

1. An airplane is flying on a compass bearing of  $320^\circ$  at 550 mph. Find the component form of the velocity of the airplane. The wind is blowing North at 35 mph. Find the component form of the wind. What is the ground speed of the airplane?

2. A basketball is shot at a  $70^\circ$  angle from the horizontal direction with an initial speed of 10 m/sec. Find the component form of the initial velocity.

3. Find the magnitude and direction of the following vectors.

a.  $\langle 2, 4 \rangle$

b.  $\langle 4, -3 \rangle$

c.  $\langle -5, -1 \rangle$

d.  $\langle -6, 2 \rangle$

4. Find the component form of the vector using the given direction and magnitude.

a.  $\theta = 44^\circ$   
 $|v| = \sqrt{15}$

b.  $\theta = 332^\circ$   
 $|v| = 7$

5. Given:  $u = \langle 3, -6 \rangle$ ,  $v = \langle -5, -3 \rangle$  find each of the following:

a.  $u + v$

b.  $3u - v$

c.  $u - v$

d.  $2u - 4v$

6. Given  $u = \langle 3, -2 \rangle$  and  $v = \langle -5, 2 \rangle$ , find each of the following:

a.  $u \cdot v$

b.  $u \cdot u$

7. Find the angle between the given vectors.

a.  $\langle -2, 5 \rangle$   
 $\langle 13, 2 \rangle$

b.  $\langle -3, -1 \rangle$   
 $\langle 2, 5 \rangle$

8. For each parametric equation, graph, eliminate the parameter, and check your solution with your calculator.

a.  $x = 2t + 1$   
 $y = t - 1$

b.  $x = t^2 + 1$   
 $y = 3t + 2$

c.  $x = 3 \cos t$   
 $y = 3 \sin t$

9. Write the parametric equation that represents each situation.

a. The line through the points  $A = (2, -3)$   
 $B = (-6, -2)$ .

b. The circle with center  $(-4, 5)$  and radius 3.