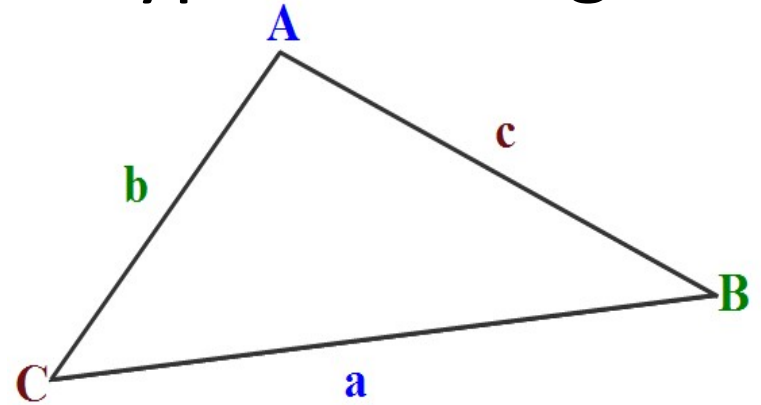


Notes: 6.5 Law of Sines → works for any type of triangle

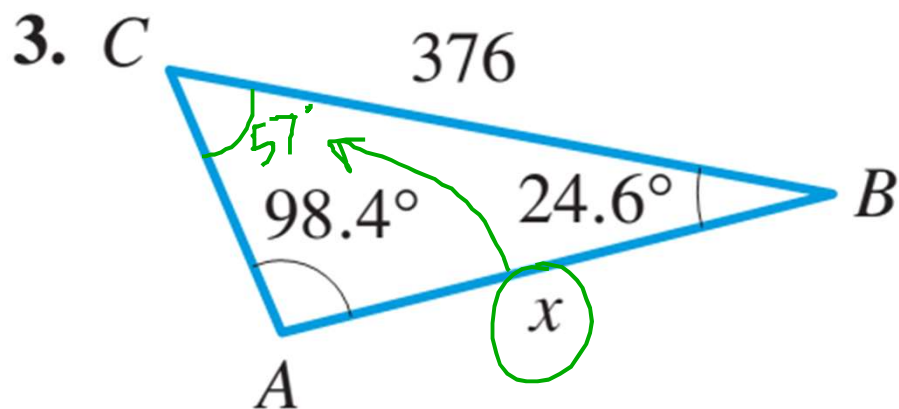
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

← angle
← opposing side



Note: you will use only 2 of the given ratios each time you set up an equation

3-8 ■ Finding an Angle or Side
the indicated side x or angle θ .



$$\begin{array}{r} 98.4 \\ + 24.6 \\ \hline 123^\circ \end{array}$$

$$\begin{array}{r} \angle C = 180 \\ - 123 \\ \hline 57^\circ \end{array}$$

$$\frac{\sin 57^\circ}{x} = \frac{\sin 98.4^\circ}{376}$$

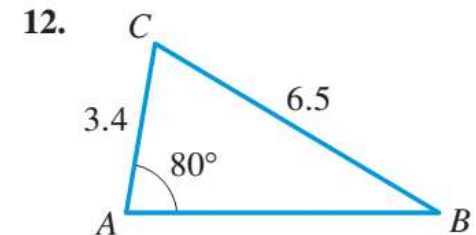
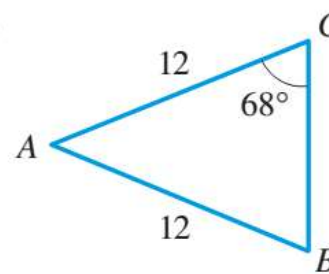
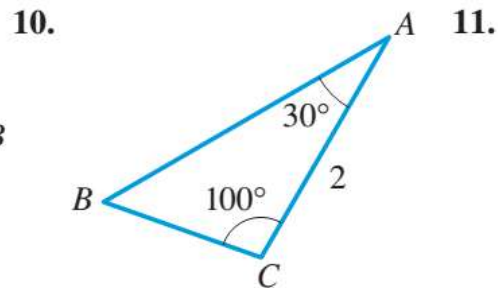
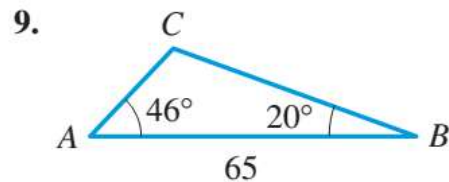
$$x \cdot \sin 98.4 = 376 \sin 57$$

