

MATH VOCABULARY

Words	Description	Sections
absolute value	the distance of a number from zero	Number and Quantity
addition	mathematical operation that represents combining collections of objects together into a larger collection; it is signified by the plus (+) sign	Number and Quantity
additive inverse	two numbers whose sum is 0; example: $\frac{3}{4}$ and $-\frac{3}{4}$ are additive inverses of one another because they equal 0	Number and Quantity
area	the number of square units that covers a shape or figure; example: you would need to know the area of a room to buy carpet	Number and Quantity
associative property of addition	a property for addition that means you can add three numbers in any order and get the same result; example: $1+(2+3) = (1+2)+3$; $(a + b) + c = a + (b + c)$	Number and Quantity
associative property of multiplication	a property for multiplication that means you can multiply three numbers in any order and get the same result; example: $(3 \times 4) \times 2 = 3(4 \times 2)$; $(a \times b) \times c = a \times (b \times c)$	Number and Quantity
coefficient	a constant that multiplies a variable	Number and Quantity
commutative property of addition	a property for addition that means you can add two numbers in any order and get the same result; example: $50+25=25+50$ and $a + b = b + a$	Number and Quantity
commutative property of multiplication	a property for multiplication that means you can multiply two numbers in any order and get the same result; example: $3 \times 4 = 4 \times 3$; $a \times b = b \times a$	Number and Quantity
complex number	a number consisting of a real and imaginary part; it can be written in the form $a + bi$, where a and b are real numbers, and i is the standard imaginary unit with the property $i^2 = -1$	Number and Quantity
complex plane	a geometric representation of the complex numbers established by the real axis and the orthogonal imaginary axis; it can be thought of as a modified Cartesian plane, with the real part of a complex number represented by a displacement along the x-axis, and the imaginary part by a displacement along the y-axis; also known as a z-plane	Number and Quantity
complex solution	a solution or set of solutions containing a complex number	Number and Quantity
conjugate	if b and d are both non-negative, then the binomials $a \sqrt{rt} b + c \sqrt{rt} d$ and $a \sqrt{rt} b - c \sqrt{rt} d$ are conjugates of one another	Number and Quantity
coordinate	one or more numbers that uniquely determine the position of a point or other geometric element on a line, graph, or map	Number and Quantity
cube root	a cube root of a number, denoted $\sqrt[3]{x}$ or $x^{1/3}$, is a number such that $a^3 = x$	Number and Quantity

data display	an organized way to display data; example: tables, charts, tally tables, pictographs, bar graphs, circle graphs, line plots, Venn Diagrams	Number and Quantity
descriptive modeling	modeling that simply describes the phenomena or summarizes them in a compact form; example: graphs of observations	Number and Quantity
determinant	a special number associated with any square matrix; it is a scale factor or coefficient for measure when the matrix is regarded as a linear transformation; example: a 2x2 matrix with determinant 2 when applied to a set of points with finite area will transform those points into a set with twice the area	Number and Quantity
difference	the result of subtracting two numbers; example: $20 - 5 = 15$	Number and Quantity
direction	seen in the difference between velocity and speed; in physics, speed is pure scalar - something with a magnitude but no direction - 5 m/s does not tell us which way the object is moving; velocity must be expressed as a vector with both a magnitude and a direction - 5 m/s eastward	Number and Quantity
distance	a numerical description of how far apart objects are.	Number and Quantity
distributive property of multiplication over addition	$a(b + c) = a * b + a * c$	Number and Quantity
endpoint	the starting point of a ray	Number and Quantity
equation	a mathematical statement that says that two expressions have the same value; any number sentence with an =; example: $4 + 2 = 3 + 3$	Number and Quantity
exponents	numbers that indicate the operation of repeated multiplication	Number and Quantity
expressions	finite combinations of symbols that are well-formed according to the rules applicable in the context at end	Number and Quantity
formula	an equation that states a rule or a fact	Number and Quantity
Fundamental Theorem of Algebra	every non-constant single-variable polynomial with complex coefficients has at least one complex root; every non-zero single-variable polynomial with complex coefficients has exactly as many complex roots as its degree, if each root is counted up to its multiplicity	Number and Quantity
graph(noun)	a type of drawing used to represent data	Number and Quantity
identity matrices	n-by-n square matrices with ones on the main diagonal and zeroes elsewhere	Number and Quantity
integer exponents	exponents who only have integer values	Number and Quantity
line segment	two points on a line, and all the points between those two points	Number and Quantity
magnitude	the relative size of a mathematical object or vector	Number and Quantity

matrices	plural of matrix; a rectangular array of data	Number and Quantity
midpoint of a segment	a point on a line segment that divides the segment into two congruent segments	Number and Quantity
modulus	$\text{abs}(x+iy) = \sqrt{x^2+y^2}$	Number and Quantity
multiplication	the process of repetitive addition	Number and Quantity
multiplicative inverse	two numbers whose product is 1; example: $\frac{3}{4}$ and $\frac{4}{3}$ are multiplicative inverses of one another because $\frac{3}{4} \times \frac{4}{3} = \frac{4}{3} \times \frac{3}{4} = 1$	Number and Quantity
origin	the point (0, 0) on a coordinate plane, where the x-axis and the y-axis intersect	Number and Quantity
parallelogram rule	a rule used to add two vectors using the vectors as sides of the parallelogram and the resultant is the diagonal of the parallelogram	Number and Quantity
point	a location in a plane or in space, having no dimensions	Number and Quantity
polar form	the polar form of a complex number is written in any of the following forms: $r\cos \theta + i\sin \theta$, $r(\cos \theta + i\sin \theta)$, or $rcis \theta$; In any of these forms r is called the modulus or absolute value; θ is called the argument	Number and Quantity
polynomial identities	Polynomial identities involving sums and differences of like powers include $x^2 - y^2 = (x - y)(x + y)$ $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$ $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$ $x^4 - y^4 = (x - y)(x + y)(x^2 + y^2)$ $x^5 - y^5 = (x - y)(x^4 + x^3y + x^2y^2 + xy^3 + y^4)$ $x^5 + y^5 = (x + y)(x^4 - x^3y + x^2y^2 - xy^3 + y^4)$ $x^6 - y^6 = (x - y)(x + y)(x^2 + xy + y^2)(x^2 - xy + y^2)$ $x^6 + y^6 = (x^2 + y^2)(x^4 - x^2y^2 + y^4),$ which are the polynomial versions of the so-called binomial numbers. Further identities include $(x_1^2 - Dy_1^2)(x_2^2 - Dy_2^2) = (x_1x_2 + Dy_1y_2)^2 - D(x_1y_2 + x_2y_1)^2$ $(x_1^2 + Dy_1^2)(x_2^2 + Dy_2^2) = (x_1x_2 \pm Dy_1y_2)^2 + D(x_1y_2 \mp x_2y_1)^2.$	Number and Quantity
product	the result of two numbers being multiplied together; example: $4 \times 5 = 20$	Number and Quantity

