

Mathematical dictionary

The words a mathematics lesson depends on, explained in plain English.

Number

decimal

a number written with a point, where the digits after the point are parts of a whole

denominator

the number below the line in a fraction, showing how many equal parts the whole is split into

difference

the answer when one number is subtracted from another

digit

a single figure from 0 to 9 that a number is written with

equivalent

having the same value, even though it is written differently

estimate

a sensible answer worked out quickly from rounded numbers

factor

a whole number that divides exactly into another number

fraction

a number written as one whole split into equal parts, with a number of those parts taken

highest common factor *(also HCF)*

the largest whole number that divides exactly into two or more numbers

integer

a whole number, which may be positive, negative or zero

lowest common multiple *(also LCM)*

the smallest number that two or more numbers all divide into exactly

multiply *(also multiplies, multiplied, multiplying, multiplication)*

to add a number to itself a given number of times

multiple

a number you get by multiplying another number by a whole number

numerator

the number above the line in a fraction, showing how many equal parts are taken

percentage

a number of parts out of a hundred

place value

the value a digit has because of where it sits in a number

power *(also powers)*

how many times a number is multiplied by itself

prime

a whole number greater than 1 that divides only by itself and 1

product

the answer when two or more numbers are multiplied

quotient

the answer when one number is divided by another

reciprocal *(also reciprocals)*

the number you multiply by to get 1, found by turning a fraction upside down

recur *(also recurs, recurring)*

to repeat the same digits forever after the decimal point

round *(also rounds, rounded, rounding)*

to replace a number with a nearby simpler one

simplify *(also simplifies, simplified, simplifying)*

to write something in its smallest or plainest form without changing its value

root *(also square root)*

a number that gives another number when multiplied by itself a given number of times

sum

the answer when numbers are added together

surd

a root that cannot be written exactly as a fraction, so it is left in root form

Ratio and proportion

proportion

a relationship where two amounts change by the same factor

ratio

a way of comparing two or more amounts, showing how much of one there is for each of the other

scale factor

the number every length is multiplied by when a shape is enlarged

unitary

a method that first finds the value of one part or one item

Algebra

coefficient

the number in front of a letter, showing how many of it there are

expand *(also expands, expanded, expanding)*

to multiply out brackets so the expression has no brackets left

expression

a group of numbers and letters joined by operations, with no equals sign

factorise *(also factorisation, factorize)*

to write an expression as a product, usually by putting brackets back in

formula

a rule written with letters, showing how to work one quantity out from others

gradient

how steep a line is, found by how far it rises for each step across

identity

a statement that is true for every value of the letters in it

index *(also indices)*

the small raised number showing what power something is raised to

inequality

a statement that one quantity is larger or smaller than another

intercept

the point where a graph crosses an axis

linear

making a straight line when drawn as a graph

quadratic

an expression or equation whose highest power is a square

rearrange *(also rearranges, rearranged, rearranging)*

to change the order of a formula so a different letter is on its own

sequence

a list of numbers that follows a rule

substitute *(also substitutes, substituted, substituting, substitution)*

to put a number in place of a letter

term

one part of an expression or one number in a sequence

nth term

a rule that gives any number in a sequence from its position

variable

a letter standing for a quantity that can change

Geometry

adjacent

next to, and sharing a side or a corner

arc

part of the curved edge of a circle

area

the amount of space inside a flat shape

bearing

a direction given as an angle clockwise from north, written with three figures

bisector

a line that cuts an angle or another line exactly in half

chord

a straight line joining two points on

the edge of a circle

circumference

the distance all the way round a circle

congruent

exactly the same shape and size

diameter

a straight line across a circle through its centre

edge (*also edges*)

a straight line where two faces of a solid meet

face (*also faces*)

a flat surface of a solid shape

hypotenuse

the longest side of a right-angled triangle, opposite the right angle

parallel

always the same distance apart and never meeting

perimeter

the total distance around the edge of a shape

perpendicular

meeting at a right angle

polygon

a flat shape with straight sides

radius

the distance from the centre of a circle to its edge

sector

a slice of a circle between two radii

segment

the part of a circle cut off by a chord

similar

the same shape but a different size

tangent

a line that touches a curve at exactly one point

transformation

a change to a shape's position, size or orientation

vector

a quantity with both size and direction

vertex (*also vertices*)

