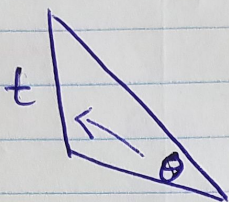


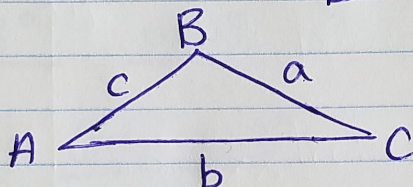
5.5 Law of Sines

The Law of Sines



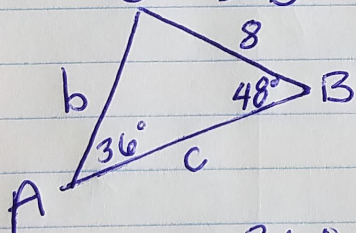
θ & t are a side-angle pair.

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



AAS or ASA

Ex #1 Solve $\triangle ABC$ given $\angle A = 36^\circ$,
 $\angle B = 48^\circ$ & $a = 8$.



$$\begin{aligned} \angle C &= 180^\circ - 36^\circ - 48^\circ \\ \angle C &= 96^\circ \end{aligned}$$

$$\frac{\sin 36^\circ}{8} = \frac{\sin 48^\circ}{b}$$

$$b = \frac{8 \sin 48^\circ}{\sin 36^\circ}$$

$$b \approx 10.115$$

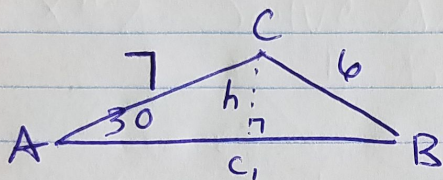
$$\frac{\sin 36^\circ}{8} = \frac{\sin 96^\circ}{c}$$

$$c = \frac{8 \sin 96^\circ}{\sin 36^\circ}$$

$$c \approx 13.536$$

$\angle A = 36^\circ$	$\angle B = 48^\circ$	$\angle C = 96^\circ$
$a = 8$	$b \approx 10.115$	$c \approx 13.536$

Ex #3 Solve $\triangle ABC$ given $a=6, b=7$
 & $\angle A = 30^\circ$



$h \approx 3.5$
 $h < b < 7$
 2 triangles

$\triangle 1$

$$\frac{\sin 30^\circ}{6} = \frac{\sin B_1}{7}$$

$$B_1 = \sin^{-1}\left(\frac{7 \sin 30^\circ}{6}\right)$$

$$\star B_1 \approx 35.6853^\circ$$

$$C_1 = 180^\circ - A - B_1$$

$$\star C_1 \approx 114.3147^\circ$$

$$\frac{\sin 30^\circ}{6} = \frac{\sin 114.3147^\circ}{c_1}$$

$$c_1 = \frac{6 \sin 114.3147^\circ}{\sin 30^\circ}$$

$$\star c_1 \approx 10.9356$$

$\triangle 2$

$$B_2 = 180^\circ - B_1$$

$$\star B_2 \approx 144.3147^\circ$$

$$C_2 = 180^\circ - A - B_2$$

$$\star C_2 \approx 5.6853^\circ$$

$$\frac{\sin 30^\circ}{6} = \frac{\sin 5.6853^\circ}{c_2}$$

$$c_2 = \frac{6 \sin 5.6853^\circ}{\sin 30^\circ}$$

$$\star c_2 \approx 1.1888$$

$\angle A = 30^\circ$	$a = 6$
$\angle B_1 \approx 35.685^\circ$	$b = 7$
$\angle C_1 \approx 114.315^\circ$	$c_1 \approx 10.936$
$\angle B_2 \approx 144.315^\circ$	
$\angle C_2 \approx 5.685^\circ$	$c_2 \approx 1.189$