Algebra 2

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.	Geometry	Section A: Geometry of Quadrilaterals; pg 1-16
IA-1.2	Connect algebra with other branches of mathematics.	Probability and Statistics	Section A: Introduction to Probability; pg 1-13
IA-1.3	Apply algebraic methods to solve problems in real-world contexts.	Probability and Statistics	Section B: Permutations and Combinations; pg 1-15
IA-1.4	Judge the reasonableness of mathematical solutions.	Rational Functions	Section C: Solving Rational Equations and Inequalities; pg 1-15
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	Section A: Functions and Relations; pg 1-19
IA-1.6	Understand how algebraic relationships can be represented in concrete models, pictorial models, and diagrams.	Geometry	Section A: Geometry of Quadrilaterals; pg 1-16
IA-1.7	Understand how to represent algebraic relationships by using tools such as handheld computing devices, spreadsheets, and computer algebra systems (CASs).	Linear and Quadratic Functions	Section C: Writing and Graphing Linear Functions; pg 1-19
IA-2	The student will demonstrate through the mathematical processes an understanding of functions, systems of equations, and systems of linear inequalities.		

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IA-2.1	Carry out a procedure to solve a system of linear inequalities algebraically.	Systems of Equations and Inequalities	Section C: System of Linear Inequalities; pg 1-10
IA-2.2	Carry out a procedure to solve a system of linear inequalities graphically.	Systems of Equations and Inequalities	Section C: System of Linear Inequalities; pg 1-10
IA-2.3	Analyze a problem situation to determine a system of linear inequalities that models the problem situation.		
IA-2.4	Use linear programming to solve contextual problems involving a system of linear inequalities.		
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	Section A: Functions and Relations; pg 1-19
IA-2.6	Apply a procedure to write the equation of a composition of given functions.	Linear and Quadratic Functions	Section A: Functions and Relations; pg 1-19
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 Rational Functions	Section C: Writing and Graphing Linear Functions; pg 1-19 Section D: Graphing Quadratic Functions; pg 1-10 Section B: Graphing Rational Functions and Domain and Range; pg 1-13

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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	Section C: Writing and Graphing Linear Functions; pg 1-19 Section D: Graphing Quadratic Functions; pg 1-10
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 Equations and Inequalities	Section B: Systems of Equations; pg 1-20
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.		
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	Section E: Solving Quadratic Functions; pg 1-15

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IA-3.4	Use the discriminant to determine the number and type of solutions of a quadratic equation.	Linear and Quadratic Functions	Section E: Solving Quadratic Functions; pg 1-15
IA-3.5	Analyze given information (including quadratic models) to solve contextual problems.	Linear and Quadratic Functions	Section F: Graphing Zeros and Min/Max Values; pg 1-14
IA-3.6	Carry out a procedure to write an equation of a quadratic function when given its roots.	Linear and Quadratic Functions	Section G: Determining a Quadratic Function; pg 1-11
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	Section F: Graphing Zeros and Min/Max Values; pg 1-14
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	Section F: Graphing Zeros and Min/Max Values; pg 1-14

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IA-4.5	Carry out a procedure to simplify algebraic expressions involving rational exponents.	Radical Functions	Section A: Roots and Properties of Exponents; pg 1-10
IA-4.6	Carry out a procedure to simplify algebraic expressions involving logarithms.	Exponential and Logarithmic Equations	Section E: Solving Exponential and Logarithmic Equations; pg 1-14
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	Section C: Solving Radical Equations and Inequalities; pg 1-15
IA-4.10	Carry out a procedure to solve logarithmic equations algebraically.	Exponential and Logarithmic Equations	Section E: Solving Exponential and Logarithmic Equations; pg 1-14
IA-4.11	Carry out a procedure to solve logarithmic equations graphically.	Exponential and Logarithmic Equations	Section E: Solving Exponential and Logarithmic Equations; pg 1-14
IA-4.12	Carry out a procedure to solve rational equations algebraically.	Rational Functions	Section C: Solving Rational Equations and Inequalities; pg 1-15

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IA-4.13	Carry out a procedure to graph logarithmic functions.	Exponential and Logarithmic Equations	Section D: Graphing Logarithmic Functions and Domain and Range; pg 1-9
IA-4.14	Carry out a procedure to graph exponential functions.	Exponential and Logarithmic Equations	Section B: Graphing Exponential Functions and Domain and Range; pg 1-10
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	Section C: Circles; pg 1-14
IA-5.2	Carry out a procedure to write an equation of a circle centered at the origin when given its radius.	Conic Sections	Section C: Circles; pg 1-14
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	Section D: Ellipses; pg 1-13
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	Section D: Ellipses; pg 1-13
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	Section E: Hyperbolas; pg 1-18

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IA-5.6	Carry out a procedure to write an equation of a hyperbola centered at the origin with specified vertices.	Conic Sections	Section E: Hyperbolas; pg 1-18
IA-5.7	Match the equation of a conic section with its graph.	Conic Sections	Section E: Hyperbolas; pg 1-18
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.	Discrete Mathematics: Sequence and Series	Section A: Arithmetic Sequences and Series; pg 1-15 Section B: Geometric Sequences and Series; pg 1-18
IA-6.2	Carry out a procedure to write a specified term of an arithmetic or geometric sequence when given the nth term of the sequence.	Discrete Mathematics: Sequence and Series	Section A: Arithmetic Sequences and Series; pg 1-15 Section B: Geometric Sequences and Series; pg 1-18
IA-6.3	Carry out a procedure to write a formula for the nth term of an arithmetic or geometric sequence when given at least four consecutive terms of the sequence.	Discrete Mathematics: Sequence and Series	Section A: Arithmetic Sequences and Series; pg 1-15 Section B: Geometric Sequences and Series; pg 1-18
IA-6.4	Carry out a procedure to write a formula for the nth term of an arithmetic or geometric sequence when given at least four terms of the sequence.	Discrete Mathematics: Sequence and Series	Section A: Arithmetic Sequences and Series; pg 1-15 Section B: Geometric Sequences and Series; pg 1-18

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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.	Discrete Mathematics: Sequence and Series	Section A: Arithmetic Sequences and Series; pg 1-15 Section B: Geometric Sequences and Series; pg 1-18
IA-6.8	Carry out a procedure to define a sequence recursively when given four or more consecutive terms of the sequence.	Discrete Mathematics: Sequence and Series	Section A: Arithmetic Sequences and Series; pg 1-15 Section B: Geometric Sequences and Series; pg 1-18
IA-6.9	Translate between the explicit form and the recursive form of sequences.		