



NYLearns

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Glossary

Common Core Curriculum Maps

Math/Grade 9 – Grade 12

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Grade 9 – Grade 12

AA similarity Angle-angle similarity.
When two triangles have corresponding angles that are congruent, the triangles are similar.

abscissa The x-value of an ordered pair that describes the vertical distance from the x-axis. It is always written as the first element in the ordered pair. 3 is the abscissa of the ordered pair (3, 5).

absolute value function The absolute value function is $y = |x|$; y is equal to the distance of x from zero.

addition Rule A method for finding the probability that either or both of two events occurs. If events A and B are mutually exclusive (disjoint), then $P(A \text{ or } B) = P(A) + P(B)$. Otherwise, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

amplitude Half the difference between the minimum and maximum values of the range.

angle The shape formed by two rays (called sides of the angle) with the same endpoint (called the vertex of the angle).

angle-side-angle (ASA) A postulate that states if two angles and the included side of one triangle are congruent to two angles and the included side of another triangle, then these two triangles are congruent.

arc A part of a circle.

Arithmetic sequence A sequence in which successive terms have a common difference. All arithmetic sequences can be written as $a_n = a_1 + (n-1)d$ where a_n is the nth term of the sequence, a_1 is the first term and d is the common difference. 3, 7, 11, 15, 19 ... is an arithmetic seq

asymptote A line or curve that approaches a given curve arbitrarily closely.

binomial theorem The expansion of $(a + b)^n$ where n is a positive integer is: $(a + b)^n = C_0 a^n + C_1 a^{n-1} b + C_2 a^{n-2} b^2 + \dots + C_{n-1} a b^{n-1} + C_n b^n$

box plot A data display that shows the five-number summary. The whiskers, stretching outward from the first quartile and third quartile as shown below, are no longer than 1.5 times the interquartile range (IQR). Outliers beyond that are marked separately.

causation An action or occurrence can cause another to occur.

circle The locus of all points that are a fixed distance from a given point.

combinations A selection in which order is not important.

complements The opposite of an event. That is, the set of all outcomes of an experiment that are not included in an event. The complement of event A is written A^c and is often read aloud as "not A".

complete the square A method used to solve a quadratic equation.

complex number Any number that can be written in the form $a + bi$ where a and b are real numbers and i is $\sqrt{-1}$ (the square root of -1). Note that the set of real numbers is a subset of the set of complex numbers.

Conditional probability A probability that is computed based on the assumption that some event has already occurred. The probability of event B given that event A has occurred is written $P(B|A)$.

Conditional relative frequency Conditional relative frequency is found by dividing a frequency that is not in the total row or the total column by the frequency's row total or column total.

congruence In geometry, two figures are congruent if they have the same shape and size.

conjugate The conjugate is where you change the sign in the middle of two terms like this: $3x+1$ $3x-1$ It is only used in expressions with two terms (called "binomials")

constant function In mathematics, a constant function is a function whose values do not vary and thus are constant. For example, if we have the function $f(x) = 4$, then f is constant since f maps any value to 4.

correlation The degree to which two variables are associated. For example, height and weight have a moderately strong positive correlation.

correlation coefficient A number that is a measure of the strength and direction of the correlation between two variables. Correlation coefficients are expressed using the variable r , where r is between 1 and -1 , inclusive. The closer r is to 1 or -1 , the less scattered the points.

cosine A trigonometric function abbreviated $\cos$. In a right triangle, the ratio of the length of the leg adjacent to the reference angle to the length of the hypotenuse.

decreasing intervals A function f is decreasing on an interval if $f(x_1) > f(x_2)$ for each $x_1 < x_2$ in the interval.

determinant The determinant of a matrix is a special number that can be calculated from the matrix. It tells us things about the matrix that are useful in systems of linear equations, in calculus and more. The symbol for determinant is two vertical lines; $|A|$ means

dilation A transformation in which a figure grows larger. Dilations may be with respect to a point (dilation of a geometric figure) or with respect to the axis of a graph (dilation of a graph).

domain The set of independent values in a function; the set of first elements in ordered pairs in a function.

dot plot A statistical chart consisting of plotted data points plotted on a simple scale, typically using filled in circles, that show the relationship between two sets of data.

end behavior The way a graph of an equation behaves at the far left and right ends as the input variable goes to positive or negative infinity $+\infty$

expected value For a random variable, the weighted average of its possible values, with weights given by their respective probabilities.

experiment In the study of probability, the name given to any controlled, repeatable process. For example, the following are all experiments: tossing a coin, rolling a die, or selecting a ball from a bag.

exponential decay An equation used to calculate how things get smaller over time - used for radioactive decay and age dating. $y = C(1 - r)^t$ where y is the final amount, C is the original amount, r is the rate of change, and t is time.

exponential function An equation of the form $y = bx$ where there is a variable as an exponent. Exponential functions are the inverse of logarithms.

exponential growth An equation used to calculate how things increase over time - used for growth of bacteria and other populations.