a corner where two or more edges meet

volume

the amount of space inside a solid shape

Statistics and probability

average

a single value chosen to stand for a whole set of data

axis (*also axes*)

one of the lines a graph is measured against

correlation

how closely two sets of data are related

cumulative

adding up as you go along, so each total includes the ones before

data

the set of values collected

frequency

how many times something happens

mean

the average found by adding all the values and dividing by how many there are

median

the middle value when the data is put in order

mode

the value that appears most often

outlier

a value far away from all the others

probability

how likely something is, given as a number between 0 and 1

quartile

a value marking one quarter of the way through ordered data

range

the difference between the largest and smallest values

sample

a smaller group chosen to stand for a larger one

Words not yet checked

absolute value

the distance of a number from zero, ignoring whether it is positive or negative.

addition

combining two or more numbers to find their total.

altitude

height above sea level or another fixed reference level.

angle

the amount of turn between two straight lines that meet at a point

annular

Describing a shape made by the space between two concentric circles.

apex angle

the angle at the point of a triangle opposite its base.

arccos

The operation that finds an angle when its cosine is known.

arctan

The operation that finds an angle when its tangent is known.

area model

a rectangle diagram split into smaller rectangles, used to show how to multiply fractions.

arithmetic

the branch of mathematics that deals with adding, subtracting, multiplying and dividing numbers.

ascending order

arranged from smallest to largest

average speed

total distance travelled divided by total time taken.

bar model

a diagram made of rectangles that shows the parts and total of an equation.

base

the side of a shape chosen as the bottom for working out its area.

basis point

a unit equal to one hundredth of one percent, used for small changes in rates.

bimodal

having two values that appear most often in a list of numbers.

bodmas

a rule that says which operation to do first in a calculation.

bond

a type of loan to a government or company that pays regular money and is paid back later.

box method

a way of multiplying or expanding by splitting a rectangle into smaller parts.

bracket

one of a pair of curved symbols, (), used to group numbers or letters.

brackets

A pair of signs used in mathematics to group together a part of an expression.

cancel

to remove a shared number from the top and bottom of a fraction before multiplying.

cardinal directions

The four main compass points: North, South, East and West.

category

a group of non-numerical items, for example a colour, used as data.

centre

the fixed middle point of a circle

circle

a round flat shape whose edge is always the same distance from its centre

circular

round in shape, with every point on its edge the same distance from the centre.

column vector

a vector written vertically with one number above another.

common denominator

a bottom number shared by two or more fractions, used for adding or comparing them.

common difference

the fixed number added to each term to get the next term

common factor

a number that divides exactly into two or more other numbers.

common ratio

the fixed number used to create each next term in a geometric sequence

commutativity

the rule that swapping two numbers before you add or times them leaves the answer the same

component

one of the numbers that make up a vector.

compounding

the process of earning profit on both the original amount and profit already earned.

concentric

Having the same centre.

constant

a fixed number that stands alone, like 3 in $3x+3$.

convergence

the process of getting closer and closer to a particular value

conversion

a change of a value from one form, such as a fraction, to another, such as a percentage.

convert

to change a number from one form into another, such as a mixed number into an improper fraction

approximately

close to but not exactly; about.

ascending

arranged from smallest to largest.

bus stop method

a written method for division using a roof-like sign and a divisor.

coordinate

a number or pair of numbers that fixes the position of a point.

cosine

in a three-sided shape with a right angle, the ratio of the adjacent side to the hypotenuse.

cosine rule

a formula connecting three side lengths and one angle in a three-sided shape.

counterexample

an example that proves a general statement is not always true

coupon

The regular interest payment made on a bond.

cube

the number you get when a value is multiplied by itself twice.

cuboid

a 3D solid shape whose six faces are all rectangles.

dataset

a collection of numbers or information being studied

decimal place

the position of a digit after the decimal point, such as tenths or hundredths

decimal places

the digits written after the point in a number.

decimal point

the dot used to separate the whole part of a number from the fractional part.

degree

a unit for measuring angles; 360 of them make one full turn.

depreciation

the loss in value of something over time.

