Speed & Velocity

1. Sally is running with a constant speed of 6 m/s. How long will it take her to run 100 meters?

2. The earth is about 1.5 x 10^{11} m away from the sun. What is the average speed (in m/s) of the earth as it orbits around the sun in it's (nearly) circular orbit?

3. You are standing at the edge of a large field. At the opposite end of the field is a huge building. You yell at the building, and hear an echo 2.5 seconds later. If the speed of sound is 340 m/s, how far away from the building are you?

4. Sharon walks 20 meters down a hall with a constant speed of 2 m/s. Then she walks backwards 20 meters down the hall, this time with a constant speed of 4 m/s.
   a. What was her average speed for the whole trip?

   b. What was her average velocity for the whole trip?

5. The position as a function of time for Deoxys is given by $x = -30t^2 + 240t + 100$. Standard SI units. (That means x is meters and t is seconds.)
   a. What is the initial velocity of Deoxys ? (That means v at time 0.)

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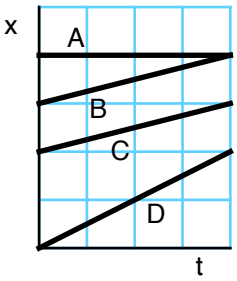
b. When is Deoxys not moving?

c. For the first 6 seconds of the motion, what was the average velocity of Deoxys?

d. For the first 6 seconds of the motion, what was the average speed of Deoxys?

6. The position as a function of time for four different objects are shown in the graph to the right.

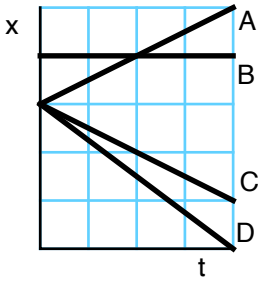


a. Which object is going the fastest?

b. Which objects have the same speed?

c. Which object traveled the farthest?

7. The position as a function of time for four different objects are shown in the graph to the right.



a. Which object is going the fastest?

b. Which objects have the same speed?

c. Which object traveled the farthest?

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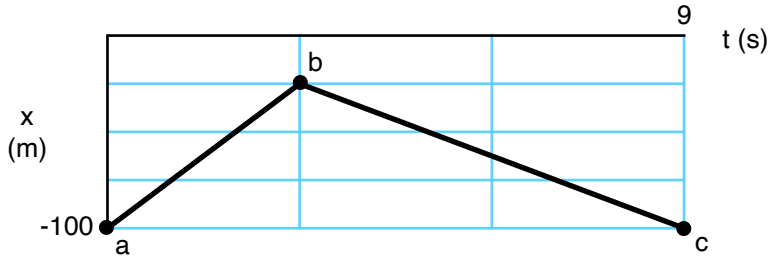
8. The position as a function of time for something in the graph below.



a. From point *a* to *b*, what is the velocity and the speed?

b. From point *b* to *c*, what is the velocity and the speed?

c. From point *a* to *c*, what is the average velocity and the average speed?

Answers:

1) 16.7 s *2) 30,000 m/s* *3) 425 m* *4.a) 2.67 m/s* *b) 0 m/s* *5. a) 240 m/s*
b) t = 4 *c) 60 m/s* *d) 100 m/s* *6. a) D* *b) B & C* *c) D* *7. a) D*
b) A & C *c) D* *8. a) 25 m/s & 25 m/s* *b) -12.5 m/s & 12.5 m/s*
c) 0 m/s & 16.7 m/s