

## Chapter 6 Practice Test

**For Exercises 1 and 2, use the Law of Sines to find the remaining sides and angles of the triangle.**

- $A = 40^\circ$ ,  $B = 12^\circ$ ,  $b = 100$
- $C = 150^\circ$ ,  $a = 5$ ,  $c = 20$
- Find the area of the triangle:  $a = 3$ ,  $b = 6$ ,  $C = 130^\circ$ .
- Determine the number of solutions to the triangle:  $a = 10$ ,  $b = 35$ ,  $A = 22.5^\circ$ .

**For Exercises 5 and 6, use the Law of Cosines to find the remaining sides and angles of the triangle.**

- $a = 49$ ,  $b = 53$ ,  $c = 38$
- $C = 29^\circ$ ,  $a = 100$ ,  $b = 300$
- Use Heron's Formula to find the area of the triangle:  $a = 4.1$ ,  $b = 6.8$ ,  $c = 5.5$ .
- A ship travels 40 miles due east, then adjusts its course  $12^\circ$  southward. After traveling 70 miles in that direction, how far is the ship from its point of departure?
- $\mathbf{w} = 4\mathbf{u} - 7\mathbf{v}$  where  $\mathbf{u} = 3\mathbf{i} + \mathbf{j}$  and  $\mathbf{v} = -\mathbf{i} + 2\mathbf{j}$ . Find  $\mathbf{w}$ .
- Find a unit vector in the direction of  $\mathbf{v} = 5\mathbf{i} - 3\mathbf{j}$ .
- Find the dot product and the angle between  $\mathbf{u} = 6\mathbf{i} + 5\mathbf{j}$  and  $\mathbf{v} = 2\mathbf{i} - 3\mathbf{j}$ .
- $\mathbf{v}$  is a vector of magnitude 4 making an angle of  $30^\circ$  with the positive  $x$ -axis. Find  $\mathbf{v}$  in component form.
- Find the projection of  $\mathbf{u}$  onto  $\mathbf{v}$  given  $\mathbf{u} = \langle 3, -1 \rangle$  and  $\mathbf{v} = \langle -2, 4 \rangle$ .
- Give the trigonometric form of  $z = 5 - 5i$ .
- Give the standard form of  $z = 6(\cos 225^\circ + i \sin 225^\circ)$ .
- Multiply  $[7(\cos 23^\circ + i \sin 23^\circ)][4(\cos 7^\circ + i \sin 7^\circ)]$ .
- Divide  $\frac{9\left(\cos \frac{5\pi}{4} + i \sin \frac{5\pi}{4}\right)}{3(\cos \pi + i \sin \pi)}$ .
- Find  $(2 + 2i)^8$ .
- Find the cube roots of  $8\left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}\right)$ .
- Find all the solutions to  $x^4 + i = 0$ .