dimension

a measurement of a shape, such as its length or width.

dimensions

the measurements of a shape, such as length, width and height.

direct proportion

a relationship where two amounts change together while their ratio stays the same.

directed path

a line with an arrow showing direction from one place to another

directly proportional

when one amount is multiplied by a number, the other amount is multiplied by that same number.

discriminant

a value calculated from the numbers in an equation; if it is negative, the equation has no real solutions.

displacement

the straight-line distance and direction from a starting point to a final position.

distributive property

the rule that $a(b+c)=ab+ac$.

divide

to split a number into equal parts, or find how many times one number fits inside another.

division

the operation of splitting a number into equal parts.

divisor

the number that another number is divided by.

duration

the length of time until a bond or gilt is paid back.

embedding

a way of turning words into coordinates or vectors so meanings can be compared mathematically

equal

having the same size or number

equation

a mathematical statement with an equals sign showing that two sides are equal.

equilateral

having all sides the same length

equilateral triangle

a triangle with all three sides the same length.

equivalent fraction

a different fraction that means the same amount as another fraction.

evaluate

to work out the value of an expression

even

able to be divided exactly by 2.

exponent

the raised number showing how many times to multiply a number by itself.

fibonacci

a famous sequence where each number is the total of the two before it

finite

limited in size; not going on forever.

fixed point

a value that stays the same when an iterative process is applied to it.

chunking

a division method that breaks a larger number into easier smaller parts.

cos

the adjacent side divided by the hypotenuse for an angle in a right triangle.

elimination

removing one unknown from simultaneous equations by adding or subtracting them

endpoint

the point at which a route or line finishes

even number

a whole number that can be divided exactly by two.

foil

a way to multiply two brackets that each have two terms, multiplying First, Outer, Inner and Last.

fraction wall

a diagram of strips divided into equal parts, used to compare fractions.

geometric

describing a sequence where each term is multiplied by the same number to get the next.

geometry

the branch of mathematics that studies shapes, sizes, and space.

gilt

A bond issued by the UK government to borrow money.

height

the distance straight up from the base of a shape to its top, used to find area.

hexagon

a flat shape with six straight sides

hundredths

the value of one part when a whole is divided into one hundred equal parts.

improper fraction

a fraction with a top number larger

than or equal to its bottom number

interest

Money paid for borrowing or earned on savings.

interest rate

the percentage of an amount that is paid or earned as interest.

intersect

to cross each other

inverse sine

The operation that finds which corner has a given sine value.

isosceles triangle

a three-sided shape with two sides equal in length

iteration

one complete repeat of a repeating process

iterative

using a repeated rule, where each result is used to find the next one.

iterative process

a method that repeats a rule, using the previous answer to produce the next

lattice method

a written multiplication method that uses a grid to organise the calculation.

leg

one of the two shorter sides of a right-angled triangle.

like terms

terms that have the same letter or letters, or no letter, so they can be added or subtracted together.

line segment

a straight part of a line that starts at one point and ends at another.

magnitude

the size of a number without its sign.

major arc

the longer of the two parts of the circumference between two points on a circle.

major segment

the larger of the two parts of a circle cut off by a chord.

mapping

matching or sending each point of one shape to a point of another.

mass

the amount of matter in an object, measured in grams or kilograms.

maturity

the time when a bond is paid back.

minor arc

the shorter of the two parts of the circumference between two points on a circle.

minor segment

the smaller of the two parts of a circle cut off by a chord.

mixed number

a number made of a whole amount and a fraction, such as $3\frac{1}{2}$

negative

below zero; a number or term with a minus sign is below zero.

negative number

a number less than zero, written with a minus sign.

non-reflex angle

the smaller angle between two lines, measuring less than 180 degrees

number line

a straight line with numbers marked at equal distances, used to show value and order.

odd number

a whole number that cannot be divided exactly by two.

apex

the point of a triangle opposite the base, often its top point.

arithmetic sequence

a sequence where the same number is added or subtracted each time

compound

to earn interest on both the original amount and on interest already earned.

corresponding

matching sides or points in similar shapes.

enlarge

to make a shape bigger by multiplying every length by the same number.

fractional part

the part of a mixed number that is less than one, written as a fraction.

