

Alaska Mathematics Standards

Vocabulary Word List

Grade 8



Expressions and Equations

axis (plural – axes)	A reference line from which distances or angles are measured in a coordinate grid.
coefficient	A numerical factor in a term of an algebraic expression.
constant	A fixed value which contains not variables (e.g., -5 is the constant term in $2x^2 + 4x - 5$).
coordinate plane	A 2-dimensional system in which the coordinates of a point are its distances from two intersecting, usually perpendicular, straight lines called axes. (Also called coordinate <i>grid</i> or coordinate <i>system</i> .)
coordinate system	Also known as a coordinate grid. A 2-dimensional system in which the coordinates of a point are its distances from two intersecting, usually perpendicular, straight lines called axes.
coordinates	An ordered pair of numbers that identify a point on a coordinate plane.
cube root	A number that must be multiplied by itself three times to equal a given number. (e.g., the cube root of 27 is 3 because $3 \cdot 3 \cdot 3 = 27$)
diagram	A drawing that represents a mathematical situation.
Distributive Property	$a \cdot (b + c) = (a \cdot b) + (a \cdot c)$ and $a \cdot (b - c) = (a \cdot b) - (a \cdot c)$, where a , b , and c stand for any real numbers.
equation	A statement that two mathematical expressions are equal.
equivalent	Naming the same number.
exponents	A short-hand method of expressing repeated multiplication (e.g., $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^5$ where the base is 2 or the number multiplied by itself, and 5 is the exponent which tells how many times the base was multiplied).
expression	A variable or combination of variables, numbers, and symbols that represents a mathematical relationship.
factor	An integer that divides evenly into another.
formula	An expression used to calculate a desired result, such as a formula to find area. Formulas can also be equations involving numbers and/or variables (e.g., the formula for calculating density is $D=M/V$ where M = mass and V = volume)
graph	A pictorial device used to show a numerical relationship.
inequality	A mathematical sentence that compares two unequal expressions using one of the symbols $<$, $>$, \leq , \geq , or \neq .
Integer exponent	An exponent is a number that tells how many times a factor is repeated in a product. For positive exponents $3 \cdot 3 \cdot 3 = 3^3 = 27$. For negative exponents the rule is $a^{-n} = 1/a^n$. For example, $3^{-4} = 1/3^4 = 1/3 \cdot 3 \cdot 3 \cdot 3 = 1/81$

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integers	The set of whole numbers and their opposites.
irrational numbers	A real number that cannot be written as a simple fraction (e.g., rational: $1.5=3/2$, $7=7/1$, $.333=1/3$. Irrational: $\pi=3.141592\dots$, $\sqrt{3}=1.732050\dots$ they are not repeating decimals and don't create simple fractions.
like terms	Terms whose variables (and their exponents) are the same.
line of best fit	A line on a graph showing the general directions that a group of points seem to be heading.
linear equations	An equation for a line.
markdowns	The amount by which a price is reduced.
markups	An amount added to the cost price to determine the selling price; broadly: profit.
multiplicative inverse	Another name for reciprocal. When you multiply a number by its multiplicative inverse you get 1 (e.g., $3/2 \times 2/3 = 1$)
non-zero divisor	A quantity, not including zero, by which another quantity, the dividend, is to be divided.
ordered pair	A pair of numbers that gives the coordinates of a point on a grid in this order (horizontal coordinate, vertical coordinate). (also known as a coordinate pair)
origin	The intersection of the x - and y - axes in a coordinate plane, described by the ordered pair (0, 0).
percent	A special ratio that compares a number to 100 using the symbol %.
percent decrease	Percent decrease is a measure of percent change, which is the extent to which a variable loses value. It is found by comparing the initial (or before) and final (or after) quantities according to a specific formula. It is assumed that both the initial and the final quantities are positive (larger than 0).
percent error	Percent error is the difference between a predicted value and the actual value. Percent errors tell you how close or how far you came to the actual answer.
percent increase	Percent increase is a measure of percent change, which is the extent to which a variable gains value. It is found by comparing the initial (or before) and final (or after) quantities according to a specific formula. It is assumed that both the initial and the final quantities are positive (larger than 0).
polynomials	An expression consisting of variables and coefficients (terms), that involves only the operations of addition, subtraction, multiplication and non-negative integer exponents.
proportion	An equation showing that two ratios are equivalent.

