

Chapter 11 Motion

Section 11.1 Distance and Displacement

(pages 328–331)

This section defines distance and displacement. Methods of describing motion are presented. Vector addition and subtraction are introduced.

Reading Strategy (page 328)

Predicting Write a definition for *frame of reference* in your own words in the left column of the table. After you read the section, compare your definition to the scientific definition and explain why a frame of reference is important. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Frame of Reference	
Frame of reference probably means	Frame of reference actually means

1. What two things must you know to describe the motion of an object?

Choosing a Frame of Reference (pages 328–329)

2. Is the following sentence true or false? A frame of reference is not necessary to describe motion accurately and completely. _____
3. What is a frame of reference? _____

4. Movement in relation to a frame of reference is called _____.
5. Imagine that you are a passenger in a car. Circle the letter of the best frame of reference you could use to determine how fast the car is moving relative to the ground.
- a. the people sitting next to you in the backseat
 - b. the driver of the car
 - c. a van traveling in the lane next to your car
 - d. a sign post on the side of the road

Measuring Distance (page 329)

6. Distance is _____.
7. Circle the letter of the SI unit best suited for measuring the length of a room in your home.
- a. kilometers
 - b. meters
 - c. centimeters
 - d. millimeters

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Measuring Displacements (page 330)

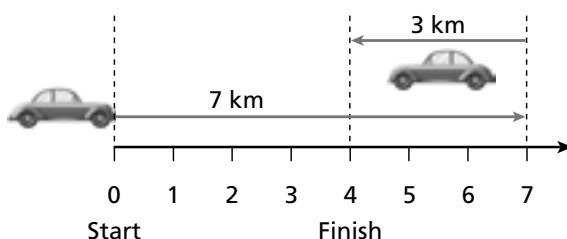
8. Is the following sentence true or false? Five blocks south is an example of a displacement. _____
9. Compare and contrast distance and displacement. _____

10. What would your total displacement be if you walked from your front door, around the block, and then stopped when you reached your front door again?
 - a. one block
 - b. two blocks
 - c. the entire distance of your trip
 - d. zero

Combining Displacements (pages 330–331)

11. A vector is a quantity that has both _____ and _____.
12. Circle the letter of each answer that could describe the magnitude of a vector.
 - a. length
 - b. direction
 - c. amount
 - d. size
13. To combine two displacements that are in opposite directions, the magnitudes _____ from one another.

For questions 14 and 15, refer to the figure below.



14. The magnitudes of the two displacement vectors are _____ and _____.
15. Because the two displacements are in opposite directions, the magnitude of the total displacement is _____.
16. Circle the letter that answers the question. What is the displacement of a cyclist who travels 1 mile north, then 1 mile east, and finally 1 mile south?
 - a. 3 miles east
 - b. 1 mile north
 - c. 3 miles south
 - d. 1 mile east
17. The vector sum of two or more other vectors is called the _____.