

8-6

Study Guide and Intervention *(continued)*

The Law of Sines

Exercises

Find each measure using the given measures of $\triangle ABC$. Round angle measures to the nearest degree and side measures to the nearest tenth.

1. If $c = 12$, $m\angle A = 80$, and $m\angle C = 40$, find a .

18.4

2. If $b = 20$, $c = 26$, and $m\angle C = 52$, find $m\angle B$.

37°

3. If $a = 18$, $c = 16$, and $m\angle A = 84$, find $m\angle C$.

62°

4. If $a = 25$, $m\angle A = 72$, and $m\angle B = 17$, find b .

7.7

5. If $b = 12$, $m\angle A = 89$, and $m\angle B = 80$, find a .

12.2

6. If $a = 30$, $c = 20$, and $m\angle A = 60$, find $m\angle C$.

35°

Draw a triangle to go with each exercise and mark it with the given information. Then solve the problem. Round angle measures to the nearest degree and side measures to the nearest tenth.

1. One side of a triangular garden is 42.0 feet. The angles on each end of this side measure 66° and 82° . Find the length of fence needed to enclose the garden.

192.9 ft

2. Two radar stations A and B are 32 miles apart. They locate an airplane X at the same time. The three points form $\angle XAB$, which measures 46° , and $\angle XBA$, which measures 52° . How far is the airplane from each station?

25.5 mi from A, 23.2 mi from B.

3. A civil engineer wants to determine the distances from points A and B to an inaccessible point C in a river. $\angle BAC$ measures 67° and $\angle ABC$ measures 52° . If points A and B are 82.0 feet apart, find the distance from C to each point.

86.3 ft to point B, 73.9 ft to point A.

4. A ranger tower at point A is 42 kilometers north of a ranger tower at point B . A fire at point C is observed from both towers. If $\angle BAC$ measures 43° and $\angle ABC$ measures 68° , which ranger tower is closer to the fire? How much closer?

Tower B is 11.0 km closer than Tower A

8-6 Practice

The Law of Sines

Solve each $\triangle STU$ described below. Round measures to the nearest tenth.

6. $m\angle T = 85, s = 4.3, t = 8.2$

$\angle S \approx 31.5^\circ, \angle U \approx 63.5^\circ, u \approx 7.4$

7. $s = 40, u = 12, m\angle S = 37$

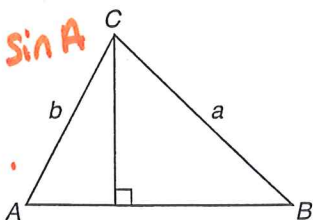
$\angle T \approx 132.6^\circ, \angle U \approx 10.4^\circ, t \approx 48.9$

8. $m\angle U = 37, t = 2.3, m\angle T = 17$

$\angle S \approx 126^\circ, s \approx 6.4, u \approx 4.7$

1. **ALTITUDES** In triangle ABC , the altitude to side AB is drawn.

$a \sin B = b \sin A$
length of altitude.

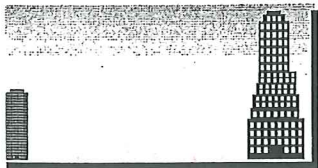


Give two expressions for the length of the altitude in terms of a, b , and the sine of the angles A and B .

2. **MAPS** Three cities form the vertices of a triangle. The angles of the triangle are $40^\circ, 60^\circ,$ and 80° . The two most distant cities are 40 miles apart. How close are the two closest cities? Round your answer to the nearest tenth of a mile.

26.1 mi

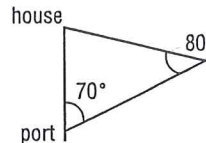
3. **PHOTOS** Greg took a photograph of the view from his city apartment. The building on the left is the Rocket Tower and the building on the right is the Cloud Scratcher.



3.45 mi

Greg's camera has a 60° viewing angle. Greg knows that he is 2 miles from the Cloud Scratcher and that the Rocket Tower is 3 miles from the Cloud Scratcher. How far is Greg from the Rocket Tower? Round your answer to the nearest hundredth.

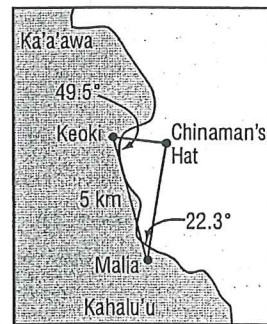
4. **BOATING** A boat heads out to sea from a port that sits along a straight shoreline. The boat heads in a direction that makes a 70° angle with the shoreline. After sailing for 3 miles, the skipper looks back at the shore and sees his house. The house, like the port, also sits on the shore. The lines of sight to the port and to his home make an 80° angle. How far is the skipper's home from the port? Round your answer to the nearest tenth of a mile.



5.9 mi

- ISLANDS** For Exercises 5 and 6, use the following information.

Oahu is a Hawaiian Island. Off of the coast of Oahu, there is a very tiny island known as Chinaman's Hat. Keoki and Malia are observing Chinaman's Hat from locations 5 kilometers apart.



Use the information in the figure to answer the following questions.

5. How far is Keoki from Chinaman's Hat? Round your answer to the nearest tenth of a kilometer.

2.0 km

6. How far is Malia from Chinaman's Hat? Round your answer to the nearest tenth of a kilometer.

4.0 km