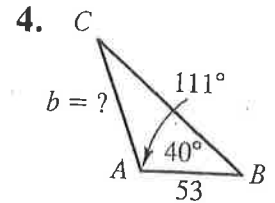## PRACTICE EXERCISES

Solve each triangle for the indicated side. Express your answer to two significant digits.

1. **2.** **3.** **4.**
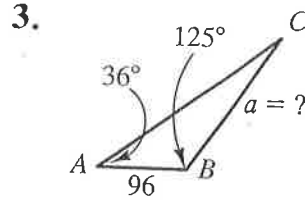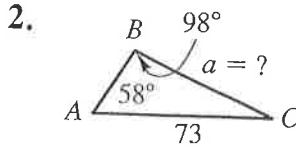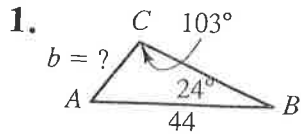
5. $\angle A = 39°$, $\angle B = 42°$, $c = 47$; find a.

6. $\angle A = 41°$, $\angle B = 57°$, $c = 52$; find b.

7. $\angle B = 72°$, $\angle C = 31°$, $a = 103$; find b.

8. $\angle B = 34°$, $\angle C = 71°$, $a = 115$; find b.

9. $\angle A = 48°$, $\angle B = 38°$, $b = 49$; find c.

10. $\angle A = 35°$, $\angle B = 56°$, $a = 51$; find c.

11. $\angle A = 128°$, $\angle C = 19°$, $a = 47$; find c.

12. $\angle B = 119°$, $\angle C = 21°$, $b = 59$; find c.

13. $\angle A = 49.7°$, $\angle B = 48.6°$, $a = 31$; find b.

14. $\angle A = 48.7°$, $\angle B = 40.2°$, $b = 29$; find a.

Solve each triangle PQR. Give angle measures to the nearest degree and lengths to two significant digits.

15. $p = 18$, $\angle Q = 46°$, $\angle R = 39°$

16. $p = 24$, $\angle Q = 51°$, $\angle R = 38°$

17. $q = 48$, $\angle P = 63°$, $\angle R = 51°$

**18.** $q = 75$, $\angle P = 42°$, $\angle R = 20°$

Solve each triangle PQR. Express the lengths of the sides to three significant digits and angle measures to the nearest tenth of a degree.

19. $\angle P = 32.6°$, $\angle R = 46.9°$, $r = 115$

20. $\angle P = 45.8°$, $\angle R = 32.6°$, $p = 113$

21. $\angle P = 54.2°$, $\angle Q = 45.9°$, $r = 76.1$

22. $\angle P = 76.7°$, $\angle Q = 29.3°$, $r = 87.0$

23. $\angle Q = 113.4°$, $\angle P = 27.5°$, $p = 56.3$

24. $\angle Q = 129.7°$, $\angle P = 23.8°$, $p = 112$

25. $\angle R = 54.9°$, $\angle Q = 110.3°$, $q = 73.2$

26. $\angle R = 21.7°$, $\angle Q = 97.5°$, $q = 85.3$

27. $\angle P = 47.3°$, $\angle Q = 65.2°$, $p = 96.4$

28. $\angle P = 55.9°$, $\angle Q = 73.8°$, $p = 73.4$

29. $\angle Q = 132.7°$, $\angle P = 28.1°$, $p = 67.4$

30. $\angle Q = 31.7°$, $\angle P = 42.9°$, $p = 87.6$

Surveying In Exercises 36–40, give angle measures to the nearest degree and lengths to two significant digits, unless otherwise specified.

36. From two points P and Q that are 140 ft apart, the lines of sight to a flagpole across a river make angles of 79° and 58°, respectively, with the line joining P and Q. What are the distances from P and Q to the flagpole?
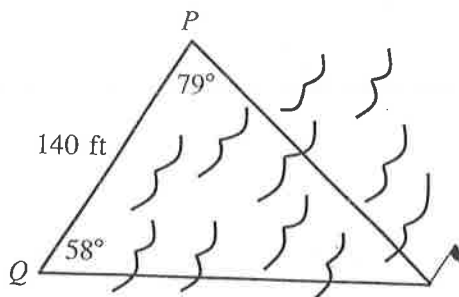
37. Suppose that a parcel of land is triangular, with vertices A and B on the roadway and the third vertex marked at point C. A surveyor measures the distance from A to B and finds that it is 245.8 ft. The lines of sight from A and B to C make angles of 79.46° and 51.67°, respectively, with the line from A to B. Find the measure of angle C and the lengths of sides AC and BC. Give the angle measure to the nearest hundredth of a degree and the lengths to the nearest tenth of a foot.
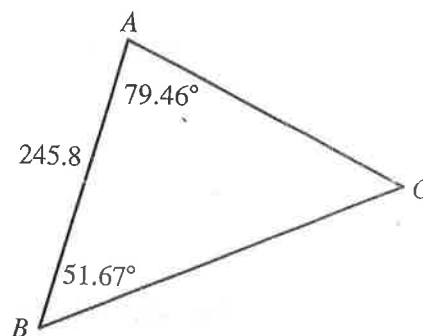
38. As you walk on a straight level path toward a mountain, the measure of the angle of elevation to the peak from one point is 33°. From a point 1000 ft closer, the angle of elevation is 35°. How high is the mountain?
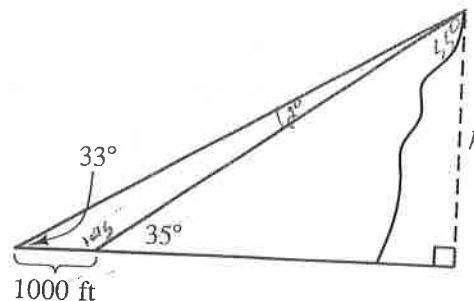
39. A flagpole stands on the edge of the bank of a river. From a point on the opposite bank directly across from the flagpole, the measure of the angle of elevation to the top of the pole is 25°. From a point 200 ft further away and in line with the pole and the first point, the measure of the angle of elevation to the top of the pole is 21°. Draw a diagram. Then find the distance across the river.

40. You measure the angle of elevation to an airplane as 46.3°. At the same time your friend, who is 600 ft closer to a point directly beneath the plane, measures the angle of elevation as 47.5°. Draw a diagram. Then find the altitude of the plane.