properties of exponents	Zero Exponent Property	$a^0 = 1, (a \neq 0)$	Number and Quantity
	Negative Exponent Property	$a^{-b} = \frac{1}{a^b}, a \neq 0$	
	Product of Powers Property	$a^b \cdot a^c = a^{(b+c)}, a \neq 0$	
	Quotient of Powers Property	$\frac{a^b}{a^c} = a^{b-c}, a \neq 0$	
	Power of a Product Property	$a^c \cdot b^c = (ab)^c, a, b \neq 0$	
	Power of a Quotient Property	$\frac{a^c}{b^c} = \left(\frac{a}{b}\right)^c, a, b \neq 0$	
	Power of a Power Property	$(a^b)^c = a^{bc}$	
	Rational Exponent Property	$a^{1/b} = \sqrt[b]{a}, b \neq 0$ $a^{\frac{c}{b}} = \sqrt[b]{a^c} = \left(\sqrt[b]{a}\right)^c$	
quadratic equation/expression	a polynomial equation whose term of highest degree is 2.		Number and Quantity
quadratic polynomial	a trinomial whose term of highest degree is 2		Number and Quantity
quantities	a property which exists as magnitude or multitude; a specified or indefinite number or amount; a considerable amount or number		Number and Quantity
quotient	the answer to a division problem; example: $20/5 = 4$		Number and Quantity
radical	an expression in the form $\sqrt[n]{A}$ or $\sqrt[n]{A}$		Number and Quantity
rational exponents	exponents that are fractions		Number and Quantity
rational number	a number that can be expressed as the ratio of two integers		Number and Quantity
real coefficient	a constant that multiplies a variable where the constant is a real number		Number and Quantity
real numbers	the combined set of rational numbers and irrational numbers		Number and Quantity
scalar	a quantity used to multiply vectors in the context of vector spaces		Number and Quantity
scaling	a linear transformation that enlarges or diminishes objects		Number and Quantity
solution	the value of a variable that makes an equation true		Number and Quantity
square matrices	a matrix with the same number of rows and columns; example: 2x2, 3x3, 4x4, etc		Number and Quantity

subtraction	the arithmetic operation of finding the difference between two quantities or number	Number and Quantity
sum	the answer to an addition problem; example: $3 + 2 = 5$	Number and Quantity
symbol	a printed or written sign used to represent an operation, element, quantity, quality, or relation	Number and Quantity
transformation	a change in the position, shape, or size of a geometric figure	Number and Quantity
unit	the name assigned to an attribute measurement	Number and Quantity
vector	a quantity with magnitude and direction in the plan or in space, defined by an ordered pair or triple of real numbers	Number and Quantity
vector quantity	the magnitude of a vector	Number and Quantity
velocity	a vector with magnitude and direction representing the movement of an object	Number and Quantity
zero matrices	a matrix with zero values for all members of the matrix	Number and Quantity
absolute value	the distance of a number from zero	Algebra
addition	mathematical operation that represents combining collections of objects together into a larger collection. It is signified by the plus (+) sign	Algebra
algebraic expressions	an algebraic expression is made up of the signs and symbols of algebra; include the Arabic numerals, literal numbers, the signs of operation, and so forth; such an expression represents one number or one quantity	Algebra
approximation	an inexact representation of something that is still close enough to be useful	Algebra
arithmetic expressions	an expression that represents a numeric value and is built with arithmetic operators; evaluated by performing a sequence of arithmetic operations to obtain a numeric value, which replaces the expression	Algebra
circle	a closed curve with all of its points in one plane and the same distance from a fixed point, the center	Algebra
coefficient	a constant that multiplies a variable	Algebra
combination	a selection in which order is not important	Algebra
complete the Square	a method of transferring a quadratic equation so it is in the form "perfect square = k" where k is greater than or equal to 0	Algebra
complex solution	a solution or set of solutions containing a complex number	Algebra
computer algebra system	a software Program that facilitates symbolic mathematics; the core functionality of a CAS is manipulative of mathematical expressions in symbolic form; example: MathematicalL, Maple, TI-NSpire, Derive (TI-92)	Algebra

coordinate	one or more numbers that uniquely determine the position of a point or other geometric element on a line, graph, or map	Algebra
coordinate axes	the x- and y-axes in the coordinate plane	Algebra
coordinate plane	the plane determined by a horizontal number line, called the x-axis, and a vertical number line, called the y-axis, intersecting at a point called the origin; each point in the coordinate plane can be specified by an ordered pair of numbers	Algebra
derive	a logical or mathematical process indicating through a series of statements that a result such as a theorem or a formula necessarily follows from the initial assumptions	Algebra
difference	the result of subtracting two numbers; example: $20 - 5 = 15$	Algebra
division	for every real number a and every non-zero real number b , the quotient a/b is defined by $a / b = a \cdot 1 / b$	Algebra
equation	a mathematical statement that says that two expressions have the same value; any number sentence with an $=$; example: $4 + 2 = 3 + 3$	Algebra
equivalent	the same in amount, value or importance; example: $2/3$ is equivalent to $4/6$; $2 + 3$ is equivalent to 5	Algebra
exponential function	the function e^x where e is the number (approximately 2.71.8281828) such that the function e^x equals its own derivative; it is used to model phenomena when a constant change in the independent variable gives the same proportional change (increase or decrease) in the dependent variable	Algebra
exponents	numbers that indicate the operation of repeated multiplication	Algebra
expressions	finite combinations of symbols that are well-formed according to the rules applicable in the context at end	Algebra
extraneous solution	a solution of a simplified version of an equation that does not satisfy the original equation	Algebra
factor(noun)	a number that divides evenly into another number; example: the factors of 12 are 1, 2, 3, 4, 6 and 12	Algebra
factor(verb)	the decomposition of an object into a product of other objects, or factors, which when multiplied together give the original; also known as factoring	Algebra
formula	an equation that states a rule or a fact	Algebra
function	a correspondence between two sets, the domain and range, that assigns to each member of the domain exactly one member of the range.	Algebra
graph(noun)	a type of drawing used to represent data	Algebra

