

# Glossary

**absolute value** The absolute value of a positive number is the number itself. For example, the absolute value of 3 is 3. The absolute value of a negative number is the opposite of the number. For example, the absolute value of  $-6$  is 6.

**acre** A unit of area equal to 43,560 square feet.

**addend** See **addition**.

**addition** A mathematical operation based on “putting things together.” Numbers being added are called **addends**; the result of addition is called the **sum**. In  $12 + 33 = 45$ , 12 and 33 are addends, and 45 is the sum. Subtraction “undoes” addition:  $12 + 33 = 45$ ;  $45 - 12 = 33$ , and  $45 - 33 = 12$ .

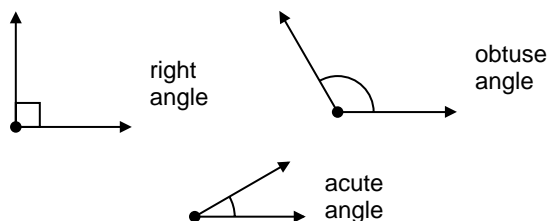
**additive inverses** Two numbers whose sum is 0. The additive inverse of a number is also called its opposite. Example:  $3 + (-3) = 0$ . The additive inverse of 3 is  $-3$ , and the additive inverse of  $-3$  is 3.

**algebraic expression** An expression that contains a variable. For example, if Maria is 2 inches taller than Joe, and if the variable  $M$  represents Maria’s height, then the expression  $M - 2$  represents Joe’s height.

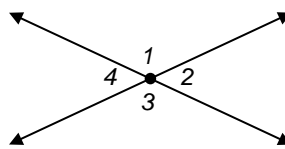
**algorithm** A set of step-by-step instructions for doing something—carrying out a computation, solving a problem, and so on.

**analog clock** A clock that shows the time by the positions of the hour and minute hands. A **digital clock** shows the time in hours and minutes with a colon separating the two.

**angle** Two rays with a common endpoint. The common endpoint is called the **vertex of the angle**. An acute angle has a measure greater than  $0^\circ$  and less than  $90^\circ$ . An obtuse angle has a measure greater than  $90^\circ$  and less than  $180^\circ$ . A right angle has a measure of  $90^\circ$ . A straight angle has a measure of  $180^\circ$ .

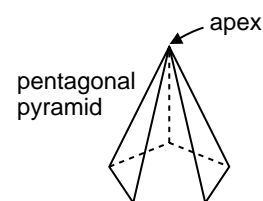


**angles, adjacent** Two angles with a common side that do not otherwise overlap. In the diagram, angles 1 and 2 are adjacent angles. So are angles 2 and 3, angles 3 and 4, and angles 4 and 1.

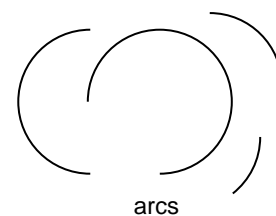


**angles, vertical** Two intersecting lines form four angles. In the diagram, angles 2 and 4 are vertical angles. They have no sides in common. Their measures are equal. Similarly, angles 1 and 3 are vertical angles.

**apex** In a pyramid or cone, the vertex opposite the base.



**arc** Part of a circle from one point on the circle to another. For example, a semicircle is an arc; its endpoints are the endpoints of a diameter of the circle.



**area** The measure of the surface inside a closed boundary. The formula for the area of a rectangle is  $A = l \times w$  where  $A$  represents the area,  $l$  the length, and  $w$  the width. The formula may also be expressed as  $A = b \times h$ , where  $b$  represents the length of the base and  $h$  the height of the rectangle.

**arithmetic fact** Any of the basic addition and multiplication relationships and the corresponding subtraction and division relationships. There are

- 100 addition facts, from  $0 + 0 = 0$  to  $9 + 9 = 18$
- 100 subtraction facts, from  $0 - 0 = 0$  to  $18 - 9 = 9$
- 100 multiplication facts, from  $0 \times 0 = 0$  to  $9 \times 9 = 81$
- 90 division facts, from  $\frac{0}{1} = 0$  to  $\frac{81}{9} = 9$

An **extended fact** is obtained by multiplying some or all numbers in an arithmetic fact by a power of 10; for example,  $20 + 30 = 50$ ,  $400 \times 6 = 2400$ ,  $500 - 300 = 200$ ,  $\frac{240}{60} = 4$ .

**array** A rectangular arrangement of objects in rows and columns.

**attribute** A common feature (size, shape, color, number of parts, and so on) of a set of figures.

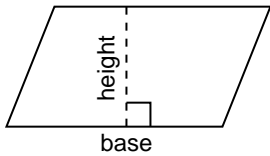
**average** See **mean**.

**axis** Either of the two number lines used to form a coordinate grid.

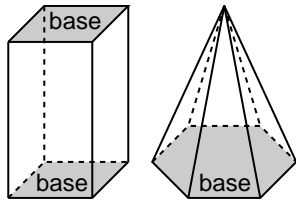
**bar graph** A graph in which horizontal or vertical bars represent data.

**base** See **exponential notation**.

**base of a parallelogram** One of the sides of a parallelogram; also, the length of this side. The shortest distance between the base and the side opposite the base is the **height of the parallelogram**.

