Glossary

A

Absolute value   The distance a number is from 0 on a number line

Acute angle   An angle whose measure is between 0° and 90°

Addends   The numbers being added in an addition problem

Addition principle of equality   If the same algebraic expression is added to both sides of an equation, the new equation has the same solutions as the original equation

Additive identity   The number 0 is called the additive identity

Additive identity property   The sum of any number and 0 is equal to the number itself

Additive inverse   The opposite of an integer; two integers are additive inverses (or opposites) if their sum is equal to 0

Adjacent angles   Two angles with a common side

Algebraic expression   A combination of variables and numbers using any of the operations of addition, subtraction, multiplication, or division, as well as exponents

Altitude of a triangle   The height of a triangle

Angle   Two rays with a common endpoint, called a vertex

Area   The measure of the interior of (or suface enclosed by) of a plane figure

Ascending order   For a polynomial, when the exponents on the terms increase in order from left to right

Associative property of addition   The grouping of the numbers in addition can be changed

Associative property of multiplication   The grouping of the numbers in multiplication can be changed

Average   The sum of all the values in a set divided by the number of numbers in the set; also referred to as the mean or the arithmetic average

B

Bar graph   A graph used to emphasize comparative amounts

Base   In the expression a^n, the number a is called the base

Binomial   A polynomial with two terms

C

Change in value   To calculate the change in value, take the end value and subtract the beginning value

Circle   The set of all points in a plane that are some fixed distance from a fixed point, called the center of the circle

Class   In a histogram, an interval (or range) of numbers that contains data items

Circle graph   A graph used to help in understanding percents or parts of a whole

Circumference   The perimeter of a circle

Class boundaries   In a histogram, numbers that are halfway between the upper limit of one class and the lower limit of the next class

Class width   In a histogram, the difference between the class boundaries of a class (the width of each bar)

Closed figure   A figure that begins and ends at the same point

Closed interval   An interval that includes both endpoints

Coefficient   The number written next to a variable

Combined variation   When a variable varies either directly or inversely with more than one other variable.

Commission   A fee paid to an agent or salesperson for a service

Commutative property of addition   The order of the numbers in addition can be reversed

Commutative property of multiplication   The order of the numbers in multiplication can be reversed

Complementary angles   Two angles are complementary if the sum of their measures is 90°

Composite number   A counting number with more than two different factors (or divisors)

Compound inequality   A mathematical expression that uses inequality symbols to compare the order of three expressions or values

Compound interest   Interest paid on interest earned

Conditional equation   An equation that has a finite number (a countable number) of solutions

Congruent angles   Two angles with the same measure

Conjugates   The two expressions $(a - b)$ and $(a + b)$ are called conjugates; the product of conjugates results in the difference of two squares

Consecutive even integers   Even integers are consecutive if each is 2 more than the previous even integer

Consecutive integers   Integers are consecutive if each is 1 more than the previous integer

Consecutive odd integers   Odd integers are consecutive if each is 2 more than the previous odd integer

Constant (or constant term)   A term that consists of only a number

Constant of variation   The constant multiplier in a relationship of direct or inverse variation

Contradiction   An equation that simplifies to a statement that is never true (such as $0 = 2$) and has no solution

Coordinate   Either of the numbers in an ordered pair; may also refer to the number that corresponds to a point on a number line

Cube   A rectangular solid in which the length, width, and height are all equal

Cube root   The cube root of a number equals another number that when cubed results in the original number

Cube of a number   In expressions with exponent 3, the base is said to be cubed

D

Data   Value(s) measuring some characteristic of interest such as income, height, weight, grade point averages, scores on tests, and so on

Decimal notation   Notation that uses a decimal point, with whole numbers written to the left of the decimal point and fractions written to the right of the decimal point

Decimal numbers   Numbers written in decimal notation; also called decimals

Decimal point   A period inserted between the whole number and fractional parts of a decimal number

Degree of a polynomial   The largest of the degrees of the polynomial's terms

Degree of a term   The sum of the exponents on the variables of the term

Denominator   The bottom number in a fraction

Dependent variable   The second coordinate y in an ordered pair

Descending order   For a polynomial, when the exponents on the terms decrease in order from left to right

Diameter   The distance from one point on a circle through the center to the point directly opposite it

Difference   The result of subtraction

Difference of two squares   A binomial that can be written in the form $x^2 - a^2$

Digit   A symbol used in our number system; namely 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9

Direct variation   A variable quantity y varies directly as a variable x if there is a constant k such that $\frac{y}{x} = k$ or $y = kx$. When two variables vary directly, an increase in one indicates an increase in the other

Discount   A reduction in the original selling price of an item; the difference between the original price and the sale price

Discriminant   In the quadratic formula, the expression $b^2 - 4ac$

Distributive property   The product of a number and a sum is equal to the sum of the products of the number and each of the addends. If a, b and c are whole numbers, then $a(b + c) = ab + ac$.