graph(verb)	to plot (a function) on a graph	Algebra
graph of an equation in two variables	set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line)	Algebra
half-plane	either of the two parts into which a plane divides the three-dimensional euclidean space; a planar region consisting of points on one side of an infinite straight line, and no points on the other side; closed half-plane-points on the line are included; open half-plane-points on the line are not included	Algebra
inequality	a mathematical expression which shows that two quantities are not equal	Algebra
integer	the set of numbers containing zero, the natural numbers, and all the negatives of the natural numbers	Algebra
inverse of a matrix	the inverse of a square matrix A is a matrix A^{-1} such that $AA^{-1} = I$ where I is the identity matrix; a square matrix A has an inverse if the determinant $ A $ does not equal zero	Algebra
line	an infinite set of points forming a straight path extending in two directions; example: lines can be short, long, straight, or curved	Algebra
linear	of or pertaining to a line; having a degree of one	Algebra
linear function	a function defined by $f(x) = mx + b$	Algebra
linear inequality	an inequality with highest degree of one	Algebra
logarithmic function	an inverse of an exponential function	Algebra
long division	a standard procedure for dividing simple or complex multidigit numbers in which the dividend is divided by the divisor and the result is a quotient	Algebra
mathematical induction	a form of mathematical proof in which the first in an infinite sequence of statements is proven true and therefore all the following instances must be true	Algebra
matrices	plural of matrix; a rectangular array of data	Algebra
maximum value	the highest/largest value of a given set of data	Algebra
minimum value	the lowest/least value of a given set of data	Algebra
multiple	the product of that number and any other whole number; zero is a multiple of every number; example: 8, 12, 16, 20 are multiples of 4	Algebra
multiplication	the process of repetitive addition	Algebra
Pascal's Triangle	a triangle developed by Pascal whose numbers are the coefficients for the binomial expansions	Algebra
point	a location in a plane or in space, having no dimensions	Algebra

point of intersection	the meeting point of two non-parallel lines	Algebra
polynomial	made up of terms that are only added, subtracted or multiplied	Algebra
	Polynomial identities involving sums and differences of like powers include $x^2 - y^2 = (x - y)(x + y)$ $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$ $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$ $x^4 - y^4 = (x - y)(x + y)(x^2 + y^2)$ $x^5 - y^5 = (x - y)(x^4 + x^3y + x^2y^2 + xy^3 + y^4)$ $x^5 + y^5 = (x + y)(x^4 - x^3y + x^2y^2 - xy^3 + y^4)$ $x^6 - y^6 = (x - y)(x + y)(x^2 + xy + y^2)(x^2 - xy + y^2)$ $x^6 + y^6 = (x^2 + y^2)(x^4 - x^2y^2 + y^4),$ which are the polynomial versions of the so-called binomial numbers. Further identities include $(x_1^2 - Dy_1^2)(x_2^2 - Dy_2^2) = (x_1x_2 + Dy_1y_2)^2 - D(x_1y_2 + x_2y_1)^2$ $(x_1^2 + Dy_1^2)(x_2^2 + Dy_2^2) = (x_1x_2 \pm Dy_1y_2)^2 + D(x_1y_2 \mp x_2y_1)^2.$	
polynomial identities		Algebra
powers	a number that indicates the operation of repeated multiplication	Algebra
product	the result of two numbers being multiplied together; <u>example</u> : 4x5=20	Algebra

properties of exponents	Zero Exponent Property	$a^0 = 1, (a \neq 0)$	Algebra
	Negative Exponent Property	$a^{-b} = \frac{1}{a^b}, a \neq 0$	
	Product of Powers Property	$a^b \cdot a^c = a^{(b+c)}, a \neq 0$	
	Quotient of Powers Property	$\frac{a^b}{a^c} = a^{b-c}, a \neq 0$	
	Power of a Product Property	$a^c \cdot b^c = (ab)^c, a, b \neq 0$	
	Power of a Quotient Property	$\frac{a^c}{b^c} = \left(\frac{a}{b}\right)^c, a, b \neq 0$	
	Power of a Power Property	$(a^b)^c = a^{bc}$	
	Rational Exponent Property	$a^{1/b} = \sqrt[b]{a}, b \neq 0$ $a^{\frac{c}{b}} = \sqrt[b]{a^c} = \left(\sqrt[b]{a}\right)^c$	
Pythagorean triples	a Pythagorean triple is a set of three integers a, b, c which form the sides of a right angled triangle; the smallest Pythagorean triple is the set of numbers 3,4,5		Algebra
quadratic equation/expression	a polynomial equation whose term of highest degree is 2.		Algebra
quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a},$ the solutions of a quadratic equation in the form $ax^2 + bx + c = 0$; a does not equal zero and $b^2 - 4ac$ is greater than or equal to 0 are given by the formula		Algebra
quadratic function	a function defined by $f(x) = ax^2 + bx + c$ where a does not equal 0		Algebra
quantities	a property which exists as magnitude or multitude; a specified or indefinite number or amount; a considerable amount or number		Algebra
radical equation	an equation containing a radical with a variable in the radicand		Algebra
ratio	a pair of numbers that compares different types of units		Algebra
rational equation	an equation in which one or more of the terms is a fraction		Algebra
rational expressions	a fraction in which the numerator and/or the denominator are polynomials		Algebra
real numbers	the combined set of rational numbers and irrational numbers		Algebra

scale (of a graph)	the numerical system used to define the axis on a graph or a line on a data display	Algebra
simple equation	an equation containing only one unknown quantity and that quantity is only in the first degree; example: $2x + 9 = 24$	Algebra
simple rational function	a rational function (quotient of two polynomials) of the form $[(x-a)(x-b)]/[(x-c)(x-d)]$	Algebra
solution	the value of a variable that makes an equation true	Algebra
square root	the square root of x is the number that, when multiplied by itself, gives the number, x	Algebra
subtraction	the arithmetic operation of finding the difference between two quantities or number	Algebra
sum	the answer to an addition problem; example: $3 + 2 = 5$	Algebra
system of equations	two or more equations in the same variable	Algebra
systems of linear equations	two or more linear equations in the same variables	Algebra
term	a single number or a variable, or numbers and variables multiplied together; a term is typically separated by an addition or subtraction sign	Algebra
variable	a letter used to represent a number value in an expression or an equation; example: "x" in $x+2=4$	Algebra
absolute value function	the absolute value function is used to measure the distance between two numbers $f(x) = x $ or $\text{abs}(x)$	Functions
addition formula for sine	$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \sin \beta \cos \alpha$	Functions
addition formula for cosine	$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$	Functions
addition formula for tangent	$\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 + \tan \alpha \tan \beta}$	Functions
algebraic expressions	an algebraic expression is made up of the signs and symbols of algebra; include the Arabic numerals, literal numbers, the signs of operation, and so forth; such an expression represents one number or one quantity	Functions
amplitude	half the distances between the minimum and maximum values of the range of a periodic function with a bounded range; example: the height of a wave	Functions
angle	the union of two rays with a common endpoint, called the vertex	Functions