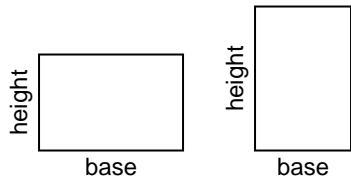


**base of a polygon** The side on which the polygon “sits”; the side that is perpendicular to the height of the polygon.

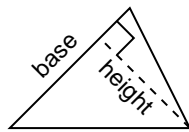


**base of a polyhedron** The “bottom” face of a polyhedron; the face whose shape is the basis for classifying a prism or pyramid.

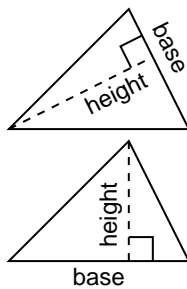
**base of a rectangle** One of the sides of a rectangle; also, the length of this side. The length of the side perpendicular to the base is the **height of the rectangle**.



**base of a 3-dimensional figure** One face or a pair of faces on the figure. The height is the length of a line segment drawn perpendicular to a base of the figure that extends from that base to an opposite face or vertex.



**base of a triangle** One of the sides of a triangle; also, the length of this side. The shortest distance between the base and the vertex opposite the base is the **height of the triangle**.



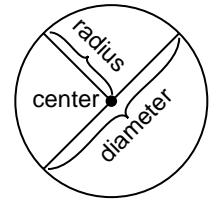
**bisect** To divide a segment, angle, or figure into two parts of equal measure.

**broken-line graph** See **line graph**.

**capacity** A measure of how much liquid a container can hold. See also **volume**.

**chance** The probability of an outcome in an uncertain event. For example, in tossing a coin there is an equal chance of getting heads or tails.

**circle** The set of all points in a plane that are a given distance (the **radius**) from a given point (the **center** of the circle).



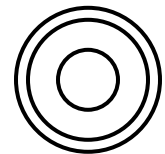
**circle graph** A graph in which a circle and its interior are divided into parts to represent the parts of a set of data. The circle represents the whole set of data. Also called a **pie graph**.

**circumference** The distance around a circle or sphere.

**common** Shared by two or more numbers. A **common denominator** of two fractions is any nonzero number that is a multiple of the denominators of both fractions. A **common factor** of two numbers is any number that is a factor of both numbers.

**complementary angles** Two angles whose measures total  $90^\circ$ .

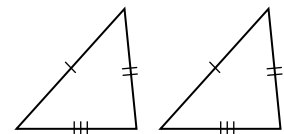
**composite number** A whole number that has more than two whole-number factors. For example, 10 is a composite number because it has more than two factors: 1, 2, 5, and 10. A composite number is divisible by at least three whole numbers. See also **prime number**.



concentric circles

**concentric circles** Circles that have the same center but radii of different lengths.

**cone** A 3-dimensional shape having a circular base, curved surface, and one vertex.



congruent triangles

**congruent** Two figures that are identical—the same size and shape—are called congruent figures. If you put one on top of the other, they would match exactly. Congruent figures are also said to be congruent to each other.

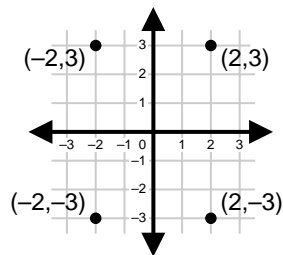
**consecutive** Following one another in an uninterrupted order. For example, A, B, C, and D are four consecutive letters of the alphabet; 6, 7, 8, 9, and 10 are five consecutive whole numbers.

**consecutive angles** Two angles that are “next to each other”; they share a common side.

**constant** A number used over and over with an operation performed on many numbers.

**conversion fact** A fact such as 1 yard = 3 feet or 1 gallon = 4 quarts.

**coordinate** A number used to locate a point on a number line, or either of two numbers used to locate a point on a coordinate grid.

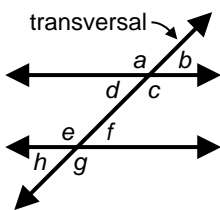


coordinate grid

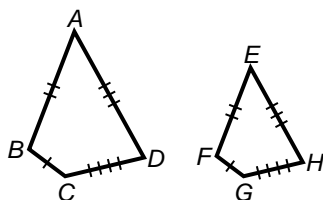
**coordinate grid** A device for locating points in a plane by means of ordered number pairs or coordinates. A

rectangular coordinate grid is formed by two number lines that intersect at right angles at their 0 points.

**corresponding angles** Any pair of angles in the same relative position in two figures, or in similar locations in relation to a transversal intersecting two lines. In the diagram,  $\angle a$  and  $\angle e$ ,  $\angle b$  and  $\angle f$ ,  $\angle d$  and  $\angle h$ , and  $\angle c$  and  $\angle g$  are corresponding angles. If any two corresponding angles are congruent, then the lines are parallel.



**corresponding sides** Any pair of sides in the same relative position in two figures. In the diagram, corresponding sides are marked with the same number of slash marks.



corresponding sides

**counting numbers** The numbers used to count things. The set of counting numbers is  $\{1, 2, 3, 4, \dots\}$ . All counting numbers are integers and rational numbers, but not all integers or rational numbers are counting numbers.

**cube** See **regular polyhedron**.

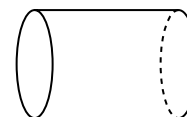
**cubic centimeter (cm<sup>3</sup>)** A metric unit of volume; the volume of a cube 1 centimeter on a side. 1 cubic centimeter is equal to 1 milliliter.

**cubic unit** A unit used in a volume and capacity measurement.

**cubit** An ancient unit of length, measured from the point of the elbow to the end of the middle finger, or about 18 inches. The Latin word *cubitum* means “elbow.”

