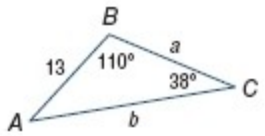
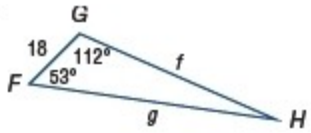
4-7 The Law of Sines and the Law of Cosines

Solve each triangle. Round to the nearest tenth, if necessary.

1. 

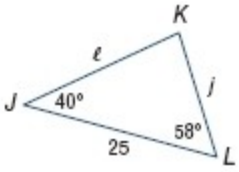
ANSWER:

$A = 32^\circ$, $a = 11.2$, $b = 19.8$

2. 

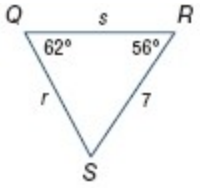
ANSWER:

$H = 15^\circ$, $f = 55.5$, $g = 64.5$

3. 

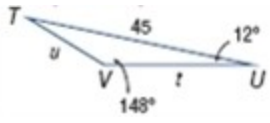
ANSWER:

$K = 82^\circ$, $j = 16.2$, $\ell = 21.4$

4. 

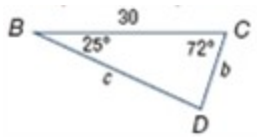
ANSWER:

$S = 62^\circ$, $r = 6.6$, $s = 7$

5. 

ANSWER:

$T = 20^\circ$, $t = 29.0$, $u = 17.7$

6. 

ANSWER:

$D = 83^\circ$, $b = 12.8$, $c = 28.7$

7. **GOLF** A golfer misses a 12-foot putt by putting 3º off course. The hole now lies at a 129º angle between the ball and its spot before the putt. What distance does the golfer need to putt in order to make the shot?

ANSWER:

about 0.85 ft

8. **ARCHITECTURE** An architect's client wants to build a home based on the architect Jon Lautner's Sheats-Goldstein House. The length of the patio will be 60 feet. The left side of the roof will be at a 49º angle of elevation, and the right side will be at an 18º angle of elevation. Determine the lengths of the left and right sides of the roof and the angle at which they will meet.

ANSWER:

left: about 20.1 ft, right: about 49.2 ft; 113°

9. **TRAVEL** For the initial 90 miles of a flight, the pilot heads 8º off course in order to avoid a storm. The pilot then changes direction to head toward the destination for the remainder of the flight, making a 157° angle to the first flight course.
a. Determine the total distance of the flight.
b. Determine the distance of a direct flight to the destination

ANSWER:

a. about 138.4 mi
b. about 135.9 mi

4-7 The Law of Sines and the Law of Cosines

Find all solutions for the given triangle, if possible. If no solution exists, write *no solution*. Round side lengths to the nearest tenth and angle measures to the nearest degree.

10. $a = 9, b = 7, A = 108°$

ANSWER:

$B = 48°, C = 24°, c = 3.9$

11. $a = 14, b = 15, A = 117°$

ANSWER:

no solution

12. $a = 18, b = 12, A = 27°$

ANSWER:

$B = 18°, C = 135°, c = 27.8$

13. $a = 35, b = 24, A = 92°$

ANSWER:

$B = 43°, C = 45°, c = 24.7$

14. $a = 14, b = 6, A = 145°$

ANSWER:

$B = 14°, C = 21°, c = 8.7$

15. $a = 19, b = 38, A = 30°$

ANSWER:

$B = 90°, C = 60°, c = 32.9$

16. $a = 5, b = 6, A = 63°$

ANSWER:

no solution

17. $a = 10, b = \sqrt{200}, A = 45°$

ANSWER:

$B = 90°, C = 45°, c = 10$

Solve each triangle. Round side lengths to the nearest tenth and angle measures to the nearest degree.

28. $\triangle XYZ$, if $x = 5, y = 18$, and $z = 14$

ANSWER:

$X = 11°, Y = 137°, Z = 32°$

30. $\triangle JKL$, if $J = 125°, k = 24$, and $l = 33$

ANSWER:

$K = 23°, L = 32°, j = 50.7$

32. $\triangle FGH$, if $f = 39, g = 50$, and $h = 64$

ANSWER:

$F = 38°, G = 51°, H = 91°$

34. $\triangle LMN$, if $l = 12, m = 4$, and $n = 9$

ANSWER:

$L = 131°, M = 15°, N = 34°$