

MATHS DICTIONARY/ GLOSSARY

ACUTE ANGLE:

This is an angle which is less than 90° e.g. 45° is an acute angle.

ACUTE TRIANGLE:

This is a triangle, which contains all acute angles, i.e. all three angles are less than 90° .

AREA:

The area is an amount given to how much space an object takes up in 2 dimensions (2D). Its unit is normally metres squared (**m²**) or centimetres squared (**cm²**)

Common formula's for area:

Shape	Equation	Variables (things that change)
A Rectangle (or Square):	$L \times W$	L and W are the lengths of the rectangles sides (length and width).
A Triangle:	$\frac{1}{2} b \times h$	b and h are the base and height respectively.
A Circle:	$\pi \times r^2$	Where r is the radius.
A Trapezium:	$\frac{1}{2}(a+b)h$	Where a & b are the parallel sides, and h the height

ASCENDING:

This is when a list of values, such as numbers, is ordered to go from the lowest to the highest value.

BEARING:

Bearing indicates the direction you are going. This is measured as the angle clockwise from due north.

BIAS:

When an event (something) has a greater probability of occurring greater than normal, because it has been changed, tampered with or altered. For instance a coin, having a probability of 70% landing heads will be a biased coin. Cheating is a form of bias.

CIRCUMFERENCE:

Is the perimeter of a circle, it is found by the formula $\pi \times d$, where d is the diameter of the circle (note: the diameter is double the radius).

COMMON DENOMINATOR:

Is a number that is a common multiple of two or more of the bottom numbers (denominators) in any fractions. E.g. $\frac{2}{3}$ and $\frac{3}{4}$ can both be converted to equivalent fractions of denominator 12, With $\frac{2}{3}$ being equal to $\frac{8}{12}$ and $\frac{3}{4}$ to $\frac{9}{12}$. Hence their sum is $\frac{17}{12}$ or $1 \frac{5}{12}$.

COMMON FACTOR:

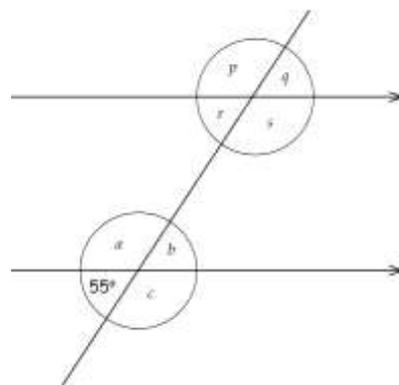
Is a number that will divide two or more other numbers without leaving a remainder E.g. the factors of 8 are 1, 2, 4, and 8 and the factors of 12 are 1, 2, 3, 4, 6 and 12, so the common factors are 1, 2 and 4.

COMMON MULTIPLE:

Is a number that is the product of 2 or more given numbers E.g. the multiples of 3 are 3, 6, 9, 12, 15 ... and so on, for 5 they are 5, 10, 15 ... and so on, therefore 15 is a common multiple of 3 and 5.

COMPLIMENTARY ANGLE:

Is the same angle on another parallel line, E.g. q and b are complimentary angles (see diagram)



DECAGON:

A polygon or shape with 10 (ten) sides



DENOMINATOR:

The bottom part of a fraction, E.g. for the fraction $\frac{3}{5}$, the denominator is 5.

DESCENDING:

This is when a list of values, such as numbers, is ordered to go from the highest to the lowest value.

DIAMETER:

The diameter is the length of the line going from one side through the centre to the other side in a circle. It is also twice the radius.

ESTIMATION:

This is when you do not need to work out a calculation accurately, but rather a rough approximation of what the answer is. All parts should be rounded to 1 significant figure, so that the calculation is easy. E.g. $3.5 \times 4.8 \approx 4 \times 5 = 20$

EQUATION:

A question with an equal sign in, to show that the two sides balance, normally they include letters and numbers E.g. $n + 7 = 15$, so $n = 8$.

EQUIVALENT FRACTIONS:

Two or more fractions that are the same amount or fraction, but contain different numerators and denominators (see diagram).



$\frac{3}{4}$ and $\frac{6}{8}$ name the same amount.

So, $\frac{3}{4}$ and $\frac{6}{8}$ are equivalent.

$$\frac{3}{4} = \frac{6}{8}$$

EXTERIOR ANGLE:

If you extend a side of a shape to form a straight line, it is the angle that is created outside of the shape. It is found by taking away the interior angle in the shape away from 180°. Exterior Angle + Interior Angle = 180°.

