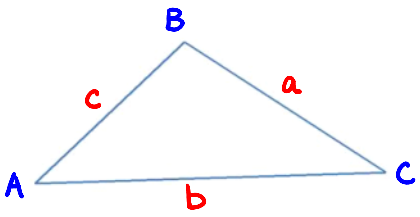
MCF3M Unit 4, Lesson 4

The Sine Law

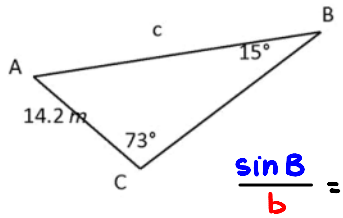
Today we will look at the sine law (or the "law of sines"). The formula we look at today will apply to ***any triangle,*** not just a right triangle.

Label the triangle below using A, B and C as angles.



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

Examples: Use the sine law to solve for the missing side in each triangle below.

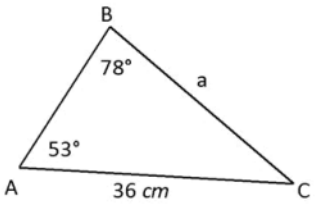


$$\frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\frac{\sin 15}{14.2} = \frac{\sin 73}{c}$$

$$c = \frac{14.2 \sin 73}{\sin 15}$$

$$\doteq 52.5 \text{ m}$$

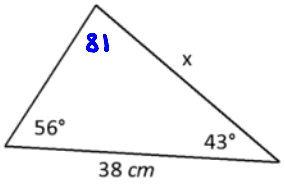


$$\frac{\sin B}{b} = \frac{\sin A}{a}$$

$$\frac{\sin 78^\circ}{36} = \frac{\sin 53^\circ}{a}$$

$$a = \frac{36 \sin 53}{\sin 78}$$

$$\doteq 29.4 \text{ cm}$$



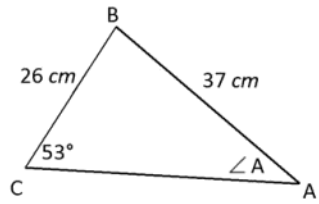
$180 - 56 - 43 = 81$

$$\frac{\sin 81}{38} = \frac{\sin 56}{x}$$

$$x = \frac{38 \sin 56}{\sin 81}$$

$$\doteq 31.9 \text{ cm}$$

The sine law can also be used to solve for angles. Try the example below.



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

$$\frac{\sin 53^\circ}{37} = \frac{\sin A}{26}$$

$$\frac{26 \sin 53}{37} = \sin A$$

$$0.56 \doteq \sin A$$

$$\sin^{-1}(0.56) = A \doteq 34^\circ$$