$$x = \frac{376 \sin 57}{\sin 98.4}$$

$$x \approx 318.76$$

Reminder: Solve the Triangle for #9-17 odd (Find all missing sides and angles!)

9–12 ■ **Solving a Triangle** Solve the triangle using the Law of Sines.



13–18 ■ **Solving a Triangle** Sketch each triangle, and then solve the triangle using the Law of Sines.

13. $\angle A = 50^\circ$, $\angle B = 68^\circ$, $c = 230$

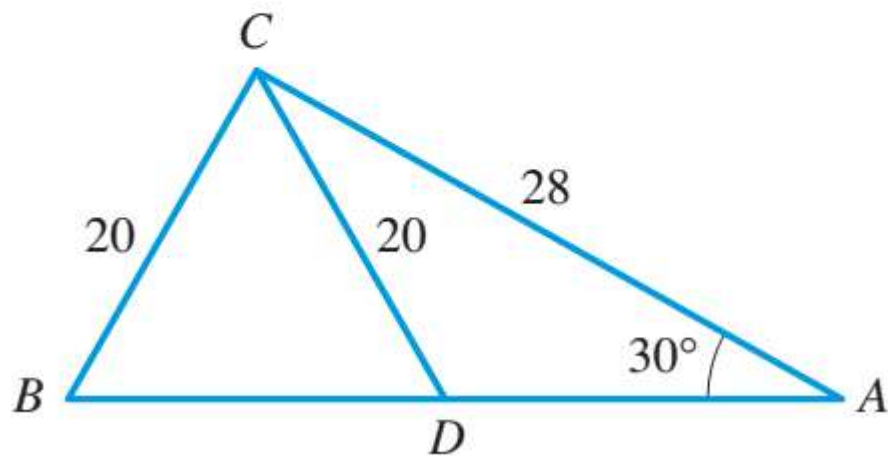
14. $\angle A = 23^\circ$, $\angle B = 110^\circ$, $c = 50$

