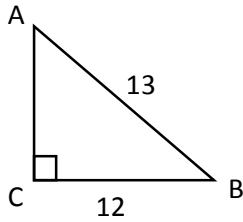


5.5 The Law of Sines

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.

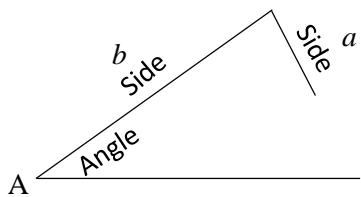
*Law of Sines*

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

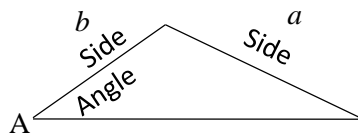
☞ With what given conditions can Law of Sines be used?

*Example*Solve the triangle given $\angle A = 36^\circ$, $\angle B = 48^\circ$, $a = 8$.

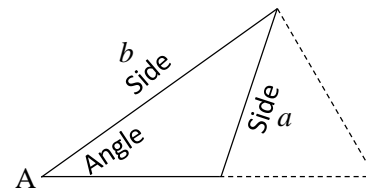
The 3 Situations of Side-Side-Angle (The Ambiguous Case)

**No Triangle**

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

**One Triangle**

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

**Two Triangles**

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

Examples

How many triangles can be made from the given information?

1. $\angle A = 42^\circ$, $a = 6$, $b = 7$

2. $\angle A = 42^\circ$, $a = 4$, $b = 5$

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

4. $\angle C = 54^\circ$, $b = 4$, $c = 5$

Solve each triangle with the given information or state that a triangle cannot be made.

(there may be one Δ , two Δ s, or no Δ)

5) $\angle A = 30^\circ$, $a = 6$, $b = 7$

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

7) $\angle C = 65^\circ$, $a = 7$, $c = 8$

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.regentsprep.org/regents/math/algtrig/att12/lawofsines.htm>

<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

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