



Math Virtual Learning

Precalculus

Ambiguous Case of the Law of Sines

April 13, 2020



Precalculus

Lesson: April 13th, 2020

Objective/Learning Target:

Students will be able to determine all missing measurements of a triangle using the Law of Sines in situations involving the ambiguous case.

Let's Get Started:

The Ambiguous Case

(Two Possible Triangles)

Now that you know how to determine if given measurements form a triangle and whether or not it is a unique triangle; you are ready for the ambiguous case in which two triangles are possible. Watch the video below to see how to solve for the missing measurements of each of the two possible triangles.

Video: [The Ambiguous Case for Sine Law - Nerdstudy](#)

Law of Sines Practice (Ambiguous Case):

On a sheet of paper, sketch the given information and determine if it makes a triangle. If so, how many possible triangles. Then solve each triangle by finding all missing side lengths and angle measures. Once you are finished, check your answers on the following page.

1. $m\angle B = 27^\circ$, $a = 28$ ft, $b = 18$ ft

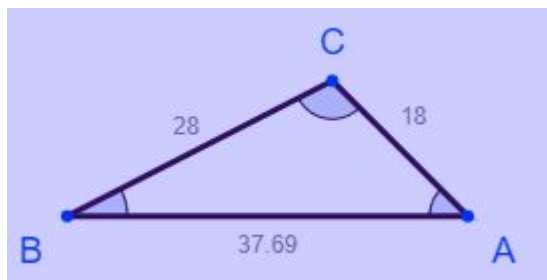
2. $m\angle C = 54^\circ$, $b = 24$ km, $c = 23$ km

Practice Problems Answer Key:

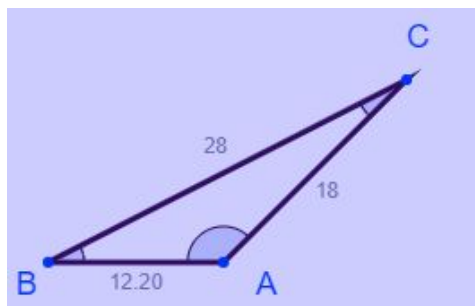
1. $m\angle B = 27^\circ$, $a = 28$ ft, $b = 18$ ft

$m\angle C = 108.1^\circ$, $m\angle A = 44.9^\circ$, $c = 37.7$ ft

Or $m\angle C = 17.9^\circ$, $m\angle A = 135.1^\circ$, $c = 12.2$ ft



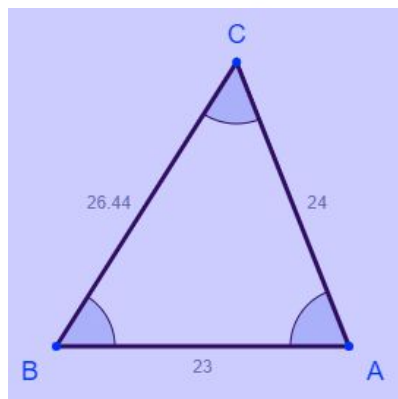
or



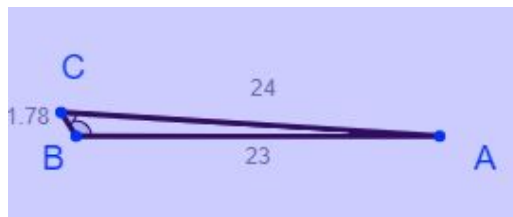
2. $m\angle C = 54^\circ$, $b = 24$ km, $c = 23$ km

$m\angle A = 68.4^\circ$, $m\angle B = 57.6^\circ$, $a = 26.4$ km

Or $m\angle A = 3.6^\circ$, $m\angle B = 122.4^\circ$, $a = 1.8$ km



or



Law of Sines (Ambiguous Case) More Practice

On a sheet of paper, sketch the given information and determine if it makes a triangle. If so, how many possible triangles. Then solve each triangle by finding all missing side lengths and angle measures. Once you are finished, check your answers on the following page.

1) $B = 22^\circ$, $b = 16.8$, $a = 22.42$

3) $a = 7$, $b = 9$, $B = 49^\circ$

2) $B = 96^\circ$, $b = 3$, $a = 24$

4) $A = 30^\circ$, $a = 6.8$, $c = 13.6$

Practice Problems Answer Key:

1) $B = 22^\circ$, $b = 16.8$, $a = 22.42$

2 Triangles

Solution 1: $A = 30^\circ$, $C = 128^\circ$, $c = 35.3$

Solution 2: $A = 150^\circ$, $C = 8^\circ$, $c = 6.2$

2) $B = 96^\circ$, $b = 3$, $a = 24$

No Triangles Exist

3) $a = 7$, $b = 9$, $B = 49^\circ$

1 Triangle

**Solution: $A = 35.94^\circ$, $C = 95.06^\circ$,
 $c = 11.88$**

4) $A = 30^\circ$, $a = 6.8$, $c = 13.6$

1 Triangle

Solution: $B = 60^\circ$, $C = 90^\circ$, $b = 11$

Additional Resources:

Click on the links below to get additional helpful videos as well as additional practice to check your understanding.

Additional Practice & Answer Key

[Law of Sines Ambiguous Case Practice \(Kuta Software\)](#)

(This worksheet includes some of the problems used in this lesson with many additional problems.)

[Law of Sines Ambiguous Case - Extra Practice \(No Answers\)](#)

Helpful Videos

[Ambiguous Case Law of Sines](#)

[Ambiguous Case of the Law of Sines](#)

Helpful Website to Check Your Answers of Practice Problems

[Online Triangle Calculator](#)