Fibonacci sequence The Fibonacci Sequence is the series of numbers: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ... The next number is found by adding up the two numbers before it.

first quartile For a data set with median M , the first quartile is the median of the data values less than M . Example: For the data set $\{1, 3, 6, 7, 10, 12, 14, 15, 22, 120\}$, the first quartile is 6.

frequency table A frequency table is a table that lists items and uses tally marks to record and show the number of times they occur.

function notation A function written using the symbol $f(x)$ in place of y .

fundamental theorem of algebra Every polynomial equation with degree greater than zero has at least one root in the set of complex numbers. Corollary: Every polynomial $P(x)$ of degree n ($n > 0$) can be written as the product of a constant k ($k \neq 0$) and n linear factors $P(x) = k(x - r_1)$

geometric sequence A sequence in which consecutive terms have a common ratio. All geometric sequences can be written as $a_n = a_1 r^{n-1}$ where a_n is the n th term of the sequence, a_1 is the first term and r is the common ratio.

geometric series The sum of the terms of a geometric sequence.

histogram A graphical representation that shows the frequency of data in intervals of equal size. The height of each bar contributes to a visual impression of the distribution of data at each interval.

Identity matrix A square matrix which has a 1 for each element on the main diagonal and 0 for all other elements.

imaginary number Complex numbers with no real part, such as $5i$.

increasing intervals A function f is decreasing on an interval if $f(x_1) < f(x_2)$ for each $x_1 < x_2$ in the interval.

independent A variable in an equation that may have its value freely chosen without considering values of any other variable. For equations such as $y = 3x - 2$, the independent variable is x . The variable y is not independent since it depends on the number chosen for

initial point When a vector is represented as a line segment, the starting point is called the initial point of a vector.

inscribed To draw (one figure) within another figure so that every vertex of the enclosed figure touches the outer figure.

intercepts The point where a curve crosses the x - or y -axis.

Interquartile range The difference between the first quartile and third quartile of a set of data. This is one way to describe the spread of a set of data.

intersections The elements two or more sets have in common. Intersection is indicated by the $\cap$ (cap) symbol.

invertible function If f is a function from a set A to a set B , then an inverse function for f is a function from B to A , with the property that a round trip (a composition) from A to B to A (or from B to A to B) returns each element of the initial set to itself.

joint relative frequency Joint relative frequency is found by dividing a frequency that is not in the total row or total column by the grand total.

Law of Cosines An equation relating the cosine of an interior angle and the lengths of the sides of a triangle.

Law of Sines Equations relating the sines of the interior angles of a triangle and the corresponding opposite sides.

Line A straight path that goes on forever in opposite directions.

line segment A part of a line. A line segment has two endpoints.

logarithmic Function A function in the form $y = \log_b x$. This is the inverse of an exponential function.

marginal relative frequency Marginal relative frequency is found by dividing a row total or column total by the grand total.

matrix A rectangular array of numbers, it uses large brackets to define the matrix. The size of a matrix is the number of rows by the number of columns.

maximum The largest value of a set or function.

midline The midline is a horizontal axis that is used as the reference line about which the graph of a periodic function oscillates.

minimum The smallest value of a set or function.

moduli The positive square root of the sum of the squares of the real and imaginary parts of a complex number.

multiplication rule A method for finding the probability that both of two events occur.

multiplicative inverses For every $a \neq 0$ there exists $1/a$ so that $a \times 1/a = 1/a \times a = 1$.

negative intervals When a polynomial has negative values, its graph lies below the X-axis in that interval.

observational studies A type of research that draws a conclusion by comparing subjects against a control group, in cases where the researcher has no control over the experiment.

outlier A value in a data set that is much higher or lower than the rest; a point which falls more than 1.5 times the interquartile range above the third quartile or below the first quartile.

parallel lines Lines going in the same direction and always being the same distance apart. If lines are parallel, they never meet or cross each other.

parallelogram rule The rule states that the sum of the squares of the lengths of the four sides of a parallelogram equals the sum of the squares of the lengths of the two diagonals.

Pascal's Triangle A triangle containing binomial coefficients. The sum of any two adjacent elements in a row can be found between them on the next row. Each row begins and ends with 1.

percent rate of change A rate of change expressed as a percent. Example: if a population grows from 50 to 55 in a year, it grows by $5/50 = 10\%$ per year.

