

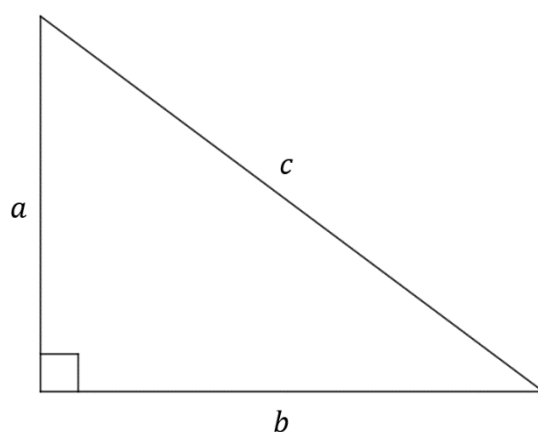
Higher GCSE Mathematics Formulae to learn

Pythagoras' theorem

In any right-angled triangle

with sides of length a , b and c , where c is the length of the hypotenuse

$$a^2 + b^2 = c^2$$



Trigonometry

$$\sin x = \frac{\text{opposite}}{\text{hypotenuse}}$$

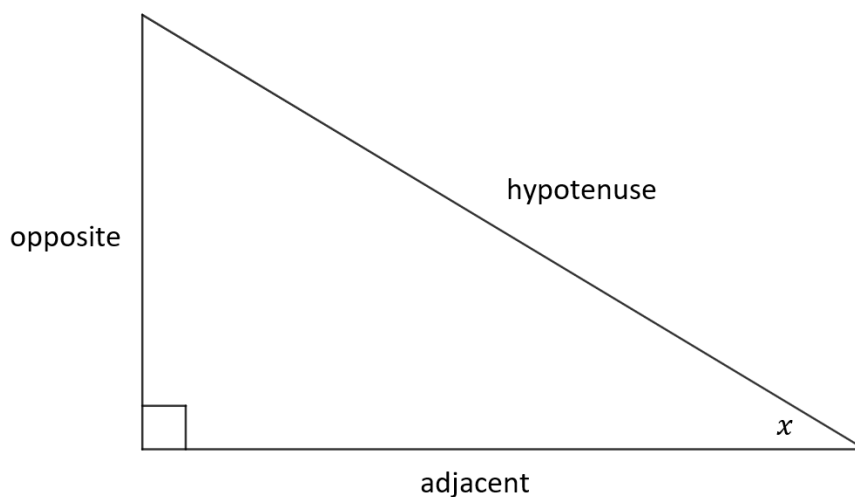
$$\cos x = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan x = \frac{\text{opposite}}{\text{adjacent}}$$

$$x = \sin^{-1}\left(\frac{\text{opposite}}{\text{hypotenuse}}\right)$$

$$x = \cos^{-1}\left(\frac{\text{adjacent}}{\text{hypotenuse}}\right)$$

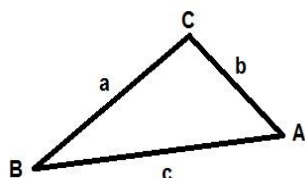
$$x = \tan^{-1}\left(\frac{\text{opposite}}{\text{adjacent}}\right)$$



Area of a triangle

$$\text{Area of a triangle} = \frac{\text{base} \times \text{perpendicular height}}{2}$$

$$\text{Area of a triangle} = \frac{1}{2} ab \cos C$$



Cosine Rule

$$a^2 = b^2 + c^2 - 2bc \cos A$$

If you know all three sides you can rearrange the formula to find any angle.

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

Sine Rule

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

Circumference and Area of a Circle

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

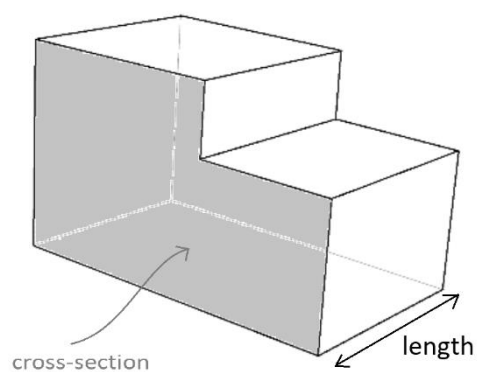
$$\text{Area of a circle} = \pi r^2$$

r is the radius and d is the diameter

The Quadratic Formula

The roots of the equation $ax^2 + bx + c = 0$ with $a \neq 0$ are $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Volume of a Prism

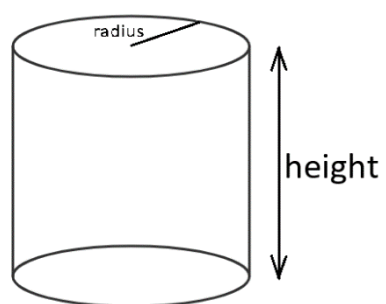


The volume of a prism = area of cross-section \times length

Volume of a cylinder

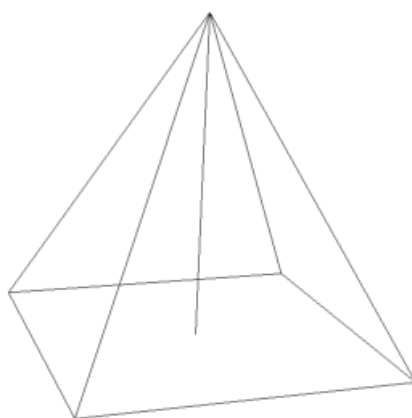
$$V = \pi r^2 h$$

$V =$ area of cross-section \times height

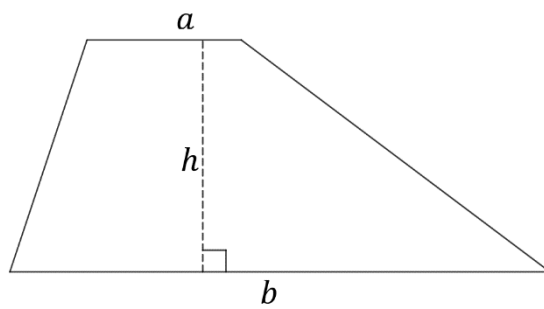


Volume of a Pyramid

$V =$ one third of the area of the base \times height



Area of a trapezium



The area of a trapezium is the sum of the areas of two triangles with the same height

$$\text{Area} = \frac{ah}{2} + \frac{bh}{2} = \frac{(a+b)h}{2}$$

You may want to check that you also know all the formulae required for the foundation tier.

[Foundation formulae](#)