**customary system of measurement** The measuring system used most often in the United States. Units for linear measure (length, distance) include inch, foot, yard, and mile; units for weight include ounce and pound; units for capacity (amount of liquid or other pourable substance a container can hold) include cup, pint, quart, and gallon.

**cylinder** A 3-dimensional shape having a curved surface and parallel circular or elliptical bases that are the same size. A can is a common object shaped like a cylinder.



cylinder

**data** Information gathered by observation, questioning, or measurement.

**decimal** A number written in standard notation, usually one containing a decimal point, as in 2.54. A decimal that ends, such as 2.54, is called a **terminating decimal**. Some decimals continue a pattern without end, for example,  $0.333\dots$ , or  $0.\overline{3}$ , which is equal to  $\frac{1}{3}$ . Such decimals are called **repeating decimals**. A terminating decimal can be thought of as a repeating decimal in which 0 repeats.

**degree (°)** A unit of measure for angles; based on dividing a circle into 360 equal parts. Also, a unit of measure for temperature.

**denominator** The number of equal parts into which the whole (or ONE or unit) is divided. In the fraction  $\frac{a}{b}$ ,  $b$  is the denominator. See also **numerator**.

**density** A rate that compares the mass of an object with its volume. For example, suppose a ball has a mass of 20 grams and a volume of 10 cubic centimeters. To find its density, divide its mass by its volume:  $\frac{20\text{g}}{10\text{cm}^3} = \frac{2\text{g}}{\text{cm}^3}$  (2 grams per cubic centimeter).

**diameter** A line segment that passes through the center of a circle (or sphere) and has endpoints on the circle (or sphere); also, the length of such a line segment. The diameter of a circle is twice its radius. See also **circle**.

**difference** See **subtraction**.

**digit** In the base-10 numeration system, one of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. Digits can be used to write any number. For example, the numeral 145 is made up of the digits 1, 4, and 5.

**dimension** A measure in one direction, for example, length or width.

**distributive property** A property that relates two operations on numbers; usually multiplication and addition, or multiplication and subtraction.

Distributive property of multiplication over addition:  $a \times (x + y) = (a \times x) + (a \times y)$

Distributive property of multiplication over subtraction:  $a \times (x - y) = (a \times x) - (a \times y)$

This property gets its name because it “distributes” the factor outside the parentheses over the two terms within the parentheses.

**dividend** See **division**.

**divisibility test** A test to determine whether a whole number is divisible by another whole number, without actually doing the division. For example, to tell whether a number is divisible by 3, check whether the sum of its digits is divisible by 3. For example, 51 is divisible by 3 since  $5 + 1 = 6$ , and 6 is divisible by 3.

**divisible by** One whole number is divisible by another whole number if the result of the division is a whole number (with a remainder of zero). For example, 28 is divisible by 7, because 28 divided by 7 is 4 with a remainder of zero. If a number  $n$  is divisible by a number  $x$ , then  $x$  is a factor of  $n$ .

**division** A mathematical operation based on “sharing” or “separating into equal parts.” The dividend is the

$\text{dividend} \div \text{divisor} = \text{quotient}$
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$\frac{\text{dividend}}{\text{divisor}} = \text{quotient}$
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total before sharing. The divisor is the number of equal parts or the number in each equal part. The

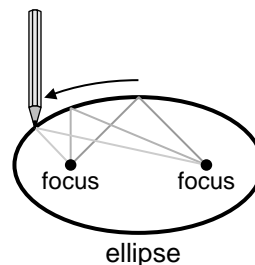
quotient is the result of division. For example, in  $\frac{28}{7} = 4$ , 28 is the dividend, 7 is the divisor, and 4 is the quotient. If 28 objects are separated into 7 equal parts, there are 4 objects in each part. If 28 objects are separated into parts with 7 in each part, there are 4 equal parts. The number left over when a set of objects is shared equally or separated into equal groups is called the remainder. For  $\frac{28}{7}$ , the quotient is 4 and the remainder is 0. For  $\frac{29}{7}$ , the quotient is 4 and the remainder is 1. Multiplication “undoes” division:  $\frac{28}{7} = 4$ , and  $4 \times 7 = 28$ .

**divisor** See **division**.

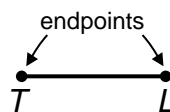
**dodecahedron** See **regular polyhedron**.

**edge** The line segment where two faces of a polyhedron meet.

**ellipse** A closed, oval, plane figure. An ellipse is the path of a point that moves so that the sum of its distances from two fixed points is constant. Each of the fixed points is called a *focus* of the ellipse.



**endpoint** The point at either end of a line segment; also, the point at the end of a ray.



Endpoints are used to name line segments; for example, segment  $TL$  or segment  $LT$  names a line segment between and including points  $T$  and  $L$ . See also **ray**.

**equation** A mathematical sentence that states the equality of two quantities.

**equidistant marks** Marks equally distant from one to the next.

**equilateral polygon** A polygon in which all sides are the same length.

**equivalent** Equal in value, but in a different form. For example,  $\frac{1}{2}$ , 0.5, and 50% are equivalent.

**equivalent equations** Equations that have the same solution. For example,  $2 + x = 4$  and  $6 + x = 8$  are equivalent equations; their solution is 2.

**equivalent fractions** Fractions that have different numerators and denominators but name the same number. For example,  $\frac{1}{2}$  and  $\frac{4}{8}$  are equivalent fractions.

