Unit 6 (Chapter 5): Analytic Trigonometry **Pre-Calculus**
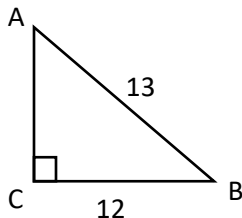
5.5 The Law of Sines
Target 6D: Use Law of Sines and Law of Cosines to solve triangles

Review Prior Concepts
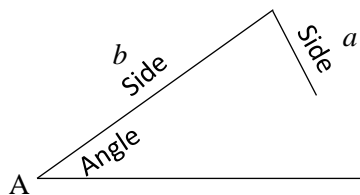
Solve the triangle for all missing sides and angles.

A

13

C ⌐ 12 B

Law of Sines

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

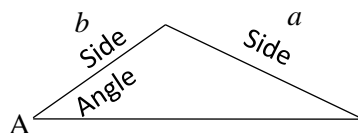➲With what given conditions can Law of Sines be used?

Example

Solve the triangle given $\angle A = 36°$, $\angle B = 48°$, and $a = 8$.

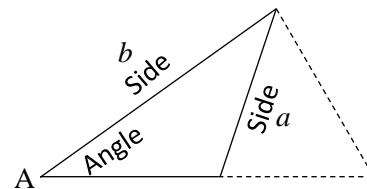## The 3 Situations of Side-Side-Angle (The Ambiguous Case)

No Triangle

If $a < h$, where $\sin A = \dfrac{h}{b}$.

One Triangle

If $a > h$, where $\sin A = \dfrac{h}{b}$,
AND $a \geq b$.

Two Triangles

If $a > h$, where $\sin A = \dfrac{h}{b}$,
AND $a < b$.

Examples

How many triangles can be made from the given information?

1. $\angle A = 42°$, $a = 6$, $b = 7$

2. $\angle A = 142°$, $a = 4$, $b = 5$

3. $\angle C = 54°$, $b = 16$, $c = 17$

4. $\angle C = 54°$, $b = 4$, $c = 5$

Solve each triangle with the given information or state that a triangle cannot be made.
(there may be one Δ, two Δs, or no Δ)

5) $\angle A = 30°$, $a = 6$, $b = 7$

6) $\angle B = 65°$, $b = 11$, $c = 8$

7) $\angle C = 65°$, $a = 8$, $c = 6$

More Practice

Law of Sines

https://www.khanacademy.org/math/geometry/hs-geo-trig/hs-geo-law-of-sines/v/law-of-sines

https://www.mathsisfun.com/algebra/trig-sine-law.html

http://www.themathpage.com/atrig/law-of-sines.htm

http://www.softschools.com/math/calculus/the_ambiguous_case_of_the_law_of_sines/

https://www.youtube.com/watch?v=yVquId7xJQY

https://www.youtube.com/watch?v=ksBaHrVqhyo

https://www.youtube.com/watch?v=S4xAKewlqA4

Homework Assignment

p.439 #1,3,7,11,13,15,19,25,29