8-1

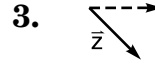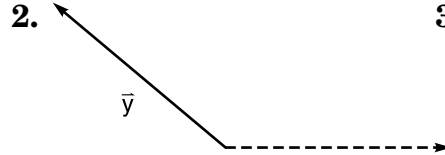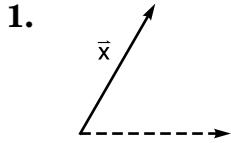# Practice

Geometric Vectors

Use a ruler and a protractor to determine the magnitude (in centimeters) and direction of each vector.

1.

2.

3.

Find the magnitude and direction of each resultant.

4. $\vec{x} + \vec{y}$

5. $\vec{x} - \vec{z}$

6. $2\vec{x} + \vec{y}$

7. $\vec{y} + 3\vec{z}$

Find the magnitude of the horizontal and vertical components of each vector shown in Exercises 1-3.

8. $\vec{x}$

9. $\vec{y}$

10. $\vec{z}$

11. *Aviation*   An airplane is flying at a velocity of 500 miles per hour due north when it encounters a wind blowing out of the west at 50 miles per hour. What is the magnitude of the airplane's resultant velocity?

8-2

Practice

Algebraic Vectors

Write the ordered pair that represents $\overrightarrow{AB}$. Then find the magnitude of $\overrightarrow{AB}$.

1. $A(2, 4), B(-1, 3)$ **2.** $A(4, -2), B(5, -5)$ **3.** $A(-3, -6), B(8, -1)$

Find an ordered pair to represent $\vec{u}$ in each equation if $\vec{v} = \langle 2, -1 \rangle$ and $\vec{w} = \langle -3, 5 \rangle$.

4. $\vec{u} = 3\vec{v}$ **5.** $\vec{u} = \vec{w} - 2\vec{v}$

6. $\vec{u} = 4\vec{v} + 3\vec{w}$ **7.** $\vec{u} = 5\vec{w} - 3\vec{v}$

Find the magnitude of each vector, and write each vector as the sum of unit vectors.

8. $\langle 2, 6 \rangle$ **9.** $\langle 4, -5 \rangle$

10. *Gardening*   Nancy and Harry are lifting a stone statue and moving it to a new location in their garden. Nancy is pushing the statue with a force of 120 newtons (N) at a 60° angle with the horizontal while Harry is pulling the statue with a force of 180 newtons at a 40° angle with the horizontal. What is the magnitude of the combined force they exert on the statue?