

## GLOSSARY

**ABACUS.** A set of parallel rods mounted on a frame. The rods hold beads that act as counters as they slide from side to side.

**ABSOLUTE VALUE.** The non-negative value of a number. A way of looking at numbers where the negative value is always made positive and the positive is never negative.  $|-5| = 5$ .

**ABSTRACT.** Not having a specific value, but the personal value given to it by each individual.

**ACUTE TRIANGLE.** When each of the three angles of a triangle is less than  $90^\circ$ .

**ADDITION METHOD.** The use of algebraic addition to eliminate one variable to solve for another. See systems of equations.

**ADDITIVE IDENTITY.** An added amount that leaves the value unchanged.  $x + 0 = x$

**ADDITIVE INVERSE.** Any number that when added gives an answer that is zero. The additive inverse of 5 is  $-5$ , and the additive inverse of  $-7$  is 7.

**ALGEBRA.** A part of mathematics that deals with relations. It uses letters to represent numbers and values.

**ALGEBRIAC ADDITION.** Operations used to find the balance between positive and negative numbers in an algebraic expression.

**ALGEBRIAC EXPRESSION.** Any use of variable symbols to express a quantity where the equal sign is not used ( $x + y - 3$ ).

**ALGEBRAIC SUBTRACTION.** The subtraction of positive and negative numbers, where signs are reversed to turn an algebraic expression into an algebraic addition.

**ALTITUDE.** The perpendicular distance (forming a  $90^\circ$  angle) between a vertex and a base (or extension of a base) of a triangle.

**AREA.** The two-dimensional measure of a surface.

**ARITHMETIC SEQUENCE.** A series of numbers that follow a pattern based on adding the same number.

**ASCENDING ORDER.** A series of numbers from left to right, where the next number is always higher.

**ASSOCIATIVE PROPERTY.** To be able to add and multiply by grouping without affecting the results of the original order.

**ATOMIC CLOCK.** The most accurate electronic clock. (It is constantly being adjusted at the atomic level.)

**AVERAGE.** A common name for the arithmetic mean.

**AXIS OF SYMMETRY.** A straight line that divides a figure into two congruent parts.

**BASE.** In algebra, the variable(s) of a monomial (in  $2x^2$ ,  $x$  is the base.) In geometry, a side of a triangle forming a  $90^\circ$  angle with the altitude.

**BIMODAL.** In statistics, a distribution having two modes.

**BINOMIAL.** Two monomials separated by an addition or subtraction sign.

**BOUNDARY LINE.** The line that defines the limits of a linear inequality.

**CAPACITY.** The amount of volume in a container, measured in liquid or cubic units.

**CARBON FIBER.** A very strong, yet flexible manufactured material with a low weight to volume ratio.

**CAUSE-EFFECT.** The actual relationship between two actions or events. (Example: low atmospheric pressure causes high winds.)

**CELSIUS.** The metric scale for temperature. Based on the work of Anders Celsius (1701-1744), water freezes at  $0^\circ$  and boils at  $100^\circ$ .

**CENTRAL ANGLE.** An angle whose vertex is at the center of a circle and whose rays end on the circle.

**CENTRAL TENDENCIES.** In statistics, the way data concentrates towards the median value of a distribution to match mean and mode.

**CHORD.** In geometry, a segment with both ends on the circle.

**CIRCUMFERENCE.** Specific name given to the perimeter of a circle ( $C = d\pi$ ).

**CLASSICAL ARCHITECTURE.** Ancient building design up to Roman times.

**COEFFICIENT.** In algebra, the leading number of a monomial. (In  $2x^3$ , 2 is the coefficient.)

**COMBINATION.** In statistics, when items are organized and their order is not important.

**COMMON DENOMINATOR.** A value that is a shared multiple of a series of numbers.

**COMMON FACTOR.** A lower number that is shared by various multiples.

**COMMUTATIVE PROPERTY.** In addition and multiplication, where the order of the values does not alter the results.

**COMPLETE FACTORING.** A way of approaching factoring where the common factors are factored first. See page 128.

**COMPLETING THE SQUARE.** Solving a quadratic equation by moving the constant and forming a perfect trinomial square with the square and linear terms.

