

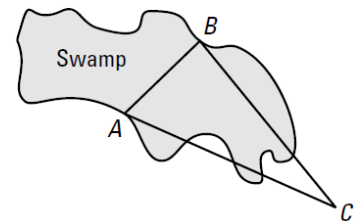
**Pre-Calculus Worksheet:**  
**8.2-8.3: Law of Sines and Law of Cosines**

Name \_\_\_\_\_ Class PD \_\_\_\_\_

**Set up and label a diagram. Show your equation(s) you need to use to solve the problem. Solve the equations and circle the answers.**

1. To find the distance  $AB$  across a river, a distance  $BC = 354\text{ m}$  is measured off on one side of the river. It is found that  $\angle ABC = 112^\circ$  and  $\angle BCA$  is  $15.33^\circ$ . Find  $AB$ .

2. Some students in Geometry are assigned the task of measuring the distance between two trees separated by a swamp. The students determine that the angle formed by tree  $A$ , a dry point  $C$ , and tree  $B$  is  $27^\circ$ . They also know that  $m\angle ABC$  is  $85^\circ$ . If  $AC$  is  $150\text{ ft}$ , how far apart are the trees?



3. From points  $P$  and  $Q$ ,  $180$  meters apart on an east-west line, a tree is sighted on the opposite side of a deep ravine. From point  $P$ , a compass indicates that the bearing of the tree is  $27^\circ$ . From  $Q$ , the bearing of the tree is  $43^\circ$ . How far from  $P$  is the tree? (Note: pay attention to what order  $P$  and  $Q$  must be in)

4. To determine the distance  $RS$  across a deep canyon, Joanna measures a distance  $TR = 582\text{ yd}$ . She then finds that  $\angle STR = 32.83^\circ$  and  $\angle SRT = 120.33^\circ$ . Find  $RS$ . What is the area of  $RST$ ?

5. Two lookout towers,  $L$  and  $M$ , are 50 kilometers apart. The ranger in Tower  $L$  sees a fire at point  $C$  such that  $m\angle CLM = 40^\circ$ . The ranger in Tower  $M$  sees the same fire such that  $m\angle CML = 65^\circ$ . How far is the fire from Tower  $L$ ?

6. The Vietnam Veteran's Memorial in Washington D.C. is in the shape of an unenclosed isosceles triangle (V-shaped) with equal sides of length 246.75 feet and the angle between these sides measuring  $125.2^\circ$ . Find the distance between the ends of the two equal sides.

7. A boy is flying two kites at the same time. He has 380 ft of line out to one kite and 420 ft to the other. He estimates the angle between the two lines to be  $30^\circ$ . Approximate the distance between the kites.

8. A ship is sailing due north. At a certain point the bearing of a lighthouse is 12.5 km away is  $N 38.8^\circ E$ . Later on, the captain notices that the bearing of the lighthouse has become  $S 44.2^\circ E$ . How far did the ship travel between the two observations of the lighthouse?

9. Two radar stations 2.4 miles apart are tracking an airplane. The straight-line distance between Station A and the plane is 7.4 miles. The straight-line distance between Station B and the plane is 6.9 miles. What is the angle of elevation from Station A to the plane? Round to the nearest degree.

10. During a figure skating routine, Jackie and Peter skate apart with an angle of  $15^\circ$ . Jackie skates for 5 meters and Peter skates for 7 meters. How far apart are the skaters?

**Complete the triangle using the Law of Sines or Cosines (suggestion draw a picture).**

11.  $a = 75$ ,  $b = 100$ ,  $\angle A = 30^\circ$

12.  $a = 20$ ,  $b = 25$ ,  $c = 22$

13.  $a = 50$ ,  $b = 100$ ,  $\angle A = 50^\circ$

14.  $a = 100$ ,  $b = 80$ ,  $\angle A = 135^\circ$

15. Find the area of the triangle whose sides have the given lengths:  
 $a = 5$ ,  $b = 7$ ,  $c = 8$