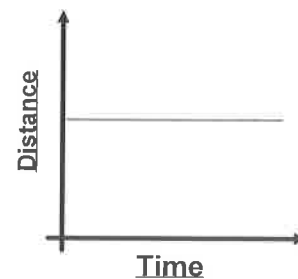
*\*MOVING AWAY FROM SENSOR\**

A falling line shows that distance from a point decreases as time increases.



*\*MOVING TOWARDS SENSOR\**

A horizontal line shows that distance from a point remains constant



*\*NO MOVEMENT\**

### Rate of Movement

The **speed** of a person affects the steepness of the graph.

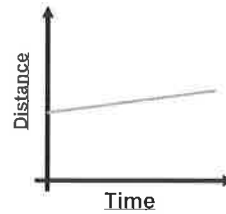
The steeper the line is, the faster the rate of movement.

Remember:

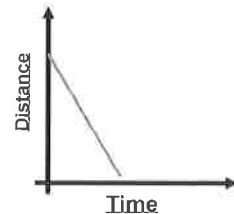
$$\text{speed} = \frac{\Delta \text{distance}}{\Delta \text{time}}$$

Which graph represents slow movement?

Which one represent fast movement?



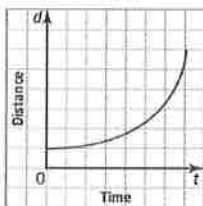
SLOW



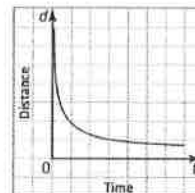
FAST

### Changes of Rate of Movement

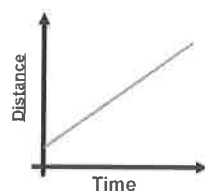
A curve may represent an increase in rate of movement (acceleration)



A curve may represent a decrease in rate of movement (deceleration)

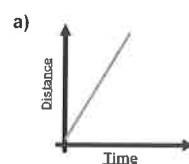


A straight line represents an object moving at a constant rate or steady pace.

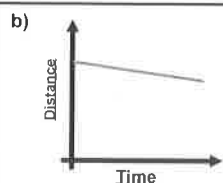


### Practice Describing Distance Time Graphs

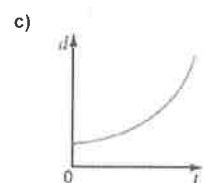
A person walks in front of a motion sensor. Describe the motion that would produce each of the following graphs:



This line is steep. The person moves at a fast, steady pace away from the sensor.



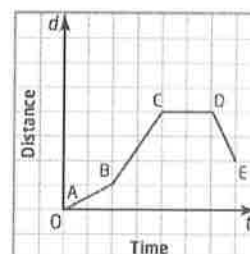
The person moves at a slow; steady pace towards the sensor.



The curve indicates a change in speed, the person moves away from the sensor; slowly at first, and then gradually picks up speed (acceleration away from the sensor)

### Analyzing a Distance-Time Graph

Describe the following graph that represents a person's distance from home over a period of time:



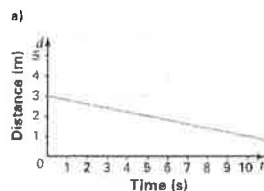
AB: Away from home at a slow steady pace.

BC: Away from home at a fast steady pace.

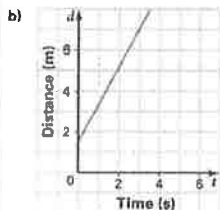
CD: No movement

DE: Towards home at a fast steady pace.

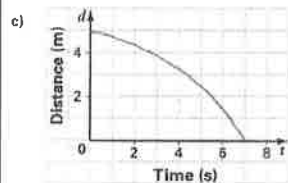
Describe the motion represented by each of the following graphs:



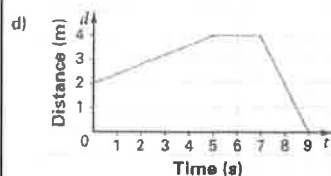
The person starts at a distance of 3 meters from the sensor and walks towards it at a slow, steady pace.



The person starts at a distance of 1.5 meters from the sensor and walks away from it at a fast, steady pace.

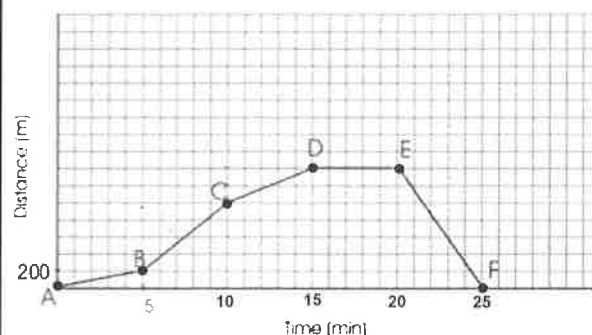


The person starts at a distance 5 meters from the sensor and walks toward it, slowly at first, and then gradually picks up speed.



The person starts at a distance of 2 meters from the sensor, takes 5 seconds to walk at a slow steady pace away from the sensor, pauses for 2 seconds, and then walks at a fast steady pace towards the sensor.

Chris walks each day as part of his daily exercise. The graph shows his distance from home as he walks his route.



Using the graph, give an explanation of what is occurring over Chris' walk. Include information about time, distance, direction and speed during each segment

AB:  $\text{speed} = \frac{200}{5} = 40 \text{ m/min.}$

Chris walks away from home at a constant speed of 40 m/min.

BC:  $\text{speed} = \frac{800}{5} = 160 \text{ m/min}$

Chris walks quickly away from his house at a speed of 160 m/min.

CD:  $\text{speed} = \frac{400}{5} = 80 \text{ m/min}$

Chris walks away from his house at a constant speed of 80 m/min

DE: Chris stops for a 5 minute break.

EF: Chris walks home quickly at a speed of 280 m/min