



Alignment Document
State of Nebraska and Aventa Learning Algebra II

Algebra II
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.	Complex Numbers	Introduction
		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.		
	12.1.2 Express the equivalent forms of numbers using exponents, radicals, scientific notation, absolute values, fractions, decimals, and percents.			
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.			
		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.	Covered throughout the course

	12.2.3 Perform estimations and computations of real numbers mentally, with paper and pencil, and with technology.			
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.				
12.4 Geometry/Spatial Concepts	12.4.1 Calculate perimeter and area of two-dimensional shapes and surface area and volume of three-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.				
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.			
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.		
		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.		
	12.5.2 Write equations and make predictions from sets of data.	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.		
		12.5.2.C Determine what the y-intercept or beginning value indicates about the data.		
		12.5.2.D Determine the validity of predictions made from regression equations.		
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.	Counting	Probability: An introduction	
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.			

		12.5.4.B Describe how dropping an outlier changes the other measures.		
	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.		
		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.		
	12.5.6 Calculate probabilities of independent events.	12.5.6.A Calculate probabilities using the fundamental counting principle and permutations.	Counting Counting Counting Counting	Permutations Combinations Counting Subsets Formula Counting: An introduction to choosing subsets
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.		
		12.6.1.B Use families of curves to describe the effect of changing coefficients of an equation.		
	12.6.2 Solve problems involving equations and inequalities.	12.6.2.A Use appropriate methods to solve linear and quadratic equations.	Quadratics Quadratics Quadratics Linear (missing)	Quadratics The Discriminate of a Quadratic The quadratic formula: Where did it come from?

	<p>12.6.3 Solve problems involving systems of two equations, and systems of two or more inequalities.</p>	<p>12.6.3.A Solve systems by graphing, substitution, elimination, or matrices.</p>	<p>Systems of Linear Equations</p> <p>Systems of Linear Equations</p> <p>Systems of Linear Equations</p> <p>Systems of Linear Equations</p> <p>Systems of Linear Equations</p> <p>Systems of Linear Equations</p>	<p>Systems of two linear equations with two variable</p> <p>The Substitution way to solve a system</p> <p>The two other possibilities for systems of two linear equations</p> <p>The addition method to solve a system which has two linear equations with two variables</p> <p>Gauss – Jordon Elimination</p> <p>Systems having three linear equations</p>
	<p>12.6.4 Solve problems using patterns and functions.</p>	<p>12.6.4.A Apply direct and indirect variations.</p> <p>12.6.4.B Recognize the properties of families of functions.</p> <p>12.6.4.C Recognize patterns of exponential growth and decay and their significance to real-life situations.</p> <p>12.6.4.D Represent a problem in multiple formats (words, tables, graphs, and symbols).</p>	<p></p> <p>Composition of Functions</p> <p>Exponential and Logarithm functions</p> <p>Exponential and Logarithm functions</p> <p>Exponential and Logarithm functions</p>	<p></p> <p>Definition of Functions</p> <p>Computations with exponential functions</p> <p>Graphs of exponential functions</p> <p>Exponential functions with fractional bases</p>