



Alignment Document

State of West Virginia And Aventa Learning Algebra 2

Algebra 2 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
M.S.A2.2	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will demonstrate understanding of patterns, relations and functions, represent and analyze mathematical situations and structures using algebraic symbols, use mathematical models to represent and understand quantitative relationships, and analyze change in various contexts.		
M.O.A2.2.1	determine equations of lines including parallel, perpendicular, vertical and horizontal lines, and compare and contrast the properties of these equations.	Systems of Linear Equations	Substitution Method to solve a system
M.O.A2.2.2	factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes; analyze and describe the relationship between the factored form and the graphical representation.	Polynomials	Working with Cubes
		Polynomials	The Factor Theorem
		Polynomials	Factoring Polynomials

M.O.A2.2.3	define complex numbers, simplify powers of 'i', perform basic operations with complex numbers, and give answers as complex numbers in simplest form.	Complex Numbers	Working with complex numbers
		Complex Numbers	Addition and Subtraction in a Complex Plane
		Complex Numbers	Introduction
		Complex Numbers	Absolute Value of a Complex Number
		Complex Numbers	The complex number i
M.O.A2.2. 4	simplify expressions involving radicals and fractional exponents, convert between the two forms, and solve equations containing radicals and exponents.	Exponential and Logarithmic Functions	Computations with exponential functions
M.O.A2.2. 5	solve quadratic equations over the set of complex numbers: apply the techniques of factoring, completing the square, and the quadratic formula; use the discriminate to determine the number and nature of the roots; identify the maxima and minima; use words, graphs, tables, and equations to generate and analyze solutions to practical problems..	Complex Numbers	Introduction
		Complex Numbers	The complex number i
		Complex Numbers	Working with complex numbers
		Complex Numbers	Absolute Value of a Complex Number
		Quadratics	The Quadratic Formula
		Quadratics	Completing the Square
		Quadratics	The Discriminant of a Quadratic
		Quadratics	Developing the Quadratic Formula
M.O.A2.2.6	develop and use the appropriate field properties of matrices by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.	Systems of Linear Equations	Using your calculator to solve systems of linear equations

M.O.A2.2.7	define a function and find its zeros; express the domain and range using interval notation; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.	Composition of Functions	Definition of Functions
		Composition of Functions	Checking that two functions really are inverse functions of each other
		Composition of Functions	Function Notation
		Composition of Functions	Horizontal Line Test
		Composition of Functions	Combining functions
		Composition of Functions	Finding an Inverse Function
		Composition of Functions	Review of Functions
		Composition of Functions	Inverse functions
		Conic Sections	Parabolas in Standard Form
M.O.A2.2.8	analyze families of functions and their transformations; recognize linear, quadratic, radical, absolute value, step, piece-wise, and exponential functions; analyze connections among words, graphs, tables and equations when solving practical problems with and without technology.	Absolute Value	Absolute Value equations in other places
		Quadratics	Zeros of the quadratic function
		Quadratics	Introduction
		Quadratics	Factored form of quadratics
		Quadratics	Quadratic functions and their graphs
		Quadratics	From the zeros to the equation of quadratic functions
		Quadratics	Quadratic functions in the real world
		Exponential and Logarithmic Functions	Exponential functions: an example
		Exponential and Logarithmic Functions	Graphs of exponential functions
		Exponential and Logarithmic Functions	Exponential functions: an intuitive approach



		Exponential and Logarithmic Functions	Exponential functions: the formal definition
		Exponential and Logarithmic Functions	Introduction
		Exponential and Logarithmic Functions	Computations with exponential functions
		Absolute Value	Shortcuts
M.O.A2.2.9	solve quadratic inequalities, graph their solution sets, and express solutions using interval notation.	Absolute Value	Absolute Value and Inequalities
M.O.A2.2.10	solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum or minimum values of a function over the feasible region using linear programming techniques.		
M.O.A2.2.11	solve practical problems involving direct, inverse and joint variation.		
M.O.A2.2.12	analyze the conic sections; identify and sketch the graphs of a parabola, circle, ellipse, and hyperbola and convert between graphs and equations.	Quadratics	Quadratic functions and their graphs
		Quadratics	Graphing Parabolas
		Conic Sections	Circles
		Conic Sections	Ellipses in Standard Form
		Conic Sections	How to get the equation of an ellipse
		Conic Sections	General equation for conic sections.
		Conic Sections	Circles in Standard Form
		Conic Sections	Foci of Ellipses
		Conic Sections	Hyperbolas
		Conic Sections	What kind of conic is it?
		Conic Sections	Parabolas
		Conic Sections	Finding the Center and Radius of a Circle
		Conic Sections	"Vertical" ellipses
		Conic Sections	Hyperbola in Standard Form
		Conic Sections	Parabolas in Standard Form
		Conic Sections	Ellipses
		Conic Sections	Eccentricity
		Conic Sections	Asymptotes for hyperbolas



M.O.A2.2.13	solve absolute value inequalities graphically, numerically and algebraically and express the solution set in interval notation.	Absolute Value	Absolute Value and Inequalities Shortcuts Summary
		Absolute Value	Absolute Value and Inequalities
		Absolute Value	Absolute Value and Inequalities Shortcuts
M.O.A2.2.14	define a logarithmic function, transform between exponential and logarithmic forms, and apply the basic properties of logarithms to simplify or expand an expression.	Exponential and Logarithmic Functions	Values of logarithm functions
		Exponential and Logarithmic Functions	Comparing sizes
		Exponential and Logarithmic Functions	Introduction
		Exponential and Logarithmic Functions	Values of logarithm functions: a look at your calculator
		Exponential and Logarithmic Functions	Logarithm functions
		Exponential and Logarithmic Functions	Properties of Logarithms
		Exponential and Logarithmic Functions	Logarithm functions and exponential functions together
		Exponential and Logarithmic Functions	Computations with logarithm functions
M.O.A2.2.15	perform a quadratic regression, determine the regression equation and use the results to predict specific values of a variable.		
M.O.A2.2.16	describe and illustrate how patterns and sequences are used to develop recursive and closed form equations; analyze and describe characteristics of each form.	Sequences and Series	Implicitly (or Recursively) defined sequences