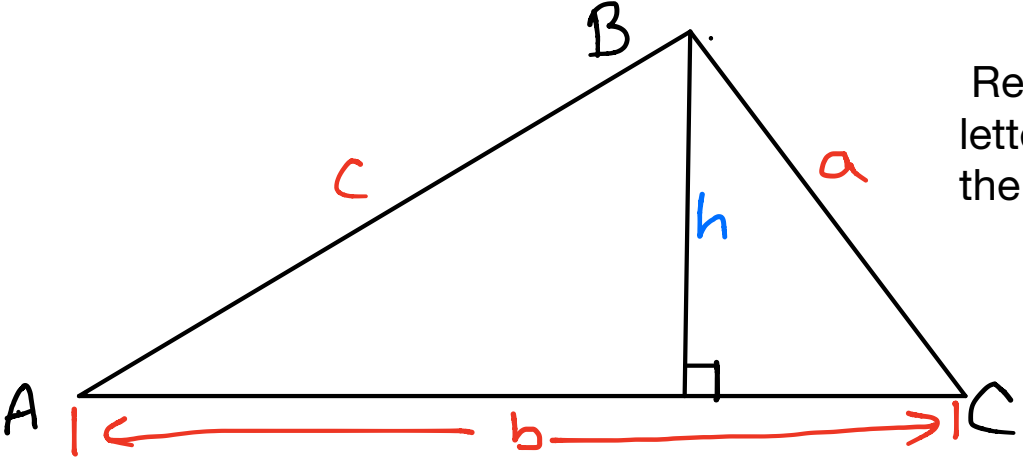

Recall that the lowercase letter side is always opposite the capital letter angle.

$\sin(\angle A) = \frac{h}{c}$

$h = c\sin(\angle A)$

$\sin(\angle C) = \frac{h}{a}$

$h = a\sin(\angle C)$

$c\sin(\angle A) = a\sin(\angle C)$

$\frac{c\sin(\angle A)}{c} = \frac{a\sin(\angle C)}{c}$

$\sin(\angle A) = \frac{a\sin(\angle C)}{c}$

$\frac{\sin(\angle A)}{a} = \frac{a\sin(\angle C)}{ac}$

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

by similar logic

* The Law of Sines

equivalently,

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

*On any triangle, the ratios of the sine of an angle and the length of its opposite side are always equal.

Recall identifying congruence

SSS
SAS
← Law of Cosines

ASA
AAS
← Law of Sines

Recall SSA is not congruence statement.

$$\frac{\sin(16)}{15} = \frac{\sin(79)}{a}$$

$$\frac{a\sin(16)}{\sin(16)} = \frac{15\sin(79)}{\sin(16)}$$

$$a = \frac{15\sin(79)}{\sin(16)} \approx 53.419$$

$$\frac{\sin(33)}{23} = \frac{\sin(\angle B)}{18}$$

$$\frac{18\sin(33)}{23} = \frac{23\sin(\angle B)}{23}$$

$$\frac{18\sin(33)}{23} = \sin(\angle B)$$

$$\arcsin\left(\frac{18\sin(33)}{23}\right) = m(\angle B)$$

QI

$25.229 \approx m(\angle B)$ between $(0, 90°)$

b/c $\sin(x)$ is positive in QII also,

$$180 - \arcsin\left(\frac{18\sin(33)}{23}\right) = m(\angle B)$$

$$180 - 25.229 \approx m(\angle B)$$

$154.771 \approx m(\angle B)$ ← rejected

→ $154.771 + (33) \approx 187° > 180°$

angle we know

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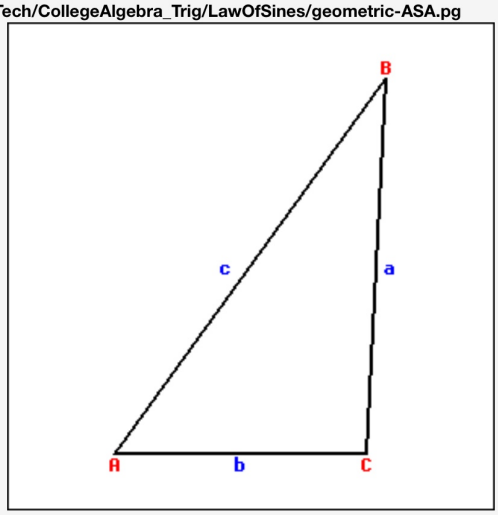
This set is visib

(1 point) **CUNY/CityTech/CollegeAlgebra_Trig/LawOfSines/geometric-ASA.pg**



Finish solving the triangle:

$\angle A =$	54°	a =	
$\angle B =$	33°	b =	
$\angle C =$		c =	13

degrees

$$m(\angle C) = 180 - (54 + 33)$$

$$= 93^\circ$$

$$\frac{\sin(\angle C)}{c} = \frac{\sin(\angle A)}{a}$$

$$\frac{\sin(93)}{13} = \frac{\sin(54)}{a}$$

$$a\sin(93) = 13\sin(54)$$

$$a = \frac{13\sin(54)}{\sin(93)}$$

$$a \approx 10.532$$

$$\frac{\sin(\angle C)}{c} = \frac{\sin(\angle B)}{b}$$

$$\frac{\sin(93)}{13} = \frac{\sin(33)}{b}$$

$$\vdots$$

$$b = \frac{13\sin(33)}{\sin(93)} \approx 6.898$$