arc length	the measure of the distance along the curved line making up the arc; longer than the straight line distance between its endpoints (which would be a chord)	Functions
arithmetic sequence	the sequence of consecutive numbers in which each term is obtained by adding a fixed number to the preceding term except the first term; the fixed number is known as the common difference of the arithmetic progression pattern; the difference may be positive, negative or zero.	Functions
asymptotes	lines such that the distance between the curves and the lines approach zero as they tend to infinity	Functions
average rate of change of a function	avg. rate = $[f(x_2) - f(x_1)] / (x_2 - x_1)$	Functions
circle	a closed curve with all of its points in one plane and the same distance from a fixed point, the center	Functions
constant	a value that does not change	Functions
constant rate (per unit interval)	object, number, percentage, graph, etc. that goes either up or down or sideways by the same number	Functions
coordinate	one or more numbers that uniquely determine the position of a point or other geometric element on a line, graph, or map	Functions
coordinate plane	the plane determined by a horizontal number line, called the x-axis, and a vertical number line, called the y-axis, intersecting at a point called the origin; each point in the coordinate plane can be specified by an ordered pair of numbers	Functions
cosine	the cosine of an acute angle A in a right triangle equals length of leg adjacent to angle A divided by length of hypotenuse	Functions
cube root function	a function f is called a cube root function if $f(x)$ = cube root of x; the cube root function is an odd function; the implied domain of f consists of the entire real numbers	Functions
decreasing	to grow or cause to grow gradually less or smaller	Functions
decreasing function	a function with a graph that moves downward as it is followed from left to right; example: any line with a negative slope is decreasing	Functions
difference	the result of subtracting two numbers; example: $20 - 5 = 15$	Functions
Domain	the set of all inputs a function accepts	Functions

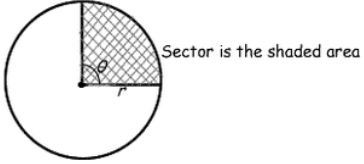
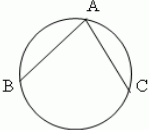
end behavior	the appearance of a graph as it is followed farther and farther in either direction; for polynomials, the end behavior is indicated by drawing the positions of the arms of the graph, which may be pointed up or down; other graphs may also have end behavior indicated in terms of the arms, or in terms of asymptotes or limits; polynomial end behavior; 1) if the degree n of a polynomial is even, then the arms of the graph are either both up or both down; 2) If the degree n is odd, then one arm of the graph is up and one is down; 3) If the leading coefficient a_n is positive, the right arm of the graph is up; 4) If the leading coefficient a_n is negative, the right arm of the graph is down	Functions
equation	a mathematical statement that says that two expressions have the same value; any number sentence with an $=$; example: $4+2=3+3$	Functions
equivalent	the same in amount, value or importance; example: $\frac{2}{3}$ is equivalent to $\frac{4}{6}$; $2+3$ is equivalent to 5	Functions
estimate	to find a number or quantity close to an exact amount	Functions
evaluate	to substitute number values into an expression.	Functions
even	a natural number divisible only by two; example: 2,4,6,8	Functions
explicit expression	a mathematical function containing only independent variables	Functions
exponential function	the function e^x where e is the number (approximately 2.71.8281828) such that the function e^x equals its own derivative; it is used to model phenomena when a constant change in the independent variable gives the same proportional change (increase or decrease) in the dependent variable	Functions
exponents	numbers that indicate the operation of repeated multiplication	Functions
expressions	finite combinations of symbols that are well-formed according to the rules applicable in the context at end	Functions
extreme values	the largest value of a function is known as the maximum value of the function; the smallest value of a function is known as minimum value of a function; together they are known as the extreme values	Functions
factor(verb)	the decomposition of an object into a product of other objects, or factors, which when multiplied together give the original; also known as factoring	Functions
formula	an equation that states a rule or a fact	Functions
frequency	the number of times a particular item appears in a data set	Functions
function	a correspondence between two sets, the domain and range, that assigns to each member of the domain exactly one member of the range.	Functions
function notation	a notation used in defining a function; example: $f(x) = 2x + 20$	Functions

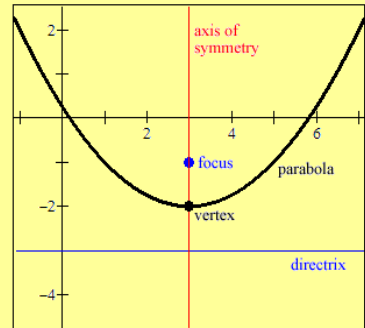
geometric sequence	a sequence $\{a_k\}$, $k=1, 2, \dots$, such that each term is given by a multiple r of the previous one	Functions
graph(noun)	a type of drawing used to represent data	Functions
increasing	becoming greater in size, amount, intensity, or degree	Functions
increasing function	a function with a graph that goes up as it is followed from left to right; example: any line with a positive slope is increasing	Functions
input	the number that is substituted for the variable in a function or rule machine	Functions
input-output pairs	a unique domain and range value for a given function	Functions
integer	the set of numbers containing zero, the natural numbers, and all the negatives of the natural numbers	Functions
intercept	the x-intercept of a line or curve is the point where it crosses the x-axis, and the y- intercept of a line or curve is the point where it crosses the y-axis	Functions
inverse function	any pair of functions f and g such that $f[g(x)]=g[f(x)]=x$ for all values of x in the domains of f and g	Functions
inverse relationship	opposite; -5 is the additive inverse of 5, because their sum is zero; $1/3$ is the multiplicative inverse of 3, because their product is 1	Functions
invertible function	a function that has an inverse; see inverse function	Functions
length	a measurement of a distance or dimension; usually the longest dimension	Functions
linear function	a function defined by $f(x) = mx + b$	Functions
logarithmic function	an inverse of an exponential function	Functions
logarithm	the power to which a given base must be raised to equal a given number	Functions
maxima	plural of maximum; the highest value of a given set of data	Functions
midline	in the graph of a trigonometric function, the horizontal line halfway between its maximum and minimum values	Functions
minima	plural of minimum; the lowest/least value of a given set of data	Functions
negative numbers	a real number that is less than zero	Functions
non-invertible function	a function that does not have an inverse	Functions
odd	a whole number that is not divisible by 2; example: 1, 3, 5, 7	Functions

