

GCSE MATHEMATICS HIGHER TIER

Formulae Sheet

Insert

Perimeter, area and volume

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

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:

Circumference of a circle = $2\pi r = \pi d$

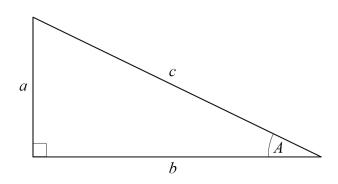
Area of a circle = πr^2

Quadratic formula

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:

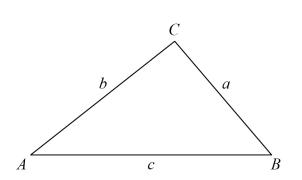
$$\sin A = \frac{a}{c}$$
 $\cos A = \frac{b}{c}$ $\tan A = \frac{a}{b}$

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

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

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

Area of triangle =
$$\frac{1}{2}ab \sin C$$



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:

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

Probability

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

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

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

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