Accel Math III
Unit 7: Extended Trigonometry
Lesson 1: Law of Sines (Part I) **MA3A6**

EQ: How do you solve triangles that are not "right"?

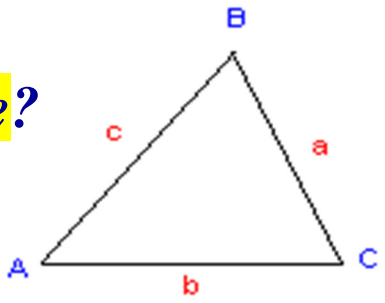
Recall:

What trig ratios are used to solve right triangles?

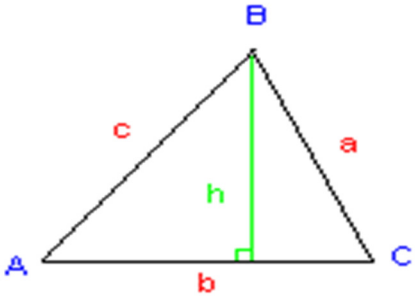
Two Methods to Solve "Non-Right Triangles":

- Law of Sines
- Law of Cosines

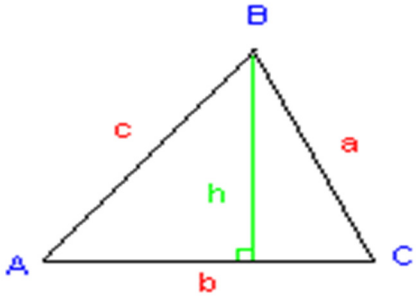
How can we solve this non-right triangle?



Let's drop down a perpendicular from ∠B. Call it h.



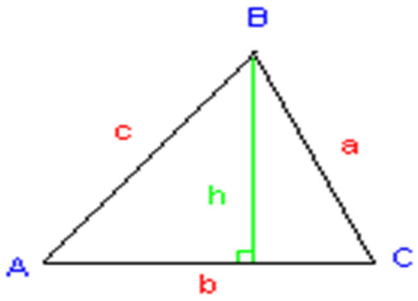
We have formed two right triangles.



The left triangle has the following trig relationship:

$\sin A = h/c$ *WHY?*

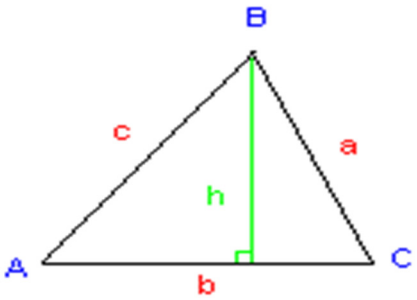
$c \sin A = h$



The triangle on the right has the trig relationship:

$\sin C = h/a$ *WHY?*

$a \sin C = h$



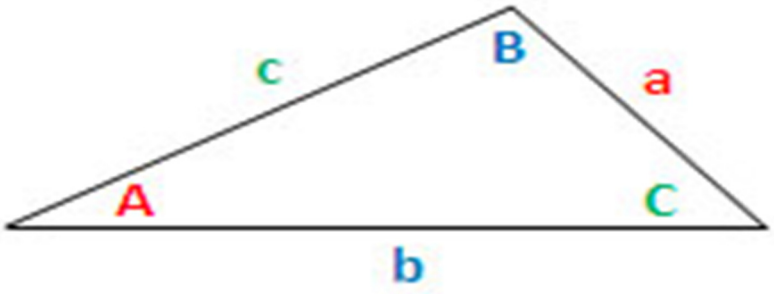
Using the transitive property:

If $c \sin A = h$ *and* $h = a \sin C$, *then*

$$c \sin A = a \sin C$$

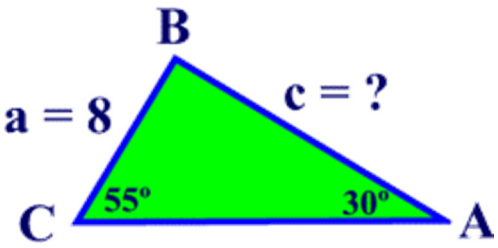
Dividing by ac yields: $\frac{\sin A}{a} = \frac{\sin C}{c}$

