Average Speed Problems

Concepts

A. What is meant by the term *instantaneous speed*? How about *instantaneous velocity*?

B. Use the word *instantaneous* to explain what is meant by the terms constant speed and constant velocity.

C. Define the phrase *average speed* - give a <u>words</u> definition and a <u>math</u> definition.

D. If all you know is how far something traveled and how long it took, which of the following could you calculate?

    ____ average speed   ____ constant speed   ____ instantaneous speed

E. If all you know is the average speed of something and the time it moved, which of the following can you calculate?

    ____ distance traveled ____ constant speed   ____ instantaneous speed

F. If all you know is the constant speed of something and the time it moved, which of the following can you calculate?

    ____ distance traveled ____ average speed   ____ instantaneous speed

Problems

1. Let's say you move from Point A to Point B with a <u>constant</u> speed of 15 m/s for 10 seconds.
    a. How far did you travel?

    b. Could you have sped up or slowed down at any point during the 10 seconds?

    c. How fast were going at the 3 second mark? How about the 5 second mark?

    d. What was your <u>average</u> speed for the entire 10 seconds?

2. Now let's say you move from Point A to Point B with an <u>average</u> speed of 15 m/s for 10 seconds.
    a. How far did you travel?

    b. Could you have sped up or slowed down at any point during the 10 seconds?

    c. How fast were going at the 3 second mark? How about the 5 second mark?

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3. You travel to Concord (10 km away) in 45 minutes, through a lot of traffic. What was your average speed for the trip in m/s?

4. Imagine you walked 10 meters in 15 seconds, then another 10 meters in only 5 seconds.
   a. What was your average speed for the first 10 meters?

   b. What was your average speed for the second 10 meters?

   c. What was your average speed for the whole 20 meters? Be careful!

5. You walk 200 m down a hallway at 1.2 m/s and then run another 200 m at 2.5 m/s.
   a. How many seconds does it take you to travel the entire 400 m?

   b. What was your average speed for this entire trip?

6. You drive down the highway at 30 m/s for 20 minutes and then drive for an additional 10 km at a speed of 15 m/s.
   a. What was the total distance you traveled?

   b. What was the total time you traveled?

   c. What was your average speed for the entire trip?

Answers: 1. a) 150 m   b) no   c) both 15 m/s   d) 15 m/s   2. a) 150 m   b) sure!
c) can't tell either   3) 3.7 m/s   4. a) 0.67 m/s   b) 2.0 m/s   c) 1.0 m/s   5. a) 247 s
b) 1.62 m/s   6. a) 46 km   b) 1867 s   c) 24.6 m/s