

Course: 1200310 Algebra 1

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BASIC INFORMATION

Course Number:	1200310
Course Title:	Algebra 1
Course Abbreviated Title:	Algebra 1
Course Path:	Section: Grades PreK to 12 Education Courses» Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »
Number of Credits:	One credit (1)
Course Length:	Year
Course Type:	Core
Course Level:	2
Status:	State Board Approved

STANDARDS (40)

<u>LA.910.1.6.1:</u>	The student will use new vocabulary that is introduced and taught directly;
<u>LA.910.1.6.2:</u>	The student will listen to, read, and discuss familiar and conceptually challenging text;
<u>LA.910.1.6.5:</u>	The student will relate new vocabulary to familiar words;

<u>LA.910.3.1.3:</u>	The student will prewrite by using organizational strategies and tools (e.g., technology, spreadsheet, outline, chart, table, graph, Venn Diagram, web, story map, plot pyramid) to develop a personal organizational style.
<u>MA.912.A.1.8:</u>	Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.
<u>MA.912.A.10.1:</u>	Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
<u>MA.912.A.10.2:</u>	Decide whether a solution is reasonable in the context of the original situation.
<u>MA.912.A.10.3:</u>	Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
<u>MA.912.A.2.13:</u>	Solve real-world problems involving relations and functions.
<u>MA.912.A.2.3:</u>	Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.
<u>MA.912.A.2.4:</u>	Determine the domain and range of a relation.
<u>MA.912.A.3.1:</u>	Solve linear equations in one variable that include simplifying algebraic expressions.

<u>MA.912.A.3.10:</u>	Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
<u>MA.912.A.3.11:</u>	Write an equation of a line that models a data set, and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.
<u>MA.912.A.3.12:</u>	Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph.
<u>MA.912.A.3.13:</u>	Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
<u>MA.912.A.3.14:</u>	Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
<u>MA.912.A.3.15:</u>	Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
<u>MA.912.A.3.2:</u>	Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
<u>MA.912.A.3.3:</u>	Solve literal equations for a specified variable.

<u>MA.912.A.3.4:</u>	Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.
<u>MA.912.A.3.5:</u>	Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
<u>MA.912.A.3.7:</u>	Rewrite equations of a line into slope-intercept form and standard form.
<u>MA.912.A.3.8:</u>	Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form .
<u>MA.912.A.3.9:</u>	Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line.
<u>MA.912.A.4.1:</u>	Simplify monomials and monomial expressions using the laws of integral exponents.
<u>MA.912.A.4.2:</u>	Add, subtract, and multiply polynomials.
<u>MA.912.A.4.3:</u>	Factor polynomial expressions.
<u>MA.912.A.4.4:</u>	Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
<u>MA.912.A.5.1:</u>	Simplify algebraic ratios.
<u>MA.912.A.5.4:</u>	Solve algebraic proportions.

<u>MA.912.A.6.1:</u>	Simplify radical expressions
<u>MA.912.A.6.2:</u>	Add, subtract, multiply, and divide radical expressions (square roots and higher).
<u>MA.912.A.7.1:</u>	Graph quadratic equations with and without graphing technology.
<u>MA.912.A.7.10:</u>	Use graphing technology to find approximate solutions of quadratic equations.
<u>MA.912.A.7.2:</u>	Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
<u>MA.912.A.7.8:</u>	Use quadratic equations to solve real-world problems.
<u>MA.912.D.7.1:</u>	Perform set operations such as union and intersection, complement, and cross product.
<u>MA.912.D.7.2:</u>	Use Venn diagrams to explore relationships and patterns and to make arguments about relationships between sets.
<u>MA.912.G.1.4:</u>	Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.

