

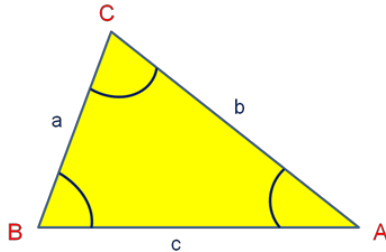
Today's Learning Goal(s): By the end of the class, I will be able to:

- Correctly write the cosine **LAW** in one of the two forms.
- Use the cosine law to solve a non-right triangle.

## MCF 3MI 5.4 Applying the Cosine **LAW** in Acute Triangles

Date: \_\_\_\_\_

The Cosine **Law** can be used with any triangle, even if it is not a right triangle. Given any triangle,



$$\textcircled{1} \quad a^2 = b^2 + c^2 - 2bc \cos A \quad (\text{SAS})$$

and

$$\textcircled{2} \quad \cos A = \frac{b^2 + c^2 - a^2}{2bc} \quad (\text{SSS})$$

When the triangle we are solving involves 2 known sides and the contained angle (a.k.a. SAS), then we use the formula given in  $\textcircled{1}$ , because the sine law will not work.

Remember to take the square root of the answer to find  $a$ .

When the triangle we are solving involves 3 known sides, but no known angles (a.k.a. SSS), then we use the formula given in  $\textcircled{2}$ .

Remember to take the inverse cos, (or  $\cos^{-1}$ ) to find the measure of angle A.

Note: In this case, always find the largest angle first in case it is an obtuse angle.

The largest angle will be located opposite the longest side. [Think about it!]

Ex. 1 Solve the triangle. (Round side lengths and angles to **1** decimal place.)

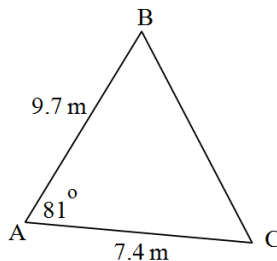


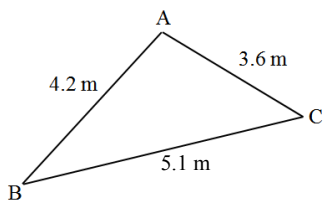
Diagram is not drawn to scale.

$a$	$\angle B$	$\angle C$
Since we have SAS, use $\textcircled{1}$	Now use the sine law (it's easier)	Now use the triangle sum
$a^2 = b^2 + c^2 - 2bc \cos A$		$\angle C \doteq$
		$\doteq$

Ex. 2 Solve the triangle. (Round side lengths and angles to the nearest **tenth**)

*Diagram is not drawn to scale.*

**(Tenth means 1 decimal place).**

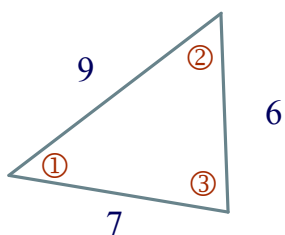


Since we have SSS, use ②	Now use the sine law (it's easier)	Now use the triangle sum
		$\angle B \doteq$
		$\doteq$

**Today's Homework:** pp. 299-301 # 2 – 5, 7, 9

Quick Practice Question:

Label the angle you should find first as "D".  
Write the formula for cosD.



Remember: For Good Form

**degree symbol on all angles**

**always round correctly at the END**

**approximately equal sign when necessary**

**add length units at end ONLY**