15. $\angle A = 30^\circ$, $\angle C = 65^\circ$, $b = 10$

16. $\angle A = 22^\circ$, $\angle B = 95^\circ$, $a = 420$

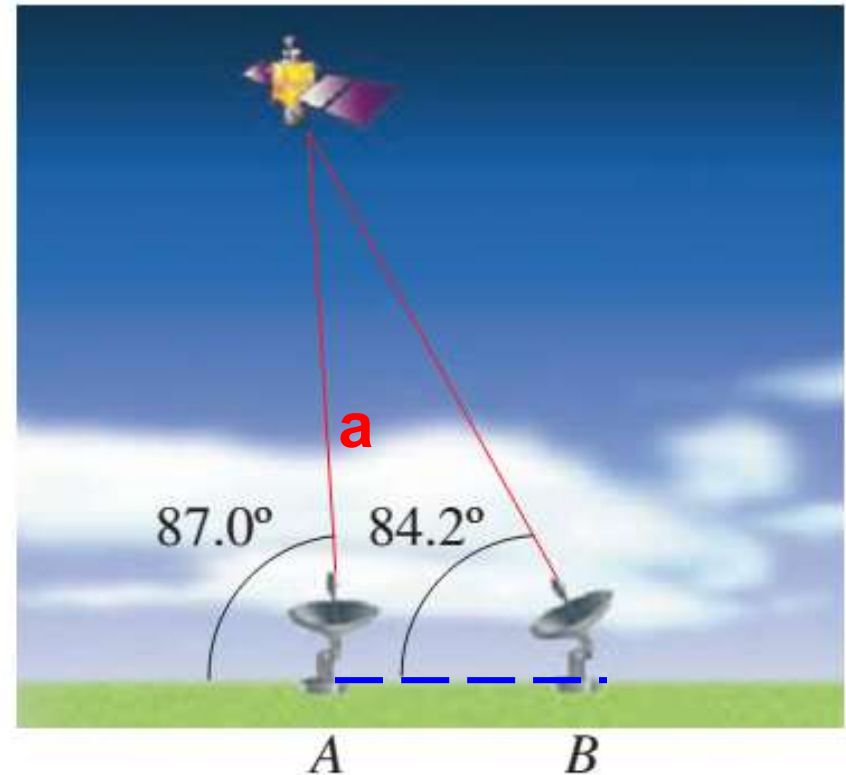
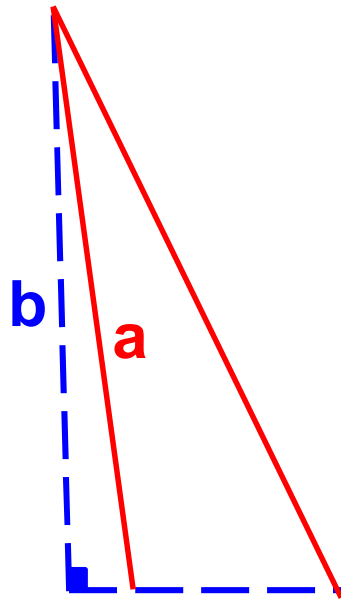
17. $\angle B = 29^\circ$, $\angle C = 51^\circ$, $b = 44$

29. **Finding Angles** For the triangle shown, find (a) $\angle BCD$ and (b) $\angle DCA$.

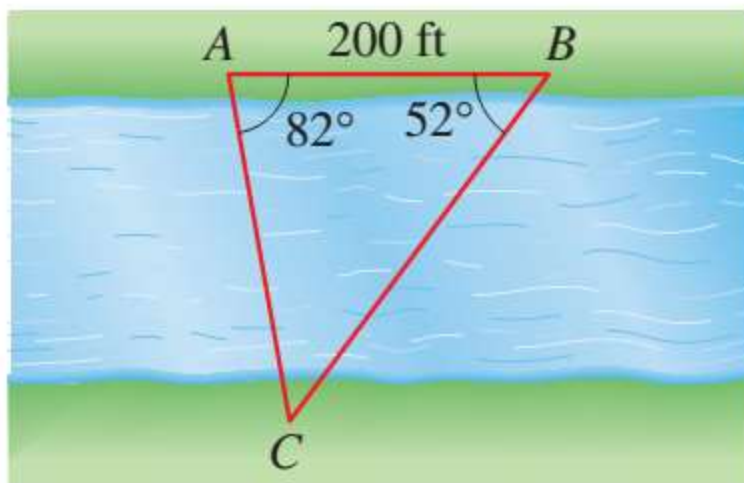


31. Tracking a Satellite The path of a satellite orbiting the earth causes the satellite to pass directly over two tracking stations A and B , which are 50 mi apart. When the satellite is on one side of the two stations, the angles of elevation at A and B are measured to be 87.0° and 84.2° , respectively.