EXPRESSION:

Is a part of a sentence that combines numbers and operation signs e.g. times or add, but does not have an equal sign. E.g. $b + b + b$

FACTOR:

Is a number that will divide into a number and leave a whole number with no remainder E.g. the factors of 8 are 1, 2, 4 and 8. This is because you can divide 8 by all these numbers and get a whole number (not a decimal) and without leaving a remainder.

FORMULA:

A set of symbols and numbers that expresses a fact or rule, e.g. $\pi \times r^2$ is the formula for calculating the area of a circle.

GEOMETRY:

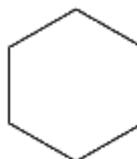
Geometry is the study of figures in two dimensions (plane geometry) and three dimensions (solid geometry). It includes the study of points, lines, triangles, quadrilaterals, other polygons, circles, spheres, prisms, pyramids, cones and cylinders.

GRADIENT

The gradient is the steepness of a line, it is calculated by how much it goes up or down for every single unit it goes left or right. The formula for calculating the gradient is the change in the Y-axis ÷ by the change in the X-axis.

HEPTAGON:

A heptagon is a 7 (seven) sided shape.

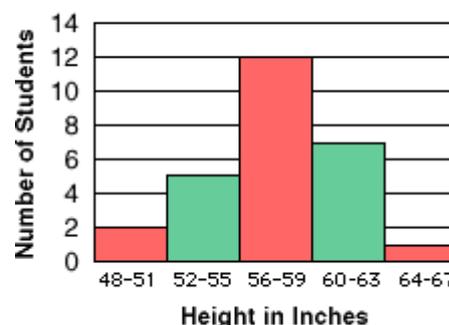


HEXAGON:

A hexagon is a 6 (six) sided shape

HISTOGRAM:

A bar graph that shows the number of times data occur within intervals (see diagram).



INTEGERS:

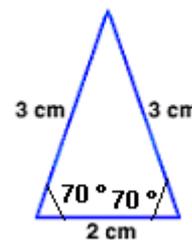
Is ANY whole number, e.g. 3, 4, -2 or 96. Integers may be positive and negative and 0 is also an integer.

INTERIOR ANGLES:

Are the angles within a shape or polygon, the sum (add up all the angles) of the interior angles in a triangle equal 180° , a quadrilateral/ circle 360° and so on...

ISOSCELES TRIANGLE:

This is a triangle where two sides are the same length and the opposite two angles are also equal (see diagram)

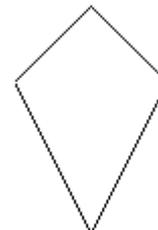


JUSTIFY:

Explain why something must be true or correct, often by stating a known fact or rule in your argument.

KITE:

Is a four sided shape (quadrilateral) with two pairs of equal length, and two angles in the middle which are equal (see diagram).



LIMITATIONS:

Is the limit in which you can stretch something to be true. This word is normally associated with the assumptions that you make about something. You will often hear what are the limitations of the assumptions made.

LINEAR EXPRESSIONS:

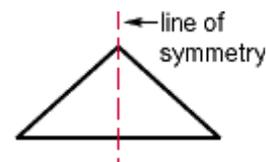
A function of the form $f(x) = mx + c$ where m and b are some fixed numbers. The names "m" and "c" are traditional. Functions of this kind are called "linear" because their graphs would result in a straight line/s.

LINE OF BEST FIT:

A line of best fit is used to show a trend on a scatter diagram. It is drawn through the middle of the points in the same direction as the points are going. You should have an equal amount of plotted points above and below the line. The line of best fit, rarely goes through 0 or the origin.

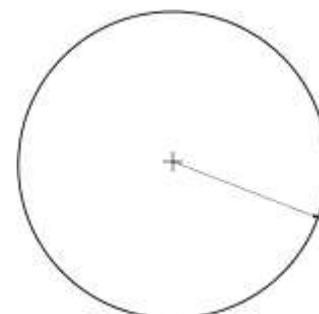
LINE OF SYMMETRY:

A line that divides a figure into two equal or matching parts (see diagram). Note: that you can have more than one line of symmetry, a square has 4.



LOCI:

Is a set of points that forms a shape or a graph, E.g. a circle can be defined as the locus of points (circumference) that are all the same distance from a given point (centre of the circle).



LOWER QUARTILE (First Quartile):

For a set of data, a number for which 25% or 1/4 of the data is less than that number. The lower quartile is the same as the median of the part of the data which is less than the median (same as the 25th percentile).