percent	a fraction, or ratio, in which the denominator is assumed to be 100; the symbol % is used for percent	Functions																
percent rate of change	a rate of change expressed as a percent; example: if a population grows from 50 to 55, it grows by $5/50 = 10\%$ per year	Functions																
period	the length of a repeated pattern in a graph that repeats the same pattern	Functions																
periodic phenomena	instances where a pattern is repeated	Functions																
periodicity	repeating the same pattern over and over	Functions																
periodicity of trigonometric functions	the length of a repeated pattern within a trigonometric function	Functions																
piecewise-defined functions	a function which is defined symbolically using two or more formulas	Functions																
polynomial functions	a function consisting of monomial or a sum or difference of monomials	Functions																
positive numbers	a real number greater than zero	Functions																
properties of exponents	<table><tr><td>Zero Exponent Property</td><td>$a^0 = 1, (a \neq 0)$</td></tr><tr><td>Negative Exponent Property</td><td>$a^{-b} = \frac{1}{a^b}, a \neq 0$</td></tr><tr><td>Product of Powers Property</td><td>$a^b \cdot a^c = a^{(b+c)}, a \neq 0$</td></tr><tr><td>Quotient of Powers Property</td><td>$\frac{a^b}{a^c} = a^{b-c}, a \neq 0$</td></tr><tr><td>Power of a Product Property</td><td>$a^c \cdot b^c = (ab)^c, a, b \neq 0$</td></tr><tr><td>Power of a Quotient Property</td><td>$\frac{a^c}{b^c} = \left(\frac{a}{b}\right)^c, a, b \neq 0$</td></tr><tr><td>Power of a Power Property</td><td>$(a^b)^c = a^{bc}$</td></tr><tr><td>Rational Exponent Property</td><td>$a^{1/b} = \sqrt[b]{a}, b \neq 0$ $a^{\frac{c}{b}} = \sqrt[b]{a^c} = \left(\sqrt[b]{a}\right)^c$</td></tr></table>	Zero Exponent Property	$a^0 = 1, (a \neq 0)$	Negative Exponent Property	$a^{-b} = \frac{1}{a^b}, a \neq 0$	Product of Powers Property	$a^b \cdot a^c = a^{(b+c)}, a \neq 0$	Quotient of Powers Property	$\frac{a^b}{a^c} = a^{b-c}, a \neq 0$	Power of a Product Property	$a^c \cdot b^c = (ab)^c, a, b \neq 0$	Power of a Quotient Property	$\frac{a^c}{b^c} = \left(\frac{a}{b}\right)^c, a, b \neq 0$	Power of a Power Property	$(a^b)^c = a^{bc}$	Rational Exponent Property	$a^{1/b} = \sqrt[b]{a}, b \neq 0$ $a^{\frac{c}{b}} = \sqrt[b]{a^c} = \left(\sqrt[b]{a}\right)^c$	Functions
Zero Exponent Property	$a^0 = 1, (a \neq 0)$																	
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proportion	an equation of fractions in the form: $a/b = c/d$	Functions																
Pythagorean identity	$\sin^2 \theta + \cos^2 \theta = 1$	Functions																

quadrant	one of the quarters of the plane of the Cartesian coordinate system	Functions
quadratic function	a function defined by $f(x) = ax^2 + bx + c$ where a does not equal 0	Functions
quantities	a property which exists as magnitude or multitude; a specified or indefinite number or amount; a considerable amount or number	Functions
radian measure of an angle	the length of the arc on the unit circle subtended by the angle	Functions
Range (or a function)	the output values of a function	Functions
rate of change	the speed at which a variable changes over a specific period of time; also the same as the slope of a function	Functions
rational functions	any function which can be written as the ratio of two polynomial functions	Functions
real numbers	the combined set of rational numbers and irrational numbers	Functions
recursive process	one in which objectives are defined in terms of other objects of the same type; using some sort of recurrence relation, the entire class of objects can then be built up from a few initial values and a small number of rules; example: Fibonacci Numbers	Functions
recursively defined function	in terms of the same function of a smaller variable; in this way, a recursive function "builds" on itself; it has two parts: (1) Definition of the smallest argument (usually $f(0)$ or $f(1)$). (2) Definition of $f(n)$, given $f(n-1)$, $f(n-2)$, etc.	Functions
relative maximum	the highest point in a particular section of a graph	Functions
relative minimum	the lowest point in a particular section of a graph	Functions
sequence	an ordered list of objects or events	Functions
simple function	real-valued function over a subset of the real line which attains only a finite number of values; a finite linear combination of indicator functions of measurable sets	Functions
sine	let θ be an angle measure counterclockwise from the x-axis along an arc of the unit circle; then $\sin \theta$ is the vertical coordinate of the arc endpoint; the sine of an angle θ in a right triangle is as the ratio of the lengths of the side of the triangle opposite the angle and the hypotenuse: $\sin \theta = \text{opposite} / \text{hypotenuse}$	Functions
solution	the value of a variable that makes an equation true	Functions
special triangles	a right triangle with some regular feature that makes calculations on the triangle easier; example: 45-45-90 or 3-4-5. Knowing the ratios of the angles or sides of these special right triangles allows one to quickly calculate various lengths in geometric problems without resorting to more advanced methods	Functions

step functions	a function that can be written as a finite linear combination of indicator functions of intervals; a piecewise constant function having only finitely many pieces; also called a staircase function.	Functions
subtraction formulas for sine	$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \sin \beta \cos \alpha$ $\sin(\alpha - \beta) = \sin \alpha \cos \beta - \sin \beta \cos \alpha$	Functions
subtraction formulas for cosine	$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$ $\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$	Functions
subtraction formulas for tangent	$\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$ $\tan(\alpha - \beta) = \frac{\tan \alpha - \tan \beta}{1 + \tan \alpha \tan \beta}$	Functions
symmetry	exact correspondence of form and constituent configuration on opposite sides of a dividing line or plane or about a center or an axis	Functions
symmetry of the graph	a graph in which symmetry is present	Functions
symmetry (odd and even)	odd - a function that satisfies the relation $f(x) = f(-x)$; even - a function that satisfies the relation $f(x) = f(-x)$	Functions
tangent (tangent line)	a line that intersects a circle at exactly one point	Functions
term	a single number or a variable, or numbers and variables multiplied together; a term is typically separated by an addition or subtraction sign	Functions
trigonometric functions	the functions used to relate the sides of a right triangle to the angle measures	Functions
unit circle	a circle with radius of one	Functions
unit intervals	integer intervals used for data analysis	Functions
acute angle	an angle with measure of less than 90 degrees	Geometry
alternate interior angles	when two lines are crossed by another line (which is called a transversal), the pairs of angles on opposite sides of the transversal but inside the two lines are called alternate interior angles	Geometry
angle	the union of two rays with a common endpoint, called the vertex	Geometry
angle sum of triangles	the sum of the interior angles of any triangle is 180 degrees; $m\angle A + m\angle B + m\angle C = 180$ degrees; can be proven using the Parallel Postulate	Geometry
angle-side-angle Congruence	if two pairs of angles of two triangles are equal in measurement, and the included sides are equal in length, then the triangles are congruent	Geometry

