9.1 EXERCISES

PRACTICE

Solve for the remaining angle and sides of the triangles. See Examples 1 and 2.

1. $A = 30°, B = 45°, a = 3$

2. $A = 60°, B = 40°, a = 2$

3. $A = 70°, B = 50°, b = 4$

4. $A = 100°, B = 20°, b = 1$

5. $B = 70°, C = 30°, c = 2$

6. $B = 120°, C = 40°, b = 6$

7. $A = 20°, B = 10°, a = 2$

8. $B = 100°, C = 30°, a = 3$

Create a triangle, if possible, using the given information and the Law of Sines. See Examples 3 and 4.

9. $A = 40°, a = 2, b = 4$

10. $A = 40°, a = 4, b = 4$

11. $C = 45°, a = 2, c = 4$

12. $A = 32°, a = 4, b = 7$

13. $C = 140°, b = 1, c = 9$

14. $A = 60°, a = 5, c = 6$

15. $B = 80°, a = 2, b = 6$

16. $B = 50°, b = 2, c = 5$

17. $B = 110°, a = 1, b = 8$

18. $A = 60°, a = 10, b = 6$

19. $C = 42°, b = 9, c = 3$

20. $B = 13.2°, A = 63.7°, b = 21.2$

21. $A = 6°23', B = 64°15', c = 2.5$

22. $C = 100°, a = 18.1, c = 20.4$

23. $A = 108°, a = 9, b = 8.9$

24. $C = 24°, b = 2.4, c = 1.5$

25. $B = 16.9°, A = 29.7°, b = 17.8$

26. $A = 46°53', B = 74°13', c = 3.1$

27. $C = 116°, a = 24.1, c = 25$

28. $A = 10°, a = 2, b = 5$

29. $A = 30°, a = 15, b = 13$

30. $C = 74°, b = 4.5, c = 23$

Find the area of the triangle using the given information. See Example 5.

31. $A = 131°, b = 10, c = 25$

32. $B = 60°7', c = 18, a = 6$

33. $C = 103°, a = 10, b = 2$

34. $B = 54°, a = 10, c = 7$

35. $A = 67°49', c = 4.2, b = 9.5$

36. $C = 46°, b = 20, a = 19$

37. $A = 86°, b = 24, c = 28$

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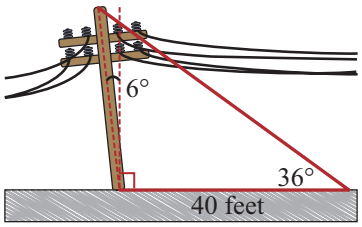
APPLICATIONS

38. A plane flies 730 miles from Charleston, SC to Cleveland, OH with a bearing of N 30° W (30° West of North). The plane then flies from Cleveland to Dallas, TX at a S 42° W bearing (42° West of South). How far is Dallas from Charleston (assume Dallas and Charleston are at the same latitude)?

39. Jack wants to build a tree house. His parents worry that he is building it too high. If Jack's dad is looking at the tree house location from a 70° angle and then moves back 10 feet so he can see it at a 50° angle, how high is the tree house location?

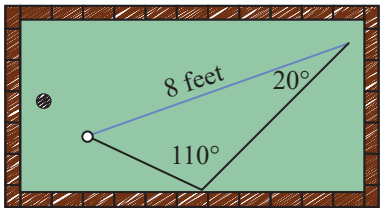
40. A telephone pole was recently hit by a car and now leans 6° from the vertical. A point 40 feet away from the base of the pole has an angle of elevation of 36° to the top of the pole. How tall is the pole?



41. As Brandy prepares to land her plane on the runway, she is descending at a 10° angle from the horizontal. Behind her is a marker on the ground that is 500 feet from the runway, and at the marker the angle between the ground and Brandy's plane is 50°. What is the actual distance (not ground distance) between Brandy's plane and the runway?

42. A surveyor sets up two positions A and B 500 yards apart as a baseline on a beach. From position A, he measures an angle of 75° between the baseline and a buoy offshore. From position B he measures an angle of 50° between the baseline and the buoy. How far is the buoy from each of the two positions?

43. Kristin is playing miniature golf. She hits the ball and it bounces off a brick, making a 110° angle. Her ball comes to a stop 8 feet away at a 20° angle from where it started. How far did the ball travel?



44. Janet is racing her friend Susan. Susan runs 10° away from Janet for 2000 feet. If she has to turn at a 50° angle to get back to Janet's path, how much shorter was Janet's run?

45. Two pieces of mail blew out into the yard. When Bob went to pick them up, he walked 10 feet to the first piece, turned 40° and walked to the next piece, and finally turned 150° to walk back to where he started. How far did Bob walk?

46. A horizontal bridge is suspended over a gorge, with the bridge and the sides of the gorge forming a downward-pointing isosceles triangle. If the bridge makes an 80° angle with the side of the gorge and the bridge is 1000 feet long, how deep is the gorge?

47. Brittany and Jim are playing catch. They are standing 30 feet away from each other. Ryan wants to join them and stands at a 50° angle away from Jim and at a 70° angle away from Brittany. How far away is Ryan from Jim and Ryan from Brittany?

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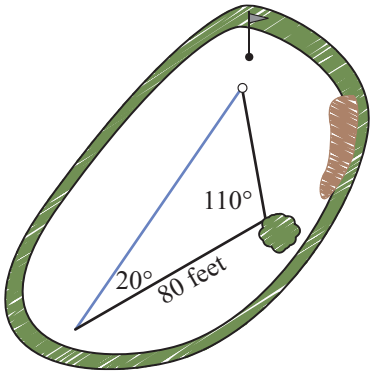
48. Alan is golfing and sets up for a long drive. He slices it and hits a tree 80 feet away. The ball ricochets off of it at a 110° angle and comes to a stop 20° away from the direction he hit it. How far from Alan did the ball land?



49. An airplane has to fly between 3 airports. The trip from the 1st to the 2nd is 120 miles. After landing at the 2nd airport, the airplane must turn 140° to head toward the 3rd airport. At the 3rd airport it must turn 100° to head to the first airport. How far does the airplane have to travel from the 2nd airport to the 3rd?

50. A ping pong net has become bent at a 70° angle instead of a 90° angle. The bottom of the net is 4.5 feet away from the end of the table. If the top of the net is 4.35 feet away from the end of the table, how high is the net?

51. A gymnast bends over backward until her hands touch the ground, at which point there is an angle of 60° between an imaginary line from her waist to her feet and an imaginary line from her waist to her hands. If the distance from her feet to her waist is 3 feet and the distance from her feet to her hands is 3.3 feet, what is the distance between her waist and hands?

52. Nancy wants to plant wildflowers between the two intersecting paths in her garden. If the paths intersect at a 72° angle and she wants the flowers to extend 12 feet down one path and 15 feet down the other, how large is the area she wants to plant?

53. An A-frame house overlooking the Atlantic Ocean has windows entirely covering one end. If the roof intersects at a 54° angle and the roof is 21 feet long from peak to ground, how much area do the windows cover?

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