MEAN:

Is the numerical average, which is worked out by adding all the numbers or values together and dividing by how many numbers or values there are. E.g. if you had the set of numbers, 1,2,2,4,6 the total sum is 15, and there are 5 numbers, therefore the mean is 15 divided by 5, which gives a value of 3.

MEDIUM:

The middle number or the average of the two middle numbers in an ordered set of data. E.g. 1, 2, 3, 4, 5 has a medium value of 3, however if a 10 was added, the medium value would be 3 and 4, so the medium value would be 3.5.

MODE:

The mode is the value in a set of data with the highest frequency or the number which occurs the most. E.g. 1,1,2,2,2,2,4,4,5,6,6,6,7 has a mode value of 2, as it occurs four times one more than any other number. Note: the mode value is NOT the number of times it occurs but the value or the number which does occur, in this example, 2 is the answer NOT 4.

MULTIPLE:

Any number that is the product of a given number. E.g the sequences 5, 10, 15, 20, 25... are the multiples of 5; and 2, 4, 6, 8, 10... are the multiples of 2.

MUTUALLY EXCLUSIVE:

Events (two or more things happening) that have no outcomes in common, E.g. getting a head and a tail with a coin has nothing in common, however, getting a queen or a spade in a deck of cards are not mutually exclusive, because there is a queen of spades (cross over).

NUMBER LINE:

A number line shows all the whole numbers either side of 0. With negative numbers to the left of zero and positive numbers to the right of zero

NUMERATOR:

The top part of a fraction, so the fraction $\frac{3}{5}$ has a numerator of 3

NUMERICAL:

This is used to state that the answer for instance must be in numbers, and therefore numerical.

OBTUSE ANGLE:

An angle whose measure is greater than 90° and less than 180° , e.g. 120° is an obtuse angle.

OBTUSE TRIANGLE:

A triangle which has an obtuse angle (above 90° and less than 180°) as one of its angles.

OCTAGON:

An octagon is a 8 (eight) sided shape. Exterior angles = $360 / 8 = 45^\circ$, Interior Angle = $180^\circ - 45^\circ = 135^\circ$, and so the sum of the interior angles is equal to $135 \times 8 = 1080^\circ$

ORIGIN:

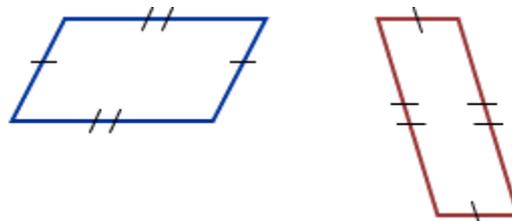
The centre of the four quadrants on a graph, with the co-ordinate (0,0). Or the origin is the start of something.

PARALLEL:

When two or more lines are always an equal distant apart, and therefore will never cross or meet.

PARALLELOGRAM:

A quadrilateral is a four sided shape whose opposite sides are parallel or equal.



PENTAGON:

A pentagon is a 5 (five) sided shape.

PERPENDICULAR:

When two lines cross at right angles (90°)

PRIME FACTOR:

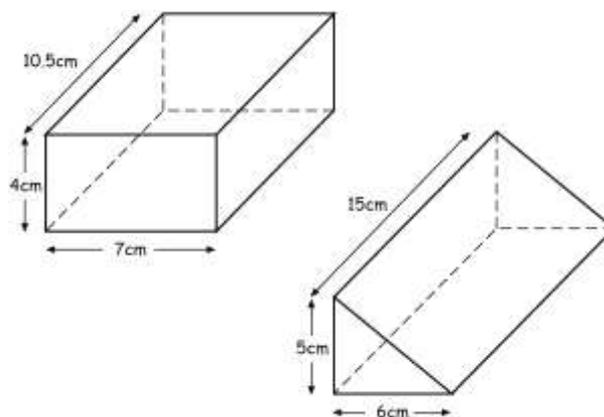
Any factor of a number that is itself a prime number. So the number 12, can be written as a product of its prime factors 2, 2 & 3, because 2 x 2 x 3 is 12.