geometric sequence

a sequence where each term is found by multiplying the previous term by the same number

ladder

an investment strategy that buys bonds with different maturity dates so payments arrive at regular times.

odd

a whole number that cannot be split exactly into two equal whole numbers.

of

in fraction work, it means multiply: taking a fraction of an amount uses multiplication

operation

Something done to a number, such as adding, subtracting, multiplying or dividing.

opposite

in a three-sided shape with a right angle, the side across from a chosen corner.

order

to arrange numbers from smallest to largest, or from largest to smallest.

origin

the fixed point (0,0) on a coordinate grid.

parentheses

the round brackets () used in calculations to show which part to do first.

per cent

for every hundred; a number out of one hundred.

percent

for every hundred; shown with a % sign.

pi

the special number about 3.14 used when working with circles

pie chart

a circular chart divided into slices to show parts of a whole.

position-to-term rule

a way to calculate any term in a sequence from its position, such as $3n+1$.

positive

a number greater than zero.

prime number

a whole number greater than 1 whose only factor is 1 and itself.

principal

The original amount of money borrowed or lent, before interest or extra payments.

proof

a logical argument showing that a mathematical statement is always true.

proper fraction

a fraction with a top number smaller than its bottom number

protractor

a tool used to measure angles.

pythagoras

a rule for finding a missing side of a right-angled triangle.

pythagoras' theorem

in a right-angled triangle, the longest side times itself equals the other two sides times themselves, added together.

quarter

one of four equal parts of one.

rate

a comparison of two different kinds of amount, such as litres per minute.

rate of change

how quickly a measurement increases or decreases over time.

ray

a straight line that starts at one point and goes on forever in one direction

rectangle

a flat shape with four straight sides and four square corners.

recurrence

a rule that defines each term using one or more earlier terms

recurring decimal

a decimal in which a digit or group of digits repeats forever.

regular

having all sides equal and all angles equal

remainder

the amount left over when a number cannot be split into equal whole groups

resultant

the single vector that has the same overall effect as adding two or more vectors.

return

The amount of money gained or lost on an amount lent or invested.

reverse

The same vector with every number changed to the opposite sign, so it points back.

right angle

a square corner, exactly a quarter of a full turn.

right triangle

a triangle with one angle that is a quarter turn.

right-angled triangle

a three-sided shape with one corner of 90 degrees.

rule

a mathematical instruction that works out every number in a sequence

scale

to enlarge or shrink a shape so every length changes in the same way

semicircular

shaped like half of a round object.

set

a collection of numbers or objects grouped together.

sign

The plus or minus mark that tells whether a value is positive or negative.

simple interest

interest calculated only on the original amount, so previous interest earns nothing.

simplest form

a fraction written with the smallest possible numbers above and below the line.

simultaneous equations

two or more equations with the same unknown values that are solved together.

sin

the opposite side divided by the hypotenuse for an angle in a right triangle.

sine

in a right-angled triangle, the side across from a chosen corner divided by the longest side.

sine rule

a formula connecting the sides of a triangle with the sin of the angle opposite each side.

solution

a value or set of values that makes an equation true when used in place of the letter.

speed

how far something travels in one unit of time

square

to work out a number times itself; also a flat shape with four equal sides and four equal corners

square number

a result of multiplying a whole number by itself, such as 1, 4, 9, 16.

subtended

formed when the two ends of a chord are joined to a point on the circumference.

subtraction

the process of taking one amount away from another.

symmetric

balanced so that one side is a mirror image of the other.

tan

the opposite side divided by the adjacent side for an angle in a right triangle.

ten-thousandths

the value of one part when a whole is divided into ten thousand equal parts.

tenths

the value of one part when a whole is divided into ten equal parts.

terminate

for a decimal to end after a fixed number of digits.

theorem

a mathematical statement that can be proved to be true.

thousandths

the value of one part when a whole is divided into one thousand equal parts.

times table

a list of numbers made by repeatedly adding the same number, such as 3, 6, 9, 12.

tip-to-tail

A method for adding vectors by placing the point of one at the start of the next.

total

the whole amount found by adding all the parts together.