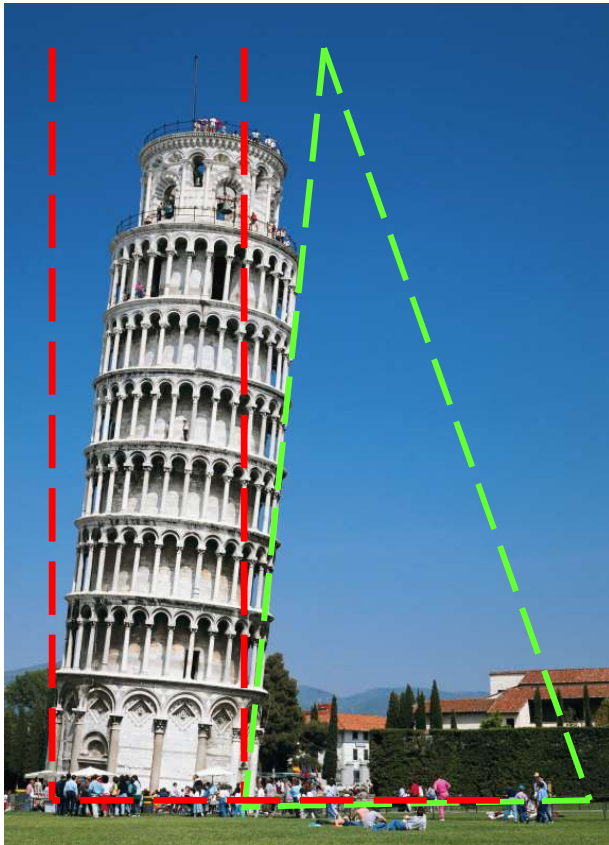
- (a) How far is the satellite from station A ?
- (b) How high is the satellite above the ground?



- 33. Distance Across a River** To find the distance across a river, a surveyor chooses points A and B , which are 200 ft apart on one side of the river (see the figure). She then chooses a reference point C on the opposite side of the river and finds that $\angle BAC \approx 82^\circ$ and $\angle ABC \approx 52^\circ$. Approximate the distance from A to C .

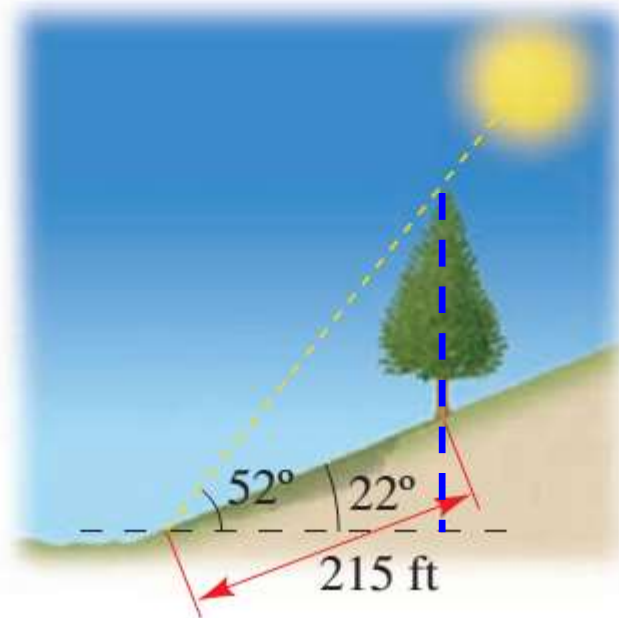


35. The Leaning Tower of Pisa The bell tower of the cathedral in Pisa, Italy, leans 5.6° from the vertical. A tourist stands 105 m from its base, with the tower leaning directly toward her. She measures the angle of elevation to the top of the tower to be 29.2° . Find the length of the tower to the nearest meter.



37. Height of a Tree A tree on a hillside casts a shadow 215 ft down the hill. If the angle of inclination of the hillside is 22° to the horizontal and the angle of elevation of the sun is 52° , find the height of the tree.

6.5:
Law of Sines



39. Calculating a Distance Observers at P and Q are located on the side of a hill that is inclined 32° to the horizontal, as shown. The observer at P determines the angle of elevation to a hot-air balloon to be 62° . At the same instant the observer at Q measures the angle of elevation to the balloon to be 71° . If P is 60 m down the hill from Q , find the distance from Q to the balloon.

**6.5:
Law of Sines**

