

## Algebra 2 CR

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
IA-1	The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation.		
IA-1.1	Communicate a knowledge of algebraic relationships by using mathematical terminology appropriately.	Linear and Quadratic Functions	Functions and Relations
IA-1.2	Connect algebra with other branches of mathematics.	Geometry	Geometry of Quadrilaterals  Geometry of Triangles
IA-1.3	Apply algebraic methods to solve problems in real-world contexts.	Linear and Quadratic Functions	Solving Quadratic Equations and Inequalities
IA-1.4	Judge the reasonableness of mathematical solutions.	Probability and Statistics	Scatterplots and Lines of Best Fit  Scatterplots and Curves of Best Fit
IA-1.5	Demonstrate an understanding of algebraic relationships by using a variety of representations (including verbal, graphic, numerical, and symbolic).	Linear and Quadratic Functions	Functions and Relations
IA-1.6	Understand how algebraic relationships can be represented in concrete models, pictorial models, and diagrams.	Linear and Quadratic Functions	Functions and Relations
IA-1.7	Understand how to represent algebraic relationships by using tools such as handheld computing devices, spreadsheets, and computer algebra systems (CASs).		

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IA-2	The student will demonstrate through the mathematical processes an understanding of functions, systems of equations, and systems of linear inequalities.		
IA-2.1	Carry out a procedure to solve a system of linear inequalities algebraically.	Systems of Equations and Inequalities	Systems of Inequalities
IA-2.2	Carry out a procedure to solve a system of linear inequalities graphically.	Systems of Equations and Inequalities	Systems of Inequalities
IA-2.3	Analyze a problem situation to determine a system of linear inequalities that models the problem situation.	Systems of Equations and Inequalities	Systems of Inequalities
IA-2.4	Use linear programming to solve contextual problems involving a system of linear inequalities.		

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IA-2.5	Carry out procedures to perform operations on polynomial functions (including $f(x) + g(x)$ , $f(x) - g(x)$ , $f(x) * g(x)$ , and $f(x)/g(x)$ ).	Linear and Quadratic Functions	Functions and Relations
IA-2.6	Apply a procedure to write the equation of a composition of given functions.	Linear and Quadratic Functions	Functions and Relations
IA-2.7	Carry out a procedure to graph translations of parent functions (including $y = x$ , $y = x^2$ , $y =$ square root of $x$ , $y =$ absolute value of $x$ , and $y = 1/x$ ).	Linear and Quadratic Functions  Radical Functions  Rational Functions	Writing and Graphing Linear Equations and Inequalities  Graphing Quadratic Functions  Graphing Radical Functions and Domain and Range  Graphing Rational Functions and Domain and Range
IA-2.8	Carry out a procedure to graph transformations of parent functions (including $y = x$ , $y = x^2$ , and $y =$ absolute value of $x$ ).	Linear and Quadratic Functions	Writing and Graphing Linear Equations and Inequalities  Graphing Quadratic Functions

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IA-2.9	Carry out a procedure to graph discontinuous functions (including piecewise and step functions).		
IA-2.10	Carry out a procedure to determine the domain and range of discontinuous functions (including piecewise and step functions).		
IA-2.11	Carry out a procedure to solve a system of equations (including two linear functions and one linear function with one quadratic function).	Systems of Linear Equations and Inequalities	Systems of Equations (two linear functions only)
IA-3	The student will demonstrate through the mathematical processes an understanding of quadratic equations and the complex number system.		
IA-3.1	Carry out a procedure to simplify expressions involving powers of $i$ .		

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IA-3.2	Carry out a procedure to perform operations with complex numbers (including addition, subtraction, multiplication, and division).		
IA-3.3	Carry out a procedure to solve quadratic equations algebraically (including factoring, completing the square, and applying the quadratic formula).	Linear and Quadratic Functions	Solving Quadratic Equations and Inequalities
IA-3.4	Use the discriminant to determine the number and type of solutions of a quadratic equation.	Linear and Quadratic Functions	Solving Quadratic Equations and Inequalities
IA-3.5	Analyze given information (including quadratic models) to solve contextual problems.	Linear and Quadratic Functions	Determining a Quadratic Function
IA-3.6	Carry out a procedure to write an equation of a quadratic function when given its roots.	Linear and Quadratic Functions	Determining a Quadratic Function

