

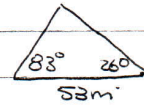
Sine Law

What happens if a triangle is NOT a right angle triangle?

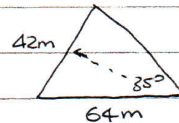
Under the following circumstances you can still figure out the unknown sides and angles

If you have 2 angles and 1 side

OR



If you have 2 sides and an opposite angle



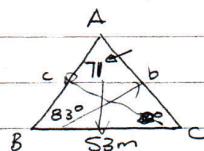
You use SINE LAW to determine what is missing

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

OR

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

Example 1:



Find b → first

STEP 1: get missing angle → $180 - 83 - 71 = 26$

STEP 2: Place in ~~sin~~ SINE LAW

$$\frac{\sin 71}{53} = \frac{\sin 83}{b} = \frac{\sin 26}{c}$$

∴ to find b

$$\frac{\sin 71}{53} = \frac{\sin 83}{b}$$

$$b \sin 71 = 53 \sin 83$$

$$b = \frac{53 \sin 83}{\sin 71}$$

$$\therefore b = 55.6 \text{ m}$$

∴ to find c

$$\frac{\sin 71}{53} = \frac{\sin 26}{c}$$

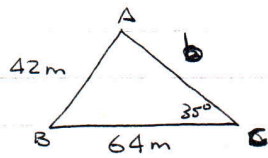
$$c \sin 71 = 53 \sin 26$$

$$c = \frac{53 \sin 26}{\sin 71}$$

$$\therefore c = 24.6$$

(2)

Example 2:



$$\frac{\sin 35}{42} = \frac{\sin A}{64} = \frac{\sin B}{b}$$

$$42 \sin A = 64 \sin 35$$

$$\sin A = \frac{64 \sin 35}{42}$$

but because it is an angle you must use \sin^{-1}

$$\sin^{-1} = \frac{64 \sin 35}{42}$$

$$\therefore \sin A = 61^\circ$$

Now is $\angle A = 61^\circ$ then $\angle B$ must be $180 - 61 - 35 = 84^\circ$

$$\therefore \frac{\sin 35}{42} = \frac{\sin 84}{b}$$

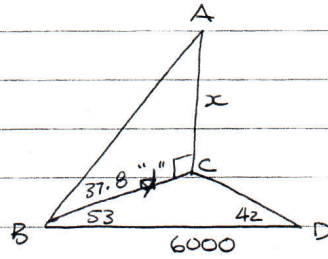
$$b \sin 35 = 42 \sin 84$$

$$b = \frac{42 \sin 84}{\sin 35}$$

$$b = 72.8$$

(3)

Example 3:



To find x we need an angle & 1 side in the triangle it is
it \rightarrow as of now we do not have it - BUT - we can
get it (get side y)

How? \rightarrow use ~~right~~ SINE LAW

$$\angle C = 180 - 53 - 42 = 85$$

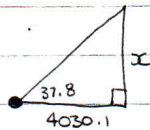
$$\frac{\sin 85}{6000} = \frac{\sin 42}{d}$$

$$d \sin 85 = 6000 \sin 42$$

$$d = \frac{6000 \sin 42}{\sin 85}$$

$$\therefore d = 4030.1$$

Now that you have " d " you can use SOHCAHTOA



$$\tan 37.8 = \frac{x}{4030.1}$$

$$x = 4030.1 \tan 37.8$$

$$x = 3126$$

$$\therefore x = 3126$$