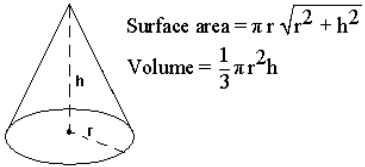
arc length	the measure of the distance along the curved line making up the arc; longer than the straight line distance between its endpoints (which would be a chord)	Geometry
area	the number of square units that covers a shape or figure; example: you would need to know the area of a room to buy carpet	Geometry
area of a circle	$A = \pi r^2$	Geometry
area of a sector	<u>Formula</u> $\frac{\theta}{2} r^2 \text{ (in radians)}$ $\frac{\theta}{360} \pi r^2 \text{ (in degrees)}$ 	Geometry
base angles	the angles formed by the base and one leg in an isosceles triangle; the base angles are always equal	Geometry
bisect	divide into two equal parts	Geometry
center	the middle	Geometry
central angle	an angle that has its vertex at the center of a circle	Geometry
chord	a line segment that connects two points on a curve	Geometry
circle	a closed curve with all of its points in one plane and the same distance from a fixed point, the center	Geometry
circumference of a circle	distance around a circle; its perimeter	Geometry
circumscribed angle	 an angle, formed by two tangents, drawn from one common po	Geometry
complementary angles	two angles whose sum is 90 degrees	Geometry
Complete the Square	a method of transferring a quadratic equation so it is in the form "perfect square = k" where k is greater than or equal to 0	Geometry
cone	3-D figure with a circular base and a vertex; example: wizard hat	Geometry

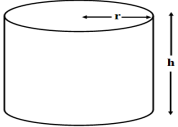
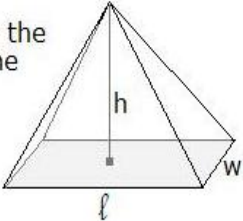
congruent/ congruence	two plane or solid figures are congruent if one can be obtained from the other by rigid motion (a sequence of rotations, reflections, and translations); having the same size and shape	Geometry
constant	a value that does not change	Geometry
converse	the interchanging of the "if" and "then" parts of a conditional statement	Geometry
coordinate	one or more numbers that uniquely determine the position of a point or other geometric element on a line, graph, or map	Geometry
coordinate plane	the plane determined by a horizontal number line, called the x-axis, and a vertical number line, called the y-axis, intersecting at a point called the origin; each point in the coordinate plane can be specified by an ordered pair of numbers	Geometry
corresponding angles	when two lines are crossed by a transversal, the angles in matching corners are called corresponding angles	Geometry
cosine	the cosine of an acute angle A in a right triangle equals length of leg adjacent to angle A divided by length of hypotenuse	Geometry
cross-section	the intersection of a 3-dimensional body with a plane	Geometry
cylinder	a 3-D figure having two parallel bases that are congruent circles; example: tube	Geometry
density	the quantity of something per unit measure, especially per unit length, area, or volume	Geometry
derive	a logical or mathematical process indicating through a series of statements that a result such as a theorem or a formula necessarily follows from the initial assumptions	Geometry
diagonal	the line segment connecting two nonadjacent vertices in a polygon	Geometry
diameter	the line segment joining two points on a circle and passing through the center of the circle	Geometry
difference	the result of subtracting two numbers; example: $20 - 5 = 15$	Geometry
dilations	transformations that move each point along the ray through the point emanating from a fixed center, and multiplies distances from the center by a common scale factor	Geometry
directrix	a straight line used in generating a curve such as a parabola; a line perpendicular to the axis of symmetry used in the definition of a parabola; example: A parabola is defined as follows: for a given point, called the focus, and a given line not through the focus, called the directrix, a parabola is the locus of points such that the distance to the focus equals the distance to the directrix 	Geometry

distance	a numerical description of how far apart objects are.	Geometry
distance formula	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ given the two points (x_1, y_1) and (x_2, y_2), the distance between these points is given by the formula	Geometry
ellipses	The set of all points in a plane such that the sum of the distances to two fixed points is a constant.	Geometry
endpoint	the starting point of a ray	Geometry
equation	a mathematical statement that says that two expressions have the same value; any number sentence with an =; example: $4+2=3+3$	Geometry
equation of a circle	$(x-h)^2 + (y-k)^2 = r^2$	Geometry
equidistant	equally distant; example: any two points on a circle are equidistant from the center	Geometry
equilateral triangle	a triangle with all sides the same length	Geometry
focus/foci (plural)	two points inside an ellipse or parabola that are used in it's formal definition; example: if you take any point on the ellipse, the sum of the distances to the focus points (foci) is constant	Geometry
formula	an equation that states a rule or a fact	Geometry
function	a correspondence between two sets, the domain and range, that assigns to each member of the domain exactly one member of the range.	Geometry
geometric construction	draw shapes, angles, or lines accurately; these constructions use only a compass, straightedge, and pencil; there are no numbers involved.	Geometry
geometric figure	any point, line, segment, ray, angle, polygon, curve, region, plane, surface, solid, etc.; formally a geometric figure is any set of points on a plane or in space	Geometry
horizontal stretch	a transformation which is characterized by the scale factor	Geometry
hyperbolas	a smooth curve that lies in a plane, which can be defined by either its geometric properties or by the kinds of equations for which it is the solution set; a hyperbola has two foci and two vertices; it is centered on a point (h, k) which is the "center" of the hyperbola	Geometry
input	the number that is substituted for the variable in a function or rule machine	Geometry
output	the number that is the result of a function or rule machine	Geometry
inscribed angle	an angle placed inside a circle with its vertex on the circle and whose sides contain chords of the circle	Geometry
intercept	the x-intercept of a line or curve is the point where it crosses the x-axis, and the y- intercept of a line or curve is the point where it crosses the y-axis	Geometry

interior angle	an angle whose sides are determined by two consecutive sides of a polygon.	Geometry
isosceles triangle	a triangle with at least two equal sides	Geometry
law of cosines	a statement about a general triangle that relates the lengths of the sides to the cosine of one of its angles: $c^2 = a^2 + b^2 - 2ab \cos \alpha$	Geometry
law of sines	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ an equation relating the lengths of the sides of an arbitrary triangle to the sines of its angles a, b, and c are the lengths of the sides of a triangle, and A, B, and C are the opposite angles	Geometry
length	a measurement of a distance or dimension; usually the longest dimension	Geometry
line	an infinite set of points forming a straight path extending in two directions; example: lines can be short, long, straight, or curved	Geometry
line segment	two points on a line, and all the points between those two points	Geometry
median	the middle value in a set of data when the data is ordered from the greatest to least; example: The median of 13,7,6,4,2,2,1 is 4	Geometry
non-right triangle	a triangle without a 90 degree angle	Geometry
origin	the point (0, 0) on a coordinate plane, where the x-axis and the y-axis intersect	Geometry
parabola	a conic section that is the intersection of a right circular conical surface and a plane parallel to a generating straight line of that surface	Geometry
parallel	two lines are parallel if they are in the same plane and never intersect	Geometry
parallelogram	a quadrilateral with opposite sides parallel	Geometry
perimeter	the distance around the outside of an object; the sum of the lengths of the sides of a polygon; example: you would need to know the perimeter of a yard to buy a fence	Geometry
perpendicular	two lines are perpendicular if the angle between them is 90 degrees	Geometry
perpendicular bisector	a line or segment that passes through the midpoint and forms a right angle with another segment	Geometry
perpendicular line	a line that forms a right angle with another line or segment	Geometry
point	a location in a plane or in space, having no dimensions	Geometry
polygons	a closed plane figure made up of several line segments that are joined together	Geometry
proportion	an equation of fractions in the form: $a/b = c/d$	Geometry
proportionality	the relationship of two variables with a ratio that is constant	Geometry
pyramid	a three-dimensional figure that has a polygon for its base and whose faces are triangles having a common vertex; example: Egyptian monument	Geometry

