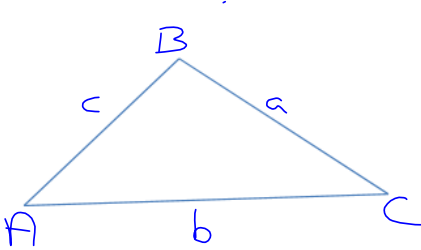


MCF3M

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.

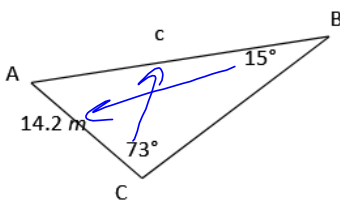
Label the triangle below using A, B and C as angles.



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

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

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

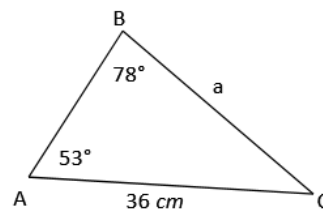


$$\frac{c}{\sin C} = \frac{b}{\sin B}$$

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

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

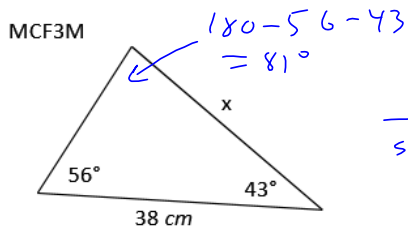
$$c \approx 52.5 \text{ m}$$



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

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

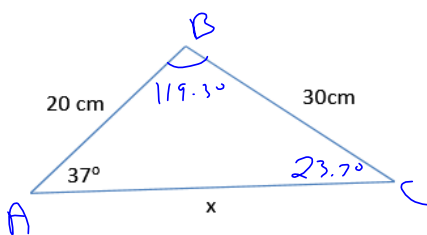
$$a \approx 29.4 \text{ cm}$$



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

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

$$x \approx 31.9 \text{ cm}$$



$$\frac{20}{\sin C} = \frac{30}{\sin 37^\circ}$$

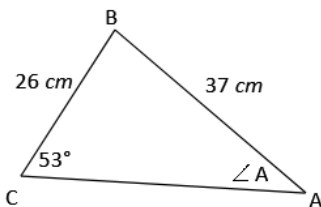
$$30 \sin C = 20 \sin 37^\circ$$

$$\sin C = \frac{20 \sin 37^\circ}{30}$$

$$C = \sin^{-1} \left(\frac{20 \sin 37^\circ}{30} \right)$$

$$C \approx 23.7^\circ$$

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



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

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

$$A \approx 34^\circ$$

$$\frac{x}{\sin 119^\circ} = \frac{30}{\sin 37^\circ}$$

$$x = \frac{30 \sin 119^\circ}{\sin 37^\circ}$$

$$x \approx 47.59 \text{ cm}$$

Text page 207 #1, 2, 3, 4a, 7