Law of Sines:

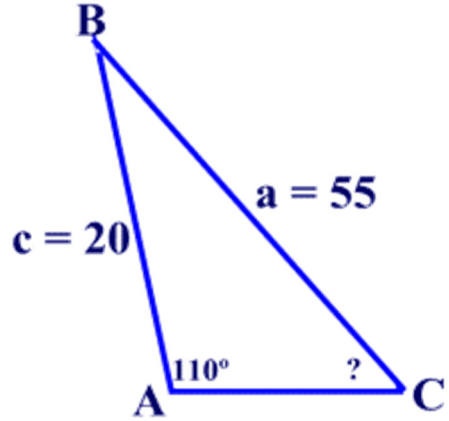


$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

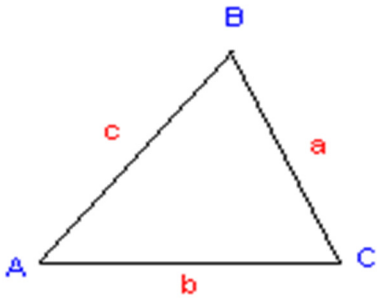
Ex. 1 Given side $a = 8$, $m\angle A = 30°$ and $m\angle C = 55°$. Find side c to the nearest tenth of an integer.



Ex 2. $a = 55$, $c = 20$, and $m\angle A = 110°$. Find the measure of $\angle C$ to the *nearest degree.*



Ex. 3 Given $\angle A = 50^o$, $\angle B = 65^o$ and $a = 12$. Solve the triangle.



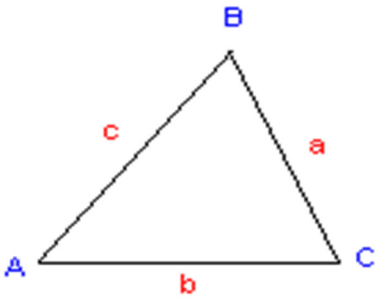
$\angle A =$ $a =$

$\angle B =$ $b =$

$\angle C =$ $c =$

Ex. 4 Solve the triangle if $\angle B = 30^o$, $\angle C = 70^o$ and $b = 10$.

$\angle A =$ $a =$



$\angle B =$ $b =$

$\angle C =$ $c =$

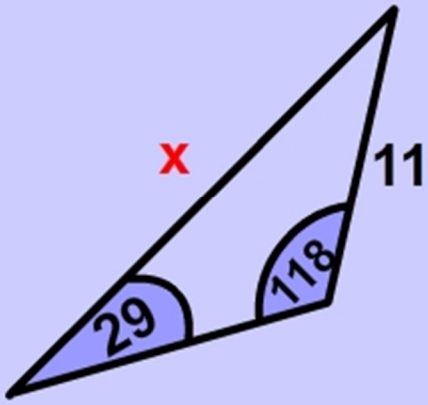
When to Use Law of Sines:

Case 1) 2 sides and 1 angle

Trying to get :
angle opposite a known side

Case 2)1 side and 2 angles

Trying to get :
side opposite a known angle



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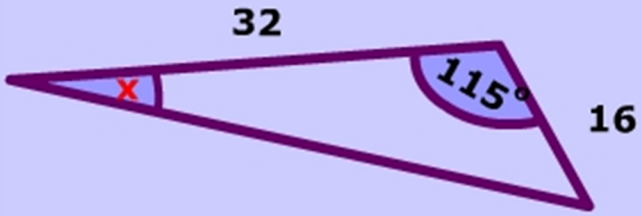
case Not suited for Law of Sines



Assignment: Practice Worksheet #1 Part I