Dividend   The number being divided in a division problem

Divisible   If a number can be divided by another number so that the remainder is 0, then the dividend is divisible by the divisor

Divisor   The number doing the dividing in a division problem

Domain axis   In the graph of a relation, the horizontal axis (the x-axis)

Domain of a function   The set of all first coordinates in a relation

Double root   *See* **Double solution**

Double solution   The special cases where the two factors of a quadratic equation are the same, and there is only one solution. Also called a double root.

E

Elements   The items in a set

Empty set (null set)   A set with absolutely no elements

Equation   A statement that two algebraic expressions are equal

Equivalent equations   Equations with the same solution

Even number   If an integer is divided by 2 and the remainder is 0, then the integer is even

Exponent   A number placed above the base to show the number of times the base is multiplied by itself

Exponential notation   Notation of the form a^n, where a is the base, and n is the exponent

Extraneous roots   *See* **Extraneous solution**

Extraneous solution   A number that is found when solving an equation but that does not satisfy the original equation; may be introduced by multiplying by the LCD. Also called an extraneous root.

F

Factor   A number that is being multiplied; may also refer to a number that divides a given number

Factor theorem   If $x = c$ is a root of a polynomial equation in the form $P(x) = 0$, then $x - c$ is a factor of the polynomial $P(x)$

Factoring   Given a product, the process used to find the factors

FOIL method   Procedure for multiplying two binomials; multiply the first terms, the outside terms, the inside terms, and the last terms

Formula   General statement (usually an equation) that relates two or more variables

Fraction   A number that can represent parts of a whole, the ratio of two numbers, or division; also called a rational number

Frequency   In a histogram, the number of data items in a class

Function   A relation in which each domain element has exactly one corresponding range element

Function notation   Notation of the form $f(x)$, where f is the name of the function, and x is the input variable

G

Graph   Visual representation of numerical information

Greatest common factor (GCF)   The largest integer or algebraic term that is a factor (or divisor) of all of the numbers or terms

H

Half-open interval   An interval that includes only one endpoint

Histograms   Used to indicate data in classes (a range or interval of numbers)

Horizontal asymptote   If a graph approaches but never crosses a horizontal line as x goes to $\pm\infty$, the horizontal line is called a horizontal asymptote.

Horizontal line   A line with a slope of 0

Hypotenuse   The longest side of a right triangle; the side opposite the right angle

I

Identity   An equation that leads to a statement that is always true (such as $0 = 0$) and has an infinite number of solutions

Improper fraction   A fraction in which the numerator is greater than or equal to the denominator

Independent variable   The first coordinate x in an ordered pair

Index of a radical   The index of the radical $\sqrt[n]{a}$ is the number n

Inequality   A mathematical expression that includes the symbols $<, >, \leq, \geq,$ or $\neq$

Integers   The set of numbers consisting of the whole numbers and their opposites

Interest   Money paid for the use of money

Intersection   The intersection of two (or more) sets is the set of all elements that belong to both setsInterval notation   Notation to represent intervals of real numbers where brackets indicate that an endpoint is included and parentheses indicate that an endpoint is not included

Interval of real numbers   The set of all real numbers between two endpoints

Inverse variation   A variable quantity varies inversely as a variable x if there is a constant k such that $x \cdot y = k$ or $y = \dfrac{k}{x}$. When two variables vary inversely, an increase in one indicates a decrease in the other.

Irrational numbers   Numbers that can be written as infinite nonrepeating decimals

Isosceles triangle   A triangle in which two or more sides have equal lengths

J

Joint variation   If the combined variation is all direct variation (the variables are multiplied), then it is called joint variation

L

Leading coefficient   The coefficient of the term in a polynomial with the largest degree

Least common denominator (LCD)   The least common multiple of the denominators of two or more fractions

Least common multiple (LCM)   The smallest number that is a multiple of each of the given numbers or terms

Leg   Either of the two sides of a right triangle that are not the hypotenuse

Like radicals   Radicals that have the same index and radicand or can be simplified so that they have the same index and radicand

Like terms (similar terms)   Terms that are constants or terms that contain the same variables raised to the same powers

Line   A line has no beginning or end. Lines are labeled with small letters or by two points on the line

Line graph   A graph used to indicate trends over a period of time

Line of symmetry   The line through the vertex of a parabola that divides the graph into two symmetrical parts

Line segment   Consists of two points on a line and all the points between them

Linear equation in x   An equation that can be written in the form $ax + b = c$, where a, b, and c are constants and $a \neq 0$

Linear function   A function represented by an equation of the form $y = mx + b$

Linear inequality   An inequality that contains only constant or linear terms

Lower class limit   In a histogram, the smallest number that belongs to a class

M

Mass   The amount of material in an object

Mean   The sum of all the values in a set divided by the number of numbers in the set; also referred to as the average or arithmetic average

