When we don't have a right angle triangle and we need to find angles or sides we can use:

The Sine Law

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{C}$$ ✱To solve for angle

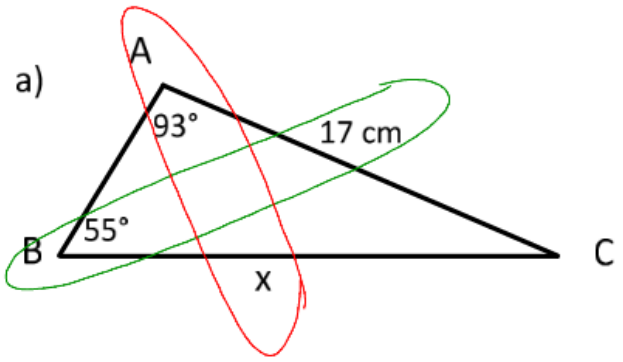
or

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$ ✱To solve for side

These ratios can be used to find unknown sides or angles in oblique triangles.

Ex. 1 Solve for the unknown.

a)

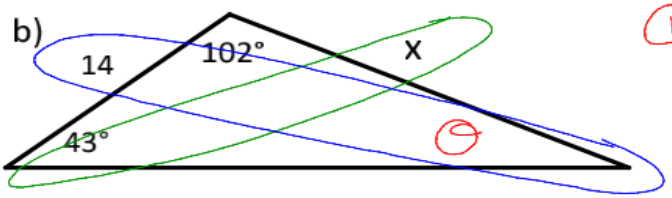


$$\frac{17}{\sin 55^\circ} = \frac{x}{\sin 93^\circ}$$

$$\sin 93^\circ \cdot \frac{17}{\sin 55^\circ} = x$$

$$x \doteq 20.7 \text{ cm}$$

b)



① $\theta = 180 - 102 - 43$

$= 35^\circ$

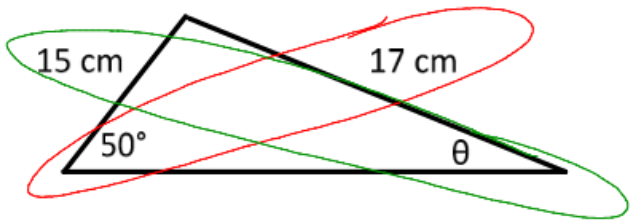
②

$$\frac{x}{\sin 43^\circ} = \frac{14}{\sin 35^\circ}$$

$$x = \frac{14}{\sin 35^\circ}(\sin 43^\circ)$$

$$\doteq 16.6$$

c)



We need to find an angle,

∴ use: $\frac{\sin A}{a} = \frac{\sin B}{b}$

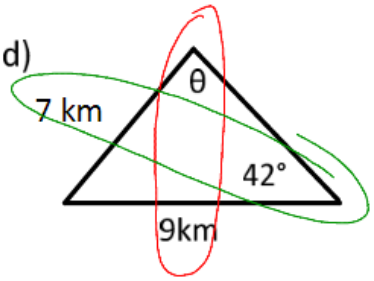
$$\frac{\sin\theta}{15} = \frac{\sin 50^\circ}{17}$$

$$\sin\theta = 15 \cdot \frac{\sin 50^\circ}{17}$$

$$\theta = \sin^{-1}\left(15 \cdot \frac{\sin 50^\circ}{17}\right)$$

$$\doteq 42.5^\circ$$

d)



$$\frac{\sin\theta}{9} = \frac{\sin 42}{7}$$

$$\sin\theta = 9 \cdot \frac{\sin 42}{7}$$

$$\theta = \sin^{-1}\left(9 \cdot \frac{\sin 42}{7}\right)$$

$$\theta \doteq 59.4^\circ$$

$$\sin\theta \doteq 0.86031$$

$$\theta = \sin^{-1}(0.86031)$$

$$\theta \doteq 59.4$$