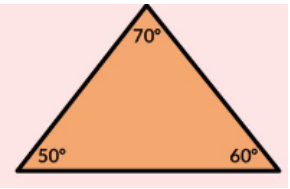
5.05 Honors Activity Part A

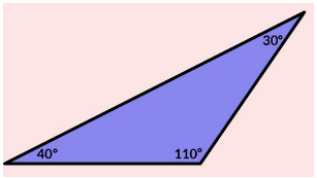
How do we solve for unknown measurements in triangles that are not right triangles?

Vocabulary

Oblique Triangle Vocabulary Video **Click Here**

Oblique triangle: a triangle that does _____ have a right angle.





Two types of oblique triangles:

1) _____triangle with 3 _____angles
2) _____triangle with 1_____ angle and 2 _____angles

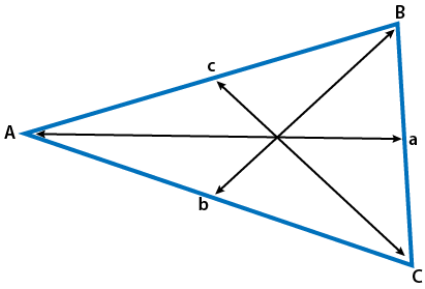
Deriving the Law of Sines Video **Click Here**

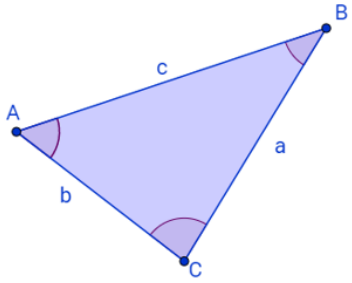
Law of Sines

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

where A, B, and C are the values of angles and a, b, and c are the values of sides.

It is important to keep the labeling consistent: a is always across from ___, b across from ___, and c across from ___.This is demonstrated in the following triangle:

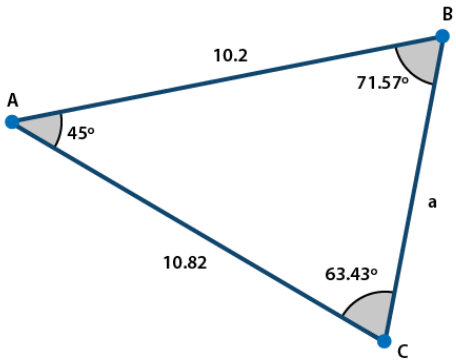


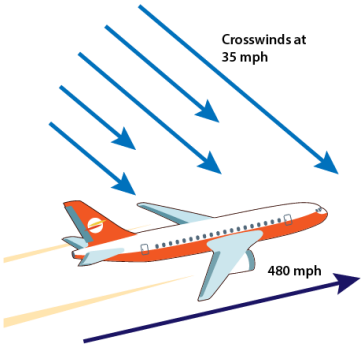
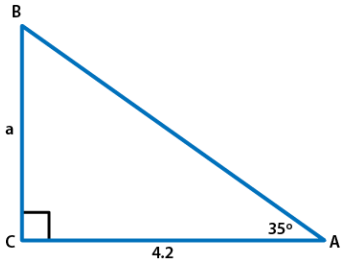


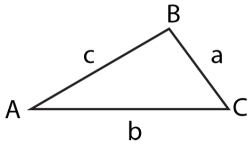
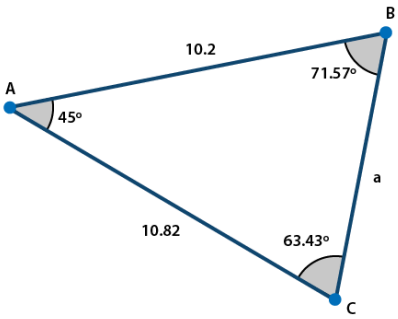
Law of sines

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

Example: Find a. round to the nearest tenth

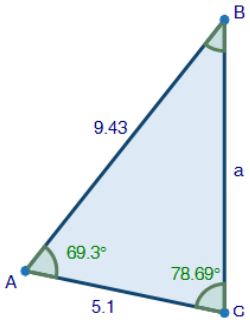


Law of Sines Q1 Video Click Here	**Law of Sines Q2** Video Click Here
An airplane is flying with a velocity of 480 mph in a northeast direction. A crosswind in a southeast direction blows against the airplane at 35 mph so that it creates a 110˚ angle with the direction of travel of the airplane. This causes the new velocity of the airplane to drop to 520 mph. How many degrees does the crosswind cause the airplane to veer off course? Round the final answer to the nearest tenth. 	 For the following triangle, use the Law of Sines to solve for side a. Round the final answer to the nearest tenth.

Deriving the Law of Cosines Video Click Here	
Law of Cosines: $a^2=b^2+c^2 - 2bc\ cosA$ $b^2=a^2+c^2 - 2ac\ cosB$ $c^2=a^2+b^2 - 2ab\ cosC$ 	Find a. round to the nearest tenth 

Law of Cosines Q1 Video Click Here

Given a different sunshade shown below with sides measured in feet, help Johanna find the length of side a.



