



Alignment Document  
State of Illinois and Aventa Learning Algebra II

**Algebra II**  
2005-2007 Benchmark Blueprint

State Goals	Learning Standards	Benchmarks	Unit Name	Course Topic Description
6 Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.	6.A Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.	6.A.5 Perform addition, subtraction and multiplication of complex numbers and graph the results in the complex plane.	Complex Numbers	Addition and Subtraction in a Complex Plane
			Complex Numbers	Working with complex numbers
			Complex Numbers	Graphing Complex Numbers
	6.B Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships.	6.B.5 Identify, represent and apply numbers expressed in exponential, logarithmic and scientific notation using contemporary technology.	Exponential and Logarithm functions	Values of logarithm functions: a look at your calculator
			Exponential and Logarithm functions	Logarithm functions
			Exponential and Logarithm functions	Real Life Logarithmic Examples
			Exponential and Logarithm functions	Values of logarithm functions
6.C Compute and estimate using mental mathematics, paper-and-	6.C.5 Determine the level of accuracy needed for computations involving	Exponential and Logarithm functions	More Real Life Logarithmic Examples	
		Complex Numbers	Logarithm functions and exponential functions together	
			Complex Numbers	Introduction

	pencil methods, calculators and computers.	measurement and irrational numbers.		
	<b>6.D</b> Solve problems using comparison of quantities, ratios, proportions and percents.	<b>6.D.5</b> Solve problems involving loans, mortgages and other practical applications involving geometric patterns of growth.	Absolute Value	Absolute Value equations in other places
<b>7</b> Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.	<b>7.A</b> Measure and compare quantities using appropriate units, instruments and methods.	<b>7.A.5</b> Apply nonlinear scales (e.g., Richter, decibel, pH) to solve practical problems.		
	<b>7.B</b> Estimate measurements and determine acceptable levels of accuracy.	<b>7.B.5</b> Estimate perimeter, area, volume, and capacity of irregular shapes, regions and solids and explain the reasoning supporting the estimate.		
	<b>7.C</b> Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.	<b>7.C.5a</b> Use dimensional analysis to determine units and check answers in applied measurement problems.		
		<b>7.C.5b</b> Determine how changes in one measure may affect other measures (e.g., what happens to the volume and surface area of a cube when the side of the cube is halved).		
<b>8</b> Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.	<b>8.A</b> Describe numerical relationships using variables and patterns.	<b>8.A.5</b> Solve mathematical problems involving recursive patterns and use models that employ such relationships.		
	<b>8.B</b> Interpret and describe numerical relationships using tables, graphs and symbols.	<b>8.B.5</b> Use functions including exponential, polynomial, rational, parametric, logarithmic, and trigonometric to describe numerical relationships.	Exponential and Logarithm functions Exponential and Logarithm functions Exponential and Logarithm functions Exponential and Logarithm functions	Computations with exponential functions Exponential functions: an example Graphs of exponential functions Introduction

			Exponential and Logarithm functions	Exponential functions: the formal definition
			Exponential and Logarithm functions	Exponential functions: an intuitive approach
<b>8.C</b> Solve problems using systems of numbers and their properties.	<b>8.C.5</b> Use polynomial, exponential, logarithmic and trigonometric functions to model situations.		Exponential and Logarithm functions	Computations with exponential functions
			Exponential and Logarithm functions	Introduction
			Exponential and Logarithm functions	Exponential functions: the formal definition
			Exponential and Logarithm functions	Exponential functions: an intuitive approach
			Exponential and Logarithm functions	Graphs of exponential functions
			Exponential and Logarithm functions	Exponential functions: an example
			Composition of Functions	Function Notation
<b>8.D</b> Use algebraic concepts and procedures to represent and solve problems.	<b>8.D.5</b> Formulate and solve nonlinear equations and systems including problems involving inverse variation and exponential and logarithmic growth and decay.		Exponential and Logarithm functions	More Real Life Logarithmic Examples
			Exponential and Logarithm functions	Exponential functions with fractional bases
			Exponential and Logarithm functions	Real Life Logarithmic Examples
			Exponential and Logarithm functions	Graphs of exponential functions

			Exponential and Logarithm functions	Comparing sizes
			Exponential and Logarithm functions	Computations with exponential functions
<b>9</b> Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.	<b>9.A</b> Demonstrate and apply geometric concepts involving points, lines, planes and space.	<b>9.A.5</b> Use geometric figures and their properties to solve problems in the arts, the physical and life sciences and the building trades, with and without the use of technology.		
	<b>9.B</b> Identify, describe, classify and compare relationships using points, lines, planes and solids.	<b>9.B.5</b> Construct and use two- and three-dimensional models of objects that have practical applications (e.g., blueprints, topographical maps, scale models).		
	<b>9.C</b> Construct convincing arguments and proofs to solve problems.	<b>9.C.5a</b> Perform and describe an original investigation of a geometric problem and verify the analysis and conclusions to an audience.		
		<b>9.C.5b</b> Apply physical models, graphs, coordinate systems, networks and vectors to develop solutions in applied contexts (e.g., bus routing, areas of irregular shapes, describing forces and other physical quantities).		
	<b>9.D</b> Use trigonometric ratios and circular functions to solve problems.	<b>9.D.5</b> Analyze and solve problems involving periodic patterns (e.g., sound waves, tide variations) using circular functions and communicate results orally and in writing.		
<b>10</b> Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.	<b>10.A</b> Organize, describe and make predictions from existing data.	<b>10.A.5</b> Construct a statistics-based presentation, individually and as members of a team, to communicate and justify the results of a project.		
	<b>10.B</b> Formulate questions, design data collection methods, gather and analyze data and communicate	<b>10.B.5</b> Design a statistical experiment to answer a question about a realistic situation, conduct the experiment, use		



	findings.	statistics to interpret the data, and communicate the results, individually and as members of a team.		
	<b>10.C</b> Determine, describe and apply the probabilities of events.	<b>10.C.5a</b> Compute conditional probabilities and the probabilities of independent events.	Counting	Probability: More examples
		<b>10.C.5b</b> Compute probabilities in counting situations involving permutations and combinations.	Counting	Counting Subsets Formula
			Counting	Combinations
			Counting	Counting: An introduction to choosing subsets
			Counting	Frequency Expectation
			Counting	Interpretation of probability
				Permutations
		<b>10.C.5c</b> Make predictions using probabilities associated with normally distributed events.	Counting	Frequency Expectation Interpretation of probability