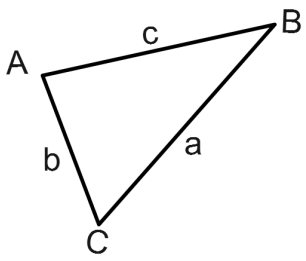
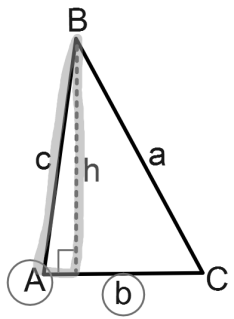
Finding an expression for the area of this generic triangle using each side as the base.



Write an expression for the area of this triangle using angle A and side b as the base.



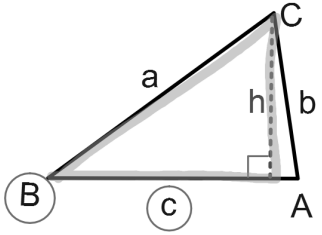
$\sin A = \frac{h}{c}$

h = $c \sin A$

Area = $\frac{1}{2}(b)(c \sin A)$

Area of Triangle ABC = $\frac{1}{2}bc \sin A$

Write an expression for the area of this triangle using angle B and side c as the base.



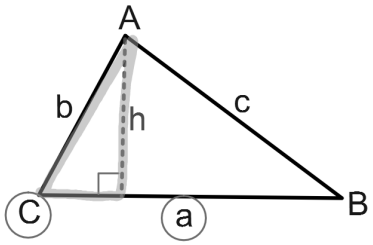
$\sin B = \frac{h}{a}$

h = $a \sin B$

Area = $\frac{1}{2}(c)(a \sin B)$

Area of Triangle ABC = $\frac{1}{2}ac \sin B$

Write an expression for the area of this triangle using angle C and side a as the base.



$\sin C = \frac{h}{b}$

h = $b \sin C$

Area = $\frac{1}{2}(a)(b \sin C)$

Area of Triangle ABC = $\frac{1}{2}ab \sin C$

All three of these equations should lead to the same Area.

$$A = \frac{1}{2}bc\sin A = \frac{1}{2}ac\sin B = \frac{1}{2}ab\sin C$$

$$\boxed{\frac{1}{2}bc\sin A = \frac{1}{2}ac\sin B = \frac{1}{2}ab\sin C}$$

Simplify: divide by $\frac{1}{2}abc$

$$\frac{\frac{1}{2}bc\sin A}{\frac{1}{2}abc} = \frac{\frac{1}{2}ac\sin B}{\frac{1}{2}abc} = \frac{\frac{1}{2}ab\sin C}{\frac{1}{2}abc}$$

The Law of Sines:

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

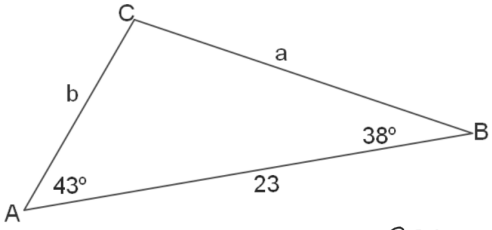
In any triangle, where do you find the longest side?

Opposite the largest angle.

Where do you find the shortest side?

Opposite the smallest angle?

Use the Law of Sines to find the lengths of the missing sides in this triangle. Round to a tenth.



$\angle C = 99°$
$a = 15.9$
$b = 14.3$

1ST find C: $180 - 38 - 43 = 99°$

You could find either a or b next:

Side a

$$\frac{\sin 43°}{a} = \frac{\sin 99°}{23}$$

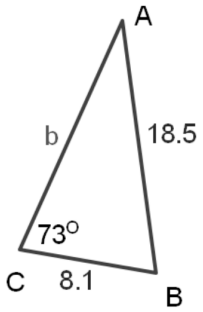
$a = 15.9$

Side b

$$\frac{\sin 38°}{b} = \frac{\sin 99°}{23}$$

$b = 14.3$

Use the Law of Sines to find remaining sides and angles in this triangle. Round to a tenth.



$\angle A = 24.8°$
$\angle B = 82.2°$
$b = 19.2$

1ST find A: $\frac{\sin 73°}{18.5} = \frac{\sin A}{8.1}$

$\sin A = \frac{8.1 \sin 73°}{18.5} \approx .42$

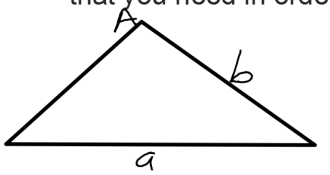
$\angle A = \sin^{-1}(\ ) = 24.8°$

2nd find B: $180 - 73 - 24.8 = 82.2°$

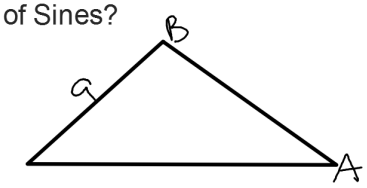
3rd find b: $\frac{\sin 73°}{18.5} = \frac{\sin 82.2}{b}$

$b = 19.2$

What is the least amount of information about a triangle that you need in order to use the Law of Sines?



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



1. One angle and two sides.

How must these sides and this angle be positioned on the triangle?

The angle has to come directy after the 2 sides.

SSA

2. One side and two angles.

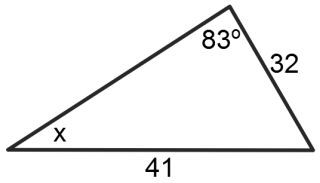
How must these angles and this side be positioned on the triangle?

The side has to come directly after the 2 angles.

AAS

Find the measure of x to the nearest hundredth.

1.



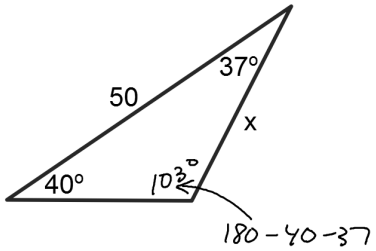
$$\frac{\sin X}{32} = \frac{\sin 83}{41}$$

$\sin X = 0.77$

$X = \sin^{-1}(\ )$

$X = 50.78°$

2.



$$\frac{\sin 103^\circ}{50} = \frac{\sin 40^\circ}{x}$$

$x = 32.98$

You can now finish Hwk #29
Sec 14-4

Due Tomorrow

Page 803

Problems: 1, 3-5, 11, 12, 17, 18, 28