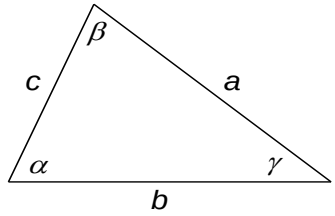
The Law of Sines
§5.1

Oblique Triangle – a triangle without a right angle.



Law of Sines

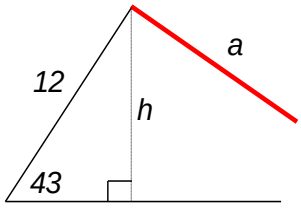
$$\frac{\sin\alpha}{a} = \frac{\sin\beta}{b} = \frac{\sin\gamma}{c}$$

Example 1
Find the remaining parts of the triangle.

a. $\beta = 51°$, $\gamma = 34°$, a = 9.4

b. $\alpha = 27°$, $\gamma = 93°$, a = 12.6

Ambiguous Case (SSA or ASS)
$\alpha = 43°$, b = 12, a = ????



a < h	a = h	h < a < b	a ≥ b
0 triangles	1 triangle	2 triangles	1 triangle

Example 3
Find the remaining parts of the triangle.

a. $\beta = 57°$, a = 12.1, b = 11.4 (SSA)

b. b = 9.4, c = 6.4, $\gamma = 47.1°$ (SSA)

c. b = 9.4, c = 6.9, $\gamma = 47.1°$ (SSA)

Pg 276, 1-17 odd

The Law of Cosines
§5.2

Law of Cosines

$a^2 = b^2 + c^2 - 2bc\cos\alpha \qquad \cos\alpha = \dfrac{a^2 - b^2 - c^2}{-2bc}$

$b^2 = a^2 + c^2 - 2ac\cos\beta \qquad \cos\beta = \dfrac{b^2 - a^2 - c^2}{-2ac}$

$c^2 = a^2 + b^2 - 2ab\cos\gamma \qquad \cos\gamma = \dfrac{c^2 - a^2 - b^2}{-2ab}$

Problem with law of cosines (SAS)
1. Solve side first
2. Pick angle, check if realistic
3. If answer is not realistic, must do other angle first.

Example 1
Solve the remaining parts of the triangle.

a. $a = 9.7$, $b = 5.3$, $c = 11.2$ b. $\gamma = 73°$, $a = 5$, $b = 11$

Pg 285, 1-13 odd