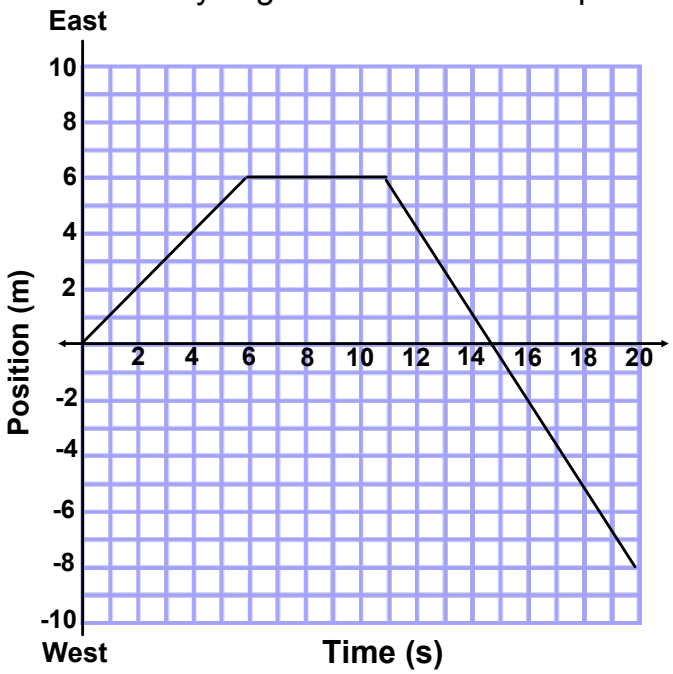
- Slope at any point is the instantaneous velocity.
- Sign of the slope indicates the direction the object is travelling.
- Distance is the sum of the displacements in both directions.
- Average *velocity* is the object's *displacement* divided by the time.
- Average *speed* is the object's *distance*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

Analyzing Position - Time Graphs



Examples

1. What was the object's position at the 4 second mark? 10 s mark? 18s mark?

@ 4s → 4m [E], @ 10s → 6m [E], @ 18s → -5m [E] or 5m [W]

2. Calculate the distance traveled during the first 14 seconds.

$d = 6m[E] + 5m[W] = 11m$ total distance

3. Calculate the average speed during the first 14 seconds.

$v_{sp} = \frac{d}{t} = \frac{11m}{14s} = 0.78 m/s$

4. Calculate the average velocity during the first 14 seconds.

$\vec{v}_{avg} = \frac{\vec{d}}{t} = \frac{\text{position}}{\text{time}} = \frac{1m}{14s} = 0.07 m/s$

5. Calculate the instantaneous velocity at the 16 second mark.

$v_{instant} = \text{slope} = \frac{-14}{9} = -1.5 m/s$

6. Calculate the object's total distance traveled and final position.

$d = 6m[E] + 6m[W] + 8m[W] = 20m$

$\vec{d} = -8m[E]$

7. Calculate the object's average speed and velocity for the full 20 seconds.

$v_{sp} = \frac{d}{t} = \frac{20m}{20s} = 1 m/s$ $\vec{v}_{avg} = \frac{\vec{d}}{t} = \frac{-8}{20}$

$= -0.4 m/s$

Attachments

moving-man_all.jar