Period The period of sine and cosine equations relates to how often the graph goes a full repetition around the unit circle. The period is how long it takes for sine or cosine to return to the same place.

periodicity The quality, state, or fact of being regularly recurrent or having periods.

permutations Selections of objects in which the order of the objects matters.

perpendicular lines Two lines that intersect to form right angles.

point A single exact location on a plane or in space having no dimensions and often represented by a dot.

polar form The polar coordinates of a complex number on the complex plane. The polar form of a complex number is written in any of the following forms: $r \cos \theta + i r \sin \theta$, $r(\cos \theta + i \sin \theta)$, or $r e^{i \theta}$. In any of these forms r is called the modulus or absolute value. θ

polynomial A polynomial is an expression made with constants, variables and exponents, which are combined using addition, subtraction and multiplication, but not division.

positive intervals When a polynomial has positive values, its graph lies above the X-axis in that interval.

properties of inequality Exactly one of the following is true: $a < b$, $a = b$, $a > b$. If $a > b$ and $b > c$ then $a > c$. If $a > b$, then $b < a$. If $a > b$, then $-a < -b$. If $a > b$, then $a \pm c > b \pm c$. If $a > b$ and $c > 0$, then $a \times c > b \times c$. If $a > b$ and $c < 0$, then $a \times c < b \times c$. If $a > b$

quadratic equation An equation where the highest exponent of the variable (usually "x") is a square (2). It is usually written $ax^2 + bx + c = 0$

radian measure Radian measure of any angle is the length of the arc intercepted on a circle with a radius of 1 by an angle in the standard position on a coordinate plane.

random variable An assignment of a numerical value to each outcome in a sample space.

range The possible values for the dependent variable in a function or relation. The difference between the maximum value and the minimum value in a data set.

rate of change Not only how much a function has changed, but also the length of the interval over which it has changed.

rational exponent The use of rational numbers as exponents. A rational exponent represents both an integer exponent and an n th root. The root is found in the denominator (like a tree, the root is at the bottom), and the integer exponent is found in the numerator.

rational expression A quotient of two polynomials with a non-zero denominator.

real number A number that is either rational or irrational; real numbers include all numbers except for imaginary numbers.

rectangular form A function (or relation) written using (x, y) or (x, y, z) coordinates.

relative frequency The ratio of the observed frequency of some outcome and the total frequency of the random experiment. Suppose a random experiment is repeated N times and some outcomes is observed f times, then the ratio f/N is called the relative frequency of the outcome

relative maximum The highest point in a particular section of a graph.

relative minimum The lowest point in a particular section of a graph.

remainder theorem When you divide a polynomial $f(x)$ by $x-c$ the remainder r will be $f(c)$.

residuals The vertical distance between a data point and the graph of a regression equation. The residual is positive if the data point is above the graph. The residual is negative if the data point is below the graph. The residual is 0 only when the graph passes through

rigid motion A transformation consisting of rotations and translations which leaves a given arrangement unchanged.

sample survey The process of selecting a sample of elements from a target population in order to conduct a survey.

scalar multiplication To multiply a matrix by a single number; the number is a scalar, so the process is called scalar multiplication.

scale factor The ratio of any two corresponding lengths in two similar geometric figures. The ratio of areas of two similar figures is the square of the scale factor and the ratio of the volumes of two similar figures is the cube of the scale factor.

side-angle-side (SAS) A postulate that states that if two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, then these two triangles are congruent.

side-side-side (SSS) A postulate that states that if three sides of one triangle are congruent to three sides of another triangle, then these two triangles are congruent.

similarity transformation A rigid motion followed by a dilation.

simulation models A mathematical model of a system or process that includes key inputs which affect it and the corresponding outputs that are affected by it.

sine A trigonometric function abbreviated sin. In a right triangle, the ratio of the length of the leg opposite the reference angle to the length of the hypotenuse.

standard deviation A measure of the dispersion of a set of data from its mean. The more spread apart the data, the higher the deviation. Standard deviation is calculated as the square root of variance.

step function A function that has a graph resembling a staircase.

subsets Set A is a subset of set B if all of the elements (if any) of set A are contained in set B. This is written $A \subset B$. Note: The empty set is a subset of every set.

symmetries Trigonometric functions are also symmetric; that is, they can be reflected around a specific location. Symmetric functions are considered "even" if (such as the cosine function) and "odd" if (such as the sine function). Even functions are symmetric around

tangent A line that intersects a circle in exactly one point. A trigonometric function abbreviated tan; the ratio between the sine of an angle and the cosine of the same angle. In a right triangle, the ratio of the length of the leg opposite the reference angle

terminal point When a vector is represented as a line segment, the end point is called the terminal point of a vector.

theorem A statement or conjecture that can be proven to be true based on postulates, definitions, or other proven theorems.

theoretical probability The ratio of the number of expected outcomes if the experiment is repeated over and over; $P(E)$; Example: the theoretical probability of drawing a king from a standard deck of cards is $4/52$.

third quartile For a data set with median M, the third quartile is the median of the data values greater than M. Example: For the data set {2, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the third quartile is 15.

trigonometric function The six functions sine, cosine, tangent, cosecant, secant, and cotangent.

unions Combining the elements of two or more sets. Union is indicated by the $\cup$ (cup) symbol.

vector A vector is a geometric object that has both a magnitude (or length) and direction

velocity The rate of change of position is known as velocity. Velocity is also defined as the distance per unit time. For example, if s is distance traveled in time t, then velocity $v=s/t$

zero matrix A matrix where all the elements are zero.