translation

moving every point by the same vector, without turning or resizing it

triangle

a flat shape with three straight sides

triangular number

a number that can be shown as dots arranged in a triangle

trigonometry

the mathematics of relationships be-

tween angles and side lengths in triangles.

uniform

the same at all points; not changing.

unique

being the only one; here, no other value is tied with the mode.

unit price

the cost for one single gram, litre, item, or other measure

upper bound

a number that is greater than or equal to every possible value in a set.

value

the number that a letter or symbol stands for

vertical

going straight up and down

vertically opposite

describing two angles, the same size, formed across from each other when two lines cross

whole number

a number that is not negative and has no part after a decimal point, such as 0, 1, 2 or 3.

whole numbers

the numbers zero, one, two, three, and so on, with no fraction or decimal part.

yield

The money earned on an amount lent or invested, usually shown as a percentage.

yield curve

a line showing how yields change for different times to maturity.

algebraic method

a way of solving a problem by using letters to stand for the numbers you want to find.

commutative

describes an operation whose order does not affect the answer.

unit fraction

a fraction whose top number is one.

algebraic

using letters to stand for unknown numbers.

bar chart

a diagram using bars to show how many of each category there are

counter-example

an example that shows a general statement is false.

decrease

to make an amount smaller, usually by subtracting a percentage of the starting amount

discount

money taken off a normal price, often given as a percentage

dot notation

a way of writing a recurring decimal

by putting a dot over the digit or digits that repeat.

factor pair

Two numbers that multiply together to make a chosen number.

increase

to make an amount larger, usually by adding a percentage of the starting amount

index form

A way of writing repeated multiplication using a small raised number, such as 2^3 .

interval

the gap between two marks on a number line or scale.

irrational

a number whose decimal part never ends and never repeats, so it cannot be written as a fraction.

original value

the amount before a percentage increase or decrease is applied

prime factor

A factor that is also a prime.

prime factor decomposition

Writing a number as a product of its prime factors.

rational

a number that can be written as a fraction of two whole numbers.

reduce

to make an amount smaller, especially by removing a stated percentage from it

terminating decimal

a number whose digits after the point stop after a limited number of places.

account

a record with a bank for keeping money

balance

the amount of money in an account at a particular time

cap

an upper limit on how large an amount can be

capped

limited to a largest number or size.

certain

sure to happen; its probability is one

compound interest

interest calculated on the original amount plus interest already added

cross-multiply

multiply the top of each side by the bottom of the other in two equal fractions

curve

a line that bends instead of being straight.

d.p

short for decimal place

deposit

money you put into a savings account

double

to become twice as large.

effective annual rate

the true percentage change over one year when interest is added more than once

equally likely

having the same probability as each other

even chance

exactly as likely to happen as not; its probability is one half

event

something that may happen in a probability situation

expect

to work out the average number of times an outcome would happen over many goes

fair

where every possible outcome has the same probability

fee

money charged by a bank for a service

frequency tree

a diagram that splits a total into groups using two features

graph

a drawing that shows how one amount changes compared with another

gross interest

interest before any fees or charges are taken away

impossible

cannot happen; its probability is zero

inclusive

including the end number in a range

less than or equal to

a number is smaller than another number or the same as it

likely

has a probability more than one half but less than one

locked in

not able to take your money out for a set time.

maximum

the largest amount or number allowed

midpoint

the number exactly halfway between two other numbers

minimum

the smallest amount or number allowed

multiplier

a number that turns an original amount into a new amount for a percentage change

never-ending decimal

a number written with a decimal point whose digits go on without stopping

outcome

one of the possible results when something is done

overlap

the part where two groups share members

plot

to mark locations in the correct place on a graph

positive number

a number above zero, such as 5

random

chosen so that every outcome has the same probability

repeating block

a group of digits that repeats forever in a decimal

repeating decimal

a number written with a decimal point in which a digit or group of digits repeats forever

round-half-up

the rule that a number exactly halfway between two numbers goes to the larger number

unlikely

has a probability more than zero but less than one half

venn diagram

a diagram with circles that shows what different groups share

withdraw

to take money out of a bank.

