

Chapter 13

This chapter is a great resource for quickly accessing definitions for algebra terms you may not be familiar with. When you need the explanation of an algebra term, you can easily refer to the comprehensive glossary in this chapter.

Glossary

In this Chapter...

Glossary

A

Absolute Value

The absolute value of a number is always the positive value of the number, whether the number is positive or negative. For example, the absolute value of 5 and -5 is 5. An absolute value is indicated by two thin vertical lines around a number, such as $|5|$.

B

Base

The base in an exponential expression is the number or variable being multiplied by itself. For example, in the expression 6^2 , the base is 6, while the exponent is 2.

Binomial

A binomial is a polynomial with two terms, such as $5x + 7$.

C

Coefficient

A coefficient is a number in front of a variable. For example, 5 is the coefficient in the expression $5x$.

Common Denominator

A common denominator is a denominator, or bottom number, shared by a group of fractions. For example, $\frac{1}{4}$ and $\frac{3}{4}$ have a common denominator of 4. To add and subtract fractions, the fractions must have a common denominator.

Composite Number

A composite number is a number that you can divide evenly by itself, the number 1 and one or more other numbers. For example, 4, 6 and 8 are composite numbers.

Compound Inequality

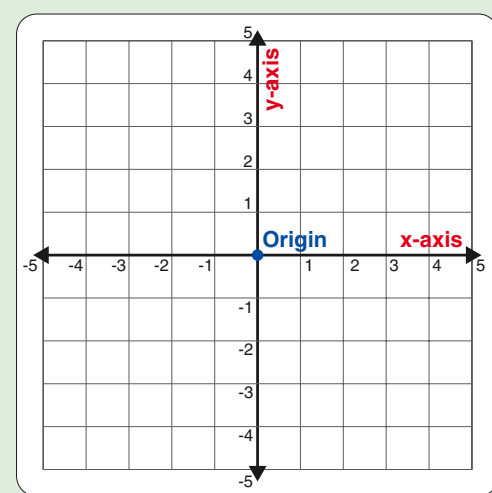
A compound inequality is the combination of two inequalities, which are written together. For example, $2 < x < 8$ is a compound inequality.

Coordinate

A coordinate is one part of an ordered pair (x,y) . The x coordinate tells you how far along the x -axis a point is located in a coordinate plane, while the y coordinate tells you how far along the y -axis a point is located in a coordinate plane.

Coordinate Plane

A coordinate plane is a grid used to graph equations. The coordinate plane contains a horizontal line, called the x -axis, and a vertical line, called the y -axis, which intersect at a point called the origin.

**Cube Root**

The cube root of a number is a number you can multiply by itself three times to equal the given number. For example, the cube root of 8, written as $\sqrt[3]{8}$, is 2, since $2 \times 2 \times 2$ equals 8.

D

Cubed

When a number or variable is said to be cubed, it means the number or variable is multiplied by itself three times. For example, b^3 can be read as " b cubed," and means $b \times b \times b$.

Degree

The degree of an expression refers to the highest exponent in the expression. For example, $x^2 + x + 5$ has a degree of 2. If an expression contains more than one variable, such as x and y , the degree is determined by adding the exponents of each term together. The term with the highest total of exponents determines the degree of the expression. For example, $x^2y^3 + xy$ has a degree of 5.

Denominator

A denominator is the bottom number in a fraction. For example, in the fraction $\frac{3}{4}$, the denominator is 4.

Difference

The difference is the answer to a subtraction problem.

Distributive Property

The distributive property allows you to eliminate a set of parentheses $()$ by multiplying each number and variable within the parentheses by a number or variable outside the parentheses. For example, $3(a + b)$ equals $3a + 3b$.

Dividend

The dividend is the number being divided by another number in a division problem. For example, in the division problem $10 \div 5$, 10 is the dividend.

E

Divisor

The divisor is the number being divided into another number in a division problem. For example, in the division problem $10 \div 5$, 5 is the divisor.

Equation

An equation is a mathematical statement containing an equals sign $(=)$, indicating that the two sides of the equation are equal.

Even Number

An even number is a number that you can divide evenly by 2. For example, 2, 4, 6 and 8 are even numbers.

Exponent

An exponent, or power, appears as a small number above and to the right of a number or variable, such as in 2^3 . An exponent indicates the number of times a number or variable is multiplied by itself. For example, 2^3 equals $2 \times 2 \times 2$.

