

Virginia State Core Curriculum
Standards adopted 2001
Algebra II

Strand	Reference	Description	High School Algebra Boardworks presentations
Expressions and Operations	All.1	The student, given rational, radical, or polynomial expressions, will	
		a) add, subtract, multiply, divide, and simplify rational algebraic expressions;	Simplifying rational functions Operations with algebraic fractions Improper fractions Partial fractions
		b) add, subtract, multiply, divide, and simplify radical expressions containing rational numbers and variables, and expressions containing rational exponents;	Zero negative and fractional exponents Rational exponents Manipulating radicals
		c) write radical expressions as expressions containing rational exponents and vice versa; and	Rational exponents
		d) factor polynomials completely.	Factoring Factoring quadratic expressions Quadratic equations and factoring
	All.2	The student will investigate and apply the properties of arithmetic and geometric sequences and series to solve real-world problems, including writing the first n terms, finding the nth term, and evaluation summation formulas. Notation will include Σ and a_n .	Sequences and rules Arithmetic sequences Geometric sequences Sequences and series The sum of an arithmetic series The sum of a geometric series

	All.3	The student will perform operations on complex numbers, express the results in simplest form using patterns of the power of i , and identify field properties that are valid for the complex numbers.	–
Equations and Inequalities	All.4	The student will solve, algebraically and graphically,	
		a) absolute value equations and inequalities;	Absolute value functions
		b) quadratic equations over the set of complex numbers;	–
		c) equations containing rational algebraic expressions; and	Simplifying rational functions Operations with algebraic fractions Improper fractions Partial fractions
		d) equations containing radical expressions.	Manipulating formulas Manipulating radicals Plotting and sketching graphs
		Graphing calculators will be used for solving and for confirming the algebraic solutions.	–
	All.5	The student will solve nonlinear systems of equations, including linear-quadratic and quadratic-quadratic, algebraically and graphically. Graphing calculators will be used as a tool to visualize graphs and predict the number of solutions.	Systems of linear and quadratic equations One linear and one quadratic equation
All.6	The student will recognize the general shape of function (absolute value, square root, cube root, rational, polynomial, exponential, and logarithmic) families and will convert between graphic and symbolic forms of functions. A transformational approach to graphing will be employed. Graphing calculators will be used as a tool to investigate the shapes and behaviors of these functions.	Graphs of important non-linear functions Plotting and sketching graphs Absolute value functions Transforming functions part 1 Transforming functions part 2	

Functions

All.7	The student will investigate and analyze functions algebraically and graphically. Key concepts include	
	a) domain and range, including limited and discontinuous domains and ranges;	Domain, range and composite functions
	b) zeros;	Plotting and sketching graphs
	c) x- and y-intercepts;	Graphs of quadratic functions Plotting and sketching graphs
	d) intervals in which a function is increasing or decreasing;	Plotting and sketching graphs
	e) asymptotes;	Plotting and sketching graphs
	f) end behavior;	Plotting and sketching graphs
	g) inverse of a function; and	Inverse functions
	h) composition of multiple functions.	Domain, range and composite functions
	Graphing calculators will be used as a tool to assist in investigation of functions.	-
All.8	The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x-intercepts of a graph, and factors of a polynomial expression.	Solving quadratic equations Graphs of quadratic functions Plotting and sketching graphs
All.9	The student will collect and analyze data, determine the equation of the curve of best fit, make predictions, and solve real-world problems, using mathematical models. Mathematical models will include polynomial, exponential, and logarithmic functions.	Specifying the problem and planning Collecting data Comparing data Non-linear relationships Measuring correlation Scatter plots Lines of best fit Exponential growth and decay

Statistics	All.10	The student will identify, create, and solve real-world problems involving inverse variation, joint variation, and a combination of direct and inverse variations.	Direct proportion Inverse proportion
	All.11	The student will identify properties of a normal distribution and apply those properties to determine probabilities associated with areas under the standard normal curve.	The normal distribution
	All.12	The student will compute and distinguish between permutations and combinations and use technology for applications.	Permutations Combinations