



The Sine Law

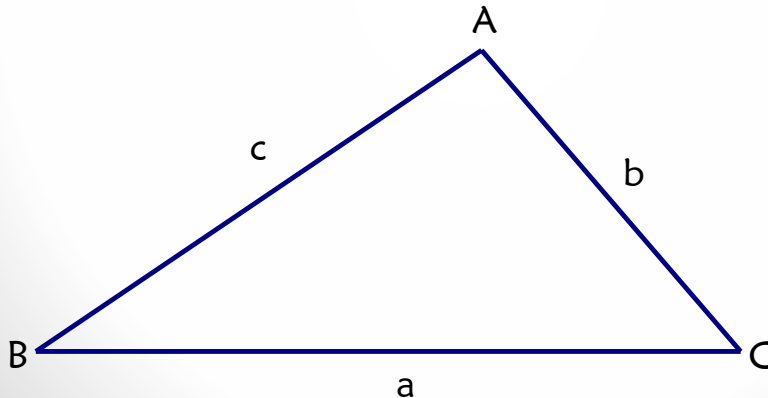
Learning Goals

- Explore the relationship between each side in an acute triangle and the sine of its opposite angle.
- Use the sine law to calculate unknown side lengths and angle measures in acute triangles.

* Not a Right Triangle =

Minds on ...

- What if, we are given $\triangle ABC$ is not a right triangle? SOHCAHTOA therefore cannot be applied.



The Sine Law

- In a non-right triangle ABC ,

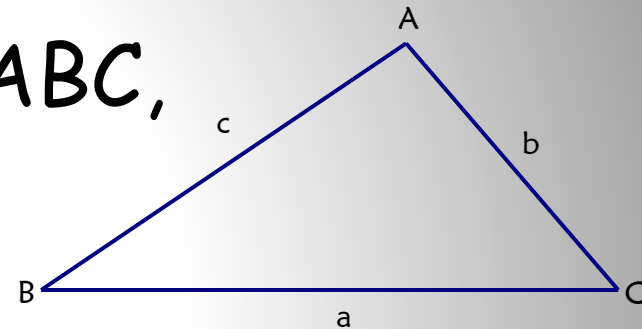
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Use this version when finding an angle.

or

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

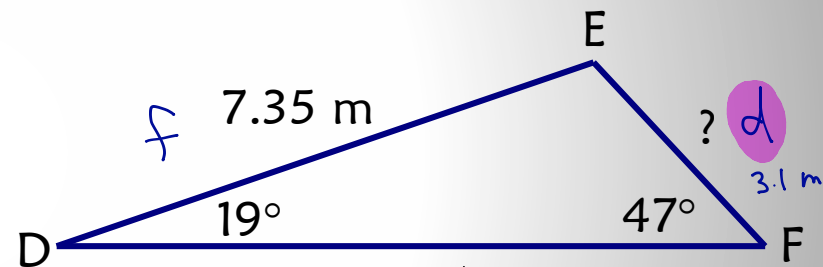
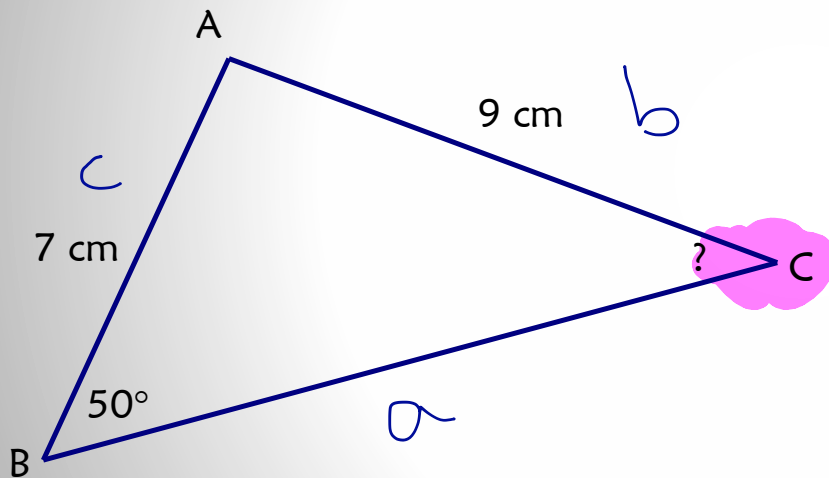
Use this version when finding a side.



NOTE: You will only use 2 out of 3 ratios at a time. Depending on the information given.

Examples

1. Find the missing measurements.



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

$$\frac{\sin C}{7} = \frac{\sin 50^\circ}{9}$$

$$\sin C = \frac{7 \sin 50^\circ}{9}$$

$$\sin C = \frac{7(0.766)}{9}$$

$$\sin C = 0.5958$$

$$\angle C = \sin^{-1}(0.5958)$$

$$\angle C = 37^\circ$$

$$\frac{d}{\sin D} = \frac{f}{\sin F}$$

$$\frac{d}{\sin 19^\circ} = \frac{7.35}{\sin 47^\circ}$$

$$d = \frac{7.35(\sin 19^\circ)}{\sin 47^\circ}$$

$$d = \frac{7.35(0.3256)}{0.7314}$$

$$d = 3.1 \text{ m}$$

Consolidation

Not a Right Triangle

- Use the Sine Law when:
 - Given 2 angles & 1 side to find another side.
 - Given 2 sides & 1 opposite angle to find another angle.

Reinforcement

- Page 433 #3