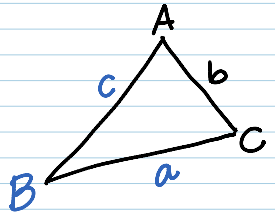
Law of Sines

review basic geometry: naming angles & sides

- Angles: CAPITAL letters
- sides: lowercase letters



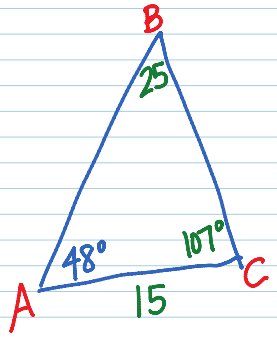
Law of Sines!

-can be used in non-right triangles when you know 1 side & any 2 other parts of the triangle

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

Examples:

① Solve ΔABC with $C = 107°$, $B = 25°$ & $b = 15$.



$\measuredangle A$

$180 - (25 + 107)$

$48°$

a

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

$$\frac{\sin 48°}{a} = \frac{\sin 25°}{15}$$

$$\frac{a \sin 25}{\sin 25} = \frac{15 \sin 48}{\sin 25}$$

$$a = \frac{(15 \sin 48)}{(\sin 25)}$$

c

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

$$\frac{\sin 107}{c} = \frac{\sin 25}{15}$$

$$\frac{c \sin 25}{\sin 25} = \frac{15 \sin 107}{\sin 25}$$

$$C = \frac{15 \sin 107}{\sin 25}$$

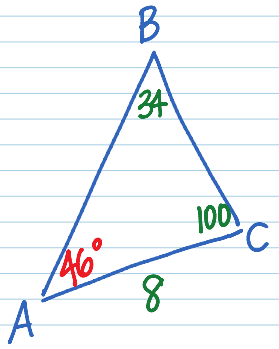
$a = \frac{(15\sin 46)}{(\sin 25)}$

$a = 26.38$

$C = \frac{15\sin 101}{\sin 25}$

$C = 33.94$

② Solve ΔABC with $B = 34°$, $C = 100°$, $b = 8$



$\measuredangle A$

$180 - (34 + 100)$

$46°$

a

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

$\frac{\sin 46}{a} = \frac{\sin 34}{8}$

$\frac{a\sin 34}{\sin 34} = \frac{8\sin 46}{\sin 34}$

$a = 10.29$

C

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

$\frac{\sin 100}{c} = \frac{\sin 34}{8}$

$\frac{c\sin 34}{\sin 34} = \frac{8\sin 100}{\sin 34}$

$C = 14.09$

③ Solve ΔABC with $A = 51°$, $B = 44°$ & $c = 11$