CHAPTER 3 Review

VECTORS AND THE GRAPHICAL METHOD

Review Questions

1. The magnitude of a vector is a scalar. Explain this statement.

2. If two vectors have unequal magnitudes, can their sum be zero? Explain.

3. What is the relationship between instantaneous speed and instantaneous velocity?

4. What is another way of saying –30 m/s west?

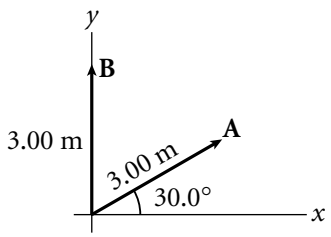
5. Is it possible to add a vector quantity to a scalar quantity? Explain.

6. Vector **A** is 3.00 units in length and points along the positive *x*-axis. Vector **B** is 4.00 units in length and points along the negative *y*-axis. Use graphical methods to find the magnitude and direction of the following vectors:

a. $\mathbf{A} + \mathbf{B}$
b. $\mathbf{A} - \mathbf{B}$
c. $\mathbf{A} + 2\mathbf{B}$
d. $\mathbf{B} - \mathbf{A}$

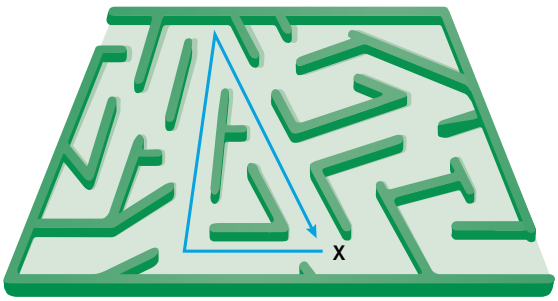
7. Each of the displacement vectors **A** and **B** shown in the figure below has a magnitude of 3.00 m. Graphically find the following:

a. $\mathbf{A} + \mathbf{B}$
b. $\mathbf{A} - \mathbf{B}$
c. $\mathbf{B} - \mathbf{A}$
d. $\mathbf{A} - 2\mathbf{B}$



8. A dog searching for a bone walks 3.50 m south, then 8.20 m at an angle of 30.0° north of east, and finally 15.0 m west. Use graphical techniques to find the dog's resultant displacement vector.

9. A man lost in a maze makes three consecutive displacements so that at the end of the walk he is back where he started, as shown below. The first displacement is 8.00 m westward, and the second is 13.0 m northward. Use the graphical method to find the third displacement.



Conceptual Questions

10. If **B** is added to **A,** under what conditions does the resultant have the magnitude equal to $A + B$?

11. Give an example of a moving object that has a velocity vector and an acceleration vector in the same direction and an example of one that has velocity and acceleration vectors in opposite directions.

12. A student accurately uses the method for combining vectors. The two vectors she combines have magnitudes of 55 and 25 units. The answer that she gets is either 85, 20, or 55. Pick the correct answer, and explain why it is the only one of the three that can be correct.

13. If a set of vectors laid head to tail forms a closed polygon, the resultant is zero. Is this statement true? Explain your reasoning.