

Summer 2022 GCSE Maths Higher: Formula You Will Be Given

Probability

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \text{ given } B)P(B)$$

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

$$\text{Area of a trapezium} = \frac{1}{2}(a + b)h$$

Volume of a prism = area of cross section \times length

Where r is the radius and d is the diameter:

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

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

These are given in relevant questions.

Where r is the radius of a sphere or cone, l is the slant height of a cone and h is the perpendicular height of a cone:

$$\text{Curved surface area of a cone} = \pi r l$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Volume of a cone} = \frac{1}{3}\pi r^2 h$$



Kinematics formulae

These are given in relevant questions.

Where a is constant acceleration, u is initial velocity, v is final velocity, s is displacement from the specific position when $t = 0$ and t is time taken:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

Compound interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

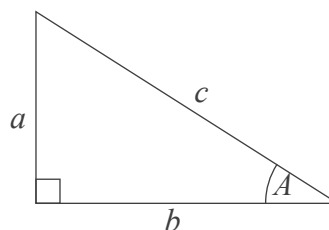
$$\text{Total accrued} = P\left(1 + \frac{r}{100}\right)^n$$

Quadratic formulae

The solution of $ax^2 + bx + c = 0$ where $a \neq 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Pythagoras' Theorem and Trigonometry

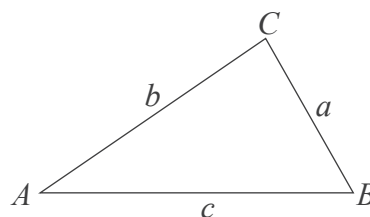


In any right-angled triangle where a , b and c are the length of the sides and c is the hypotenuse:

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

In any right-angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$



In any triangle ABC where a , b and c are the length of the sides:

$$\text{sine rule:} \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule:} \quad a^2 = b^2 + c^2 - 2bccosA$$

$$\text{area of a triangle:} \quad \frac{1}{2}absinC$$

Summer 2022 GCSE Maths Higher: Formula You Need To Know

Perimeter, area and volume

Where b is the base and h is the perpendicular height:

Area of a rectangle = bh

Area of a triangle = $\frac{1}{2}bh$

Area of a parallelogram = bh

Where l is the length of a cuboid, w is the width of a cuboid and h is the height:

Volume of a cuboid = lwh

Where r is the radius of a cylinder and h is the height:

Volume of a cylinder = $\pi r^2 h$

Where a is the area of the base and h is the perpendicular height:

Volume of a pyramid = $\frac{1}{3}ah$

Compound measures

Speed = $\frac{\text{distance}}{\text{time}}$

Density = $\frac{\text{mass}}{\text{volume}}$

Pressure = $\frac{\text{force}}{\text{area}}$

Exact values of trigonometric functions

θ	0°	30°	45°	60°	90°
$\sin\theta$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
$\cos\theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
$\tan\theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Undefined