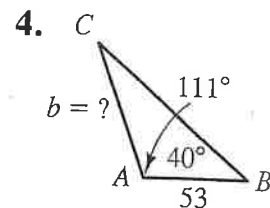
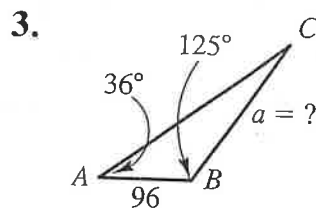
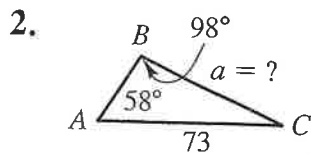
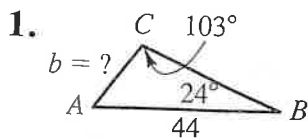


PRACTICE EXERCISES

Law of Sines

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



5. $\angle A = 39^\circ$, $\angle B = 42^\circ$, $c = 47$; find a .
6. $\angle A = 41^\circ$, $\angle B = 57^\circ$, $c = 52$; find b .
7. $\angle B = 72^\circ$, $\angle C = 31^\circ$, $a = 103$; find b .
8. $\angle B = 34^\circ$, $\angle C = 71^\circ$, $a = 115$; find b .
9. $\angle A = 48^\circ$, $\angle B = 38^\circ$, $b = 49$; find c .

10. $\angle A = 35^\circ$, $\angle B = 56^\circ$, $a = 51$; find c .
11. $\angle A = 128^\circ$, $\angle C = 19^\circ$, $a = 47$; find c .
12. $\angle B = 119^\circ$, $\angle C = 21^\circ$, $b = 59$; find c .
13. $\angle A = 49.7^\circ$, $\angle B = 48.6^\circ$, $a = 31$; find b .
14. $\angle A = 48.7^\circ$, $\angle B = 40.2^\circ$, $b = 29$; find a .

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

15. $p = 18$, $\angle Q = 46^\circ$, $\angle R = 39^\circ$
16. $p = 24$, $\angle Q = 51^\circ$, $\angle R = 38^\circ$
17. $q = 48$, $\angle P = 63^\circ$, $\angle R = 51^\circ$
18. $q = 75$, $\angle P = 42^\circ$, $\angle R = 20^\circ$

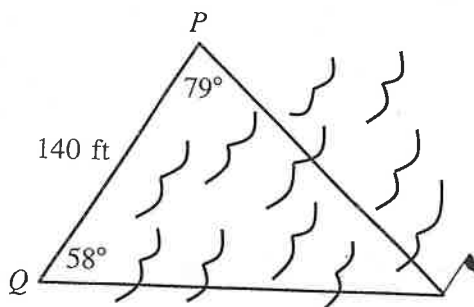
Solve each triangle PQR . Express the lengths of the sides to three significant digits and angle measures to the nearest tenth of a degree.

19. $\angle P = 32.6^\circ$, $\angle R = 46.9^\circ$, $r = 115$
20. $\angle P = 45.8^\circ$, $\angle R = 32.6^\circ$, $p = 113$
21. $\angle P = 54.2^\circ$, $\angle Q = 45.9^\circ$, $r = 76.1$
22. $\angle P = 76.7^\circ$, $\angle Q = 29.3^\circ$, $r = 87.0$
23. $\angle Q = 113.4^\circ$, $\angle P = 27.5^\circ$, $p = 56.3$
24. $\angle Q = 129.7^\circ$, $\angle P = 23.8^\circ$, $p = 112$
25. $\angle R = 54.9^\circ$, $\angle Q = 110.3^\circ$, $q = 73.2$
26. $\angle R = 21.7^\circ$, $\angle Q = 97.5^\circ$, $q = 85.3$
27. $\angle P = 47.3^\circ$, $\angle Q = 65.2^\circ$, $p = 96.4$
28. $\angle P = 55.9^\circ$, $\angle Q = 73.8^\circ$, $p = 73.4$
29. $\angle Q = 132.7^\circ$, $\angle P = 28.1^\circ$, $p = 67.4$
30. $\angle Q = 31.7^\circ$, $\angle P = 42.9^\circ$, $p = 87.6$

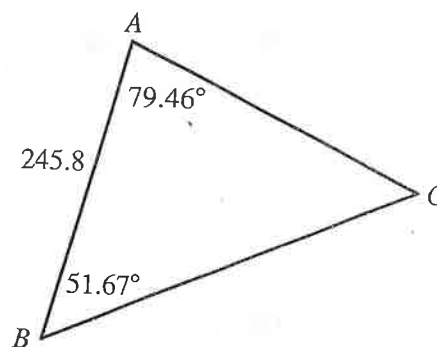
Applications

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

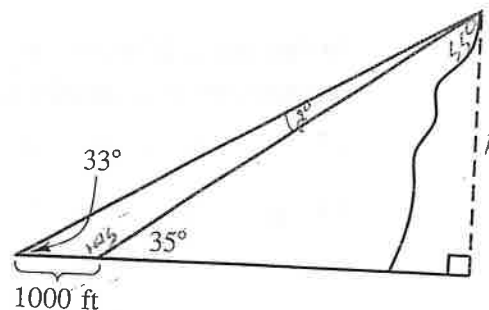
36. From two points P and Q that are 140 ft apart, the lines of sight to a flagpole across a river make angles of 79° and 58° , respectively, with the line joining P and Q . What are the distances from P and Q to the flagpole?



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.