**equivalent ratios** Ratios that can be named by equivalent fractions. For example, the ratios 12 to 20, 6 to 10, and 3 to 5 are equivalent ratios, because  $\frac{12}{20} = \frac{6}{10} = \frac{3}{5}$ .

**estimate** A calculation of a close, rather than exact, answer; a “ballpark” answer; a number close to another number.

**even number** A whole number such as 2, 4, 6, and so on that can be evenly divided by 2 (divided by 2 with 0 remainder). See also **odd number**.

**exponential notation** A shorthand way of representing repeated multiplication of the same factor. For example,  $2^3$  is exponential notation for  $2 \times 2 \times 2$ . The small, raised 3, called the **exponent**, indicates how many times the number 2, called the **base**, is used as a factor.

**extended fact** See **arithmetic fact**.

**face** A flat surface on a 3-dimensional shape.

**fact** See **arithmetic fact**.

**fact family** A group of addition or multiplication facts together with the related subtraction or division facts. For example,  $5 + 6 = 11$ ,  $6 + 5 = 11$ ,  $11 - 5 = 6$ , and  $11 - 6 = 5$  form a fact family.  $5 \times 7 = 35$ ,  $7 \times 5 = 35$ ,  $\frac{35}{7} = 5$ , and  $\frac{35}{5} = 7$  form another fact family.

**factor (noun)** A number that is multiplied by another number. Factors may be whole numbers or rational numbers expressed as fractions or decimals. For example, 4, 3, and 2 are factors in the expression  $4 \times 3 \times 2$ ; 0.5 and 25 are factors in  $0.5 \times 25$ ;  $\frac{1}{2}$  and 9 are factors in  $\frac{1}{2} \times 9$ ; and  $-2$  and  $-5$  are factors in  $-2 \times (-5)$ . See also **multiplication**.

**factor (verb)** To represent a number as a product of factors.

**factorial** A product of a whole number and all the smaller whole numbers except 0, for example,  $3 \times 2 \times 1$ . The exclamation point, !, is used to write factorials. For example:

$$3! = 3 \times 2 \times 1 = 6 \quad 3! \text{ is read as "three factorial."}$$

**formula** A general rule for finding the value of something. A formula is often written in abbreviated form with letters, called **variables**. For example, a formula for distance traveled can be written as  $d = r \times t$ , where the variable  $d$  stands for distance,  $r$  for speed, and  $t$  for time.

**fraction** A number in the form  $\frac{a}{b}$  or  $a/b$ , where  $a$  and  $b$  are whole numbers and  $b$  is not 0. Fractions are used to name part of a whole object or part of a whole collection of objects, or to compare two quantities. A fraction can represent division; for example,  $\frac{2}{3}$  can be thought of as 2 divided by 3.

**geometric solid** A 3-dimensional shape bounded by surfaces. Common geometric solids include the rectangular prism, square pyramid, cylinder, cone, and sphere. Despite its name, a geometric solid is "hollow"; it does not include the points in its interior.

**greatest common factor** The largest factor that two or more numbers have in common. For example, the common factors of 24 and 36 are 1, 2, 3, 4, 6, and 12. The greatest common factor of 24 and 36 is 12.

**height of a parallelogram** See **base of a parallelogram**.

**height of a rectangle** See **base of a rectangle**.

**height of a 3-dimensional figure** See **base of a 3-dimensional figure**.

**height of a triangle** See **base of a triangle**.

**hypotenuse** In a right triangle, the side opposite the right angle.

**icosahedron** See **regular polyhedron**.

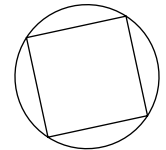
**improper fraction** See **top-heavy fraction**.

**inequality** A number sentence stating that two quantities are not equal, or might not be equal. Relation symbols for inequalities include  $\neq$ ,  $<$ ,  $>$ ,  $\leq$ , and  $\geq$ .

**integer** Any whole number or its opposite, for example,  $-2$ ,  $2$ ,  $6$ ,  $-100$ .

**intersect** To meet (at a point, line, and so on).

**inscribed polygon** A polygon, all of whose vertices are points on a circle or other figure.

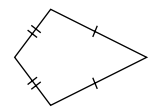


**irrational numbers** Numbers that cannot be written as fractions where both the numerator and denominator are integers and the denominator is not zero. For example,  $\sqrt{2}$  and  $\pi$  are irrational numbers. An irrational number can be represented by a nonterminating, nonrepeating decimal. For example, the decimal for  $\pi$ , 3.141592653... , continues without a repeating pattern. The number 1.10100100010000... is irrational; there is a pattern in the decimal, but it does not repeat.

inscribed square

**key sequence** A set of instructions for performing a particular calculation or function with a calculator.

**kite** A quadrilateral with exactly two pairs of adjacent congruent sides. (A rhombus is not a kite.)

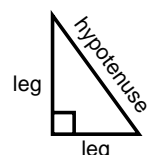


kite

**least common denominator** The least common multiple of the denominators of every fraction in a given collection of fractions. See also **least common multiple**.

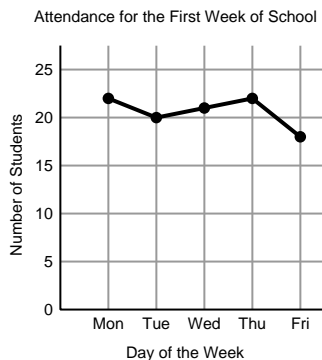
**least common multiple** The smallest number that is a multiple of two or more numbers. For example, some common multiples of 6 and 8 are 24, 48, and 72. 24 is the least common multiple of 6 and 8.