RELATED GLOSSARY TERM DEFINITIONS (64)

Algebraic expression:	An expression that includes at least one variable. Algebraic expressions do not contain equality or inequality symbols (= or).
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Approximate:	A number or measurement that is close to or near its exact value.
Area:	The number of square units needed to cover a surface.
Chart:	A data display that presents information in columns and rows.
Constant:	Any value that does not change.
Coordinate plane:	A two-dimensional network of horizontal and vertical lines that are parallel and evenly-spaced; especially designed for locating points, displaying data, or drawing maps.
Coordinate:	Numbers that correspond to points on a coordinate plane in the form (x, y) , or a number that corresponds to a point on a number line.
Domain:	The set of values of the independent variable(s) for which a function or relation is defined.
e:	$e=2.7182818284\dots$, is an irrational number and the base of the natural logarithm. e is sometimes known as Napier's constant although the symbol e honors Euler.
Equal:	Having the same value ($=$).
Equation:	A mathematical sentence stating that the two expressions have the same value. Also read the definition of equality.
Estimate:	Is an educated guess for an unknown quantity or outcome based on known information. An estimate in computation may be found by rounding, by using front-end digits, by clustering, or by using compatible numbers to compute.
Expression:	A mathematical phrase that contains variables, functions, numbers, and/or operations. An expression does not contain equal or inequality signs.

Factor:	A number or expression that is multiplied by one or more other numbers or expressions to yield a product.
Formula:	A rule that shows the relationship between two or more quantities; involving numbers and/or variables.
Geometry:	The branch of mathematics that explores the position, size, and shape of figures.
Height:	A line segment extending from the vertex or apex of a figure to its base and forming a right angle with the base or plane that contains the base.
Integral:	Integer valued.
Intersection:	The intersection of two sets A and B is the set of elements common to A and B. For lines or curves, it is the point at which lines or curves meet; for planes, it is the line where planes meet.
Line:	A collection of an infinite number of points in a straight pathway with unlimited length and having no width.
Line graph:	A collection of an infinite number of points in a straight pathway with unlimited length and having no width.
Linear equation:	An algebraic equation in which the variable quantity or quantities are raised to the zero or first power.
Literal equations:	An equation that contains more than one variable; an implicit equation; often mathematical formula.
Mass:	The amount of matter of an object.
Model:	To represent a mathematical situation with manipulatives (objects), pictures, numbers or symbols.

Number line:	A line of infinite extent whose points correspond to the real numbers according to their distance in a positive or negative direction from a point arbitrarily taken as zero.
Operation:	Any mathematical process, such as addition, subtraction, multiplication, division, raising to a power, or finding the square root.
Origin:	The point of intersection of the x- and y-axes in a rectangular coordinate system, where the x-coordinate and y-coordinate are both zero. On a number line, the origin is the 0 point. In three dimensions, the origin is the point (0, 0, 0).
Parallel lines:	Two lines in the same plane that are a constant distance apart. Parallel lines have equal slopes.
Pattern:	A predictable or prescribed sequence of numbers, objects, etc. Patterns and relationships may be described or presented using multiple representations such as manipulatives, tables, graphics (pictures or drawings), or algebraic rules (functions).
Perpendicular:	Two lines, two line segments, or two planes are said to be perpendicular when they intersect at a right angle.
Plot:	To locate a point by means of coordinates, or a curve by plotted points, or to represent an equation by means of a curve so constructed.
Point:	A specific location in space that has no discernable length or width.
Product:	The result of multiplying numbers together.
Properties of Equality:	1) A balanced equation will remain balanced if you add, subtract, multiply or divide both sides by the same number. 2) A quantity equal to another quantity can be substituted for it. Reflexive property: $a=a$ Symmetric property: If $a=b$ then $b=a$. Transitive property: If $a=b$ and $b=c$ then $a=c$.

Proportion:	A mathematical sentence stating that two ratios are equal.
Rate:	A ratio that compares two quantities of different units.
Rate of change:	The ratio of change in one quantity to the corresponding change in another quantity.
Real number:	The set of all rational and irrational numbers.
Relation:	A relation from A to B is any subset of the cross product (Cartesian product) of A and B.
Root:	A root of a polynomial is a number x such that $P(x)=0$. A polynomial of degree n has n complex roots.
Set:	A set is a finite or infinite collection of distinct objects in which order has no significance.
Simplify:	The process of converting a fraction or mixed number, to an equivalent fraction, or mixed number, in which the greatest common factor of the numerator and the denominator of the fraction is one. Simplify also refers to using the rules of arithmetic and algebra to rewrite an expression as simply as possible.
Square:	A rectangle with four congruent sides; also, a rhombus with four right angles.
Synthetic division:	A shortcut method for dividing a polynomial by another polynomial of the first degree. It can be used in place of the standard long division algorithm. This method reduces the polynomials factor into a set of numeric values. After these values are processed, the resulting set of numeric outputs is used to construct the polynomial quotient and the polynomial remainder.
System of linear equations:	Two or more related linear equations that have a common solution (A system of linear equations can have no common solutions, one common solution, or many common solutions).

