Disclaimers and Notices

New York State Next Generation Mathematics Learning Standards GLOSSARY Grades PreK - 8

Mathematical language provides a common platform for students to explore complex topics and ideas from many perspectives and to construct viable mathematical arguments. This Glossary is intended to provide definitions of some mathematical terms used in PreK – grade 8 level instruction and includes terms found in the New York State Next Generation Mathematics Learning Standards. This non-exhaustive glossary clarifies for students and teachers what is meant by various terms when the New York State Education Department uses them for mathematics. At times, there are alternative definitions for some glossary terms within the mathematical community and some terms/definitions contained within this glossary can be used in different standard areas. However, it is important to use these terms as they are used within the Next Generation Mathematics Learning Standards. After numerous reviews in consultation with NYS educators, we have adopted the mathematics definitions contained in this glossary. We therefore encourage all teachers to become familiar with these definitions and use them consistently throughout a student's educational program.

adja cent angles Two angles in a plane that share a common ray and a common vertex, but have no interior points in common (the angles do not overlap).

Example: In the figure below, angles 1 and 2 are adjacent angles.

algebra The br anch of mathematics that uses letters, symbols, and/or characters to represent numbers and express mathematical relationships.

algebraic equation Two expressions connected by an equal sign, where at least one of the expressions is algebraic. D O V R V H H ³ H [S U H V V L R Q ´

algebraic expression A m athematical representation comprised of both numbers and variables.

algebrai c inequality A m athematical sentence that is written using two expressions, at least one of which is algebraic, and one or more relation symbols: , , ! , ,d z

Example: 3x 7 !22

algebr aic relationship A relationship between two or more quantities using an algebraic expression.

Examples: The algebraic relationship which represents 2, 4,.16

alternate exterior angles A pair of angles on opposite sides of a transversal, but outside the lines the transversal intersects.

Examples:

alternate interior angles A pair of angles on opposite sides of a transversal, but inside the lines the transversal intersects.

Examples:

analog clock A clock that displays the time by the position of the hands (60-minute and 12-hour) on a dial.

Example:

angle (‘) A geometric figure formed by two rays that have a common arithm etic mean (see “ mean (arithmetic)”)

arithmet ic solution A complete process that produces a result when solving a mathematical problem using numbers.

array An arrangement of objects into rows and/or columns.

ascending orde r An arrangement in order from least to greatest or smallest to largest.

association A relationship.

A s
associative p roperty of addition A property of real numbers that states that the sum of a set of numbers is the same, regardless of how the numbers are grouped.

Example: 2 (3.5 1.3) (2 3.5) 1.

associative pr operty of multiplication A property of real numbers that states that the product of a set of numbers is the same, regardless of how the numbers are grouped.

Example: 6 (18 7) u(6 18) 7

attribute A characteristic that identifies an object or s

bar gra ph A graph that uses horizontal or vertical bars to display frequency of data.
Example:

bar model (see “tape diagram ”)

base (1) A quantity that is raised to an exponent, (e.g., 2^3 or b^a, where 2 and b are the bases, respectively); (2) a designated side of a two-dimensional figure (a height and the line containing this base must always be perpendicular);
Example:

Base (3) a designated face of a three-dimensional figure (a height and the plane containing this base must always be perpendicular).

Examples:

base ten num ber system A place value number system in which ten digits, 0 through 9, are used to represent a number and the value of each place is 10 times the value of the place to its right; the value represented by of any digit in the number is the product of that digit and its place value.

Example:

benchmark A

cardinal num ber A number that denotes how many objects are in a set.

carry (as oppos ed to “map” i n transformational ge chord   A line segment connecting any two points on a circle.

Example: In circle C, $\overline{AB}$ is a chord.

circle A ll points in the same plane that are equidistant from a fixed point called its center.

circle grap h A graph in which the data is represented by sectors of a circle; the total of all the sectors should be 100% of the data.

Example:

circumferen ce The distance around a circle, calculated by multiplying the length of the

coefficient A constant that multiplies a variable.

Example: In $3x \quad 4y \quad 14$

compens ation   A strategy that can be used for addition which usually involves increasing one addend while decreasing the other by the same amount.

Example: When adding 46 + 38, add 2 to 38 to make 40 and take two away from 46, resulting in 44; then add 40 + 44 to get 84.

complem entary angles Two angles whose measures have a sum of   90 congruenc e A condition in which a finite, sequence of rigid motions (rotations, reflections, translations) exists that maps one figure completely on to another figure.

congruent (≅) Term used to describe angles or sides that have the same measure.

congruent fi gures Two or more figures where all corresponding angle measures and corresponding side lengths are equal.

congruent tr iangles Two or more triangles where all corresponding angle measures and corresponding side lengths are equal.

Example: 7 U L D Q $ % & H L V F R Q J U X H Q W ( ) W R W U L D Q J O H

conjecture A statement, thought to be true, which has neither been proven nor refuted by counterexample.

consecutive Following one right after the other in order.

Example: 1, 2, 3, .. are consecutive positive integers and {..., 2, 0, 2, 4, ...} are consecutive even integers.

conserva tion of number An understanding that rearranging a group of objects does not affect its number.

constant A fixed value; a quantity that does not change its value.

Example: In the expression 3s 4, 4 is a constant.

constant of proportionality (unit rate) The value of the ratio of two proportional quantities.

constrai nt A limiting condition.

construct ion A precise method of drawing using only a straightedge and/or compass.

Example: The construction of the perpendicular bisector of segment AB.

context   Specific constraints of a given situation.

converse   A statement formed by reversing the hypothesis and conclusion of a conditional statement.

conversi on factor   The ratio (factor) that shows the equivalent relationship between two different units of measure; used to change between units of measure.

convert   To change the form, but not the value of a particular number or quantity.