**leg of a right triangle** A side of a right triangle that is not the hypotenuse.



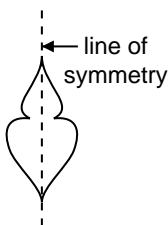
**line** A straight path that extends infinitely in opposite directions.

**line graph (broken-line graph)** A graph in which points are connected by a line or line segments to represent data.

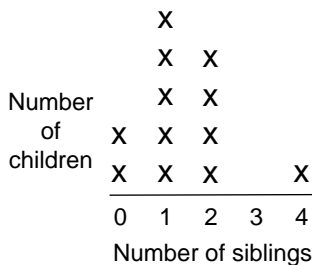


line graph

**line of symmetry** A line through a symmetric figure. Each point in one of the halves of the figure is the same distance from this line as the corresponding point in the other half.



**line plot** A sketch of data in which check marks, X's, or other marks above a number line show the frequency of each value.



line plot

**line segment** A straight path joining two points, called endpoints of the line segment.

**line symmetry** A figure has line symmetry if a line can be drawn through the figure that divides the figure into two parts so that both parts look exactly alike, but are facing in opposite directions.

**map legend** A diagram that explains the symbols, markings, and colors on a map. Also called a **map key**.

**map scale** A rate that compares the distance between two locations on a map with the actual distance between them. The rate is often represented by a labeled line segment, similar to a ruler.

**mathematics** A study of relationships among numbers, shapes, and patterns. Mathematics is used to count and measure things, to discover similarities and differences, to solve problems, and to learn about and organize the world.

**mean** A typical or middle value for a set of numbers. It is found by adding the numbers in the set and dividing the sum by the number of numbers. It is often referred to as the **average**.

**median** The middle value in a set of data when the data are listed in order from smallest to largest (or largest to smallest). If there is an even number of data points, the median is the mean of the two middle values.

**metric system of measurement** A measurement system based on the base-10 numeration system and used in most countries in the world. Units for linear measure (length, distance) include millimeter, centimeter, meter, kilometer; units for mass (weight) include gram and kilogram; units for capacity (amount of liquid or other pourable substance a container can hold) include milliliter and liter.

**minuend** See **subtraction**.

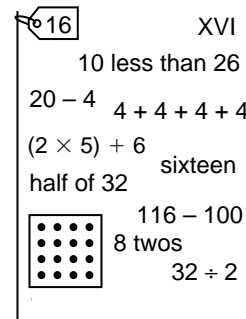
**mixed number** A number that is equal to the sum of a whole number and a fraction. For example,  $2\frac{1}{4}$  is equal to  $2 + \frac{1}{4}$ .

**mode** The value or values that occur most often in a set of data.

**multiplication** A mathematical operation. Numbers being multiplied are called factors. The result of multiplication is called the product. In  $5 \times 12 = 60$ , 5 and 12 are factors. 60 is the product. Division “undoes” multiplication;  $\frac{60}{5} = 12$  and  $\frac{60}{12} = 5$ .

**multiplicative inverses** Two numbers whose product is 1. For example, the multiplicative inverse of 5 is  $\frac{1}{5}$ , and the multiplicative inverse of  $\frac{3}{5}$  is  $\frac{5}{3}$ , or  $1\frac{2}{3}$ . Multiplicative inverses are also called reciprocals of each other.

**name-collection box** A box-like diagram containing a number, used for collecting equivalent names for that number.



name-collection box

**negative number** A number less than 0; a number to the left of 0 on a horizontal number line.

**negative rational numbers** Numbers less than 0 that can be written as a fraction or a terminating or repeating decimal. For example,  $-4$ ,  $-0.333\dots$ , and  $-\frac{4}{5}$  are negative rational numbers.

**number line** A line on which points correspond to numbers.

**number model** A number sentence that shows how the parts of a number story are related; for example:  $5 + 8 = 13$ ;  $27 - 11 = 16$ ;  $3 \times 30 = 90$ ;  $\frac{56}{8} = 7$ .

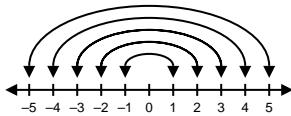
**number sentence** A sentence that is made up of numerals and a relation symbol ( $=$ ,  $<$ ,  $>$ ). Most number sentences also contain at least one operation symbol. Number sentences may also have grouping symbols, such as parentheses.

**numerator** In a whole divided into a number of equal parts, the number of equal parts being considered. In the fraction  $\frac{a}{b}$ ,  $a$  is the numerator.

**odd number** A whole number that is not divisible by 2, such as 1, 3, 5, and so on. When an odd number is divided by 2, the remainder is 1. A whole number is either an odd number or an even number.

**ONE** See **whole**.

**opposite of a number** A number that is the same distance from zero on the number line as the given number, but on the opposite side of zero. See also **additive inverses**.

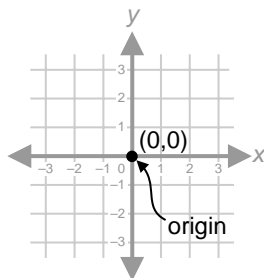


**order of operations** Rules that tell the order in which operations should be done.

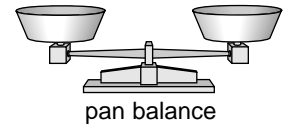
**ordered number pair** Two numbers in a specific order used to locate a point on a coordinate grid. They are usually written inside parentheses:  $(2,3)$ .