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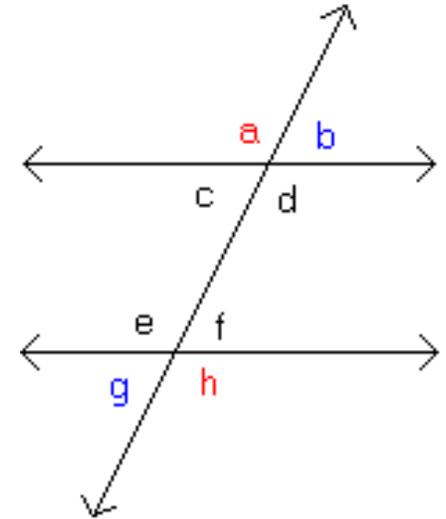
proportional relationship	A relationship between two variable quantities x and y , where y is a constant multiple (k) of x . This can be expressed in the simple equation, $y = kx$.
quadrants	The four sections of a coordinate grid that are separated by the axes.
quotient	The result of the division of one quantity by another.
radical	An expression that has a square root, cube root, etc. The expression is symbolized by $\sqrt{\quad}$
rate	A ratio comparing two different units.
rate of change	A rate that describes how one quantity changes in relation to another quantity.
ratio	A comparison of two numbers using division.
rational coefficient	A rational number which multiplies a variable.
rational number	A number that can be expressed as a ratio of two integers.
repeating decimal	A decimal which has repeating digits or a repeating pattern of digits.
scientific notation	Notation to write very large or small numbers. (e.g., $10,000,000,000 = 10^{10}$)
simple interest	A quick method for calculating the interest charge on a loan.
simultaneous linear	A set of equations in two or more variables for which there are values that can satisfy all equations simultaneously.
slope	How steep a straight line is. Rise/Run
slope intercept form	A way to express the equation of a line: $y = mx + b$ where m = slope, b = y -intercept
solution set	A set of values that satisfy a given set of equations or inequalities.
square root	A number, when multiplied by itself, gives you the original number $\sqrt{25} = 5$ because $5 \times 5 = 25$
substitution	The replacement of the letters in an algebraic expression with known values.
tax	A fee charged by a government on a product, income, or activity.
terminating decimal	A decimal which has a finite number of digits.

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Geometry

acute triangle	A triangle with no angle measuring 90° or more.	
altitude	The distance of the shortest line segment from the top of the figure and the base (the height of the figure).	
angles	When parallel lines are cut by a transversal:	
	Adjacent angles	Two angles in a plane that have a common vertex and a common side (e.g., angles a and b).
	Alternate exterior angles	Two exterior angles which lie on different parallel lines and on the opposite side of a transversal (e.g., angles b and g).
	Alternate interior angles	Two interior angles which lie on different parallel lines and on the opposite side of a transversal (e.g., angles d and e).
	Vertical angles	Two angles that are opposite one another at the intersection of two lines (e.g., angles b and c).
area	Area: The measure, in square units, of the interior region of a two-dimensional figure.	
	Circle: $A = \pi r^2$, where r = radius of the circle.	
	Regular quadrilateral: $A = b \cdot h$, where b = the base and h = the vertical height.	
	Triangle: $A = \frac{1}{2} b \cdot h$, where b = the base and h = the vertical height.	
	Cube: $A = s^2$, where s = side length	
circumference	The distance around a circle, which equals a little more than three times its diameter	
complementary angles	Two angles are complementary if they add up to 90° (right angle). They don't have to be next to each other.	
congruent	Two or more objects that have the same size and shape. It is denoted by \cong	

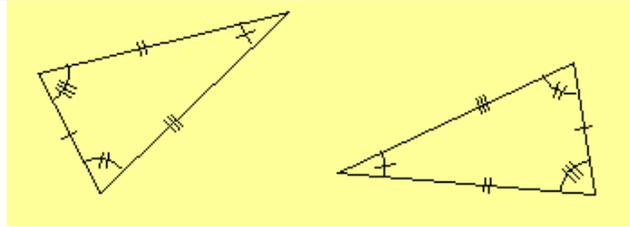


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Geometry

corresponding angles	Angles of the same measure in similar figures.	
corresponding parts	Sides or segments of the same measure in similar figures.	
cube	A three-dimensional shape with six square faces.	
dilation	A transformation in which a figure grows larger by a common factor.	
equilateral triangle	A triangle with all sides the same length.	
geometric figure	Any combination of points, lines, planes, or curves in two or three dimensions.	
isosceles triangle	A triangle that has exactly 2 congruent sides.	
obtuse triangle	A triangle that contains one angle with a measure greater than 90° (obtuse angle) and two acute angles.	
plane sections	The area created by a plane cutting through a solid.	
polygon	A closed plane figure formed from line segments that meet only at their endpoints.	
prism	A three-dimensional figure that has two congruent and parallel faces that are polygons. The remaining faces are parallelograms.	
protractor	A tool used to measure and draw angles.	
pyramid	A polyhedron whose base is a polygon and whose other faces are triangles that share a common vertex.	
Pythagorean Theorem	A statement about the sides of a right triangle. One of the angles of a right triangle is always equal to 90 degrees. This angle is the right angle. The two sides next to the right angle are called the legs and the other side is called the hypotenuse	
quadrilateral	A four-sided polygon.	
reflection	An image or shape as it would appear in a mirror.	
right prism	A prism where the lateral faces are at right angles to the base.	

