



Alignment Document
State of Hawaii and Aventa Learning Algebra II

Algebra II
2005-2007 Benchmark Blueprint

Strand	Standard	Topic	State Standard Area / Description	Unit Name	Course Topic Description
Numbers and Operations	AII.1 Understand numbers, ways of representing numbers, relationships among numbers, and number systems	Numbers and Number Systems	MA.AII.1.1 Use the complex number system, the notation for complex numbers, and the definition of "i" to solve problems	Complex Numbers	The size of Complex Numbers
				Complex Numbers	Working with complex numbers
				Complex Numbers	The complex number i
				Complex Numbers	Introduction



Numbers and Operations	AII.2 Understand the meaning of operations and how they relate to each other	Operation Properties	MA.AII.2.1 Add, subtract, multiply, and divide complex numbers	Complex Numbers	Addition and Subtraction in a Complex Plane
				Complex Numbers	Working with complex numbers
				Complex Numbers	Drawing a picture of Complex Numbers
			MA.AII.2.2 Use the inverse relationship between exponents and logarithms to solve exponential and logarithmic problems	Exponential and Logarithm functions	Logarithm functions and exponential functions together
				Exponential and Logarithm functions	Values of logarithm functions: a look at your calculator
				Exponential and Logarithm functions	Comparing sizes...just how big is it?
				Exponential and Logarithm functions	Logarithm Functions: Who Cares? (Part 2)
				Exponential and Logarithm functions	Values of logarithm functions
				Exponential and Logarithm functions	Exponential Functions: the Formal definition
				Exponential and Logarithm functions	Exponential Functions: an intuitive approach
		Exponential and Logarithm functions	Logarithm functions		

Numbers and Operations	AII.3 Use computational tools and strategies fluently and, when appropriate, use estimation	Computational Fluency	MA.AII.3.1 Use matrix operations (i.e. multiplication and inverse) to solve problems		
Numbers and Operations	AII.4 Understand attributes, units, and systems of units in measurement; and develop and use techniques, tools, and formulas for measuring	Measurement Formulas	MA.AII.4.1 Use advanced formulas or functions to solve problems dealing with determining a measurement based on another derived or given measure	Composition of Functions Composition of Functions Composition of Functions Composition of Functions Composition of Functions	A Review of Functions: A Precise Definition of a Function A Review of Functions: Function Notation and the defining equation of a function Review of Functions: What is a Function? Horizontal Line Test A Review of Functions: Function Notation
Geometry and Spatial Sense	AII.5 Analyze properties of objects and relationships among the properties		There are no benchmarks for this standard for this Grade/Course.		
Geometry and Spatial Sense	AII.6 Use transformations and symmetry to analyze mathematical situations		There are no benchmarks for this standard for this Grade/Course.		
Geometry and Spatial Sense	AII.7 Use visualization and spatial reasoning to solve problems both within and outside of mathematics		There are no benchmarks for this standard for this Grade/Course.		

Geometry and Spatial Sense	AII.8 Select and use different representational systems, including coordinate geometry		There are no benchmarks for this standard for this Grade/Course.		
Patterns, Functions, and Algebra	AII.9 Understand various types of patterns and functional relationships	Patterns	MA.AII.9.1 Apply the properties of arithmetic and geometric sequences and series to solve problems	Sequences and Series Sequences and Series Sequences and Series Sequences and Series Sequences and Series Sequences and Series Sequences and Series Sequences and Series	Geometric Series Arithmetic sequences Series Series: An important example Summation notation (also called Sigma notation) Arithmetic Series Geometric sequences Sigma notation and series Series: An important example
		Function	MA.AII.9.2 Use exponential functions to solve problems involving exponential growth and decay	Exponential and Logarithm functions Exponential and Logarithm functions Exponential and Logarithm functions Exponential and Logarithm functions	Exponential functions: the formal definition Exponential functions: an intuitive approach Computations with exponential functions Exponential functions: an example



				Exponential and Logarithm functions	Graphs of exponential functions
				Exponential and Logarithm functions	Introduction
				Exponential and Logarithm functions	Exponential functions with fractional bases
			<p>MA.AII.9.3 Use the properties of many types of functions (e.g., polynomial, step, absolute value, step, exponential, and logarithmic) to identify the function's graph</p>	Exponential and Logarithm functions	Logarithm functions and exponential functions together
				Exponential and Logarithm functions	Values of logarithm functions: a look at your calculator
				Exponential and Logarithm functions	Comparing sizes...just how big is it?
				Exponential and Logarithm functions	Logarithm functions
				Exponential and Logarithm functions	Exponential functions: the formal definition
				Exponential and Logarithm functions	Logarithm Functions: Who Cares? (Part 2)
				Exponential and Logarithm functions	Computations with exponential functions
				Exponential and Logarithm functions	Exponential functions: an intuitive approach
				Exponential and Logarithm functions	Graphs of exponential functions



				Exponential and Logarithm functions	Exponential functions: an example
				Exponential and Logarithm functions	Values of logarithm functions
				Exponential and Logarithm functions	Introduction
				Composition of Functions	Domain Restrictions
				Composition of Functions	Horizontal Line Test
				Composition of Functions	Definition of Functions
				Absolute Value	Absolute Value equations in other places
				Absolute Value	Shortcuts
			MA.AII.9.4 Use the appropriate terminology and notation to define functions and their properties (e.g., domain, range, function composition, inverses, zeros)	Composition of Functions	Checking that two functions really are inverse functions of each other
				Composition of Functions	Finding an Inverse Function
				Composition of Functions	Horizontal Line Test
				Composition of Functions	Definition of Functions



