Virginia State Core Curriculum

Standards adopted 2001

Algebra I

Strand	Reference	Description	Boardworks High School Algebra presentations
Expressions and Operations	A.1	The student will represent verbal quantitative situations algebraically and evaluate these expressions for given replacement values of the variables.	Using equations to solve problems Substituting into formulas Formula problems Rearranging a formula Manipulating formulas Generating formulas
	A.2	The student will perform operations on polynomials, including	
		a) applying the laws of exponents to perform operations on expressions;	Exponent laws
		b) adding, subtracting, multiplying, and dividing polynomials; and	Operations with polynomials Dividing polynomials The factor theorem
		c) factoring completely first- and second-degree binomials and trinomials in one or two variables. Graphing calculators will be used as a tool for factoring and for confirming algebraic factorizations.	Factoring Factoring quadratic expressions Quadratic equations and factoring
	A.3	The student will express the square roots and cube roots of whole numbers and the square root of a monomial algebraic expression in simplest radical form.	Radicals
	A.4	The student will solve multistep linear and quadratic equations in two variables, including	

Equations and		a) solving literal equations (formulas) for a given variable;	Equations, formulas and identities Solving linear equations Equations with parentheses and fractions Using equations to solve problems Substituting into formulas Formula problems Rearranging a formula Manipulating formulas Generating formulas
		b) justifying steps used in simplifying expressions and solving equations, using field properties and axioms of equality that are valid for the set of real numbers and its subsets;	Equations, formulas and identities Solving linear equations Equations with parentheses and fractions Using equations to solve problems
		c) solving quadratic equations algebraically and graphically;	Factoring Factoring quadratic expressions Quadratic equations and factoring Completing the square The quadratic formula Problems leading to quadratic equations
		d) solving multistep linear equations algebraically and graphically;	Solving linear equations Equations with parentheses and fractions Using equations to solve problems Linear graphs
		e) solving systems of two linear equations in two variables algebraically and graphically; and	Systems of equations and graphs The elimination method for systems of equations The substitution method for systems of equations Systems of linear and quadratic equations Problems leading to systems of equations

Inequalities		f) solving real-world problems involving equations and systems of equations.	Systems of equations and graphs The elimination method for systems of equations The substitution method for systems of equations Problems leading to systems of equations
		Graphing calculators will be used both as a primary tool in solving problems and to verify algebraic solutions.	–
	A.5	The student will solve multistep linear inequalities in two variables, including	
		a) solving multistep linear inequalities algebraically and graphically;	Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables
		b) justifying steps used in solving inequalities, using axioms of inequality and properties of order that are valid for the set of real numbers and its subsets;	Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables
		c) solving real-world problems involving inequalities; and	Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables
		d) solving systems of inequalities.	–
	A.6	The student will graph linear equations and linear inequalities in two variables, including	
		a) determining the slope of a line when given an equation of the line, the graph of the line, or two points on the line. Slope will be described as rate of change and will be positive, negative, zero, or undefined; and	Slopes and intercepts The equation of a straight line
		b) writing the equation of a line when given the graph of the line, two points on the line, or the slope and point on the line.	Slopes and intercepts The equation of a straight line

Functions	A.7	The student will investigate and analyze function (linear and quadratic) families and their characteristics both algebraically and graphically, including	
		a) determining whether a relation is a function;	Functions and relations
		b) domain and range;	Domain, range and composite functions
		c) zeros of a function;	Graphs of quadratic functions Plotting and sketching graphs
		d) x- and y-intercepts;	Graphs of quadratic functions
		e) finding the values of a function for elements in its domain; and	Domain, range and composite functions
		f) making connections between and among multiple representations of functions including concrete, verbal, numeric, graphic, and algebraic.	Plotting and sketching graphs
	A.8	The student, given a situation in a real-world context, will analyze a relation to determine whether a direct or inverse variation exists, and represent a direct variation algebraically and graphically and an inverse variation algebraically.	Direct proportion Inverse proportion
Statistics	A.9	The student, given a set of data, will interpret variation in real-world contexts and calculate and interpret mean absolute deviation, standard deviation, and z-scores.	The mode The median The mean Which measure of central tendency? Standard deviation
	A.10	The student will compare and contrast multiple univariate data sets, using box-and-whisker plots.	Box and whisker plots
	A.11	The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve real-world problems, using mathematical models. Mathematical models will include linear and quadratic functions.	Non-linear relationships Scatter plots Lines of best fit