



Alignment Document  
State of North Carolina and Aventa Learning Pre-Calculus

**Pre-Calculus**

Goals	Standards	Unit Name	Course Topic Description
1 The learner will describe geometric figures in the coordinate plane algebraically.	1.01 Transform relations in two dimensions; describe the results algebraically and geometrically.	Conics, Polar Coordinates and Complex Numbers	Conics: Circles, Ellipses, Hyperbolas, and Parabolas
	1.02 Use the quadratic relations (parabola, circle, ellipse, hyperbola) to model and solve problems; justify results.	Conics, Polar Coordinates and Complex Numbers	Conics: Circles, Ellipses, Hyperbolas, and Parabolas
	1.02.a Solve using tables, graphs, and algebraic properties.	Conics, Polar Coordinates and Complex Numbers	Conics: Circles, Ellipses, Hyperbolas, and Parabolas
	1.02.b Interpret the constants and coefficients in the context of the problem.	Conics, Polar Coordinates and Complex Numbers	Conics: Circles, Ellipses, Hyperbolas, and Parabolas
	1.03 Operate with vectors in two dimensions to model and solve problems.		
2 The learner will use relations and functions to solve problems.	2.01 Use functions (polynomial, power, rational, exponential, logarithmic, logistic, piecewise-defined, and greatest integer) to model and solve problems; justify results.	Exponential and Logarithmic Functions	Properties and Graphs
	2.01.a Solve using graphs and algebraic properties.	Exponential and Logarithmic Functions	Values and Applications
	2.01.b Interpret the constants, coefficients, and bases in the context of the problem.	Exponential and Logarithmic Functions	Properties and Graphs
	2.02 Use trigonometric and inverse trigonometric functions to model and solve problems; justify results.		
	2.02.a Solve using graphs and algebraic properties.		
	2.02.b Create and identify transformations		

	with respect to period, amplitude, and vertical and horizontal shifts.		
	<b>2.02.c</b> Develop and use the law of sines and the law of cosines.		
	<b>2.03</b> For sets of data, create and use calculator-generated models of linear, polynomial, exponential, trigonometric, power, logistic, and logarithmic functions.	Exponential and Logarithmic Functions	Values and Applications
	<b>2.03.a</b> Interpret the constants, coefficients, and bases in the context of the data.	Exponential and Logarithmic Functions	Values and Applications
	<b>2.03.b</b> Check models for goodness-of-fit; use the most appropriate model to draw conclusions or make predictions.	Exponential and Logarithmic Functions	Values and Applications
	<b>2.04</b> Use the composition and inverse of functions to model and solve problems.	Exponential and Logarithmic Functions	Values and Applications
	<b>2.05</b> Use polar equations to model and solve problems.	Conics, Polar Coordinates and Complex Numbers	Polar Coordinates and Complex Numbers
	<b>2.05.a</b> Solve using graphs and algebraic properties.	Conics, Polar Coordinates and Complex Numbers	Polar Coordinates and Complex Numbers
	<b>2.05.b</b> Interpret the constants and coefficients in the context of the problem.	Conics, Polar Coordinates and Complex Numbers	Polar Coordinates and Complex Numbers
	<b>2.06</b> Use parametric equations to model and solve problems.	Conics, Polar Coordinates and Complex Numbers	Parametric Equations
	<b>2.07</b> Use recursively-defined functions to model and solve problems.	Discrete Mathematics	Sequences and Series: Terms, Sums and Limits
	<b>2.07.a</b> Find the sum of a finite sequence.	Discrete Mathematics	Sequences and Series: Terms, Sums and Limits
	<b>2.07.b</b> Find the sum of an infinite sequence.	Discrete Mathematics	Sequences and Series: Terms, Sums and Limits
	<b>2.07.c</b> Determine whether a given series converges or diverges.	Discrete Mathematics	Sequences and Series: Convergence, Divergence and Applications
	<b>2.07.d</b> Translate between recursive and explicit representations.	Discrete Mathematics	Sequences and Series: Terms, Sums and Limits
	<b>2.08</b> Explore the limit of a function graphically, numerically, and algebraically.	Discrete Mathematics	Sequences and Series: Terms, Sums and Limits