

Review - Graphical Analysis

Vectors & Displacement:

- 1.) A scalar quantity has _____, while a vector quantity has both _____ and _____.
- 2.) Under what conditions is the magnitude of an object's displacement the same as its distance?
- 3.) If you are walking from point A to point B, the magnitude of your displacement will always be equal or (less than or greater than) your distance (circle one).
- 4.) Put the following items into the correct category:

1 kg , $10 \frac{\text{km}}{\text{h}}$, displacement, force, $20 \frac{\text{m}}{\text{s}} [\text{N}]$, velocity, distance, 200 km , 5 hours,
 $50 \text{ m} [\text{downstream}]$, 40 L , $9.8 \frac{\text{m}}{\text{s}^2} [\text{down}]$, acceleration, speed, mass, $10 \text{ km} [\text{SW}]$

Scalars	Vectors

Graphing Motion:

- 1.) Define slope, and then sketch some example slopes (positive, negative, and zero).
- 2.) The slope of a d vs. t graph represents _____. Describe two ways you know this to be true.

3.) The motion of two runners is graphed below (Alan and Brent).

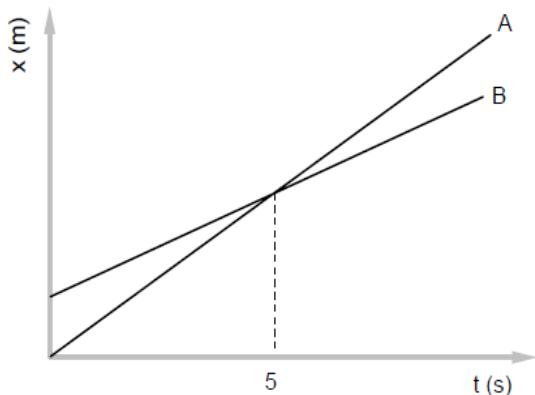
a.) Do they start at the same point? How do you know?

b.) At 2.0 s, who is ahead?

c.) At 8.0 s, who is ahead?

d.) Which is running faster? How do you know?

e.) What is happening at $t = 5.0$ s?



4.) The motion of two runners is graphed below (Jeffrey and Consuela).

a.) How long did each runner take to reach 10. m.

b.) What was the distance each traveled in the first 5.0 s.

c.) Determine the speed of each runner. Show all work.

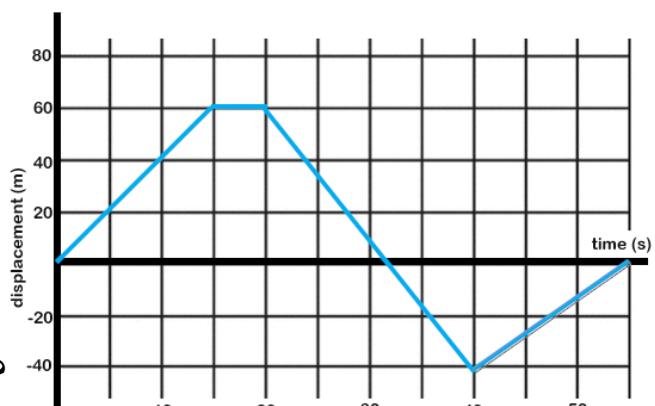


5.) The motion of a race cart on a linear track is shown below.

a.) When is the car at the starting line?

b.) When is the car sitting still?

c.) When is the car going in the negative direction?



d.) What is the biggest velocity logged? What is the biggest velocity? Show all work.

e.) What is the average velocity of the cart between 0 and 20 s? Show all work.

- f.) What is the average velocity of the cart for the entire trip? Show all work.
- 6.) Below is a graph of a ball's motion. Provide an interpretation of the ball's motion.
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- | Time (s) | Position (m) |
|----------|--------------|
| 0 | 5 |
| 3 | 5 |
| 7 | 0 |
| 10 | 0 |
- 7.) A man starts at the starting line, walks back slowly and steadily for 6.0 s. Then he stands still for 6.0 s, then walks forward steadily about twice as fast for 6.0 s. Sketch the \vec{d} vs. t and \vec{v} vs. t graphs showing this motion.
- 8.) A car is traveling down the road. Its \vec{v} vs. t graph is shown below. Sketch the \vec{d} vs. t graph that shows the motion?
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- | Time (s) | Velocity (m/s) |
|----------|----------------|
| 0 | 15 |
| 2 | 15 |
| 6 | 0 |
| 10 | 0 |
| 16 | 20 |
| 20 | 20 |
- 9.) A car moving forward but the brakes are applied. Sketch the \vec{d} vs t graph of this motion? Show some tangent lines (and label them) on your graph showing fast, slower, stopped.