**COMPOUND INTEREST.** A way of computing interest where the interest of the previous period is added and becomes part of the principal for the computation of the next period.

**COMPLEX FRACTIONS.** When large fractions involve the computation of smaller fractions first.

**COMPOUND PROBABILITY.** The result of two or more probabilities where the result of the last probability depends on the result of the previous one.

**COMPOUND UNITS.** A unit of measure containing more than one unit (*km per hour*).

**CONE.** A solid with a surface that starts at a vertex and moves away from the starting plane with a circular path to form a circular base.

**CONGRUENCE.** When two geometrical figures have both equal measurements and equal shape.

**CONJUNCTION.** In inequalities with absolute values, when any of the values of an uninterrupted series of numbers IS the answer ( $|x| < 5$ ).

**CONSECUTIVE NUMBERS.** An arithmetic series of integers without a break (1, 2, 3, 4...).

**CONVERSION FACTOR.** The value that represents the difference between units (1 ft = 12 in.).

**COORDINATE PAIR.** The two values that define the location of a point on a plane ( $x, y$ ).

**COORDINATE PLANE.** A two-dimensional object that defines various locations using coordinates pairs.

**CORRESPONDING.** Any item, or part of an item, having common features with another item, or part of an item.

**COUNTING PRINCIPLE.** The simple multiplication process where different groups can be merged (3 pants and 3 shirts equals 9 outfits).

**CUNEIFORM.** Ancient writing where a wedge was used to imprint soft clay and then left to dry to read later.

**CUSTOMARY UNITS.** Old measuring units not following the uniformity of the metric system.

**CYLINDER.** A solid made from an finite set of congruent circles whose centers share the same segment.

**DEGREE OF THE POLYNOMIAL.** The largest combined exponent count of any term of a polynomial ( $w^7x^2 + y^5z^2$  is a 9th degree).

**DENOMINATOR.** The bottom portion of a fraction.

**DEPENDENT VARIABLE.** In a function, where the value of one variable is determined by the values assumed by other variables.

**DEPTH.** Name for one of the three dimensions, normally used to show distance to the rear.

**DESCENDING ORDER.** A series of numbers from left to right, where the next number is always lower.

**DIAGONAL.** A straight line that is neither horizontal, nor vertical.

**DIAMETER.** The largest chord in a circle.

**DIFFERENCE.** The result of a subtraction.

**DIFFERENCE OF TWO SQUARES.** A binomial where both terms are squares and one of them is negative.

**DIMENSIONAL ANALYSIS.** The use of multiplication of ratios to convert units of measure. See page 203.

**DIMENSIONS.** The measures that define the size of an object.

**DISCRIMINANT.** The radical part of the quadratic formula. ( $\sqrt{b^2 - 4ac}$ )

**DISJUNCTION.** In inequalities with absolute values, when any of the values of an uninterrupted series of numbers IS NOT the answer and the answer falls beyond the series ( $|x| > 5$ ).

**DISTANCE FORMULA.** Derived from the Pythagorean Theorem, it yields distance based on a coordinate plane.

**DISTRIBUTION.** A set of measurements in common association that could define a system.

**DISTRIBUTIVE PROPERTY.** A way multiplication is applied to addition of two or more numbers in which each term inside a set of parentheses can be multiplied by a factor outside the parentheses [ $a(b + c) = ab + ac$ ].

**EQUATION.** An algebraic expression that contains an equal sign.

**EQUATION OF A LINE.** An algebraic representation of a linear relationship ( $y = ax + b$ ).

**EQUILATERAL TRIANGLE.** A triangle with three equal sides and three equal angles.

**EXPONENT.** In algebra, the elevated power(s) of a monomial (in  $3x^2$ , 2 is the exponent).

**EXPONENTIAL CURVE.** A curve plotted using a equation where one of the variables is the exponent ( $y = 0.5^x$ )

**EXPONENTIAL FUNCTION.** A relationship that could be explained using the exponential curve.

**EXPONENTIAL GROWTH.** Rapid growth that can be explained using an exponential curve.

**FACTORABLE.** An algebraic expression that may be broken up (divided) for further analysis.

**FACTORING.** The different ways of splitting or dividing an algebraic expression.

**FACTOR.** A number or expression that, once multiplied with another number or expression, becomes part of the new number or expression (The factors of 12 are 2, 3, 4 and 6).