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IA-4	The student will demonstrate through the mathematical processes an understanding of algebraic expressions and nonlinear functions.		
IA-4.1	Carry out a procedure to perform operations (including multiplication, exponentiation, and division) with polynomial expressions.		
IA-4.2	Carry out a procedure to determine specified points (including zeros, maximums, and minimums) of polynomial functions.	Linear and Quadratic Functions	Graphing Zeros and Min/Max Values
IA-4.3	Carry out a procedure to solve polynomial equations (including factoring by grouping, factoring the difference between two squares, factoring the sum of two cubes, and factoring the difference between two cubes).		
IA-4.4	Analyze given information (including polynomial models) to solve contextual problems.	Linear and Quadratic Functions	Solving Quadratic Equations and Inequalities
IA-4.5	Carry out a procedure to simplify algebraic expressions involving rational exponents.	Radical Functions	Roots and Properties of Exponents
IA-4.6	Carry out a procedure to simplify algebraic expressions involving logarithms.	Exponential and Logarithmic Functions	Solving Exponential and Logarithmic Equations
IA-4.7	Carry out a procedure to perform operations with expressions involving rational exponents (including addition, subtraction, multiplication, division, and exponentiation).		
IA-4.8	Carry out a procedure to perform operations with rational expressions (including addition, subtraction, multiplication, and division).		
IA-4.9	Carry out a procedure to solve radical equations algebraically.	Radical Functions	Solving Radical Equations
IA-4.10	Carry out a procedure to solve	Exponential and	Solving Exponential and

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	logarithmic equations algebraically.	Logarithmic Functions	Logarithmic Equations
IA-4.11	Carry out a procedure to solve logarithmic equations graphically.		
IA-4.12	Carry out a procedure to solve rational equations algebraically.	Rational Functions	Solving Rational Equations
IA-4.13	Carry out a procedure to graph logarithmic functions.	Exponential and Logarithmic Functions	Graphing Logarithmic Functions and Domain and Range
IA-4.14	Carry out a procedure to graph exponential functions.	Exponential and Logarithmic Functions	Graphing Exponential Functions and Domain and Range
IA-5	The student will demonstrate through the mathematical processes an understanding of conic sections.		
IA-5.1	Carry out a procedure to graph the circle whose equation is the form $x^2 + y^2 = r^2$ .	Conic Sections	Circles
IA-5.2	Carry out a procedure to write an equation of a circle centered at the origin when given its radius.	Conic Sections	Circles
IA-5.3	Carry out a procedure to graph the ellipse whose equation is the form $(x^2/a^2) + (y^2/b^2) = 1$ .	Conic Sections	Ellipses
IA-5.4	Carry out a procedure to write an equation of an ellipse centered at the origin when given information from among length of major axis, length of minor axis, and vertices.	Conic Sections	Ellipses
IA-5.5	Carry out a procedure to graph the hyperbola whose equation is the form $(x^2/a^2) - (y^2/b^2) = 1$ .	Conic Sections	Hyperbolas
IA-5.6	Carry out a procedure to write an equation of a hyperbola centered at the origin with specified vertices.	Conic Sections	Hyperbolas
IA-5.7	Match the equation of a conic section with its graph.		
IA-6	The student will demonstrate through the mathematical processes an understanding of sequences and series.		
IA-6.1	Categorize a sequence as arithmetic, geometric, or neither.	Patterns and Sequences	Arithmetic Sequences and Series  Geometric Sequences and Series
IA-6.2	Carry out a procedure to write a specified term of an arithmetic or	Patterns and Sequences	Arithmetic Sequences and Series

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	geometric sequence when given the $n$ th term of the sequence.		Geometric Sequences and Series
IA-6.3	Carry out a procedure to write a formula for the $n$ th term of an arithmetic or geometric sequence when given at least four consecutive terms of the sequence.	Patterns and Sequences	Arithmetic Sequences and Series  Geometric Sequences and Series
IA-6.4	Carry out a procedure to write a formula for the $n$ th term of an arithmetic or geometric sequence when given at least four terms of the sequence.	Patterns and Sequences	Arithmetic Sequences and Series  Geometric Sequences and Series
IA-6.5	Represent an arithmetic or geometric series by using sigma notation.		
IA-6.6	Carry out a procedure to calculate the sum of an arithmetic or geometric series written in sigma notation.		
IA-6.7	Carry out a procedure to determine consecutive terms of a sequence that is defined recursively.	Patterns and Sequences	Arithmetic Sequences and Series  Geometric Sequences and Series
IA-6.8	Carry out a procedure to define a sequence recursively when given four or more consecutive terms of the sequence.	Patterns and Sequences	Arithmetic Sequences and Series  Geometric Sequences and Series
IA-6.9	Translate between the explicit form and the recursive form of sequences.		