quadrilateral	a polygon with 4 sides	Geometry
radius	a line segment drawn from the center of a circle to any point on a circle; half the diameter	Geometry
ratio	a pair of numbers that compares different types of units	Geometry
rectangle	a polygon with 4 right angles	Geometry
reflection	a transformation resulting from a flip	Geometry
regular hexagon	a 6-sided polygon in which all 6 angles are equal and all 6 sides are equal	Geometry
regular polygon	a polygon in which all the angles are equal and all of the sides are equal	Geometry
right angle	an angle that measures 90 degrees	Geometry
right triangle	a triangle in which one angle is a right angle; the relation between the sides and angles of a right triangle is the basis for trigonometry	Geometry
rigid motions	a transformation of points in space consisting of a sequence of one or more translations, reflections, and/or rotations.	Geometry
rotation	a transformation in which a figure is rotated through a given angle, about a point.	Geometry
scale factor	a number which multiplies some quantity; the ratio of any two corresponding lengths in two similar geometric figures	Geometry
sequence	an ordered list of objects or events	Geometry
side-angle-side Congruence	if two pairs of sides of two triangles are equal in length, and the included angles are equal in measurement, then the triangles are congruent	Geometry
side-side-side Congruence	if three pairs of sides of two triangles are equal in length, then the triangles are congruent	Geometry
similar triangles	figures that have the same shape but not necessarily the same size; Corresponding sides of similar figures are proportional in length	Geometry
similarity	two polygons are similar if their corresponding sides are proportional	Geometry
similarity transformations	a rigid motion followed by a dilation	Geometry
sine	let θ be an angle measure counterclockwise from the x-axis along an arc of the unit circle; then $\sin \theta$ is the vertical coordinate of the arc endpoint; the sine of an angle θ in a right triangle is as the ratio of the lengths of the side of the triangle opposite the angle and the hypotenuse: $\sin \theta = \text{opposite} / \text{hypotenuse}$	Geometry
slope	a constant rate of change	Geometry
solid figures	a three dimensional figure; example: rectangular prism, cube, etc.	Geometry

sphere	a three-dimensional figure with all points in space a fixed distance from a given point, called the center; example: baseball	Geometry
square	a quadrilateral with all four sides equal in length and all right angles	Geometry
sum	the answer to an addition problem; example: $3 + 2 = 5$	Geometry
tangent (tangent line)	a line that intersects a circle at exactly one point	Geometry
theorem	a statement that has been proven on the basis of previously established statements	Geometry
transformation	a change in the position, shape, or size of a geometric figure	Geometry
translation	a transformation, or change in position, resulting from a slide with no turn	Geometry
transversal	a line that intersects two other lines	Geometry
trapezoid	a quadrilateral with exactly one pair of parallel sides	Geometry
triangle	A polygon with three sides	Geometry
triangle congruence	triangles in which all pairs of corresponding parts (angle and sides) are congruent	Geometry
trigonometric ratio	the relationship between the ratio of sides in a right triangle and the angle measures	Geometry
two-dimensional	having the dimensions of length and width	Geometry
two-dimensional cross section	the intersection of a solid with a plane	Geometry
typographic grid system	a two-dimensional structure made up of a series of intersecting vertical and horizontal axes used to structure content	Geometry
vertex	the point on an angle where the two sides intersect	Geometry
vertical angles	a pair of opposite angles that is formed by intersecting lines	Geometry
volume	a measurement of space, or capacity	Geometry
volume of a cone	 Surface area = $\pi r \sqrt{r^2 + h^2}$ Volume = $\frac{1}{3} \pi r^2 h$	Geometry

	$V = \pi r^2 h$ 	
volume of a cylinder	a measure of space, or capacity of a cylinder	Geometry
	$A = \ell w$ or the area of the base  $V = \frac{1}{3}Ah$	
volume of a pyramid	a measure of space, or capacity of a pyramid: (volume formula)	Geometry
	$V = \frac{4}{3}\pi r^3$	
volume of a sphere	a measure of space, or capacity of a sphere: (volume formula)	Geometry
Addition Rule	$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$	Probability
box plot	a method of visually displaying a distribution of data values by using the median, quartiles, and extremes of the data set; a box shows the middle 50% of the data	Statistics and Probability
categorical data	data separable into categories that are mutually exclusive; example: age groups	Probability
causation	a cause-and-effect relationship; correlation does not equal causation	Probability
center	the middle	Probability
coefficient	a constant that multiplies a variable	Probability
combination	a selection in which order is not important	Probability
complements	in probability theory, the complement of any event A is the event [not A]; the event A and its complement [not A] are mutually exclusive and exhaustive	Statistics and Probability
compound event	an event whose probability of occurrence depends upon the probability of occurrence of two or more independent events; an event that consists of two or more events that are not mutually exclusive	Statistics and Probability
conditional probability	the probability of some event A, given the occurrence of some other event B; it is written as $P(A B)$ or "the probability of A under the condition B"	Statistics and Probability
constant	a value that does not change	Probability
correlation	a single number that describes the degree of relationship between two variables	Probability

