

## Algebra 1

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
9.2	Algebra		
9.2.1	Understand the concept of function, and identify important features of functions and other relations using symbolic and graphical methods where appropriate.		
9.2.1.1	Understand the definition of a function. Use functional notation and evaluate a function at a given point in its domain.	Functions and Linear Equations	Linear Equations
9.2.1.2	Distinguish between functions and other relations defined symbolically, graphically or in tabular form.	Functions and Linear Equations	Linear Equations
9.2.1.3	Find the domain of a function defined symbolically, graphically or in a real-world context.	Functions and Linear Equations	Linear Equations
9.2.1.4	Obtain information and draw conclusions from graphs of functions and other relations.	Functions and Linear Equations	Linear Equations
9.2.1.5	Identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods, when the function is expressed in the form $f(x) = ax^2 + bx + c$ , in the form $f(x) = a(x - h)^2 + k$ , or in factored form.	Quadratics and Radicals	Quadratic Functions
9.2.1.6	Identify intercepts, zeros, maxima, minima and intervals of increase and decrease from the graph of a function.	Quadratics and Radicals	Quadratic Functions
9.2.1.7	Understand the concept of an asymptote and identify asymptotes for exponential functions and reciprocals of linear functions, using symbolic and graphical methods.		
9.2.1.8	Make qualitative statements about the rate of change of a function, based on its graph or table of values.	Functions and Linear Equations	Patterns and Sequences

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9.2.1.9	Determine how translations affect the symbolic and graphical forms of a function. Know how to use graphing technology to examine translations.		
9.2.2	Recognize linear, quadratic, exponential and other common functions in real-world and mathematical situations; represent these functions with tables, verbal descriptions, symbols and graphs; solve problems involving these functions, and explain results in the original context.		
9.2.2.1	Represent and solve problems in various contexts using linear and quadratic functions.	Functions and Linear Equations	Linear Equations
9.2.2.2	Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth.	Exponentials	Exponential Functions
9.2.2.3	Sketch graphs of linear, quadratic and exponential functions, and translate between graphs, tables and symbolic representations. Know how to use graphing technology to graph these functions.	Covered throughout course	Covered throughout course
9.2.2.4	Express the terms in a geometric sequence recursively and by giving an explicit (closed form) formula, and express the partial sums of a geometric series recursively.	Exponentials	Geometric Sequences

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9.2.2.5	Recognize and solve problems that can be modeled using finite geometric sequences and series, such as home mortgage and other compound interest examples. Know how to use spreadsheets and calculators to explore geometric sequences and series in various contexts.		
9.2.2.6	Sketch the graphs of common non-linear functions such as $f(x)$ = the square root of $x$ , $f(x) =  x $ , $f(x)= 1/x$ , $f(x) = x^3$ , and translations of these functions, such as $f(x) =$ the square root of $(x-2) + 4$ . Know how to use graphing technology to graph these functions.		
9.2.3	Generate equivalent algebraic expressions involving polynomials and radicals; use algebraic properties to evaluate expressions.		
9.2.3.1	Evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified points in their domains.		
9.2.3.2	Add, subtract and multiply polynomials; divide a polynomial by a polynomial of equal or lower degree.	Polynomials	Add and Subtract Polynomials  Multiply Polynomials
9.2.3.3	Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.	Polynomials	Factors and GCF  Factoring Trinomials  Special Factors
9.2.3.4	Add, subtract, multiply, divide and simplify algebraic fractions.	Rational Expressions	Multiplying and Dividing Rational Expressions  Adding and Subtracting Rational Expressions

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9.2.3.5	Check whether a given complex number is a solution of a quadratic equation by substituting it for the variable and evaluating the expression, using arithmetic with complex numbers.		
9.2.3.6	Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving $n$ th roots.	Numbers and Expressions	Exponents and Roots
9.2.3.7	Justify steps in generating equivalent expressions by identifying the properties used. Use substitution to check the equality of expressions for some particular values of the variables; recognize that checking with substitution does not guarantee equality of expressions for all values of the variables.	Equations	Equations
9.2.4	Represent real-world and mathematical situations using equations and inequalities involving linear, quadratic, exponential, and $n$ th root functions. Solve equations and inequalities symbolically and graphically. Interpret solutions in the original context.		
9.2.4.1	Represent relationships in various contexts using quadratic equations and inequalities. Solve quadratic equations and inequalities by appropriate methods including factoring, completing the square, graphing and the quadratic formula. Find non-real complex roots when they exist. Recognize that a particular solution may not be applicable in the original context. Know how to use calculators, graphing utilities or other technology to solve quadratic equations and inequalities.	Quadratics and Radicals  Inequalities	Solving Quadratic Equations  Multi-Step Inequalities
9.2.4.2	Represent relationships in various contexts using equations involving exponential functions; solve these equations graphically or numerically. Know how to use calculators, graphing utilities or other technology to solve these equations.	Exponentials	Exponential Functions  Growth and Decay

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9.2.4.3	Recognize that to solve certain equations, number systems need to be extended from whole numbers to integers, from integers to rational numbers, from rational numbers to real numbers, and from real numbers to complex numbers. In particular, non-real complex numbers are needed to solve some quadratic equations with real coefficients.	Covered throughout course	Covered throughout course
9.2.4.4	Represent relationships in various contexts using systems of linear inequalities; solve them graphically. Indicate which parts of the boundary are included in and excluded from the solution set using solid and dotted lines.	Solving Systems	Systems of Inequalities
9.2.4.5	Solve linear programming problems in two variables using graphical methods.		
9.2.4.6	Represent relationships in various contexts using absolute value inequalities in two variables; solve them graphically.		
9.2.4.7	Solve equations that contain radical expressions. Recognize that extraneous solutions may arise when using symbolic methods.	Quadratics and Radicals	Radical Equations
9.2.4.8	Assess the reasonableness of a solution in its given context and compare the solution to appropriate graphical or numerical estimates; interpret a solution in the original context.		