PRIME NUMBER:

Number that can be divided only by 1 and itself and have no other factors. There is an infinite number of primes, the first ten of which are 2, 3, 5, 7, 11, 13, 17, 19, 23, and 29 (by definition, the number 1 is excluded from the set of prime numbers). The number 2 is the only even prime because all other even numbers have 2 as a factor

PRISM:

A prism is a 3D shape with a consistent cross section, such as a cuboids, cylinders or triangular prisms. The volume of a prism is the cross section or area x by the remaining height or breadth (see diagram)



PRODUCT:

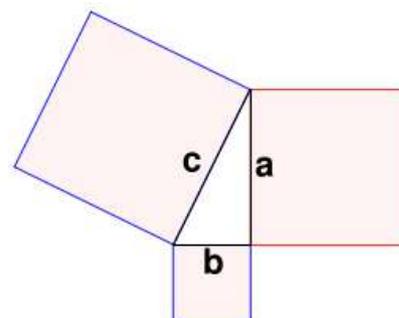
Means to multiply the numbers given by one another.

PROOFS:

Proofs are similar to workings out. A proof shows the way in which you get to the answer to show that you are correct, and that it follows the correct mathematical rules.

PYTHAGORAS:

Is the relationship between the three sides of a right angled triangle. This theory states that the squares a + b are equal in area to the square marked c. Therefore you can use the formula $a^2 + b^2 = c^2$, to calculate one of the sides if you only have the size of two of the sides.



QUADRATIC EXPRESSIONS:

A function of the form $f(x) = ax^2 + bx + c$ where a is not equal to

zero E.g. $y = 2x^2 + 4x + 3$

RANGE:

The difference between the greatest and least numbers in a set of data. E.g. the range of the data 1,2,3,4,8 would be $8 - 1$, so the range would be 7.

RADIUS:

The radius is the length from the centre of a circle to the outside of the circle. It is also half of the diameter of a circle

RATIO:

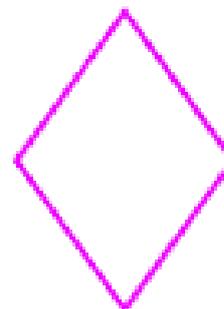
The number of a particular item in terms of another amount of another item. The ratio 7:2 (seven to two) could represent the number of parts water to parts squash in a drink.

REFLEX ANGLE:

Is an angle which is greater than 180° . E.g. 200° is a reflex angle.

RHOMBUS:

Is a parallelogram, but with all four sides equal. However not all of the angles are equal or it would be a square.



SEMI CIRCLE:

Is exactly half a circle.

SEQUENCE:

A group of numbers which follow on from each other by a set pattern, e.g. the number 1, 3, 5, 7, are a sequence, going up +2 each time, with an nth term rule of $2n + 1$.

SQUARE NUMBER:

Is a number which is another number multiplied by itself E.g. 1, 2, 9, 16, 25 are the first 5 squared numbers, as they are the answers of 1×1 , 2×2 , 3×3 , 4×4 and 5×5 .

SUM:

Sum means to add together all the numbers in the calculation

TANGENT:

Is a line which just touches the outside of a circle

THIRD QUARTILE: (see Upper Quartile)

UPPER QUARTILE (Third Quartile):

For a set of data, a number for which 75% or $\frac{3}{4}$ of the data is less than that number. The upper quartile is the same as the median of the part of the data which is greater than the median (same as the 75th percentile).

VARIABLE:

A variable is something that can change or is likely to vary. It is also a symbol denoting a quantity, often an unknown quantity or for symbolic representation, normally x or y.

VOLUME:

Volume, also called capacity, is an amount given to how much space an object takes up. Its unit is normally metres cubed ($\mathbf{m^3}$) or centimetres cubed ($\mathbf{cm^3}$).

Common equations for volume:

Shape	Equation	Variables (things that change)
A cube :	$s^3 = s \cdot s \cdot s$	(where s is the length of a side)
A rectangular prism :	$l \cdot w \cdot h$	(length, width, height)
A cylinder :	$\pi \cdot r^2 h$	(r = radius of circular face, h = distance between faces)
A sphere :	$\frac{4}{3}\pi r^3$	(r = radius of sphere) - (which is the first integral of the formula for Surface Area of a sphere)
A pyramid :	$\frac{1}{3}Ah$	(A = area of base, h = height from base to apex)
A cone (circular-based pyramid):	$\frac{1}{3}\pi r^2 h$	(r = radius of circle at base, h = distance from base to tip)

WHOLE NUMBERS:

Numbers ..., -3, -2, -1, 0, 1, 2, 3, ... are said to be integers, numbers 0, 1, 2, 3, 4, ... are called whole numbers, numbers 1, 2, 3, ... are the counting numbers.

X - ANGLE

Opposite angles are equal

Z – ANGLE:

Complimentary angles are equal