Expression

An expression is a mathematical statement that does not contain an equals sign $(=)$. An expression can contain numbers, variables and/or operators such as $+$, $-$, \times and \div . For example, $x + y$ and $5x - 2y$ are expressions.

F

Factor

Factors are numbers that you can multiply together to end up with a specific number. For example, 3 and 4 are factors of 12. Factors can also include variables. When you factor an expression in algebra, you break the expression into pieces, called factors, that you can multiply together to give you the original expression.

Formula

A formula is a statement expressing a general mathematical truth and can be used to solve or reorganize mathematical problems. For example, you can use the following formula to find the slope, or steepness, of a line.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Fraction

A fraction, such as $\frac{1}{2}$ or $\frac{3}{4}$, is a division problem written with a fraction bar (—) instead of a division sign (\div). For example, you can write $3 \div 4$ as $\frac{3}{4}$. A fraction has two parts—the top number in a fraction is called the numerator and the bottom number in a fraction is called the denominator.

Graph

A graph is a visual representation of all the solutions to an equation or inequality. You graph a line or a parabola, which is a U-shaped curve, using points plotted in a coordinate plane.

Greatest Common Factor

The greatest common factor (GCF) is the largest term that divides evenly into each term in an expression. For example, in the expression $5a + 10b + 15c$, 5 is the greatest common factor.

Grouping Symbols

Grouping symbols include parentheses (), brackets [] and braces { }. You should always work with numbers and variables inside grouping symbols first. For example, in the problem $5 \times (2 + 3)$, you should add $2 + 3$ and then multiply the result by 5.

Improper Fraction

An improper fraction is a fraction in which the numerator, or top number, is larger than the denominator, or bottom number. For example, $\frac{3}{2}$ and $\frac{4}{3}$ are improper fractions. An improper fraction can also be written as a mixed number. For example, $\frac{3}{2}$ can be written as $1\frac{1}{2}$.

Index

The index of a radical is the small number just in front of a radical sign. For example, in the radical $\sqrt[3]{8}$, 3 is the index. The index tells you which root you must find. For example, the radical $\sqrt[3]{8}$ asks you to find the third root of 8, which is the number you can multiply by itself three times to equal 8. If an index does not appear in front of a radical sign, as in $\sqrt{16}$, assume the index is 2.

Inequality

An inequality is a mathematical statement in which one side is less than, greater than, or possibly equal to the other side. Inequalities use four different symbols—less than (<), less than or equal to (\leq), greater than (>) and greater than or equal to (\geq). For example, the inequality $10 < 20$ states that 10 is less than 20.

Integer

An integer is a whole number or a whole number with a negative sign (–) in front of the number. For example, –3, –2, –1, 0, 1, 2 and 3 are integers.

Intercept

An intercept is a point where a line crosses the x-axis or y-axis in a coordinate plane. An x-intercept is the point where a line crosses the x-axis, while a y-intercept is the point where a line crosses the y-axis.

Irrational Number

An irrational number is a number that has decimal values that continue forever without a repeating pattern. Irrational numbers do not include integers or fractions. The most well-known irrational number is pi (π), which is equal to 3.1415926...

Least Common Denominator

The least common denominator is the smallest denominator, or bottom number, shared by a group of fractions. For example, $\frac{1}{2}$ and $\frac{3}{4}$ have a least common denominator of 4.

Like Terms

Terms that contain exactly matching variables are called like terms. For example, x , $2x$ and $3x$ are all like terms.

Linear Equation

A linear equation is an equation whose highest exponent of a variable in the equation is one, such as in $x = 10$.

Matrix

A matrix is a collection of numbers, called elements, which are arranged in horizontal rows and vertical columns. The collection of numbers is surrounded by brackets. Matrices is the term used to indicate more than one matrix.

$$\begin{bmatrix} 1 & 7 & 5 \\ 2 & 6 & 4 \\ 8 & 3 & 9 \end{bmatrix}$$

Mixed Number

A mixed number consists of a whole number followed by a fraction. For example, $3\frac{1}{2}$ is a mixed number. Mixed numbers can be written as improper fractions. For example, $3\frac{1}{2}$ can be written as $\frac{7}{2}$.

Monomial

A monomial is a polynomial with only one term, such as $5x$.

Natural Number

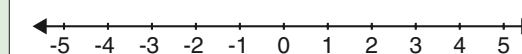
Natural numbers, also called the counting numbers, include the numbers 1, 2, 3, 4, 5 and so on.

