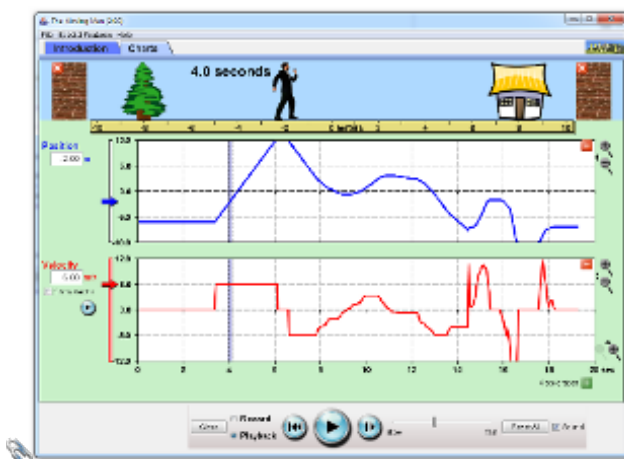


The Graphical Analysis of Position & Time

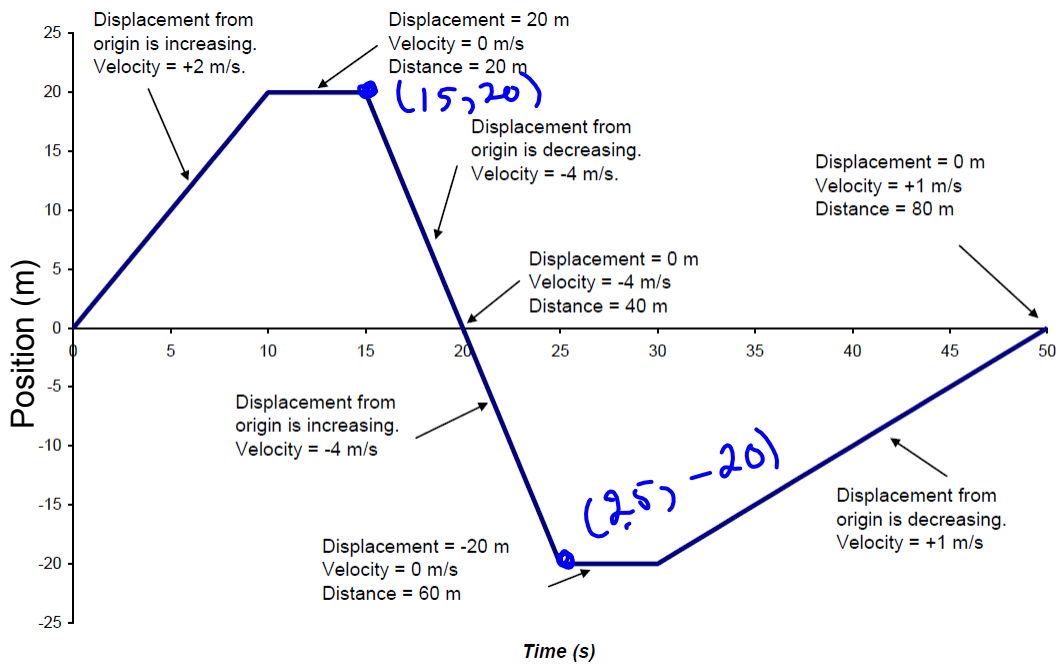
The Moving Man



*Use equation feature

Objectives

- Review Frame of reference and coordinate system.
- Analyze how position can change with time.
- Learn how to find key points on the graph.
- Develop knowledge about how the graph relates to speed and velocity.



- Slope at any point is the instantaneous velocity.
- Sign of the slope indicates the direction the object is travelling.
- Distance is the sum of the displacements in both directions.
- Average velocity is the object's displacement divided by the time.
- Average speed is the object's distance divided by the time.

Guided Practice

1. Calculate the average velocity between 10 and 20 s.

$$\vec{v}_{avg} = \frac{\vec{d}_f - \vec{d}_o}{t} \quad \vec{d}_f = 0 \text{ m} \quad \vec{d}_o = 20 \text{ m} \quad t = 10 \text{ s}$$

$$\vec{v}_{avg} = \frac{0 - 20}{10} = -2 \text{ m/s}$$

$t_f - t_o = 20 \text{ s} - 10 \text{ s}$

2. Calculate the average velocity between 5 and 35 s.

$$d_f = -15 \text{ m} \quad d_o = 5 \text{ m} \quad t = 30 \text{ s}$$

$$v_{avg} = \frac{d_f - d_o}{t} = \frac{-15 - 5}{30} = -\frac{20}{30} = -0.67 \text{ m/s}$$

3. Calculate the average velocity between 15 and 25 s.

4. Calculate the average speed between 15 and 25 s.

$$v_{sp} = \frac{d}{t}$$

then
20 m [W]