Check Your Understanding Video Click Here

Are we always able to use either of the two laws to solve for the unknowns of any given triangle? Unfortunately, no. Based on the information given in the situation, different laws will be able to be used.

In order to use the Law of Sines:	In order to use the Law of Cosines:
• •	• •

Area of Oblique Triangles Video Click Here

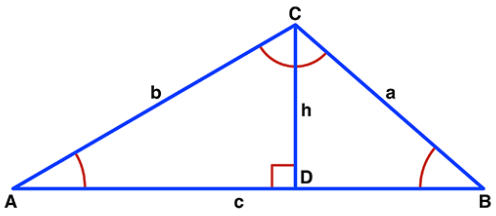
To find the area of a triangle, we use the formula:

$$A = \frac{1}{2}bh$$

We don't always know the height, but we can use trig to help us!

In an **oblique triangle,** when given two_____ and an included _____ **(SAS)**, we can determine the triangle's _____.

Using trigonometry, each triangle has a base c and an altitude h, where h = b sin A. Using the area formula for triangles,

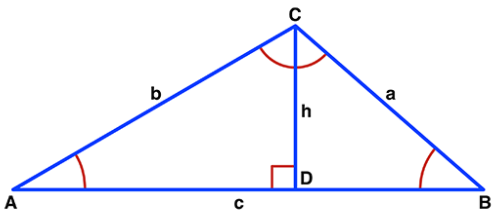


$A = \frac{1}{2} \bullet c \bullet bsinA$ or $A = \frac{1}{2} \bullet c \bullet sinA \bullet (b)$

$A = \frac{1}{2} \bullet c \bullet asinB$ or $A = \frac{1}{2} \bullet c \bullet sinB \bullet (a)$

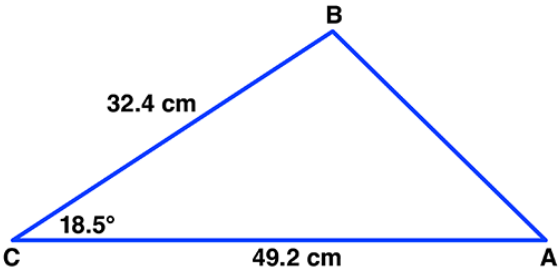
$A = \frac{1}{2} \bullet a \bullet bsinC$ or $A = \frac{1}{2} \bullet a \bullet sinC \bullet (b)$

That is, the area of any triangle is given by one half the product of the lengths of two sides times the sine of their included angle.



Area of Oblique Triangles Q1 Video [Click Here]

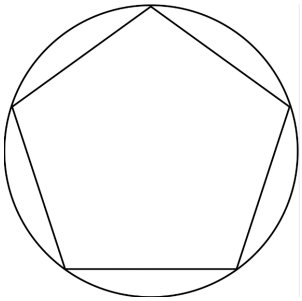
Find the area of the triangle where m∠C = 18.5°, a = 32.4 cm, and b = 49.2 cm.



Practice

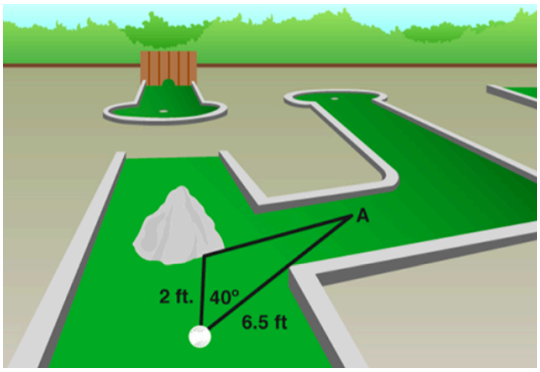
Question 1 Video CLICK HERE

Find the area of a regular pentagon (5 equal angles and sides) inscribed in a circle of radius 8 feet.



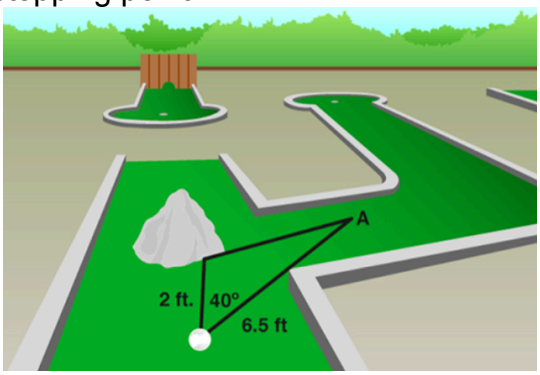
Question 2 Video CLICK HERE

In a game of mini golf, a player is attempting to hit the ball so that it lands on a particular spot, A. The ball is currently 6.5 feet away from this spot. However, due to the position of the ball the player must hit the ball on an obstacle 2 feet away forming a 40° angle. At what angle will the ball travel after hitting the obstacle?



Question 3 Video **CLICK HERE**

What is the area of the triangle created by the golf ball's path and the direct path to the ball's stopping point?



What's next? Complete the 05.05 Honors Segment Two Activity Part A Assessment.