

Algebra 2

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.	Linear and Quadratic Functions	Section A: Functions and Relations; pg 1-19
9.2.1.2	Distinguish between functions and other relations defined symbolically, graphically or in tabular form.	Linear and Quadratic Functions	Section A: Functions and Relations; pg 1-19
9.2.1.3	Find the domain of a function defined symbolically, graphically or in a real-world context.	Linear and Quadratic Functions	Section A: Functions and Relations; pg 13-19
9.2.1.4	Obtain information and draw conclusions from graphs of functions and other relations.	Linear and Quadratic Functions	Section A: Functions and Relations; pg 1-19
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.	Linear and Quadratic Functions	Section D: Graphing Quadratic Functions; pg 1-10 Section F: Graphing Zeros and Min/Max Values; pg 1-14
9.2.1.6	Identify intercepts, zeros, maxima, minima and intervals of increase and decrease from the graph of a function.	Linear and Quadratic Functions	Section F: Graphing Zeros and Min/Max Values; pg 1-14
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.		

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9.2.1.8	Make qualitative statements about the rate of change of a function, based on its graph or table of values.	Linear and Quadratic Functions	Section C: Writing and Graphing Linear Functions; pg 1-19
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.	Linear and Quadratic Functions	Section D: Graphing Quadratic Functions; pg 1-10.
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.	Linear and Quadratic Functions	Section E: Solving Quadratic Functions; pg 1-15.
9.2.2.2	Represent and solve problems in various contexts using exponential functions, such as investment growth, depreciation and population growth.	Exponential and Logarithmic Functions	Section E: Solving Exponential and Logarithmic Equations; pg 1-14.
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.	Linear and Quadratic Functions	Section D: Graphing Quadratic Equations; pg 1-10
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.	Discrete Mathematics: Sequences and Series	Section B: Geometric Sequences and Series; pg 1-18.

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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 $f(x) = \sqrt{x}$, $f(x) = x $, $f(x) = 1/x$, $f(x) = x^3$, and translations of these functions, such as $f(x) = \sqrt{(x-2) + 4}$. Know how to use graphing technology to graph these functions.	Rational Functions	Section B: Graphing Rational Functions and Domain and Range: pg 1-13.
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.	Linear and Quadratic Functions	Section A: Functions and Relations; pg 1-19
9.2.3.3	Factor common monomial factors from polynomials, factor quadratic polynomials, and factor the difference of two squares.		
9.2.3.4	Add, subtract, multiply, divide and simplify algebraic fractions.		

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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.	Linear and Quadratic Functions	Section E: Solving Quadratic Functions; pg 1-15
9.2.3.6	Apply the properties of positive and negative rational exponents to generate equivalent algebraic expressions, including those involving n th roots.	Radical Functions	Section A: Roots and Properties of Exponents; pg 1-10
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.		
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.	Linear and Quadratic Functions	Section E: Solving Quadratic Functions; pg 1-15.

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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.	Exponential and Logarithmic Functions	Section E: Solving Exponential and Logarithmic Equations; pg 1-14.
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.	Linear and Quadratic Functions	Section E: Solving Quadratic Functions; pg 1-15.
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.	Systems of Equations and Inequalities	Section C: Systems of Inequalities; pg 1-10.
9.2.4.5	Solve linear programming problems in two variables using graphical methods.	Systems of Equations and Inequalities	Section B: Systems of Equations; pg 1-20
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.	Radical Functions	Section C: Solving Radical Equations and Inequalities; pg 1-15.
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.	Radical Functions	Section C: Solving Radical Equations and Inequalities; pg 1-15.