

8-6 Study Guide and Intervention *(continued)***The Law of Sines****Exercises**

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 $\triangle XAB$, 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 Skills Practice**The Law of Sines**

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

- If $m\angle A = 35$, $m\angle B = 48$, and $b = 28$, find a . **21.6**
- If $m\angle B = 17$, $m\angle C = 46$, and $c = 18$, find b . **7.3**
- If $m\angle C = 86$, $m\angle A = 51$, and $a = 38$, find c . **48.8**
- If $a = 17$, $b = 8$, and $m\angle A = 73$, find $m\angle B$. **26.7**
- If $c = 38$, $b = 34$, and $m\angle B = 36$, find $m\angle C$. **41.1 or 138.9**
- If $a = 12$, $c = 20$, and $m\angle C = 83$, find $m\angle A$. **36.6**
- If $m\angle A = 22$, $a = 18$, and $m\angle B = 104$, find b . **46.6**

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

8. $p = 27, q = 40, m\angle P = 33$ $m\angle Q \approx 53.8, m\angle R \approx 93.2, r \approx 49.5$; or
 $m\angle Q \approx 126.2, m\angle R \approx 20.8, r \approx 17.6$

9. $q = 12, r = 11, m\angle R = 16$ $m\angle P \approx 146.5, m\angle Q \approx 17.5, p \approx 22.0$; or
 $m\angle P \approx 1.5, m\angle Q \approx 162.5, p \approx 1.0$

10. $p = 29, q = 34, m\angle Q = 111$ $m\angle P \approx 52.8, m\angle R \approx 16.2, r \approx 10.2$

11. If $m\angle P = 89, p = 16, r = 12$ $m\angle Q \approx 42.4, m\angle R \approx 48.6, q \approx 10.8$

12. If $m\angle Q = 103, m\angle P = 63, p = 13$ $m\angle R = 14, q \approx 14.2, r \approx 3.5$

13. If $m\angle P = 96, m\angle R = 82, r = 35$ $m\angle Q = 2, p \approx 35.2, q \approx 1.2$

14. If $m\angle R = 49, m\angle Q = 76, r = 26$ $m\angle P = 55, p \approx 28.2, q \approx 33.4$

15. If $m\angle Q = 31, m\angle P = 52, p = 20$ $m\angle R = 97, q \approx 13.1, r \approx 25.2$

16. If $q = 8, m\angle Q = 28, m\angle R = 72$ $m\angle P = 80, p \approx 16.8, r \approx 16.2$

17. If $r = 15, p = 21, m\angle P = 128$ $m\angle Q \approx 17.7, m\angle R \approx 34.3, q \approx 8.1$