**ordinal number** A number used to express position or order in a series, such as first, third, tenth, and so on.

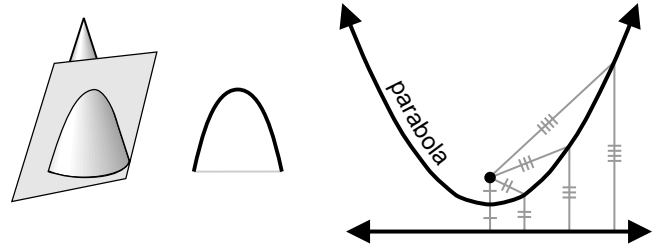
**origin** The point where the  $x$ -axis and  $y$ -axis intersect on a coordinate grid.



**pan balance** A device used to compare the weights of objects or to weigh objects.



**parabola** The curve formed by the surface of a right circular cone when it is sliced by a plane that is parallel to a side of the cone. A parabola can also be described as the curve formed by all the points that are the same distance from a line and a point not on that line.



**parallel lines (segments, rays)** Lines (segments, rays) that are the same distance apart and never meet.

**parallelogram** A quadrilateral that has two pairs of parallel sides. Pairs of opposite sides of a parallelogram are congruent.



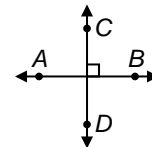
**part-to-part ratio** A ratio that compares a part of the whole to another part of the whole. For example, the statement “There are 8 boys for every 12 girls” expresses a part-to-part ratio.

**part-to-whole ratio** A ratio that compares a part of the whole to the whole. For example, the statement “8 out of 20 students are boys” expresses a part-to-whole ratio. The statement “12 out of 20 students are girls” also expresses a part-to-whole ratio.

**percent (%)** Per hundred, or out of a hundred. For example, “48% of the students in the school are boys” means that out of every 100 students in the school, 48 are boys.

**perimeter** The distance around a two-dimensional shape. A formula for the perimeter of a rectangle is  $P = 2 \times (l + w)$ , where  $l$  represents the length and  $w$  the width of the rectangle.

**perpendicular** Two rays, lines, or line segments that form right angles are said to be perpendicular to each other.



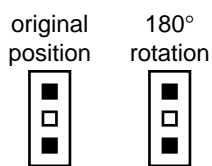
**per-unit rate** A rate that tells the quantity of items with a given unit for each item of a different unit. Two dollars per gallon, 12 miles per hour, and 4 words per minute are examples of per-unit rates.

**pi** The ratio of the circumference of a circle to its diameter. Pi is the same for every circle, approximately 3.14. Also written as the Greek letter  $\pi$ .

**place value** Determines the value of a digit in a number, written in standard notation, as determined by its position. Each place has a value ten times that of the place to its right and one-tenth the value of the place to its left.

**plane** A flat surface that extends forever.

**point symmetry** The property of a figure that can be rotated  $180^\circ$  about a point in such a way that the resulting figure (the image) exactly matches the original figure (the preimage).



**polygon** A closed figure consisting of line segments (sides) connected endpoint to endpoint.

**polyhedron** A 3-dimensional shape, whose surfaces (faces) all are flat. Each face consists of a polygon and the interior of the polygon.

**positive power of 10** See **power of 10**.

**positive rational numbers** Numbers greater than 0 that can be written as a fraction or a terminating or repeating decimal. For example,  $7$ ,  $\frac{4}{3}$ ,  $8.125$ , and  $5.111\dots$  are positive rational numbers.

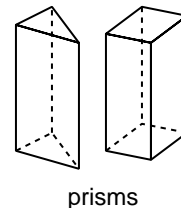
**power** Usually, a product of factors that are all the same.  $5 \times 5 \times 5$  (or 125) is called 5 to the third power, or the third power of 5, because 5 is a factor three times.  $5 \times 5 \times 5$  can also be written as  $5^3$ . In general, a power of a number  $n$  is a number that can be represented in exponential notation as  $n^a$ , where  $a$  is any number.

**power of 10** A whole number that can be written as a product using only 10 as a factor; also called a positive power of 10. For example, 100 is equal to  $10 \times 10$  or  $10^2$ . 100 is called ten squared, the second power of 10, or 10 to the second power. A negative power of 10 is a number that can be written as a product using only 0.1, or  $10^{-1}$ , as a factor. 0.01 is equal to  $0.1 \times 0.1$ , or  $10^{-2}$ . Other powers of 10 include  $10^1$ , or 10, and  $10^0$ , or 1.

**prime factorization** A number, expressed as a product of prime factors. For example, the prime factorization of 24 is  $2 \times 2 \times 2 \times 3$ .

**prime number** A whole number greater than 1 that has exactly two whole-number factors, 1 and itself. For example, 7 is a prime number because its only factors are 1 and 7. A prime number is only divisible by 1 and itself. The first five prime numbers are 2, 3, 5, 7, and 11. See also **composite number**.

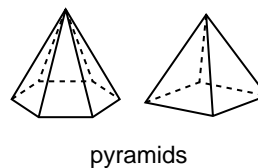
**prism** A polyhedron with two parallel faces (called bases) that are the same size and shape. Prisms are classified according to the shape of two parallel bases. The faces of a prism are always bounded by parallelograms, and are often rectangular.



