# Extra Practice Problems for Chapter 1

1. An ant crawls 67 cm west, turns around, and travels 75 cm east. What is the total distance it traveled, and what is its displacement from its starting point?

2. As an exercise, a basketball player dribbles north for 21 meters, turns around, and dribbles south for 28 meters. If the exercise takes 12 seconds, what is the player's average speed? What is her average velocity?

3. Two balls are rolling on a track. One rolls north at 4.1 m/s, while the second rolls north at 6.7 m/s. What is the relative velocity, using the faster ball as the reference? If they never collide, which one is in front on the track?

4. You walk west for 1.5 hours at a pace of 2 m/s. What is your displacement at the end of that time?

5. Two bicycles are on the same road. One travels south at 23 km/hr, while the other travels south at 14 km/hr. What is the relative velocity, using the faster bicycle as the reference? If they never meet, which one is in front?

6. Two cars are on a road. One travels at 88 km/hr east, while the other travels at 81 km/hr west. If they are 541 meters apart, how long will it take for them to collide?

Questions 7-10 refer to the graph below, for which the positive direction is north.
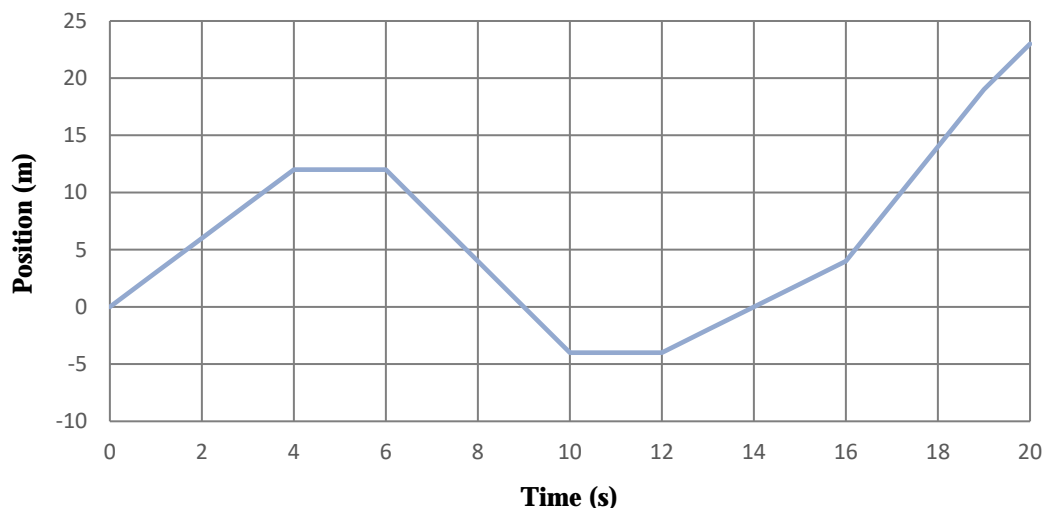
7. At what times does the object in the graph experience an acceleration? What direction is that acceleration?

8. During what time intervals is the object not moving?

9. During what time intervals is the object north of its starting position?

10. Are the instantaneous and average velocities the same from 6 seconds to 10 seconds? What about from 12 seconds to 20 seconds?

11. What is the instantaneous velocity at 14 seconds?