				Composition of Functions	Review of Functions
				Composition of Functions	Inverse functions
				Composition of Functions	Domain Restrictions
				Composition of Functions	Function Notation
				Conic Sections	Parabolas in Standard Form
			MA.AII.9.5 Determine the zeros of a function algebraically or graphically	Composition of Functions	Domain Restrictions
				Composition of Functions	Horizontal Line Test
			MA.AII.9.6 Describe the relationship among relations and functions	Composition of Functions	Review of Functions
				Composition of Functions	Horizontal Line Test
				Composition of Functions	Definition of Functions
				Composition of Functions	Function Notation
			MA.AII.9.7 Determine the domain and range of a relation given a graph or a set of points	Composition of Functions	Domain Restrictions



Patterns, Functions, and Algebra	AII.10 Use symbolic forms to represent, model, and analyze mathematical situations	Numeric and Algebraic Representations	MA.AII.10.1 Solve equations and inequalities involving absolute values	Absolute Value	Absolute Value and Inequalities Shortcuts Summary
				Absolute Value	More Complicated Absolute Value Equations
				Absolute Value	Absolute Value equations in other places
				Absolute Value	Absolute Value and Inequalities Shortcuts
				Absolute Value	Absolute Value and Inequalities
				Absolute Value	Absolute Value Equations
				Absolute Value	Shortcuts
			MA.AII.10.2 Solve systems of linear equations and inequalities in two or three variables using a variety of strategies (e.g., substitution, graphing, matrices, technology)		
			MA.AII.10.3 Solve equations containing radical and exponents		
			MA.AII.10.4 Factor polynomials representing perfect squares, the difference in squares, perfect square trinomials, the sum and difference of cubes, and general trinomials	Polynomials	The Factor Theorem
Polynomials	Working with Cubes				
Polynomials	Factoring Polynomials				
MA.AII.10.5 Apply quadratic equations to real-world situations	Quadratics	Introduction			

		<p>MA.AII.10.6 Solve quadratic equations in the complex number system</p> <p>MA.AII.10.7 Use the binomial theorem to expand binomial expression</p> <p>MA.AII.10.8 Add, subtract, multiply, divide, and simplify rational expressions, radical expressions containing positive rational numbers, and expressions containing rational exponents</p> <p>MA.AII.10.9 Translate between the equations of conic sections (e.g., circle, ellipse, parabola, hyperbola) and their graphs</p>	<p>Counting</p> <p>Counting</p> <p>Counting</p> <p>Counting</p> <p>Conic Sections</p> <p>Conic Sections</p> <p>Conic Sections</p> <p>Conic Sections</p> <p>Conic Sections</p> <p>Conic Sections</p> <p>Conic Sections</p>	<p>The Binomial Theorem</p> <p>The values in Pascal's triangle as factorials</p> <p>Some computations with factorials</p> <p>More about the Binomial Theorem</p> <p>Finding the Center and Radius of a Circle</p> <p>How to get the equation of an ellipse</p> <p>General equation for conic sections.</p> <p>Hyperbola in Standard Form</p> <p>Circles in Standard Form</p> <p>Parabolas in Standard Form</p> <p>Ellipses in Standard Form</p>
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				Conic Sections	What kind of conic is it?
				Conic Sections	Asymptotes for hyperbolas
				Conic Sections	Foci of Ellipses
				Conic Sections	"Vertical" ellipses
				Conic Sections	Eccentricity
				Conic Sections	Ellipses
				Conic Sections	Parabolas
				Conic Sections	Hyperbolas
				Conic Sections	Circles
				Quadratics	Quadratic functions and their graphs
				Quadratics	Graphing Parabolas
			MA.AII.10.10 Analyze translations and dilations for graphs of absolute value functions, parabolas, and circles, and understand how the transformations are represented in equations	Quadratics	Quadratic functions and their graphs
				Conic Sections	Finding the Center and Radius of a Circle
				Conic Sections	Parabolas in Standard Form
				Conic Sections	Circles in Standard Form
				Conic Sections	Parabolas
				Conic Sections	Circles



				Absolute Value	Absolute Value equations in other places
				Absolute Value	Shortcuts
Data Analysis, Statistics, and Probability	AII.11 Pose questions and collect, organize, and represent data to answer those questions		There are no benchmarks for this standard for this Grade/Course.		
Data Analysis, Statistics, and Probability	AII.12 Interpret data using methods of exploratory data analysis	Data Interpretation	MA.AII.12.1 Identify trends in bivariate data and find functions that model the data	Composition of Functions	Function Notation
Data Analysis, Statistics, and Probability	AII.13 Develop and evaluate inferences, predictions, and arguments that are based on data		There are no benchmarks for this standard for this Grade/Course.		
Data Analysis, Statistics, and Probability	AII.14 Understand and apply basic notions of chance and probability	Probability	<p>MA.AII.14.1 Use the fundamental counting principles for combinations and permutations to determine probability</p> <p>MA.AII.14.2 Calculate probabilities of events under different relationships (e.g., inclusion, disjoint, complementary, independent, dependent, with replacement, without replacement)</p>	<p>Counting</p> <p>Counting</p> <p>Counting</p> <p>Counting</p> <p>Counting</p>	<p>Counting: An introduction to choosing subsets</p> <p>Counting Subsets Formula</p> <p>Combinations</p> <p>Permutations</p> <p>Frequency Expectation</p> <p>Interpretation of probability</p>