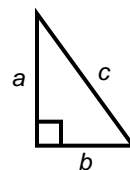
**probability** A number from 0 to 1 that indicates the likelihood that something (an event) will happen. The closer a probability is to 1, the more likely it is that an event will happen.

**product** See **multiplication**.

**pyramid** A polyhedron in which one face (the base) is a polygon and the other faces are formed by triangles with a common vertex (the apex). A pyramid is classified according to the shape of its base.



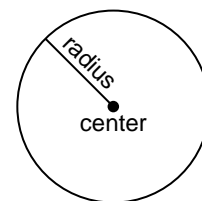
**Pythagorean Theorem** The following famous theorem: If the legs of a right triangle have lengths  $a$  and  $b$ , and the hypotenuse has length  $c$ , then  $a^2 + b^2 = c^2$ .



**quadrangle or quadrilateral** A polygon with four sides.

**quotient** See **division**.

**radius** A line segment from the center of a circle (or sphere) to any point on the circle (or sphere); also, the length of such a line segment.



**random number** A number that has the same chance of appearing as any other number.

**range** The difference between the maximum and minimum in a set of data.

**rate** A comparison of two quantities with unlike units. For example, a speed such as 55 miles per hour compares distance with time.

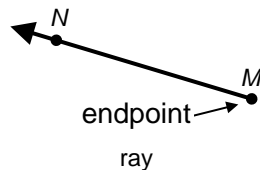


**ratio** A comparison of two quantities with like units.

Ratios can be expressed with fractions, decimals, percents, or words; or they can be written with a colon between the two numbers being compared. For example, if a team wins 3 games out of 5 games played, the ratio of wins to total games is  $\frac{3}{5}$ , 0.6, 60%, 3 to 5, or 3:5 (read “three to five”).

**rational number** Any number that can be represented in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers and  $b$  is not 0. Also, any number that can be represented by a **terminating decimal** or **repeating decimal**.  $\frac{2}{3}$ ,  $-\frac{2}{3}$ , 0.5,  $-0.5$  and 0.333... are rational numbers.

**ray** A straight path that extends infinitely from a point, called its endpoint.



**real number** Any **rational** or **irrational number**.

**reciprocal** See **multiplicative inverses**.

**rectangle** A parallelogram with four right angles.

**reference frame** A system of numbers, letters, or words to show quantities with reference to a zero point. Examples of reference frames are number lines, time lines, calendars, thermometers, maps, and coordinate systems.

**regular polygon** A convex polygon in which all the sides are the same length and all the angles have the same measure.

**regular polyhedron** A polyhedron with faces that are all congruent regular polygons.

There are five regular polyhedrons:

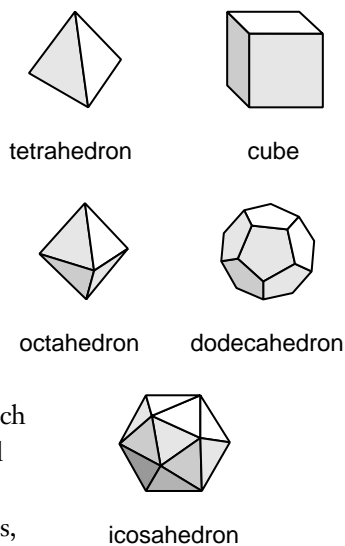
**tetrahedron:** 4 faces, each formed by an equilateral triangle

**cube:** 6 faces, each formed by a square

**octahedron:** 8 faces, each formed by an equilateral triangle

**dodecahedron:** 12 faces, each formed by a regular pentagon

**icosahedron:** 20 faces, each formed by an equilateral triangle.

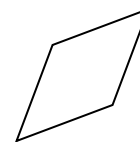


**relation symbol** A symbol used to express the association between two quantities. The symbols used

in number sentences are: = for equal to;  $\neq$  for is not equal to; < for is less than; > for is greater than;  $\leq$  for is less than or equal to;  $\geq$  for is greater than or equal to.

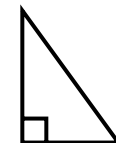
**remainder** See **division**.

**rhombus** A parallelogram whose sides are all the same length. The angles are usually not right angles, but they may be right angles.



rhombus

**right triangle** A triangle that has a right angle.



right triangle

**rotation** A turn around a center point or axis.

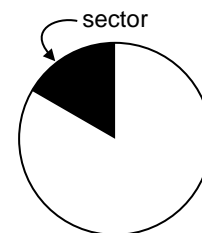
**rotation symmetry** Property of a figure that can be rotated around a point in such a way that the resulting figure (the image) exactly matches the original figure (the preimage). The rotation must be more than 0 degrees, but less than 360 degrees. If a figure has rotation symmetry, its order of rotation symmetry is the number of different ways it can be rotated to match itself exactly. “No rotation” is counted as one of the ways.

**rounding** Replacing a number with a nearby number that is easier to work with or better reflects the precision of the data. 12,964 rounded to the nearest thousand is 13,000.

**scale drawing** An accurate picture of an object in which all parts are drawn to the same scale. If an actual object measured 33 by 22 yards, a scale drawing of it might measure 33 by 22 millimeters.

**scientific notation** A system for representing numbers in which a number is written as the product of a power of 10 and a number that is at least 1 but less than 10. Scientific notation allows writing big and small numbers with only a few symbols. For example, 4,000,000 in scientific notation is  $4 \times 10^6$ . 0.00001 in scientific notation is  $1 \times 10^{-5}$ .

