



Alignment Document  
State of Mississippi and Aventa Learning Pre-Calculus

**Pre-Calculus**  
2005-2007 Benchmark Blueprint

Strands	Standards	Benchmarks	Unit Name	Course Topic Description
Number and Operations	PC.1 Explore and illustrate the characteristics and operations connecting sequences and series.	PC.1.a Express sequences and series using recursive and explicit formulas.	Discrete Mathematics	Sequences and Series: Terms, Sums and Limits
		PC.1.b Evaluate and apply formulas for arithmetic and geometric sequences and series.	Discrete Mathematics	Sequences and Series: Terms, Sums and Limits
		PC.1.c Calculate limits based on convergent and divergent series.	Discrete Mathematics	Sequences and Series: Terms, Sums and Limits
		PC.1.d Evaluate and apply infinite geometric series.	Discrete Mathematics	Sequences and Series: Terms, Sums and Limits
Algebra	PC.2 Analyze, manipulate, and solve equations and inequalities.	PC.2.a Determine characteristics of graphs of parent functions (domain/range, increasing/decreasing intervals, intercepts, symmetry, end behavior, and asymptotic behavior).	Exponential and Logarithmic Functions	Properties and Graphs
		PC.2.b Determine horizontal, vertical, and slant asymptotes and holes of rational functions and explain how each was found.		
		PC.2.c Determine the domain and range of functions, including piece-wise functions.		
		PC.2.d Determine the end behavior of polynomial functions.		
		PC.2.e Decompose composite functions into component functions.		

		<b>PC.2.f</b> Solve exponential and logarithmic equations to include real-world applications.	Exponential and Logarithmic Functions	Values and Applications
		<b>PC.2.g</b> Find the possible rational roots using the Rational Root Theorem.		
		<b>PC.2.h</b> Find the zeros of polynomial functions by synthetic division and the Factor Theorem.		
		<b>PC.2.i</b> Graph and solve quadratic inequalities.		
		<b>PC.2.j</b> Decompose a rational function into partial fractions.		
Geometry	<b>PC.3</b> Recognize, sketch, and transform graphs of functions.	<b>PC.3.a</b> Describe the attributes of graphs and the general equations of parent functions (linear, quadratic, cubic, absolute value, rational, exponential, logarithmic, square root, cube root, and greatest integer).	Exponential and Logarithmic Functions	Properties and Graphs
		<b>PC.3.b</b> Explain the effects of changing the parameters in transformations of functions.	Exponential and Logarithmic Functions	Properties and Graphs
		<b>PC.3.c</b> Predict the shapes of graphs of exponential, logarithmic, rational, and piece-wise functions, and verify the prediction with and without technology.	Exponential and Logarithmic Functions	Properties and Graphs
		<b>PC.3.d</b> Relate symmetry of the behavior of even and odd functions.		
Data Analysis & Probability	<b>PC.4</b> Adapt curves to data.	<b>PC.4.a</b> Use regression methods available through technology to determine appropriate exponential and logarithmic functions that model real-life data.	Exponential and Logarithmic Functions	Values and Applications
		<b>PC.4.b</b> Use regression methods available through technology to determine appropriate cubic functions that model real-life data.	Exponential and Logarithmic Functions	Values and Applications
	<b>PC.5</b> Explore and apply	<b>PC.5.a</b> Analyze expressions in summation	Discrete	Sequences and Series:



	fundamental principles of probability.	and factorial notation to solve problems.	Mathematics	Convergence, Divergence and Applications
		<b>PC.5.b</b> Expand and apply the Binomial Theorem to problem-solving situations.	Discrete Mathematics	Sequences and Series: Convergence, Divergence and Applications