**Area, Law of Sines and Law of Cosines** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

In problems 1-4, you are to find the missing sides and angles of the triangles and find the area.

A A

1. 2. 6.4 cm 3.8 cm

T

57.82° 35.89° C

B 6.31 cm C 4.9 cm

1. PIG , ∠P = 9 m, i = 5.13 m, and g = 4.29 m
2. EHS, ∠E = 56.2°, ∠H = 48.9°, and s = 12.38
3. Draw a triangle from the following description. With O at the origin, side OP is formed by an angle in standard position of 241.6° and is 226 cm in length. Side OR is formed by and angle in the standard position of 109.1° and is 321 cm long. Find the length of side PR and the angles of the triangle.
4. A triangle has sides of lengths 5 in., 7 in., and 10. Find the size of the largest angle and the area of the triangle.
5. Ranger Jull’s ranger station is located 17 miles due east of Ranger Will’s ranger station. Ranger Jill spots a fire by looking north of Will’s station at an angle of elevation of 37° and Ranger Will spots the same fire at an angle of elevation of 60° north of Jill’s ranger station. How far is the fire from Jill?
6. A ship is traveling at 16 mph and spots a lighthouse at an angle of 21° to starboard (right of the ship). 15 minutes later he checks to see that the lighthouse is 31°. At that moment, how far is the ship from the lighthouse? (Answer to the nearest mile.)
7. An observer on a cliff 1200 ft above sea level sights two ships in a line due East. The angles of depression of the ships from the observer are 47° and 32° respectively. Find, to the nearest foot, the distance between the ships.
8. A surveyor wants to find the width of a narrow, deep gorge from a point on the edge. To do this, the surveyor takes measurements as shown in the figure at the right. How wide is the gorge?

105°

10°

50 ft.

1. Diagonals of a parallelogram are 90 and 68, and the shorter side is 36. Find the measure of the acute angle formed by the two diagonals.
2. An isosceles triangle has a base of 22 cm and exactly one angle measuring 36°. Find its perimeter.
3. A medical rescue helicopter has flown 45 miles from its home base to pick up an accident victim and 35 miles from there to the hospital. The angle between the two legs of the trip was 125°. The pilot needs to know how far he is from his home base so he can decide whether to refuel before returning. How far is the helicopter from the helicopter’s base?
4. A surveyor at point X sights on two points, Y and Z on opposite sides of a pond. Point X is 150 yd from point Y and 200 yd from point Z. If the measure of the angle formed by the two lines of flight at point X is 42°, what is the distance across the pond?
5. A pilot takes off from Newport News, Virginia, and flies toward the Atlantic Ocean. After reaching point C, the plane develops mechanical difficulties, and the pilot needs to return to Newport News or Norfolk, Virginia. How far is it to the nearer airport?