**FAHRENHEIT.** Invented by Daniel Fahrenheit (1686-1736), it is the customary unit for measuring temperature, where water freezes at 32° and boils at 212°

**F.O.I.L.** A way of multiplying two binomials, when the First, Outside, Inside, and Last pairs of terms are multiplied, in that order.

**FORMULA.** An equation that defines a specific relationship, to be repeated as needed.

**GENERAL FORM EQUATION.** A specific way of writing a linear equation where the relation is set equal to zero.

**GEOMETRIC SEQUENCE.** A series of numbers that follow a pattern based on always multiplying the last number by the same value.

**GEOMETRY.** A branch of mathematics that deals with the graphical relationships between points, lines, angles, and the shapes they form.

**GRAPHICAL SOLUTION.** A way of finding where lines meet on a plane by plotting the equations.

**HEIGHT.** A dimension that measures vertical distance when it makes a  $90^\circ$  angle with a base.

**HORIZONTAL.** A flat, leveled orientation parallel to the earth.

**HORIZONTAL AXIS.** In a coordinate plane, the flat axis. Also called the  $x$ -axis or abscissa.

**HYPertext.** A method of linking information in a computer or network in any desired way to be able to use it at will.

**HYPOTENUSE.** The longest side of a right triangle, the one opposite the  $90^\circ$  angle.

**IDENTITY PROPERTY.** The ability of things to be always congruent to itself.

**INDEPENDENT VARIABLE.** A variable whose value determines the value of other variables.

**INEQUALITIES.** An unbalanced algebraic equation.

**INSCRIBED ANGLE.** An angle in a circle whose vertex is on the circle and both rays end on the same circle.

**INSIDE TERMS.** In the multiplication of two binomials, the second and third terms.

**INTEGERS.** Whole numbers that become negative and also keep their positive attribute.

**INTELLIGENCE QUOTIENT.** A number that represents a ratio of a theoretically tested mental age to chronological age, where 100 is normal.

**INTEREST.** The amount of money charged as the cost of borrowing money, expressed as a percent of the amount borrowed.

**INVERSE OPERATIONS.** An operation that reverses an original action (subtraction is the inverse of addition).

**INVERSE PROPERTY.** The attribute of mathematical operations to have an inverse (opposite).

**INVERSE RULES.** The rules that define which operations may be used as inverse relationships to solve equations.

**IRRATIONAL NUMBERS.** A real number that cannot be expressed as a ratio ( $\sqrt{3}$  is an irrational number).

**ISOSCELES TRIANGLE.** A triangle with two equal angles and two equal sides.

**KEVLAR.** A strong, heat-resistant material used for bulletproof vests.

**LAST TERM.** The last term of a binomial or trinomial.

**LATITUDE.** A place on the earth considered in relation to its distance from the equator.

**LEADING COEFFICIENT.** The first coefficient of a polynomial.

**LIKE TERMS.** Any two terms (monomials) having the same base and exponent.

**LINEAR DIMENSION.** A dimension in one direction only.

**LINEAR EQUATION.** An equation that represents a straight line.

**LINEAR PATTERN.** When a series of points form a pattern pointing in one direction.

**LINE OF SYMMETRY.** The straight line that divides a figure into two congruent parts. (See axis of symmetry.)

**LONGITUDE.** A measure to establish location on earth in an east or west direction from the prime meridian, which runs through Greenwich, GB.

**MEAN.** Also called arithmetic mean and commonly referred to as average, it is a quantity representing a whole set of values and found by adding the whole set and dividing it by the number of values in the set.

**MEDIAN.** In a set of ascending values, the value at the center. When two values share the center, the median is the mean of the two values.

**MEDIEVAL.** Pertaining to the Middle Ages. A period of time in the history of Europe from approximately the year 500 to 1,500.

**METRIC UNITS.** The units that comprise the metric system of measurement.

**MIDDLE TERM.** In a trinomial, the term at the center.

**MIRROR SYMMETRY.** In transformations, the reflection about an axis of symmetry.

**MODE.** In statistics, the most frequent value found in a distribution.

**MONOMIAL.** A term that has a coefficient, a base, and an exponent. (As a monomial, for example, the number 7 becomes  $7x^0$ .)