Negative Number

A negative number is a number that is less than 0 and is written with a minus sign (–) in front of the number, such as –4. Negative numbers become smaller the farther they are from zero. For example, –10 is smaller than –5.

Number Line

A number line consists of a line on which numbers are assigned to equally spaced points. A number line can be used to graph an inequality, such as $x > 2$, to visually indicate all the possible solutions to the inequality.



Numerator

The numerator is the top number in a fraction. For example, in the fraction $\frac{3}{4}$, the numerator is 3.

Odd Number

An odd number is a number that you cannot divide evenly by 2. When you divide an odd number by 2, you get a left-over value, known as a remainder.

Order of a Matrix

The order of a matrix refers to the size and shape of a matrix and indicates the number of rows and columns in a matrix. The order of a matrix is written as the number of rows, followed by an x and then the number of columns, such as 3×4 .

Order of Operations

The Order of Operations is a specific order that you should use when solving math problems. The Order of Operations specifies that you should work first with numbers in parentheses, then calculate exponents, then multiply and divide, and then add and subtract.

Ordered Pair

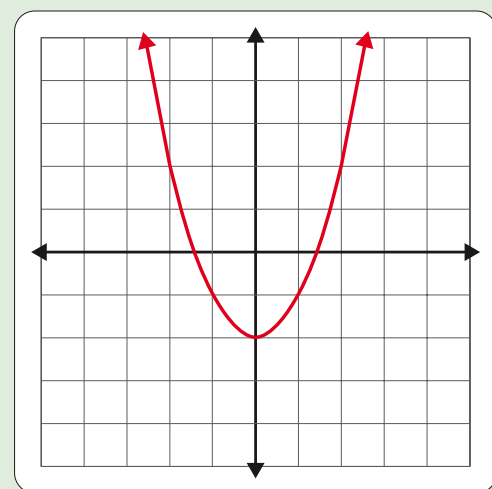
An ordered pair is two numbers, called coordinates, written as (x,y) , that gives the location of a point in a coordinate plane. The first number in an ordered pair, known as the x coordinate, tells you how far along the x -axis a point is located. The second number in an ordered pair, known as the y coordinate, tells you how far along the y -axis a point is located.

Origin

The origin in a coordinate plane is the location where the x -axis and y -axis intersect. The ordered pair representing the origin is $(0,0)$.

Parabola

A parabola is a symmetrical, U-shaped curve that results when you graph a quadratic equation.

**Parallel**

Parallel lines never intersect and have the same slope, which always keeps the lines the same distance apart from one another.

Perpendicular

Perpendicular lines intersect one another at right, or 90-degree, angles. Perpendicular lines have slopes that are negative reciprocals of each other. For example, $-\frac{1}{2}$ is the negative reciprocal of 2.

Plot

To plot a point in a coordinate plane means to mark the location of the point in the coordinate plane.

Point-Slope Equation

The point-slope equation allows you to create the equation of a line by using the slope of the line, represented by m , and one of the points on the line, represented by (x_1, y_1) . The point-slope equation is written as $y - y_1 = m(x - x_1)$.

Polynomial

A polynomial consists of one or more terms, which can be a combination of numbers and/or variables, that are added together or subtracted from one another. For example, $2x + 3y$ is a polynomial.

Positive Number

A positive number is a number that is greater than 0 and can be written with or without a positive sign (+). For example, +4 can also be written as 4. Positive numbers become larger the farther they are from zero. For example, 60 is larger than 20.

Prime Number

A prime number is a positive number that you can only evenly divide by itself and the number 1. For example, 2, 3, 5, 7 and 11 are examples of prime numbers. The number 1 is not considered a prime number.

Product

The product is the answer to a multiplication problem.

Q**Quadrant**

A coordinate plane is divided into four quadrants by the x -axis and y -axis. The four quadrants are labelled with the Roman numerals I, II, III and IV, starting with the top right quadrant and moving counterclockwise.

Quadratic Equation

A quadratic equation is an equation whose highest exponent of a variable in the equation is two, such as in $x^2 + x + 16 = 0$.

Quadratic Formula

The quadratic formula can be used to solve any quadratic equation. The quadratic formula is stated as:

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

Quotient

The quotient is the answer to a division problem.

R**Radical**

A radical is a symbol ($\sqrt{\quad}$) that tells you to find the root of a number. In algebra, you will commonly find the square root of numbers. For example, $\sqrt{25}$ equals 5.

Radicand

The radicand is the number that appears under a radical sign, such as 16 in the expression $\sqrt{16}$.

