

19 - Trigonometry

Sine Graph

When sine value is +ve:

$$1\text{st value} = \sin^{-1}(x)$$

$$2\text{nd value} = 180 - (\sin^{-1}(x))$$

When sine value is -ve:

$$1\text{st value} = 180 - \sin^{-1}(x)$$

$$2\text{nd value} = 360 + \sin^{-1}(x)$$

Tan Graph

When Tan value is +ve:

$$1\text{st value} = \tan^{-1}(x)$$

$$2\text{nd value} = 180 + \tan^{-1}(x)$$

When Tan value is -ve:

$$1\text{st value} = 180 + \tan^{-1}(x)$$

$$2\text{nd value} = 360 + \tan^{-1}(x)$$

Cosine Graph

When cosine value is +ve or -ve:

$$1\text{st Value} = \cos^{-1}(x)$$

$$2\text{nd value} = 360 - \cos^{-1}(x)$$

Non Right angled triangles

Right Angled and no angles = Pythagoras

Right angled and some angles = Trig

If the triangle is not right angled, you may need sine/cosine rule

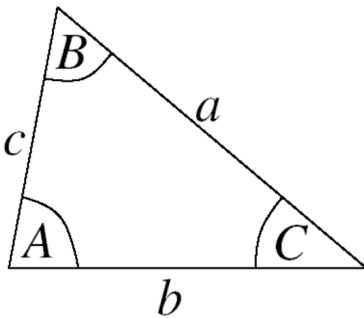
The Sine Rule

You can only use sine rule if you have a matching pair/opposites (e.g. a and Sine A)

The Cosine Rule

Missing Length = when you have 2 sides and an angle inbetween them

Missing Angle = when you have 3 sides



Sine Rule

$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)} \quad \text{or} \quad \frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$$

(for finding sides)

(for finding angles)

Cosine Rule

$$a^2 = b^2 + c^2 - 2bc \cos(A) \quad \text{or} \quad \cos(A) = \frac{b^2 + c^2 - a^2}{2bc}$$

(for finding sides)

(for finding angles)

With the **ambiguous case** (obtuse angle), work out the missing angle but then minus from 180 to get the obtuse angle.

Area of non-right angled triangle: $\frac{1}{2} ab \times \sin C$

$ab = 2$ given sides, $\sin C =$ angle between the sides

Area of right angled triangle: $\frac{1}{2}$ base \times height