**MULTIPLICATIVE IDENTITY.** Any number or expression multiplied times one is the number or expression itself.

**MULTIPLICATIVE INVERSE.** The reciprocal of a number times the number will always yield one for an answer.

**MULTIPLIER.** The factor by which a quantity is multiplied.

**NATURAL NUMBERS.** Positive numbers as they exist in nature, where neither zero nor negative numbers have a place (1, 2, 3, 4, 5, ...).

**NEGATIVE EXPONENT.** An exponent that may be represented positive in its reciprocal ( $x^{-4} = \frac{1}{x^4}$ ).

**NEGATIVE ROOT.** In even-numbered roots, one of the roots from a positive radical, the other one being its positive pair ( $\sqrt{4} = \pm 2$ ).

**NUMBER LINE.** A way of representing integers, where the center of the line is zero, with negative numbers to the left and positive numbers to the right.

**NUMBER OF OBSERVATIONS.** In statistics, the values to be evaluated.

**NUMERATOR.** The top portion of a fraction.

**OBTUSE TRIANGLE.** A triangle with one angle greater than  $90^\circ$ .

**OPEN STATEMENT.** An equation having unknown values.

**OPERATION.** Any of the many ways to carry out computations in mathematics.

**ORDER OF OPERATIONS.** A specific sequence that must be followed to arrive at the correct answer in a string of operations.

**OUTSIDE TERMS.** When multiplying two binomials, the first and last terms.

**PARABOLA.** A curve represented by  $y = x^2$ . The path taken by a projectile in flight, where the first half of the path is the mirror image of the second half.

**PARALLEL LINES.** On the same plane, two lines that never meet.

**PARALLELOGRAM.** A type of quadrilateral (four-sided figure) where opposite sides are parallel and equal.

**PERCENT.** A number that has been multiplied by 100.

**PERFECT SQUARE.** A number whose square root is an integer; any algebraic expression that has been squared.

**PERFECT TRINOMIAL SQUARE.** A type of trinomial that, when factored, yields two identical binomials.

**PERIMETER.** The continuous distance around an object.

**PERMUTATION.** The exchange of objects within a set to form different arrangement. (ABC, ACB, BAC, BCA, CAB, CBA.)

**PERPENDICULAR.** Two lines or two planes that intersect at  $90^\circ$ .

**PHYSICALIST.** Someone with the view that all that exists is ultimately physical.

**PI ( $\pi$ ).** A Greek letter, pronounced “pahi”, whose value is an irrational number that is rounded off—for typical applications—to 3.14.

**PLANE.** The flat shape that forms when two dimensions are considered at the same time. (Width times length form a plane.)

**PLOTTING.** The act of graphing points using coordinate sets.

**POINT.** A non-dimensional object that shows location only.

**POLYGON.** A closed figure on a plane with three or more straight sides (triangle, square, pentagon...).

**POLYHEDRON.** A solid figure with four or more faces.

**POLYNOMIAL.** An algebraic expression made of more than one monomial.

**POWER.** The value to which a base may be elevated, shown as an exponent.

**PRIME FACTORIZATION.** The breakdown of a number into its prime factors.

**PRINCIPLE.** A fundamental rule that has been proven concerning the dynamics of natural phenomena.

**PRISM.** A solid with parallel bases at the both ends, and whose side faces are congruent parallelograms.

**PROBABILITY.** The likelihood of an event occurring.

**PRODUCT.** The result of multiplication.

**PROPERTIES.** The attributes or conditions that define any element of algebra.

**PROPORTION.** Two ratios that are equal. Used to solve problems with similar characteristics.

**PROPORTIONAL.** Meeting the conditions of a proportion. (Similar triangles are proportional.)

**PROSTHESIS.** A manufactured invention designed to replace a body part.

**PYRAMID.** A solid with a polygon for a base, and sides made from triangles that share one side and all meet at one vertex.

**PYTHAGOREAN THEOREM.** In a right triangle, the sum of the squares of the two smaller sides is equal to the square of the largest side.

**QUADRANT.** Any of the four sections of a coordinate plane. Named first, second, third, and fourth, they are labeled starting on the NE corner and continuing counterclockwise.