Rational Number

A rational number is an integer or a fraction. A rational number is a number that you can write with decimal values that either end or have a pattern that repeats forever. The numbers 3, -5 , $\frac{1}{2}$, 9.25 and 0.2424... are rational numbers.

Real Number

A real number can be a natural number, whole number, integer, rational number or irrational number.

Reciprocal

Every number, except for zero, has a reciprocal number. When a number is multiplied by its reciprocal, the answer will always be 1. To find the reciprocal of a fraction, flip the top and bottom numbers in the fraction. For instance, the reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$. To find the reciprocal of a whole number, write the number as 1 divided by the number. For instance, the reciprocal of 3 is $\frac{1}{3}$.

Remainder

The remainder is the left-over value in the result of a division problem when a number does not evenly divide into another number.

Scalar

A scalar is a number outside a matrix, by which all the elements in a matrix are multiplied.

Scientific Notation

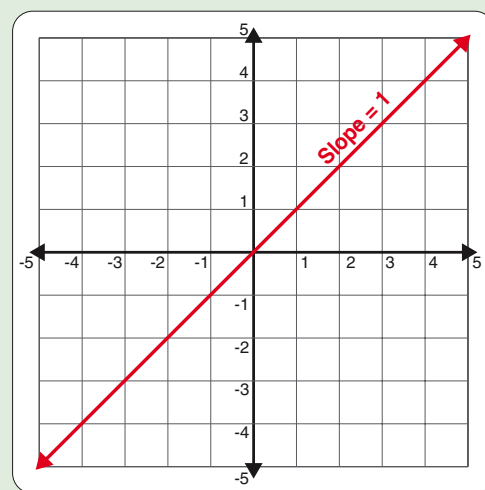
Scientific notation is a shorthand method that uses exponents for writing very large or very small numbers in a more compact form. For example, the number 325000 can be rewritten as 3.25×10^5 in scientific notation.

Simplify

To simplify an expression, you combine all the terms that can be combined. For example, $2x + 4x$ equals $6x$.

Slope

The slope of a line indicates the steepness and direction of a line.

**Slope-Intercept Form**

When the equation of a line is written in slope-intercept form, you can immediately identify the slope of the line and the y-intercept of the line. The slope-intercept form of a line is written as $y = mx + b$, where m is the slope of the line and b is the y-intercept.

Solve

When you are asked to solve a problem, you need to find the answer to the problem. For example, when you solve for x in the equation $2x - 6 = 0$, you will determine that x equals 3.

Square Root

The square root of a number is a number you can multiply by itself to equal the given number. For example, the square root of 16, written as $\sqrt{16}$, is 4, since 4×4 equals 16.

Squared

When a number or variable is said to be squared, it means the number or variable is multiplied by itself. For example, 7^2 can be read as "7 squared," and means 7×7 .

Sum

The sum is the answer to an addition problem.

Synthetic Division

Synthetic division is a shortcut method of dividing polynomials. This method can be used only when you are dividing by a polynomial with only two terms in the form $x - c$, where c is a number.

System of Equations

A system of equations is a group of two or more equations. You are often asked to find the value of each variable that solves both equations.

T**Terms**

Terms are a combination of numbers and/or variables, which are separated by addition (+) or subtraction (-) signs. For example, the expression xy contains one term, while the expression $2x + 3y$ contains two terms.

U**Trinomial**

A trinomial is a polynomial with three terms, such as $2x^2 + 5x + 7$.

Undefined

An answer of undefined in algebra means that no answer exists for a problem or expression. For example, the expression 0^0 is said to be undefined.

V**Variable**

A variable is a letter, such as x or y , which represents an unknown number. For example, if x represents Emily's age, then $x + 5$ represents the age of Emily's sister who is five years older.

Vertex

The vertex of a parabola is the lowest or highest point of a parabola.

Vertex Form

The vertex form of a quadratic equation provides information to help you graph the equation. The vertex form of a quadratic equation is written as $y = a(x - h)^2 + k$, where a , h and k are numbers.

W**Whole Number**

Whole numbers include the numbers 0, 1, 2, 3, 4, 5 and so on.

X**x-axis**

The x-axis is a horizontal line that divides a coordinate plane. On the x-axis, the numbers to the right of the origin are positive and the numbers to the left of the origin are negative.

Y**y-axis**

The y-axis is a vertical line that divides a coordinate plane. On the y-axis, the numbers above the origin are positive and the numbers below the origin are negative.