Measure of an angle   The size of the angle; measured in degrees

Metric system   The system of measurement used by about 90% of the world, but not often used in the United States

Minuend   The number, or quantity, from which another (the subtrahend) is to be subtracted

Mixed number   The sum of a whole number and a proper fraction

Monomial   A polynomial with one term

Multiples   To find the multiples of a number, multiply each of the counting numbers by that number

Multiplication (or division) principle of equality   If both sides of an equation are multiplied by (or divided by) the same nonzero constant, the new equation has the same solutions as the original equation

Multiplicative identity   The number 1 is called the multiplicative identity

Multiplicative identity property   The product of any number and 1 is the number itself

Multiplicative inverse   The reciprocal of a number; two numbers are multiplicative inverses if their product is equal to 1

N

Natural (counting) numbers   The numbers 1, 2, 3, 4, ...

Negative integers   The opposites of the natural numbers; they lie to the left of 0 on a number line

Nonterminating decimal number   If the remainder of division is never 0, the decimal quotient is nonterminating.

Note   A loan for a period of 1 year or less

Numerator   The top number in a fraction

O

Obtuse angle   An angle whose measure is between 90° and 180°

Odd numbers   If an integer is divided by 2 and the remainder is 1, then the integer is odd

Open interval   An interval that does not contain either endpoint

Opposite   Two integers are opposites (or additive inverses) if their sum is equal to 0

Ordered pair   A pair of numbers in the form (x, y) where the order of the numbers is critical

Origin   The point of intersection of the x-axis and the y-axis

P

Parabola   The graph of a quadratic function

Parallel lines   Lines in the same plane that never intersect (cross each other) and whose slopes are equal

Parallelogram   A four-sided polygon with both pairs of opposite sides parallel

Pentagon   A 5-sided polygon

Percent   The ratio of a number to 100

Perfect cube   The cube of an integer

Perfect square   The square of an integer

Perfect square trinomial   The result of squaring a binomial

Perimeter   The distance around a figure; found by adding the lengths of the sides of the figure

Perpendicular lines   Lines that intersect at 90° (right) angles and whose slopes are negative reciprocals of each other

Pi (π) The ratio of a circle's circumference to its diameter; approximated by 3.14

Plane   Flat surfaces, such as a table top or wall, represent planes

Plane geometry   The study of the properties of figures in a plane

Point   A dot represents a point. Points are labeled with capital letters

Point-slope form   The point-slope form for the equation of a line is $y - y_1 = m(x - x_1)$, where m is the slope of the line and (x_1, y_1) is any point on the line

Polygon   A closed plane figure, with three or more sides, in which each side is a line segment

Polynomial   A monomial or the indicated sum or difference of monomials

Positive integers   The natural numbers; they lie to the right of 0 on a number line

Prime factorization   The unique factorization of a composite number that contains only prime factors

Prime number   A counting number greater than 1 that has exactly two different factors (or divisors), itself and 1

Principal   The initial amount of money that is invested or borrowed

Principal square root   Every positive real number has two square roots, one positive and one negative. The positive square root is called the principal square root

Product   The result of multiplication

Profit   The difference between selling price and cost

Proper fraction   A fraction in which the numerator is less than the denominator

Proportion   A statement that two ratios are equal

Pythagorean Theorem   In a right triangle, the lengths of the legs, a and b, and the hypotenuse, c, have the following relationship: $a^2 + b^2 = c^2$

Q

Quadrant   The x-axis and y-axis separate the Cartesian plane into four quadrants

Quadratic equation   Equations that can be written in the form $ax^2 + bx + c = 0$ where $a, b,$ and c are real numbers and $a \neq 0$

Quadratic formula   A formula that is used to find the solutions of the general quadratic equation $ax^2 + bx + c = 0$; the quadratic formula is $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Quadratic function   A function of the form $y = ax^2 + bx + c$ where $a, b,$ and c are real numbers and $a \neq 0$

Quotient   The result of division

R

Radical   The complete expression involving both the radical sign and the radicand

Radical function   A function of the form $y = \sqrt[n]{g(x)}$ in which the radicand contains a variable expression

Radical sign   The symbol $\sqrt{}$

Radicand   The number, or expression, under the radical sign

Radius   The distance from the center of a circle to any point on the circle

Range axis   In the graph of a relation, the vertical axis (the y-axis)

Range of a function   The set of all second coordinates in a relation

Ratio   A comparison of two quantities by division

Rational expressions   A fraction in which the numerator and denominator are polynomials

Rational function   An algebraic expression that can be written in the form $\dfrac{P}{Q}$ where P and Q are polynomials and $Q \neq 0$

Rational number   A number that can be written in the form $\dfrac{a}{b}$ where a and b are integers and $b \neq 0$

