

SECTION 2-1 Book Work

Page 41 Conceptual Challenge

1. Space Shuttle: A space shuttle takes off from Florida, and circles around Earth several times, finally landing in California. While the shuttle is in flight, a photographer flies from Florida to California to take pictures of the astronauts when they step off the shuttle. Who undergoes the greater displacement, the photographer or the astronauts?

2. ROUNDTRIP: What is the difference between the displacement of the photographer flying from Florida to California and the displacement of the astronauts flying from California back to Florida?

Page 45 Conceptual Challenge

1. Book on a table: A book is moved once around the edge of a tabletop with dimensions 1.75 m X 2.25 m. If the book ends up at its initial position, what is its displacement? IF it completes its motion in 23 s what is the average velocity? What is its average speed?

2. Car A travels from New York to Miami at a speed of 25 m/s. Car B travels from New York to Chicago, also at a speed of 25 m/s. Are the velocities equal? Explain.

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1. Does knowing the displacement between the position of two objects give you enough information to locate the objects? Explain.

2. What is the shortest possible time in which a bacterium could move at a speed of 3.5 mm/s across a Petri dish with a diameter of 8.4 cm?

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3. Figure 2-7 shows position-time graphs of the straight line movement of two brown bears in a wildlife preserve. Which bear has the greater average velocity over the entire period? Which bear has the greater velocity at $t = 10.0$ min? Is the velocity of bear A always positive? Is the velocity of bear B ever negative?

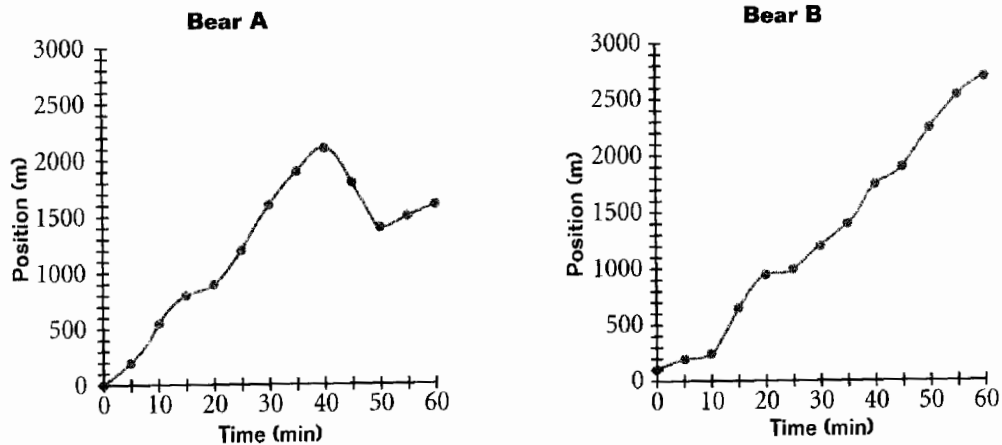


Figure 2-7

4. A chilled can push a shopping cart at a speed of 1.5 m/s. How long would it take this child to push the cart down an aisle with a length of 9.3 m?

5. An athlete swims from the north end to the south end of a 50.0 m pool in 20.0 s and makes the return trip to the starting position in 22.0 s.

a) What is the average velocity for the first half of the swim?

b. What is the average velocity for the second half of the swim?

c. What is the average velocity for the roundtrip?

6. Two students walk in the same direction along a straight path, at a constant speed – one at 0.90 m/s and the other at 1.90 m/s.

a) Assuming that they start at the same point and the same time, how much sooner does the faster student arrive at a destination 780 m away?

b) How far would the students have to walk so that the faster student arrives 5.5 min before the slower student?