**QUADRATIC EQUATIONS.** An equation that contains at least one squared value.

**QUADRATIC FORMULA.** A generalized way of factoring trinomial squares.

**QUADRATIC ROOTS.** The place where a quadratic curve crosses an axis of a coordinate plane, making one of the variables zero.

**QUADRILATERALS.** A four-sided polygon.

**QUANTITATIVE.** Being able to attach a numerical attribute. (Clara weighs 125 pounds and is great-looking. The weight is quantitative, the great looks are qualitative.)

**QUOTIENT.** The answer in the division of two numbers or expressions.

**RADICAL.** The root of a number.

**RADICAND.** The expression under a radical sign.

**RADIUS.** In a circle, the distance from the center to any point on the circle.

**RANGE.** Statistics: In a distribution, the difference between the highest number and the lowest number. In a function: The values ( $y$ ) throughout its domain ( $x$ ).

**RATIO.** The relationship between two numbers expressed as a fraction.

**RATIONAL NUMBERS.** A real number that could be expressed as a ratio.

**RATIONAL EQUATIONS.** Any equation that contains a ratio.

**REAL NUMBERS.** Any number that could measure a continuous quantity. It includes irrational, rational, integers, whole, and natural numbers.

**RECIPROCAL.** The value of a rational number where the numerator and denominator have changed places. ( $\frac{3}{4}$  is the reciprocal of  $\frac{4}{3}$ ).

**RECIPROCAL OPPOSITES.** A reciprocal value where also the sign has changed. ( $-\frac{3}{4}$  is the reciprocal opposite of  $\frac{4}{3}$ ).

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

**RECTANGULAR PRISM.** A prism with a rectangular base throughout.

**REFLECTIONS.** In transformations, the mirror image over an axis ( $x$  or  $y$ ), where every point of a figure is equidistant from the axis, but in another quadrant.

**REMAINDER.** The leftovers from division.

**REPEATING DECIMALS.** A non-ending decimal that may be converted to a fraction. A decimal that has a portion repeating indefinitely.

**RHOMBUS.** A parallelogram with four equal sides.

**RIGHT TRIANGLE.** A triangle having a  $90^\circ$  angle.

**RISE.** The vertical change ( $y$ ) of a slope.

**ROMAN NUMERALS.** The symbols (normally letters) used during Roman times to express natural numbers.

**ROOTS.** Factors from a single number that are both equal and opposites.

**ROTATIONS.** In transformations, the circular movement of a figure on an axis perpendicular to the figure.

**RUN.** The horizontal change ( $x$ ) of a slope.

**SCALENE.** A triangle having all three angles and all three sides unequal.

**SECANT.** In a circle, a straight line that intercepts a circle at two points.

**SECOND POWER.** In a monomial, a base with a two in the exponent.

**SEQUENCE.** A set of numbers with a definite order.

**SET.** A group of numbers or expressions.

**SET OF COORDINATES.** In graphing, two numbers that together define the location in a two dimensional plane.

**SIMILAR.** In geometry, a figure having the same shape but different orientation and size.

**SIMPLE PROBABILITY.** The single likelihood of an event occurring.

**SIMPLIFICATION.** The elimination of factors to diminish the size of an expression without diminishing its value.

**SLIDE RULE.** Before pocket calculators (1972), a circular or straight device with a sliding part that had logarithmic scales on them. Used for computations that today a simple scientific calculator performs with much more accuracy.

**SLOPE.** The ramp-like inclination that defines the lift of a line. Written as a ratio of the vertical component over its corresponding horizontal component (represented by the letter  $m$ ).

**SLOPE-INTERCEPT FORM EQUATION.** A linear equation written in such a way as to emphasize the slope,  $m$ , and the  $y$ -intercept,  $b$  ( $y = mx + b$ ).