Rationalizing a denominator   The process used to remove radicals from the denominator of a rational expression

Ray   A point (called the endpoint) and all the points on a line on one side of that point

Real numbers   The set of numbers that consists of all rational and irrational numbers

Reciprocals   If the product of two nonzero fractions is 1, then the fractions are called reciprocals of each other

Rectangle   A polygon with four sides in which adjacent sides are perpendicular (meet at a 90° angle)

Regular hexagon   A six-sided polygon where all sides have equal length and all angles have equal measure

Regular octagon   An eight-sided polygon where all sides have equal length and all angles have equal measure

Relation   A set of ordered pairs of real numbers

Relatively prime   Used to describe two numbers whose GCD is 1

Remainder   The number left after division

Repeating decimal number   A decimal number that does not terminate, but has a repeating pattern to its digits

Restrictions on a variable   The values of the variable that make an expression undefined

Right angle   An angle whose measure is equal to 90°

Right triangle   A triangle containing one right angle

Roster form   The elements of a set are listed within braces

Rounding   To find another number close to the given number

S

Sale price   The new, reduced price of an item after a discount has been applied

Sales tax   A tax charged on the actual selling price of goods sold by retailers

Scientific notation   Decimal numbers written as the product of a number greater than or equal to one and less than 10, and an integer power of 10

Semicircle   Half of a circle

Set   A collection of objects or numbers

Set-builder notation   The elements of a set described by giving a condition (or restriction) for the variable

Similar triangles   Two triangles are similar if the measures of the corresponding angles are equal and the lengths of the corresponding sides are proportional

Simple interest   Interest that involves only one payment at the end of the term of a loan

Simplest form for cube roots   A cube root is considered to be in simplest form when the radicand has no perfect cube as a factor

Simplest form for square roots   A square root is considered to be in simplest form when the radicand has no perfect square as a factor

Slope   The ratio of rise to run of a line

Slope-intercept form   The slope-intercept form for the equation of a line is $y = mx + b$, where m is the slope of the line and $(0, b)$ is the y-intercept

Solution   A number that gives a true statement when substituted for the variable in the equation

Solution set   The solutions to an equation

Square   A rectangle in which all four sides are the same length

Square of a number   In expressions with exponent 2, the base is said to be squared

Square root   The square root of a number equals another number that when squared results in the original number

Standard form of a linear equation   An equation of the form $Ax + By = C$, where A, B, and C are real numbers and where A and B are not both 0

Standard form of a quadratic equation   Equation of the form $ax^2 + bx + c = 0$ where a, b, and c are real numbers and $a \neq 0$

Straight angle   An angle whose measure is equal to 180°

Subtrahend   The number or quantity to be subtracted in a subtraction problem

Sum   The result of addition

Sum of two squares   An expression of the form $x^2 + a^2$; it is not factorable

Supplementary angles   Two angles are supplementary if the sum of their measures is 180°

T

Term   Any constant or variable, or the indicated product and/or quotient of constants and variables

Terminating decimal number   If the remainder of division is eventually 0, the decimal quotient is said to be terminating

Transversal   A line in a plane that intersects two or more lines in that plane in different points

Trapezoid   A four-sided polygon with one pair of opposite sides that are parallel

Triangle   A polygon with three sides

Trinomial   A polynomial with three terms

U

Union   The union of two (or more) sets is the set of all elements that belong to either one set or the other set or to both sets

Unit fraction   A fraction equivalent to 1

Unit rate   A rate with a 1 in the denominator

Upper class limit   In a histogram, the largest number that belongs to a class

V

Variable   A symbol (generally a letter of the alphabet) that is used to represent an unknown number or any one of several numbers

Vertex of a parabola   The "turning point" of the curve that represents a quadratic function

Vertex of a polygon   Each point where two sides of a polygon meet is called a vertex

Vertex of an angle   The common endpoint of the rays that form the angle

Vertical angles   The angles opposite each other created by two intersecting lines; vertical angles are congruent

Vertical asymptote   If a graph approaches but never crosses a vertical line as y goes to $\pm\infty$, the vertical line is called a vertical asymptote.

Vertical lines   A line whose slope is undefined

Vertical line test   If any vertical line intersects the graph of a relation at more than one point, then the relation is not a function

Volume   The measure of the space enclosed by a three-dimensional figure

W

Weight   Force of the Earth's gravitational pull on an object

Whole numbers   The number 0 and the natural numbers

X

x-axis   The horizontal number line

x-intercept   The point on the graph where the line crosses the x-axis

Y

y-axis   The vertical number line

y-intercept   The point on the graph where the line crosses the y-axis

Z

Zero   The x-value of the x-intercept of a function

Zero-factor law   The product of any number and 0 is equal to 0

Zero-factor property   If the product of two (or more) factors is 0, then at least one of the factors must be 0