



Alignment Document
State of Nebraska and Aventa Learning Algebra I

Algebra I
2005-2007 Benchmark Blueprint

Strand	Standards	Benchmarks	Unit Name	Course Topic Description
12.1 Numeration/Number Sense	12.1.1 Describe and compare the relationships between subsets of real numbers.	12.1.1.A Draw Venn diagrams including, but not limited to, natural, whole, integers, rational, irrational, and real numbers.	Real Numbers	Subtracting Fractions with Real Numbers
			Real Numbers	Rational Numbers
			Real Numbers	Decimals
			Real Numbers	Fractions
			Real Numbers	Order of Numbers
			Real Numbers	Adding Fractions with Real Numbers
			Real Numbers	Number Sets
			Rational Expressions	Probability Expressed as a Percent
			Variables and Expressions	Multiplying and Dividing Integers
			Variables and Expressions	Subtraction of Integers
		Variables and	Addition of Integers	



			Expressions	
			Variables and Expressions	Integers
		12.1.1.B Find intersection and union of two sets of numbers.		
		12.1.1.C Given a number, identify which subsets it belongs.		
		12.1.1.D Justify why a number does not belong to a specific set.	Real Numbers	Writing and Justifying Steps Using Properties
			Equations	Equations with Variables on Each Side
	12.1.2 Express the equivalent forms of numbers using exponents, radicals, scientific notation, absolute values, fractions, decimals, and percents.		Real Numbers	Subtracting Fractions with Real Numbers
			Real Numbers	Adding Fractions with Real Numbers
			Variables and Expressions	Fractional Exponents
			Variables and Expressions	Problem Solving using Exponents and Roots
			Variables and Expressions	Expressions with Powers
			Variables and Expressions	Exponents
			Polynomials	Computing with Scientific Notation
			Polynomials	Scientific Notation



			Polynomials	From Scientific Notation to Standard Notation
			Exponentials	Exponential Equations
			Quadratics and Radicals	Multiplying Radical Expressions
			Quadratics and Radicals	Simplifying Radicals
			Quadratics and Radicals	Adding and Subtracting Radical
			Quadratics and Radicals	Simplifying Radicals with Variables
			Quadratics and Radicals	Simplifying Radicals Containing Fractions
			Equations	Percent of Change
			Equations	Percent of a Number
12.2 Computation/Estimation	12.2.1 Solve theoretical and applied problems using numbers in equivalent forms, radicals, exponents, scientific notation, absolute values, fractions, decimals, and percents, ratios and proportions, order of operations, and properties of real numbers.		Equations	Ratios and Proportions
			Equations	Percent of Change
			Equations	Percent of a Number
			Equations	Problems with Proportions
			Quadratics and Radicals	Adding and Subtracting Radical
			Quadratics and Radicals	Multiplying Radical Expressions

			Polynomials	Scientific Notation
			Polynomials	From Scientific Notation to Standard Notation
			Polynomials	Computing with Scientific Notation
			Real Numbers	Number Sets
			Real Numbers	Subtracting Fractions with Real Numbers
			Real Numbers	Adding Fractions with Real Numbers
			Real Numbers	Rational Numbers
			Real Numbers	Order of Numbers
	12.2.2 Justify solutions to mathematical problems.	12.2.2.A Write an explanation based on the context of the problem stating why the solution is reasonable.	Equations	Equations with Variables on Each Side
	12.2.3 Perform estimations and computations of real numbers mentally, with paper and pencil, and with technology.		Real Numbers	Estimation
			Real Numbers	Estimation with Real Numbers
12.3 Measurement	12.3.1 Select and use measuring units, tools, and/or technology and explain the degree of accuracy and precision of measurements.	12.3.1.A Explain the accuracy of the measurement.		
		12.3.1.B Explain the precision of the measurement tool.		
	12.3.2 Convert between metric and standard units of measurement, given conversion factors.	12.3.2.A Change yards to meters.		
		12.3.2.B Change miles/hours to meters/second.	Equations	Mixture Problems
12.4 Geometry/Spatial Concepts	12.4.1 Calculate perimeter and area of two-dimensional shapes and surface area and volume of three-		Real Numbers	Estimation with Real Numbers

	dimensional shapes.			
	12.4.2 Create geometric models to describe the physical world.	12.4.2.A Create perspective drawing. 12.4.2.B Create scale models.		
	12.4.3 Evaluate characteristics and properties of two- and three-dimensional geometric shapes.	12.4.3.A Classify and compare attributes of two- and three-dimensional shapes. 12.4.3.B Classify shapes in terms of congruence and similarity and apply these relationships.		
		12.4.3.C Determine the effects of changing dimensions on perimeter, area, and volume.	Real Numbers	Estimation with Real Numbers
		12.4.3.D Investigate and deduce geometric properties using transformations such as translations, rotations, and reflections.		
		12.4.4 Apply coordinate geometry to locate and describe objects algebraically.	12.4.4.A Graph a geometric shape and determine the slope of the sides. 12.4.4.B Identify the missing vertices of a polygon.	Functions and Linear Equations
	12.4.5 Apply right triangle trigonometry to find length and angle measures.			
	12.4.6 Apply geometric properties to solve problems.	12.4.6.A Find missing angles and lengths of geometric shapes using geometric properties. (Properties may include, but are not limited to, similarity, parallel and line-transversal).		
	12.4.7 Apply deductive reasoning to arrive at a conclusion.	12.4.7.A Justify steps when solving an algebraic equation using properties of real numbers.	Real Numbers	Properties of Closure and Equality
			Real Numbers	Writing and Justifying Steps Using Properties
			Real Numbers	Using the Properties