**sector** A region bounded by an arc and two radii of a circle. The word *wedge* is sometimes used instead of sector.



**semicircle** See **circle**.

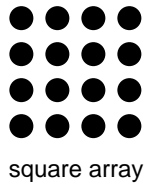
**simplest form** A fraction in which the numerator and denominator have no common factor except 1 and the numerator is less than the denominator. Also, a mixed number in which the fraction is in simplest form.

**simplify an expression** To rewrite the expression by removing parentheses and by combining like terms. For example,  $7y + 4 + 5 + 3y$  can be simplified as  $10y + 9$ ;  $3(2y + 5) - y$  can be simplified as  $5y + 15$ .

**speed** A rate that compares distance traveled with the time taken to travel that distance.

**sphere** The set of all points in space that are a given distance (the radius of the sphere) from a given point (the center of the sphere). A ball is shaped like a sphere, as is Earth.

**square array** A rectangular array with the same number of rows as columns. For example, 16 objects will form a square array with 4 objects in each row and 4 objects in each column.



**square number** A number that is the product of a whole number multiplied by itself; a whole number to the second power. 25 is a square number, because  $25 = 5 \times 5$ . A square number can be represented by a square array.

**square of a number** The product of a number multiplied by itself, symbolized by a raised 2. For example,  $3.5^2 = 3.5 \times 3.5 = 12.25$ .

**square root of a number** The square root of a number  $n$  is a number which, when multiplied by itself, results in the number  $n$ . For example, 4 is a square root of 16, because  $4 \times 4 = 16$ . The other square root of 16 is  $-4$  because  $-4 \times (-4) = 16$ .

**square unit** A unit used in area measurement.

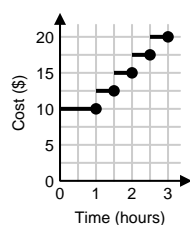
**standard notation** The most familiar way of representing whole numbers, integers, and decimals by writing digits in specified places.

**stem-and-leaf plot** A display of data in which digits with larger place values are named as stems, and digits with smaller place values are named as leaves.

Stems	Leaves
10s	1s
2	4 4 5 6 7 7 8
3	1 1 2 2 6 6 6
4	1 1 3 5 8
5	0 2

stem-and-leaf plot

**step graph** A graph that looks like steps. Particularly useful when the horizontal axis represents time.



step graph

**subtraction** A mathematical operation based on “taking away” or comparing (“How much more?”). The number being subtracted is called the **subtrahend**; the number it is subtracted from is called the **minuend**; the result of subtraction is called the **difference**. In  $45 - 12 = 33$ , 45 is the minuend, 12 is the subtrahend, and 33 is the difference. Addition “undoes” subtraction.  $45 - 12 = 33$ , and  $45 = 12 + 33$ .

**subtrahend** See **subtraction**.

**supplementary angles** Two angles whose measures total  $180^\circ$ .

**term** In an algebraic expression or equation, a number or a product of a number and one or more variables. For example, the terms of the expression  $5y + 3k - 8$  are  $5y$ ,  $3k$ , and 8. A **variable term** is a term that contains at least one variable. For example, in the equation  $4b - 8 = b + 5$ ,  $4b$  and  $b$  are variable terms. A **constant term** is a term that does not contain a variable. For example, in the equation  $4b - 8 = b + 5$ , 8 and 5 are constant terms.

**tessellation** An arrangement of closed shapes that covers a surface completely without overlaps or gaps.

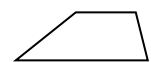
**tetrahedron** See **regular polyhedron**.

**theorem** A mathematical statement that can be proved to be true (or, sometimes, a statement that is proposed and needs to be proved). For example, the Pythagorean Theorem states that if the legs of a right triangle have lengths  $a$  and  $b$ , and the hypotenuse has length  $c$ , then  $a^2 + b^2 = c^2$ .

**tiling** Covering a surface with uniform shapes so there are no gaps or overlaps, except possibly gaps around the edges.

**top-heavy fraction** A fraction that names a number greater than or equal to 1; a fraction whose numerator is equal to or greater than its denominator. Examples of top-heavy fractions are  $\frac{7}{5}$ ,  $\frac{5}{5}$ ,  $\frac{9}{7}$ , and  $\frac{16}{4}$ . Also called **improper fraction**.

**trapezoid** A quadrilateral that has exactly one pair of parallel sides. No two sides need be the same length.



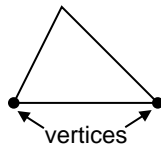
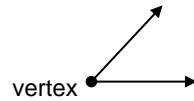
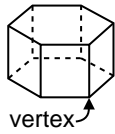
trapezoid

**triangle** A polygon with three sides. An **equilateral triangle** has three sides of the same length. An **isosceles triangle** has two sides of the same length. A **scalene triangle** has no sides of the same length.

**unit** ONE of something.

**variable** A letter or other symbol that represents a number. A variable need not represent one specific number; it can stand for many different values.

**vertex** The point at which the rays of an angle, two sides of a polygon, or the edges of a polyhedron meet.



**volume** The measure of the amount of space occupied by a 3-dimensional shape.

**whole** The entire object, collection of objects, or quantity being considered; the ONE, the unit, 100%.

**whole number** Any of the numbers 0, 1, 2, 3, 4, and so on.