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right rectangular prism	A prism with 6 rectangular faces where the lateral edge is perpendicular to the plane of the base.
right rectangular pyramid	A pyramid that has its apex aligned directly above the center of its rectangular base.
right triangle	A triangle that has one 90° angle.
rotation	A circular movement where the figure rotates around a fixed point.
scale	A drawing of an object or structure showing all parts in the same proportion of their true size.
scalene triangle	A triangle that has no congruent sides.
similar figures	Two shapes are similar when the only difference is size or orientation (flipped).
supplementary angles	If the sum of the measure of two angles is 180° , then the two angles are supplementary . If two angles form a straight line, then they are supplementary.
surface area	Surface area: The total area of the faces (including the bases) and curved surfaces of a solid figure.
	Cube: $SA = 6 \cdot (\text{length of side})^2$
	Right Prism: $SA = \text{lateral area} + \text{area of two ends}$
	Right circular cylinder: $SA = (2 \cdot \pi \cdot r^2) + (2 \cdot \pi \cdot r \cdot h)$, where h = the height, r = the radius
Surface area formula chart: http://www.basic-mathematics.com/surface-area-formula.html	
translation (transformation)	See "slide".
transversal	A line that crosses at least two other lines.
triangle	A polygon with three angles and three sides.
vertical angle	A pair of angles is said to be vertical if the angles share the same vertex and are bounded by the same pair of lines but are opposite to each other. Such angles are congruent and thus have equal measure.
volume	Volume: The number of cubic units it takes to fill a figure.
	Cone: $V = \frac{1}{3} \pi \cdot r^2 \cdot h$, where r = the radius, h = the height of the cone
	Cylinder: $V = (\pi \cdot r^2) \cdot h$, where r = the radius

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Statistics and Probability

bivariate measurement data	Data that involves two variables in which both are analyzed simultaneously. It deals with the cause or relationship between the two variables.
clustering	A set of points gathered at a particular point.
compound events	Two or more independent events considered together.
data	Information, especially numerical information. Usually organized for analysis.
degree of visual overlap	Describes the separation (or lack of separation) between two distributions.
dependent event	If the result of events is affected by the result of an independent event, the event is said to be dependent.
event	A set of outcomes to which a probability is assigned.
extrapolate	Use information gathered from statistical events to make guesses or predictions about a hypothetical situation.
frequency	The number of times an event occurs within a specific time period.
graph	A pictorial device used to show a numerical relationship.
independent event	Events for which the probability of any one event occurring is unaffected by the occurrence or non-occurrence of any of the other events.
inferences	The act or process of deriving logical conclusions from premises known or assumed to be true.
likely event	An event that is most likely to happen.
line of best fit	A line on a graph showing the general directions that a group of points seem to be heading.
mean absolute deviation	In statistics, the absolute deviation of an element of a data set is the absolute difference between that element and a given point.
measure of center	An average; a single value that is used to represent a collection of data. Three commonly used types of averages are mode, median, and mean. (also known as measure of central tendency or measure of average)
measure of variation	A measure of how much a collection of data is spread out. Commonly used types include range and quartiles. (Also known as spread or dispersion.)
negative association	A relationship between two variables such that the value of one variable increases when the value of the other variable decreases.
outlier	A value in a data set that "lies outside" of most other values in the set. (e.g., is much larger or smaller)

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Statistics and Probability

population	The entire collection of items that is the focus of concern. A population can be of any size and while the items need not be uniform, the items must share at least one measureable feature.
positive association	A relationship between two variables where the value of one variable increases as the other variable increases.
prediction	To state in advance on the basis of observation, experience, or scientific reason.
probability	The chance that a particular outcome will occur, measured as a ratio of the total possible outcomes.
random sample	A selection that is chosen randomly (purely by chance, with no predictability.)
relative frequency	The ratio of the actual number of favorable events to the total possible number of events; often taken as an estimate of probability.
sample space	The set of all possible outcomes of a random process.
scatter plot	A graph of plotted points that show the relationship between two sets of data.
simulation	Carrying out a simple experiment to collect data.
spread	A measure of how much a collection of data is spread out. Commonly used types include range and quartiles. (Also known as measures of variation or dispersion.)
statistical variability	A variability or spread in a variable or a probability distribution. Common examples of measures of statistical dispersion are the variance, standard deviation, and interquartile range.
statistics	The science of collecting, organizing, representing, and interpreting data.
tree diagrams	A diagram shaped like a tree used to display sample space by using one branch for each possible outcome.
unlikely event	An event that will probably not happen. An outcome with a probability between 0 and 0.5.

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Functions

domain (of a function)	The set of all possible input values (often the "x" variable) which produce a valid output from a particular function.
function	A relation from a set of inputs to a set of possible outputs where each input is related to exactly one output.
function notation	$f(x)$ "f of x" is a way to indicate that an equation is a function. For example, take the linear equation $y = 2x + 3$. It can be turned into a linear function $f(x) = 2x + 3$. These two mathematical statements mean the same thing.
initial input of a function	The value of the function with the input of zero. Used with the rate of change functions.
input	The input of a function is called the domain.
non-linear function	A function whose graph is not a straight line.
output	The output of a function is called the range.
range (of a function)	The set of all possible output values (usually the "y" variable or something expressed as $f(x)$), which result from using a particular function.
Illustrated Mathematics Dictionary – www.mathisfun.com/definitions.com	