withdrawal

money taken out of an account

greater than

larger than another amount

less than

smaller than another amount

nearest

the closest among a set of choices

cube root

a number that gives a specified value when multiplied by itself twice more

descending order

arranged from largest to smallest

fifth root

a number that gives a specified value when five copies are multiplied together

fourth root

a number that gives a specified value when four copies are multiplied together

fractional index

an index written as a fraction, such as one half or three quarters

index law

a rule for working with indices, such as adding them when multiplying

place value chart

a table that shows what each digit in a number is worth

round down

to replace a number with the smaller nearby number

round up

to replace a number with the larger nearby number

step

the distance from one mark to the next on a line

double rounding

changing a number to a simpler value twice, which can give the wrong answer.

hundreds digit

the digit three places from the right in a whole number.

hundredths digit

the digit in the second place after the decimal point.

non-repeating

not having a group of digits that comes round again forever.

non-terminating

going on forever without stopping.

strict

in an inequality, using only bigger or smaller, not allowing the same value.

tens digit

the digit two places from the right in a whole number.

tenths digit

the digit in the first place after the decimal point.

trailing zero

a zero at the end of a decimal number that does not change its value.

units digit

the digit in the rightmost place of a whole number.

add

to put numbers together to find their total

algebra

a branch of mathematics using letters to stand for unknown numbers

algebraic fraction

a fraction that contains letters as well as numbers

algebraic variable

a letter, such as a , x or m , that stands for a number that can change.

bureau de change

a place where you change money from one currency to another

cancelling

removing the same factor from the top and bottom of a fraction

carry

to move an extra ten to the next position on the left when a total is ten or more

cell

a small square or rectangle in a grid.

column

a line of cells going down a grid.

column method

a written way of doing multiplication by working with place values in up-and-down lines.

commission

a fee that is a share of the money being changed, not a fixed amount

constant term

a term in an expression that has no letter

conversion graph

a graph that shows how much of one currency you get for another

currency

the money used in a country

decimal number

a number that includes a point and shows a part less than one.

diagonal

a straight line that goes from one corner of a rectangle to the opposite corner

difference of two squares

an expression like one square minus another square

exchange rate

the amount of another country's money that one pound buys

factor tree

a diagram that splits a number into factors until only prime factors remain

factorial

the result of multiplying all whole numbers from a given number down to 1.

flat fee

a fixed charge taken off every exchange, whatever the amount

grid

a pattern of lines that makes boxes or squares for organising numbers

hundreds

the position in a number that counts groups of ten tens

hypervolume

the amount of space inside a four-dimensional shape, measured in fourth-power units.

intersection

the part where two circles in a Venn diagram overlap

lattice

a boxed diagram with diagonal lines used for multiplication

leading zero

a digit written at the front of a decimal to keep the other digits in their correct positions

like surds

two or more values with the same number under the root sign

negative index

a small raised number that is negative, telling you to take the reciprocal

rectangular

having four straight sides and four corners that are all the same.

row

a line of cells going across a grid.

significant digits

the figures in a number that show its true size, not noughts used only for position.

solve

to find the value that makes an equation true

subtract

to take one number away from another

ten thousands

the position in a number that counts groups of ten thousands

tens

the position in a number that counts groups of ten

tesseract

the four-dimensional shape made by moving a cube in a fourth direction.

thousands

the position in a number that counts groups of ten hundreds

truncate

to cut off extra digits instead of rounding the number

units

the position in a number that counts single ones

y-intercept

the value where a line crosses the vertical axis

at random

chosen so that every item has the same chance of being picked.

biased

not fair, so some results are more likely than others.

branch

one path in a frequency tree, leading to a group or subgroup.

double inequality

an inequality that gives both a lower and an upper limit for a value.

filled circle

a small solid circle on a number line showing that the marked value is included.

open circle

a small empty circle on a number line showing that the marked value is not included.

ordinary number

a number written in the usual way, not in standard form.

satisfy

make a statement true when a letter is replaced by that value.

standard form

a way of writing large or small numbers as a number between one and ten times a power of ten.

strictly

used to mean the end value is not included.

bidmas

the order for working out a calculation with different operations

bus stop division

a written method for dividing where the number you divide by sits outside a curved shape

fraction bar

the line in a fraction that separates the

top number from the bottom number

recurring dot

a dot written over a digit to show that it repeats forever

side length

the distance along one side of a shape