correlation coefficient	a measure that determines the degree to which two variables' movements are associated	$\rho_{X,Y} = \frac{\text{cov}(X, Y)}{\sigma_X \sigma_Y}$	Statistics and Probability
data distribution	shape of a probability distribution; it most often arises in questions of finding an appropriate distribution to use to model the statistical properties of a population, given a sample from that population; the data distribution, or shape of a distribution, may be considered either descriptively, using terms such as "j-shaped", or numerically, using quantitative measures such as skewness and kurtosis		Statistics and Probability
data set	numeric information usually gathered for analysis		Probability
difference	the result of subtracting two numbers; example: $20 - 5 = 15$		Probability
dot plots / line plot	a method of visually displaying a distribution of data values where each data value is shown as a dot or mark above a number line; also known as a line plot		Statistics and Probability
estimate	to find a number or quantity close to an exact amount		Probability
evaluate	to substitute number values into an expression.		Probability
expected value	for a random variable, the weighted average of its possible values, with weights given by their respective probabilities		Statistics and Probability
experiments	a test carried out to answer a question or investigate a problem; the results/data are analyzed, a conclusion is drawn, sometimes a theory is formed, and the results are communicated		Statistics and Probability
fraction	a number used to name a part of a group or a whole		Probability
function	a correspondence between two sets, the domain and range, that assigns to each member of the domain exactly one member of the range.		Statistics and Probability
histogram	a bar graph in which the labels for the bars are numerical intervals so the bars touch each other		Statistics and Probability
independence probability	to say that two events are independent intuitively means that the occurrence of one event makes it neither more nor less probable that the other occurs; example: the event of getting a 6 the first time a die is rolled and the event of getting a 6 the second time are independent		Statistics and Probability
inference	the process of drawing conclusions from data that are subject to random variation, for example, observational errors or sampling variation; systems of procedures that can be used to draw conclusions from datasets arising from systems affected by random variation		Statistics and Probability
intercept	the x-intercept of a line or curve is the point where it crosses the x-axis, and the y- intercept of a line or curve is the point where it crosses the y-axis		Statistics and Probability

interquartile range	a measure of variation in a set of numerical data, the interquartile range is the distance between the first and third quartiles of the data set; example: for the data set {1, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the interquartile range is $15 - 6 = 9$	Statistics and Probability
joint frequencies	the presentation of two data distributions in the same table	Probability
linear association	having a strong resemblance or relation to a line; points that are clustered close to a line	Statistics and Probability
linear fit	any line used to model the pattern in a set of paired data	Probability
linear function	a function defined by $f(x) = mx + b$	Probability
margin of error	the amount of random sampling error in a survey's results	Probability
marginal frequency	the frequency attained through the summation of joint frequencies	Probability
mean	a measure of center in a set of numerical data, computed by adding the values in a list and then dividing by the number of values in the list; example: For the data set {1, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the mean is 21	Statistics and Probability
mean deviation	the average of the distance of a set of numbers from the mean of the set	Probability
median	The middle value in a set of data when the data is ordered from the greatest to least; example: The median of 13,7,6,4,2,2,1 is 4	Statistics and Probability
multiplication rule	$P(A \text{ and } B) = P(A)P(B A) = P(B)P(A B)$	Probability
normal distribution	pattern for the distribution of a set of data which follows a bell shaped curve	Probability
number line	a diagram that represents numbers in order as points on a line	Probability
observational studies	a study involving assigning subjects to a treated or control group in which the affects of a single variable are studied	Statistics and Probability
outcome	in probability, a possible result of an experiment	Probability
outliers	extreme data points	Probability
payoff value	in game theory the value expected from a given set of moves	Probability
percent	a fraction, or ratio, in which the denominator is assumed to be 100; the symbol % is used for percent	Statistics and Probability
permutation	a way to arrange things in which order is important	Probability
plots	to mark something, such as a graph or route on a map, using coordinates	Probability
population	the set of individuals, items, or data from which a statistical sample is taken	Probability
population mean	$\mu = \frac{1}{N} \sum_{i=1}^N x_i$	Statistics and Probability
population parameter	a numerical summary of a population; because populations have so many members, these can never be known except if a census is taken	Statistics and Probability

probability	a number between 0 and 1 used to quantify likelihood for processes that have uncertain outcomes; example: tossing a coin, selecting a person at random from a group of people, tossing a ball at a target, or testing for a medical condition	Statistics and Probability
probability distribution	the set of possible values of a random variable with a probability assigned to each	Statistics and Probability
probability model	used to assign probabilities to outcomes of a chance process by examining the nature of the process; the set of all outcomes is called the sample space, and their probabilities sum to 1; see also: uniform probability model	Statistics and Probability
proportion	an equation of fractions in the form: $a/b = c/d$	Probability
quantities	a property which exists as magnitude or multitude; a specified or indefinite number or amount; a considerable amount or number	Statistics and Probability
random sample	a sample in which every element in the population has an equal chance of being selected	Statistics and Probability
random variable	an assignment of a numerical value to each outcome in a sample space	Probability
randomization	to make random in arrangement in order to control variables in an experiment	Probability
randomized experiment	an activity whose outcome can't be predicted when the activity is repeated under essentially the same conditions	Statistics and Probability
rate of change	the speed at which a variable changes over a specific period of time; also the same as the slope of a function	Statistics and Probability
real number line	an infinitely long number line consisting of the real numbers	Probability
relative frequency	the proportion of all given values in an interview; the frequency of the event/value divided by the number of data points; example: If you picked 12 marbles out of a bag, and 9 of them were green, the frequency of the green marbles would be 9, but the relative frequency would be that number (the frequency) divided by the total number of marbles; so the relative frequency would be $9/12$ or $3/4$.	Statistics and Probability
residual	the error in a result; example: we want to find x such that $f(x) = b$; given an approximation x_{approx} of x , the residual is $b - f(x_{\text{approx}})$ whereas the error is $x_{\text{approx}} - x$	Statistics and Probability
sample space	the set of all possible outcomes in an experiment	Probability
sample survey	the process of selecting a sample of elements from a target population in order to conduct a survey	Statistics and Probability
scatter plot	a graph in the coordinate plane representing a set of bivariate data; example: the heights and weights of a group of people could be displaced on a scatter plot	Statistics and Probability
simulation	a way of acting out a problem by creating a situation like one in the real world	Probability

simulation model	a mathematical model that calculates the impact of uncertain inputs and decisions we make on outcomes, such as profit and loss, investment returns, environmental consequences, etc.; computers are mostly used to carry out simulation models now	Statistics and Probability
slope	a constant rate of change	Probability
spread	a difference, as between two figures or totals	Probability
standard deviation	a measure of how spread out numbers are; the formula is the square root of the variance	Statistics and Probability
term	a single number or a variable, or numbers and variables multiplied together; a term is typically separated by an addition or subtraction sign	Statistics and Probability
theoretical probability	the probability/likelihood of an event happening based upon mathematical calculations: $P(\text{event}) = \text{Number of favorable outcomes} / \text{total number of possible outcomes}$	Statistics and Probability
two-way frequency table	a table used to show frequencies for two different variables within the same population	Statistics and Probability
uniform probability model	a probability model which assigns equal probability to all outcomes; see also: probability model	Statistics and Probability
unions	a set, every member of which is an element of one or another of two or more given sets	Statistics and Probability
variable	a letter used to represent a number value in an expression or an equation; example: "x" in $x+2=4$	Statistics and Probability