			Variables and Expressions	The Distributive Property	
			Variables and Expressions	The Associative Property	
			Variables and Expressions	The Commutative Property	
		12.4.7.B Use logic statements, paragraph proof, two-column proof, or algebraic proof to arrive at a conclusion.			
12.5 Data Analysis, Probability, and Statistical Concepts	12.5.1 Select a sampling technique to gather data, analyze the resulting data, and make inferences.	12.5.1.A Justify the chosen sampling techniques.			
		12.5.1.B Use technology to analyze the data.	Solving Systems	Analyzing Statistical Data	
	12.5.2 Write equations and make predictions from sets of data.			Solving Systems	Histograms
		12.5.2.A Display data in a scatter plot, describe its shape, and estimate how close the data comes to fitting an equation.			
		12.5.2.B Relate the slope of a regression line to the rate of change for the data set.	Functions and Linear Equations	More about Slope	
		12.5.2.C Determine what the y-intercept or beginning value indicates about the data.	Solving Systems	Analyzing Statistical Data	
		12.5.2.D Determine the validity of predictions made from regression equations.	Solving Systems	Histograms	
	12.5.3 Apply theoretical probability to represent problems and make decisions.	12.5.3.A Explain the likelihood of the next event based on theoretical probabilities.		Rational Expressions	More about the Multiplication Principle
			Rational Expressions	Counting: An introduction to the Multiplication Principle	
			Rational Expressions	The Basics of Probability	

			Rational Expressions	Using Data to Make Predictions
12.5.4 Evaluate how transformations on data affect the measures of central tendency and variability.	12.5.4.A Describe how adding the same amount to each score changes the mean, median, mode, range, outliers, interquartile points, maximum, and minimum.		Solving Systems	Statistics
			Solving Systems	Identifying Outliers
			Variables and Expressions	Stem and Leaf Plots
			Variables and Expressions	Mean, Median and Mode
	12.5.4.B Describe how dropping an outlier changes the other measures.		Solving Systems	Identifying Outliers
12.5.5 Interpret data represented by the normal distribution and formulate conclusions.	12.5.5.A Sketch a normal or bell curve, label one and two standard deviations from the mean and fill in approximate percents associated with the deviations.		Solving Systems	Statistics
			Variables and Expressions	Stem and Leaf Plots
		Variables and Expressions	Mean, Median and Mode	
	12.5.5.B Determine factors that will produce a curve that is not normal.			
	12.5.5.C Describe how sample size is related to a normal curve.			
	12.5.5.D Determine position or rank relative to others in a normally distributed group given the standard deviation and mean.		Variables and Expressions	Mean, Median and Mode
		Variables and Expressions	Stem and Leaf Plots	
		Solving Systems	Statistics	
12.5.6 Calculate probabilities of independent events.	12.5.6.A Calculate probabilities using the fundamental counting principle and permutations.		Rational Expressions	More about the Multiplication Principle
			Rational	Permutations

			Expressions	
12.6 Algebraic Concepts	12.6.1 Graph and interpret algebraic relations and inequalities.	12.6.1.A Describe a graph by identifying intercepts, slopes, maximum, minimum, increasing, decreasing, parallel, and perpendicular.	Functions and Linear Equations	More about Slope
			Functions and Linear Equations	Graphing an Equation Using Slope and Y-Intercept
		12.6.1.B Use families of curves to describe the effect of changing coefficients of an equation.		Graphing an Equation Using Intercepts
	12.6.2 Solve problems involving equations and inequalities.	12.6.2.A Use appropriate methods to solve linear and quadratic equations.	Equations	Mixture Problems
		Equations	Solving Problems	
		Equations	Equations with Variables on Each Side	
		Equations	Multiplication and Division in Equations	
		Equations	Parentheses in Equations	
		Equations	Addition and Subtraction in Equations	
		Equations	Solving Mujlti-Step Equations	
		Equations	Formulas as Equations	
		Polynomials	Factoring Other Trinomials	
		Polynomials	Solving Equations by Factoring Trinomials	

			Functions and Linear Equations	Linear Patterns
			Functions and Linear Equations	Slope-Intercept Form
			Functions and Linear Equations	Writing Linear Equations
			Quadratics and Radicals	The Quadratic Formula
			Quadratics and Radicals	Solving by Using Square Roots
			Quadratics and Radicals	Solving Quadratic Equations with Graphs
	12.6.3 Solve problems involving systems of two equations, and systems of two or more inequalities.	12.6.3.A Solve systems by graphing, substitution, elimination, or matrices.	Functions and Linear Equations	Replacement Sets and Variables
			Solving Systems	Elimination and Multiplication
	12.6.4 Solve problems using patterns and functions.	12.6.4.A Apply direct and indirect variations.	Rational Expressions	Inverse Variation
			Rational Expressions	Problem Solving
			Functions and Linear Equations	Direct Variation
		12.6.4.B Recognize the properties of families of functions.	Functions and Linear Equations	Functions
		12.6.4.C Recognize patterns of exponential growth and decay and their significance to real-life situations.	Exponentials	Exponential Graphs
			Exponentials	Graphing Exponential Equations
			Exponentials	Growth and Decay



		12.6.4.D Represent a problem in multiple formats (words, tables, graphs, and symbols).	Functions and Linear Equations	The Coordinate System
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