**SOLUTION REGION.** In inequalities, the area above or below the line that defines where the answer lies.

**SOLVING.** To find the value of an unknown quantity.

**SPACE.** The three-dimensional reach of a solid object or a container holding a certain volume.

**SPECIAL PRODUCTS.** Similar sets of multiplying binomials whose only difference is limited to the signs that defines them.  $(a + b)(a + b)$ ,  $(a - b)(a - b)$ ,  $(a + b)(a - b)$

**SPHERE.** A perfectly round object, a ball.

**SPREAD.** In statistics, operations that measure how far data expands toward higher and lower values.

**SQUARE.** The outcome when a number is multiplied by itself.

**SQUARE ROOTS.** The inverse of the square. Two of the same number whose only difference is the sign, (+ and -), and whose multiplication is the square. ( $\sqrt{4} = \pm 2$ ).

**STANDARD FORM EQUATION.** A linear equation written with both variables on the left and the constant on the right side of the equation.

$$(Ax + By = C)$$

**STOCK MARKET.** A place, normally regulated by government, where shares of the stock (ownership) of public companies are bought and sold.

**SUBSTITUTION.** Placing the value of one variable into the place of another.

**SUBSTITUTION METHOD.** A method of solving equations simultaneously by placing the value of one variable into the place of another.

**SUM OF TWO SQUARES.** A binomial of two perfect squares having two positive signs or two negative signs. An unfactorable binomial.

**SURFACE.** The contact area of any solid.

**SYMMETRICAL.** The two sides of the same object that are congruent.

**SYSTEM OF EQUATIONS.** Working together two or more equations.

**SYSTEMS OF INEQUALITIES.** Working together two or more inequalities.

**TANGENT.** In geometry, a line intercepting a circle at only one point (touching the edge of the circle, never going inside.)

**TERM.** A monomial.

**TETRAGON.** A four-sided plane figure, a quadrilateral.

**THICKNESS.** A way to describe one of the three dimensions that forms space, sometimes replaced by "depth."

**THREE DIMENSIONAL.** A solid object or a flat representation of how an object would look if all three sides were drawn on a two-dimensional surface.

**TITANIUM.** A silver-like, bright, extremely hard, light, and corrosion-resistant metal.

**TRANSFORMATION.** In geometry, moving, flipping, or rotating a figure on a plane or in space.

**TRANSLATION.** Sliding or moving a figure on a plane or in space.

**TRAPEZOID.** A quadrilateral with two parallel sides.

**TRIANGLE.** A three-sided polygon.

**TRIANGULAR PRISM.** A solid with triangular bases and rectangular sides.

**TRIMODAL.** In statistics, a distribution with three modes.

**TRINOMIAL.** A three-termed algebraic expression.

**TWO DIMENSIONS.** A flat surface, a plane.

**UNDOING.** Solving an equation by the use of the inverse rules.

**UNFACTORABLE.** An unchanging polynomial that cannot be ungrouped.

**UNKNOWN.** A value that is part of an expression or equation, represented by a letter. A variable.

**VARIABLE.** A unknown value that is part of an expression or equation, represented by a letter. The base in a monomial.

**VERTEX OF AN ANGLE.** Where two rays meet to form an angle.

**VERTICAL LINE.** A line or plane in a standing position forming a 90° angle with the earth.

**VERTICAL ANGLES.** The opposite angles that form when two lines intercept.

**VERTICAL AXIS.** In a coordinate plane, the up-and-down axis. Also called the  $y$ -axis or ordinate.

**VOLUME.** The measure of space. The capacity of an object or container.

**WHOLE NUMBERS.** When the negative attribute of integers is not considered, but including zero.

**WIDTH.** A way to describe one of the three dimensions that forms space, sometimes replaced by "thickness", "depth", or even "length."

**WITHOUT REPLACEMENT.** In compound probabilities, when an object is not considered part of the population in the second try.

**WITH REPLACEMENT.** In compound probabilities, when an object is considered part of the population in the second try.

**X AXIS.** In a coordinate plane, the flat axis. Also called the horizontal axis or abscissa.

**X COORDINATE.** In a coordinate set, the first value.

**X-INTERCEPT.** In a coordinate plane, the point where a line crosses the  $x$ -axis.

**Y AXIS.** In a coordinate plane, the up-and-down axis. Also called the vertical axis, or ordinate.

**Y COORDINATE.** In a coordinate set, the second value.

**Y-INTERCEPT.** In a coordinate plane, the point where a line crosses the  $y$ -axis.

**ZERO EXPONENT.** A monomial that turns into one ( $3^0 = 1$ ,  $x^0 = 1$ ).