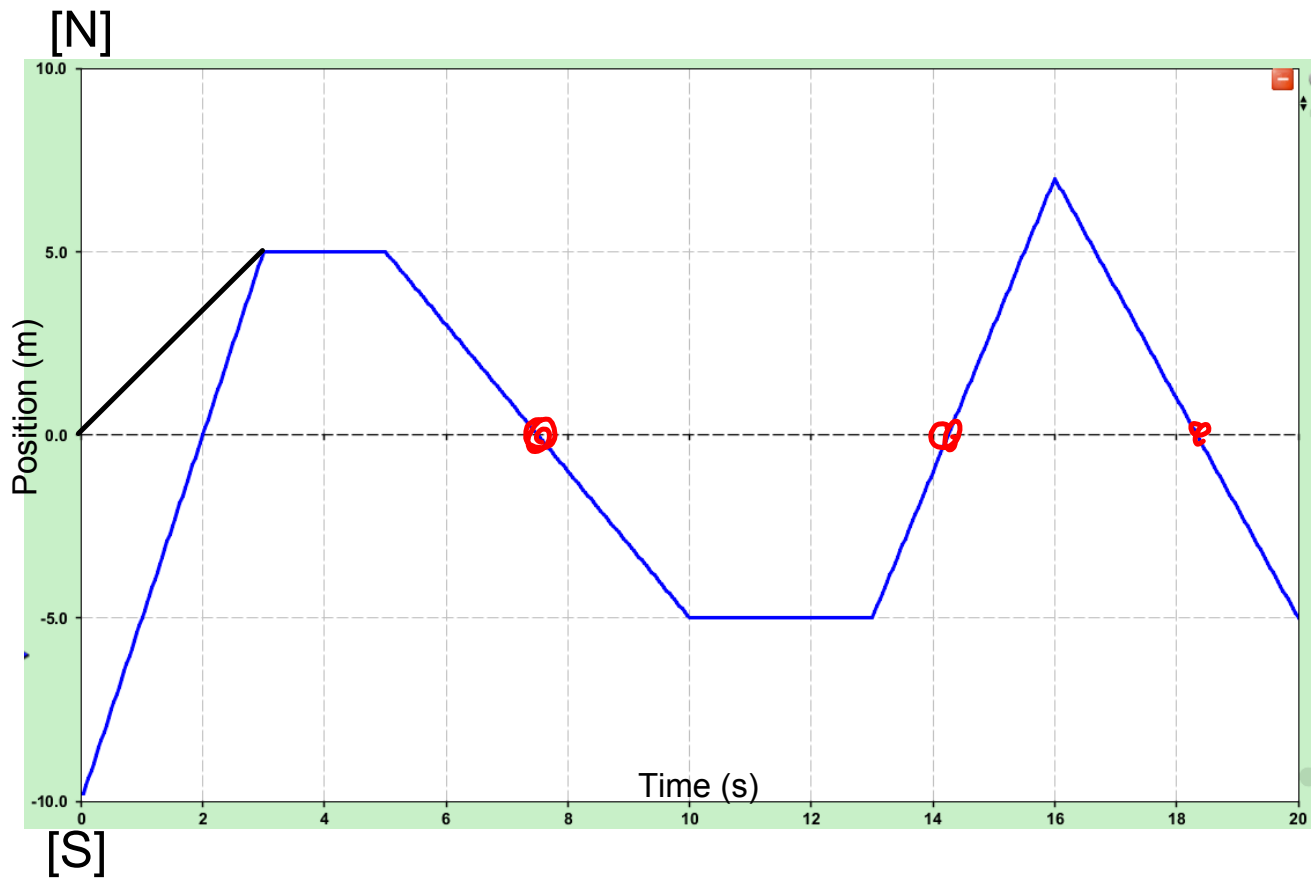
$$d = 40 \text{ m} \quad v_{sp} = \frac{40}{10} = 4 \text{ m/s}$$

5. Calculate the average speed between 20 and 50 s.

Position - Time Formative Assessment

Grade:11
Subject:Physics 112
Date:2014

Use the graph to answer the following 10 questions.



1 What was the initial velocity of the object?

$$\vec{v} = \frac{d}{t} = \frac{5.0 \text{ m}}{3 \text{ s}} = \boxed{1.7 \text{ m/s}} \quad \uparrow \text{ East}$$

2 For how long was the object not moving?

$$\begin{array}{ccc} 2s & + & 3s \\ \uparrow & & \uparrow \\ \text{between} & & \text{between} \\ 3-5s & & 10-13s \end{array} \quad \textcircled{5s}$$

3 How many times did the object return to the starting position?

3 times
around 7.5s
14.5s
and 18.5s

4 Calculate the distance traveled in the first 10 seconds.

$$d = 5\text{m}[E] + 10\text{m}[W]$$

$$= 15\text{m}$$

* direction does not matter

5 For what length of time was the object traveling south?

A 9 s

B 6 s

C 5 s

D 3 s

Attachments

moving-man_all.jar