Examples: The improper fraction $\frac{8}{3}$ converts to $2\frac{2}{3}$ as a mixed number.

32 inches converts to 2 feet 8 inches.
The unit rate $0.08/oz. converts to $1.28/pound.

coordin ate axes   The two intersecting perpendicular number lines in a plane that form four coordi nate plane   A plane containing a set of coordinate axes in which each point is located by a set of coordinates (x,y); the point of intersection of the axes is called the origin and has coordinates (0,0).

Example: The coordinates of the point on the graph are (6,4).

coordinat es   An

corr esponding parts (sides or angles) Sides or angles in the same relative position on two or more congruent or similar figures. When a statement of congruence is written, the letters of the corresponding vertices are written in an order that shows the correspondences.

Example: , I W U L $%& D Q J O H L V V L P L O D U '() , W R then W U L D Q J O H

side $\overline{AB}$ corresponds with side $\overline{}$

cube A three-dimensional figure with 6 congruent square faces.
Examples:

cube of a num ber The result of a number being multiplied by itself three times.
Example: $2^3 \quad 2 \quad 2 \quad 2 \quad 8$

cube root of a number A number (factor) that when cubed yields the original number.
Example: The cube root of 8 is 2.

cubic unit A unit for measuring volume.

cumulative frequency histogram A type of histogram in which each bar is the sum of the frequencies at and below a given value.

cup [c] A customary unit of capacity.

customary measurement system

cylind er (circular cylinder) A threedecim al expansion A number where each decimal place consists of a digit multiplied by a power depende nt events Two events in which the outcome of the first event affects the outcome of the second event.

Example: Drawing two marbles from a bag of red, green, and blue marbles without replacement.

dependent variable A variable whose value depends on the value of another variable, called an independent variable.

deposit To increase the value in an account when the account owner adds to the account.

des

dimension   A measurement of a figure in one direction.
Example: The length, width, or height of a prism.

directed line segment   A line segment with an associated direction. (also see "vector ")

distance

double -bar gr aph A graph that uses pairs of horizontal or vertical bars to compare and show the relationship between frequency of data.

double -line graph   A graph comprised of two distinct line graphs that show change over time to represent and compare data.

double -number line A d iagram that helps to make pairs of numbers in the same ratio more visible.

Example:

E

edge The boundary where a base and a lateral face, a base and lateral surface(s), two lateral faces, or two lateral surfaces of a three-dimensional figure intersect.

Examples:

elevation   Height above a specified level.

endpoint   A point at either end of a line MCID 27 >.002 Tw 4.22 0 Td ( )Tj 0.004 Tctnmorine MCIDu.odi equi lateral Having all sides congruent.

Examples:

equilat eral triangle A triangle with all sides congruent.

Example:

equivalen t Equal in value.

Examples: 3 + 3 is equivalent to 2 u3 (equivalent numerical expressions)

2.9 is equivalent to 2.90 (equivalent decimals)

1 yard is equivalent to 3 feet (equivalent lengths)

$\frac{2}{3}$ is equivalent to $\frac{8}{12}$ (equivalent fractions)

equivalent expressions Expressions that are identical when simplified using mathematical and algebraic methods.

equivalent fractions Two or more fractions that represent the same quotient (part of a set), the same size, or are represented by the same position on a number line.

Example: $\frac{1}{3}$ $\frac{3}{9}$

equivalent ratios Two ratios that express the same relationship (between numbers). (also see “equivalent fractions ”)

estimate An approximate answer.

evaluate To find the value of a mathematical expression.

Example: Evaluate the expression 2y 7 when y 5

2(5) 7 10 7 3

even number An integer that is a multiple of 2.

evTc -1.12uA13eG870luat

expanded form of a numeral A numerical expression used to show the base-ten value of each digit within that number.

Examples: $4576 = 4000 + 500 + 70$

$$47.392 = 4 \times 10 + 7 \times 1 + 3 \times \frac{1}{10} + 9 \times \frac{1}{100} + 2 \times \frac{1}{1000}$$

$$47.392 = (4 \times 10) + (7 \times 1) + \left(3 \times \frac{1}{10}\right) + \left(9 \times \frac{1}{100}\right) + \left(2 \times \frac{1}{1000}\right)$$

$$47.392 = (4 \times 10) + (7 \times 1) + (3 \times 0.1) + (9 \times 0.01) + (2 \times 0.001)$$

experiment An action or process carried out under controlled conditions in order to discover an unknown effect or law, to test or establish a hypothesis, or to illustrate a known law.

experimental probability The ratio of the total number of times the favorable outcome happens compared to the total number of times the experiment is done (number of trials); given by the formula $P(E) = \frac{\text{number of successful outcomes}}{\text{total number of outcomes}}$.

exponent A number that tells how many times the base is used as a factor; in an expression of the form b^a, a is called the exponent, b is the base, and b^a is a power of b.

exponential form A number written using exponents.

Example: $32 = 2^5$

expression A mathematical representation containing numbers, variables or a combination of both, and sometimes operation symbols; an expression does not include an equality or inequality symbol.

Examples: numeric/arithmetic expression: $(5 \quad 2) \quad 27 \quad 3$

algebraic expression: $2a \quad 3b$

extend a pattern To continue a pattern through several cycles.

extended ratio A ratio that compares more than two numbers.

Example: The measures of the angles of a triangle are in the ratio $1:2:3$.

exterior angle of a polygon An angle formed by one side of a polygon and the line containing the extension of the adjacent side; the vertex of the exterior angle is a vertex of the polygon.

Example: