9.2 EXERCISES

PRACTICE

Solve for the remaining angles and side of the triangles. See Example 2.

1. $A = 60°, b = 3, c = 7$

2. $A = 40°, b = 2, c = 3$

3. $B = 50°, a = 4, c = 6$

4. $B = 45°, a = 5, c = 4$

5. $C = 30°, a = 8, b = 6$

6. $A = 110°, b = 2, c = 1$

7. $C = 70°, a = 5, b = 7$

8. $B = 100°, a = 1, c = 3$

Solve for the angles of the given triangles. See Example 1.

9. $a = 3, b = 4, c = 2$

10. $a = 5, b = 2, c = 6$

11. $a = 8, b = 6, c = 3$

12. $a = 9, b = 4, c = 7$

13. $a = 5, b = 5, c = 5$

14. $a = 6, b = 4, c = 7$

15. $a = 5, b = 3, c = 4$

16. $a = 7, b = 2, c = 8$

Create a triangle, if possible, using the given information and the Law of Cosines. See Examples 1 and 2.

17. $A = 65°, c = 13, b = 7$

18. $C = 35°, b = 12, a = 14$

19. $B = 24.2°, a = 13.3, c = 21.2$

20. $C = 46°7', a = 27.8, b = 19.4$

21. $A = 103°, c = 8, b = 6.3$

22. $C = 75°4', b = 15.4, a = 16.8$

23. $b = 12, c = 9, a = 15$

24. $c = 4.78, b = 16.46, a = 16.54$

25. $b = 4.2, a = 7.6, c = 9.2$

26. $b = 6.84, c = 10.87, a = 7.37$

27. $a = 76.45, b = 94.45, c = 84.42$

28. $a = 5, b = 10, c = 7$

Find the area of the triangle using the given information. See Example 3.

29. $b = 12, c = 18, a = 15$

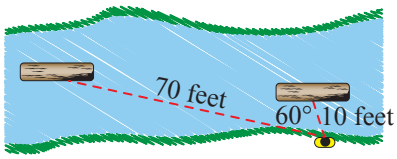
30. $a = 3, b = 7, c = 8$

31. $a = 5.45, b = 4.83, c = 9$

32. $a = 4.2, b = 9.1, c = 11.5$

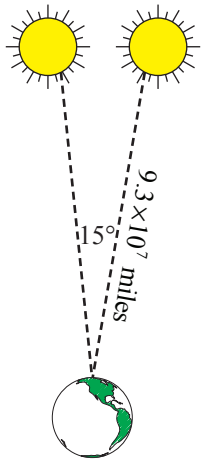
APPLICATIONS

33. A log is seen floating down a stream. The log is first spotted 10 feet away. Ten seconds later the log is 70 feet away, making a 60° angle between the two sightings. How far did the log travel?



34. A bullet is fired and ricochets off a metal sign 100 feet away, making an 80° angle as it speeds toward a tree where it embeds itself. If the sign and tree are 60 feet apart, how far did the bullet stop from where it was fired?

35. Astronomers once thought the sun revolved around Earth. The sun is 9.3×10^7 miles away and moves 15° across the sky in an hour. Assuming the sun travels in a straight line, how far would it have had to travel?



36. A pitcher 60 feet away throws a baseball to Joey. Joey bunts the ball at a 20° angle away from the pitcher. If the ball travels 50 feet, how far does the pitcher have to run to pick up the ball?

37. Nick is surfing a wave that carries him for 20 feet. He executes a sharp turn making a 100° angle. He rides the wave for 5 feet more before he topples into the water. How far is Nick from where he started?

38. A farmer puts a piece of fence across an inside corner of his barn to make a pen for his chickens. The lengths of the sides of the pen are 7 feet, 5 feet, and 8 feet. What are the respective angles?

39. Teresa wants to make a picture frame with two 5-inch and two 12-inch pieces of wood. If the diagonal length is 13 inches, what do the inside angles have to be for the two imaginary triangles?

40. Brian is up to bat. He hits the ball straight at the pitcher 60 feet away. The ball ricochets off the pitcher's shoulder at a 100° angle and comes to rest 40 feet away from the pitcher. How far did the ball travel away from Brian?

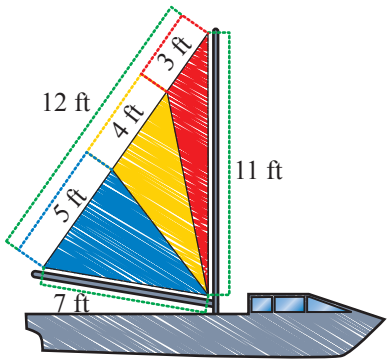
41. A plane took off and ascended for 1000 feet before leveling off. Once level, the plane flew for 500 feet, which put it 1480 feet directly away from where it started. After leveling off, what is the angle between the plane's current horizontal flight path and its ascending flight path?

42. Bob wants to build an ice skating rink in his backyard, but his wife says he can only use the part beyond the wood-chipped path running through their yard. How large would his rink be if it is triangular with sides of length 20 feet, 23 feet, and 32 feet?

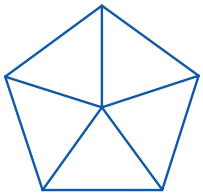
43. The USS *Cyclops* mysteriously disappeared somewhere in the Bermuda Triangle in 1918. Miami, Florida; San Juan, Puerto Rico; and the Bermudas are generally accepted as the three points of the triangle. The distances from Miami to San Juan and from Miami to the Bermudas are both 908.2 nautical miles and the distance from San Juan to the Bermudas is 839.1 nautical miles. How large an area must be searched to look for the remains of the missing ship?

44. Brian just bought a used sailboat, but it needs a new triangular sail. The dimensions of the sail are 11 feet × 12 feet × 7 feet.

a. What are the measures of the three angles of the sail?
b. How much fabric would a sail of this size require?
c. Suppose he plans to make the sail three different colors by dividing the largest angle so the 12-foot side is split into three sections of 5 feet (blue), 4 feet (yellow), and 3 feet (red), respectively. How much fabric of each color would he need?



45. Any regular (all sides are equal) n-sided polygon can be divided into n identical triangles by drawing a line from each vertex to the center of the polygon. A pentagon would be divided as shown in the figure.



a. If each side has a length of 6 inches, what would the area of the given pentagon be?
b. Using a similar method, what would be the area of an octagon with sides of length 11 inches?
c. What would be the area of a five-pointed star where each line segment has a length of 8 inches?