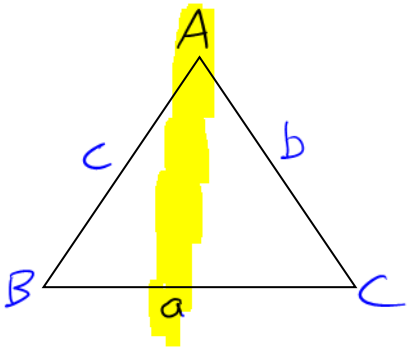
5.5: Sine Law

Learning Goal: We are learning to use the Sine Law to solve problems involving non-right triangles.



When do you use sine law?

You need a pair (angle + corresponding side) to use sine law

Missing side length

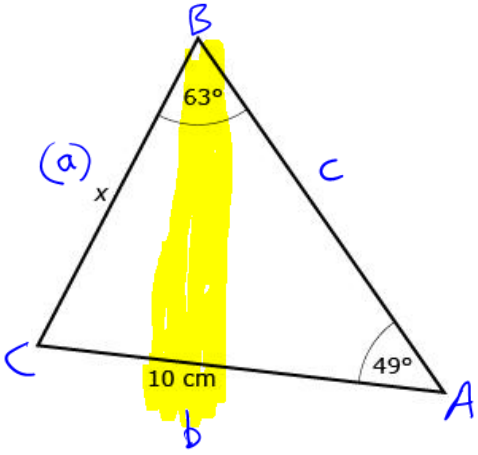
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

OR

Missing angle

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

Solve for x (side)



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

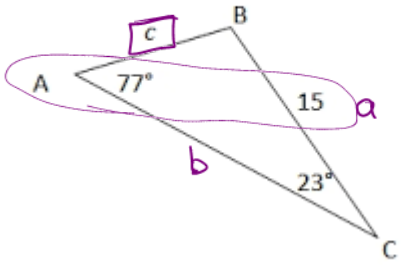
$$\frac{x}{\sin 49} = \frac{10}{\sin 63}$$

$$\frac{x}{0.7547} = \frac{10}{0.8910} \quad \times 0.7547$$

$$x = 8.47 \text{ cm}$$

Solve for c (side)

1. For ΔABC find c to the nearest hundredth.



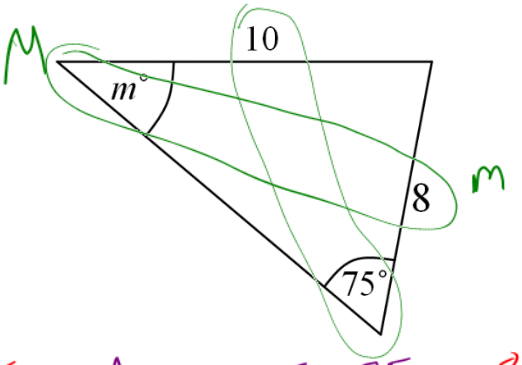
$$\frac{c}{\sin C} = \frac{a}{\sin A}$$

$$\frac{c}{\sin 23} = \frac{15}{\sin 77}$$

$$\frac{c}{0.3907} = \frac{15}{0.9745} \quad \times 0.3907$$

$$c = 6.01$$

Solve for M (angle)



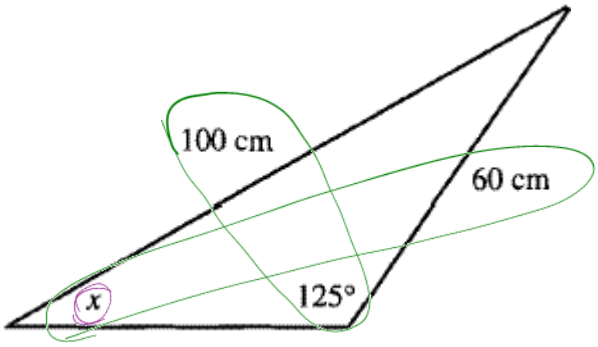
$\frac{\sin M}{8} = \frac{\sin 75}{10} \times 8$

$\sin M = 0.7727$

$M = \sin^{-1}(0.7727)$

$M = 51°$

Solve for X (angle)



$\frac{\sin X}{60} = \frac{\sin 125}{100} \times 60$

$\sin X = 0.4915$

$x = \sin^{-1}(0.4915)$

$x = 29°$

Success Criteria

- I can use the sine law to solve for a missing angle or side length in a non-right triangle
- I can recognize when to use the sine law (angle + side pair)