System of equations:	A group of two or more equations that are related to the same situation and share variables. The solution to a system of equations is an ordered number set that makes all of the equations true.
Table:	A data display that organizes information about a topic into categories using rows and columns.
Variable:	Any symbol, usually a letter, which could represent a number. A variable might vary as in $f(x)=2x+1$, or a variable might be fixed as in $2x+1=5$.
Circle:	A closed plane figure with all points of the figure the same distance from the center. The equation for a circle with center (h, k) and radius r is: $(x - h)^2 + (y - k)^2 = r^2$
Commutative property:	The order in which two numbers are added or multiplied does not change their sum or product, respectively (e.g., $2 + 3 = 3 + 2$, or $4 \times 7 = 7 \times 4$).
Exponent (exponential form):	The number of times the base occurs as a factor, for example 2^3 is the exponential form of $2 \times 2 \times 2$. The number two (2) is called the base, and the number three (3) is called the exponent.
Exponential Function:	A function of the form $y = ab^{cx+b} + e$, where a, b, c, d, e, x are real numbers, a, b, c are nonzero, $b \neq 1$, and $b > 0$.
Function:	A relation in which each value of x is paired with a unique value of y . More formally, a function from A to B is a relation f such that every $a \in A$ is uniquely associated with an object $F(a) \in B$.
Inequality:	A sentence that states one expression is greater than ($>$), greater than or equal to (\geq), less than ($<$), less than or equal to (\leq), another expression.

Monomial:	A polynomial with one term such as 5, -2xyz, or xy^4
Polynomial:	<p>The sum or difference of terms which have variables raised to positive integer powers and which have coefficients that may be real or complex. Examples: $5x^3 - 2x^2 + x - 13$, $x^2y^3 + xy$, and $(1 + i)a^2 + ib^2$. Standard form for a polynomial in one variable: $a_nx^n + a_{n-1}x^{n-1} + \dots + a_2x^2 + a_1x + a_0$</p> <p>Even though the prefix poly- means many, the word polynomial refers to polynomials with 1 term (monomials), 2 terms (binomials), 3 terms, (trinomials), etc.</p>
Quadratic Equation:	A second-order polynomial equation in a single variable x with $a \neq 0$: $ax^2 + bx + c = 0$. Because it is a second-order polynomial equation, the fundamental theorem of algebra guarantees that it has two solutions that may be both real or both complex.
Quadratic Formula:	<p>A formula for the roots of a quadratic equation. Given $ax^2 + bx + c = 0$, then</p> $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ <p>.</p>
Radical:	<p>The symbol $\sqrt[n]{x}$ used to indicate a root. The expression $\sqrt[n]{x}$ is therefore read "x radical n" or "the nth root of x." A radical without an index number is understood to be a square root.</p>
Slope:	<p>The ratio of change in the vertical axis (y-axis) to each unit change in the horizontal axis (x-axis) in the form rise/run or $\frac{y}{x}$. Also the constant, m, in the linear equation for the slope-intercept form $y = mx + b$, where</p> $m = \frac{y_1 - y_2}{x_1 - x_2}$

Width:	The shorter length of a two-dimensional figure. The width of a box is the horizontal distance from side to side (usually defined to be greater than the depth, the horizontal distance from front to back).
x-intercept:	The value of x at the point where a line or a curve intersects the x-axis. The value of y is zero at this point.
y-intercept:	the value of y at the point where a line or a curve intersects the y-axis. The value of x is zero at this point.



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