

Task (below): As you read and complete the task linked, please be sure to take notes. If you have any questions, please join Tomas at 1:00 PM or Katherine at 2:30 PM for office hours on google hangouts.

The Law of Sines

If A , B , and C are the measures of the angles of a triangle, and a , b , and c are the lengths of the sides opposite these angles, then

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

The ratio of the length of the side of any triangle to the sine of the angle opposite that side is the same for all three sides of the triangle.

The Law of Cosines

If A , B , and C are the measures of the angles of a triangle, and a , b , and c are the lengths of the sides opposite these angles, then

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

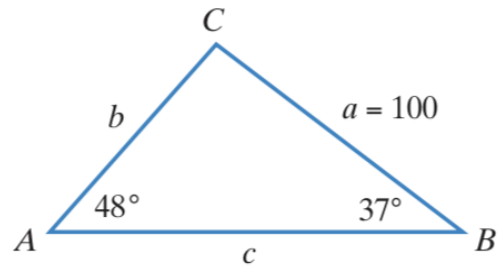
$$c^2 = a^2 + b^2 - 2ab \cos C.$$

The square of a side of a triangle equals the sum of the squares of the other two sides minus twice their product times the cosine of their included angle.

Choosing the Correct Law			
	Know Angle & Side Opp	Know 3 Sides	Know 2 Sides & Angle Between Them
Law of Sines	●		
Law of Cosines		●	●

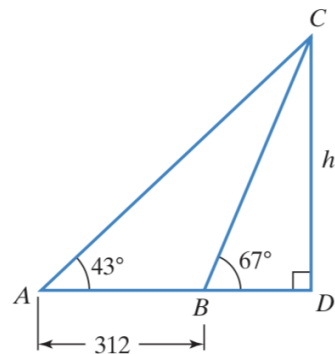
A. Practice with the Law of Sines

1. Given the triangle on the right, solve for the missing measurement and round lengths of sides to the nearest tenth and angle measures to the nearest degree.

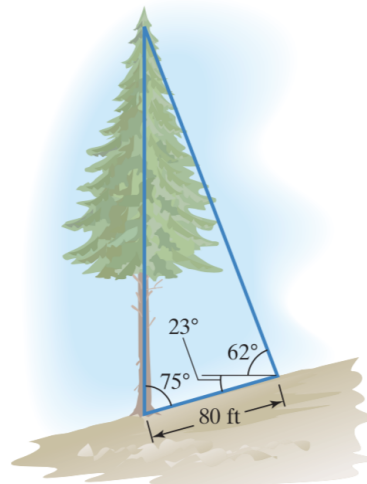


2. Solve for the missing measurement of the triangle ABC if $a = 42.1$, $c = 37$, and $A = 112^\circ$. Round lengths of sides to the nearest tenth and angle measures to the nearest degree.

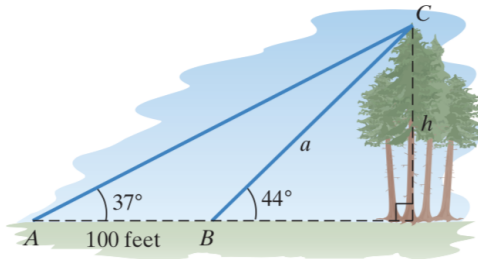
3. Given the triangle on the right, find h to the nearest tenth. Begin by using the Law of Sines to find the length of BC .



4. A pine tree growing on a hillside makes a 75° angle with the hill. From a point 80 feet up the hill, the angle of elevation to the top of the tree is 62° and the angle of depression to the bottom is 23° . Find, to the nearest tenth of a foot, the height of the tree.



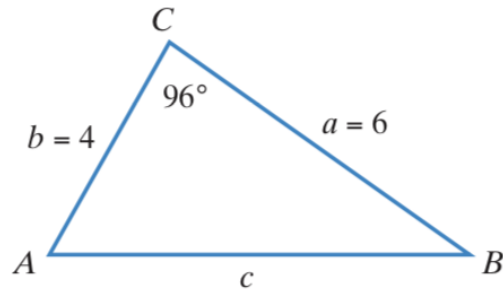
5. Redwood trees in California's Redwood National Park are hundreds of feet tall. The height of one of these trees is represented by h in the figure shown.



- Use the measurements shown to find a , to the nearest tenth of a foot, in oblique triangle ABC .
- Use the right triangle shown to find the height, to the nearest tenth of a foot, of a typical redwood tree in the park.

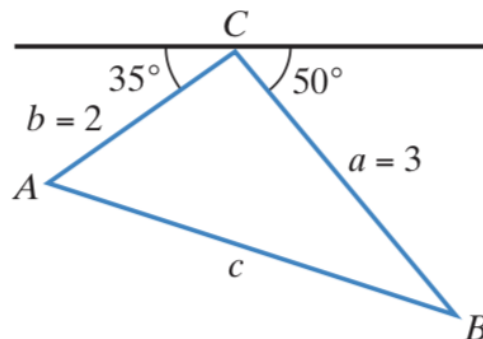
B. Practice with the Law of Cosines

6. Given the triangle on the right, solve for the missing measurement and round lengths of sides to the nearest tenth and angle measures to the nearest degree.

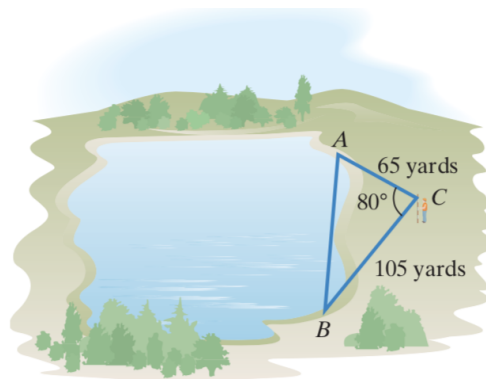


7. Solve for the missing measurement of each triangle. Round lengths of sides to the nearest tenth and angle measures to the nearest degree.
- $a = 4, c = 7, B = 55^\circ$
 - $a = 63, b = 22, c = 50$

8. Given the triangle on the right, solve for the missing measurement and round lengths of sides to the nearest tenth and angle measures to the nearest degree.



9. To find the distance across a protected cove at a lake, a surveyor makes the measurements shown in the figure. Use these measurements to find the distance from A to B to the nearest yard.



10. You are on a fishing boat that leaves its pier and heads east. After traveling for 25 miles, there is a report warning of rough seas directly south. The captain turns the boat and follows a bearing of $S40^\circ W$ for 13.5 miles.
- At this time, how far are you from the boat's pier? Round to the nearest tenth of a mile.
 - What bearing could the boat have originally taken to arrive at this spot?

