



# Alignment Document

## State of Texas And Aventa Learning Calculus

### Calculus

#### 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
111.35	Precalculus		
111.35.P.1	The student defines functions, describes characteristics of functions, and translates among verbal, numerical, graphical, and symbolic representations of functions, including polynomial, rational, power (including radical), exponential, logarithmic, trigonometric, and piecewise-defined functions.	Limits and Their Properties	Linear Models and Rates of Change
111.35.P.1.A	describe parent functions symbolically and graphically, including $f(x) = x$ to the $n$ power, $f(x) = 1/n x$ , $f(x) = \log_a x$ , $f(x) = 1/x$ , $f(x) = e$ to the $x$ power, $f(x) =  x $ , $f(x) = a$ to the $x$ power, $f(x) = \sin x$ , $f(x) = \arcsin x$ , etc.;	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.1.B	determine the domain and range of functions using graphs, tables, and symbols;	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.1.C	describe symmetry of graphs of even and odd functions;	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.1.D	recognize and use connections among significant values of a function (zeros, maximum values, minimum values, etc.), points on the graph of a function, and the symbolic representation of a function; and	Limits and Their Properties	Linear Models and Rates of Change
111.35.P.1.E	investigate the concepts of continuity, end behavior, asymptotes, and limits and connect these characteristics to functions represented graphically and numerically.	Limits and Their Properties	Finding Limits Graphically, Numerically, and Analytically



111.35.P.2	The student interprets the meaning of the symbolic representations of functions and operations on functions to solve meaningful problems.		
111.35.P.2.A	apply basic transformations, including $a * f(x)$ , $f(x) + d$ , $f(x - c)$ , $f(b * x)$ , and compositions with absolute value functions, including $ f(x) $ , and $f( x )$ , to the parent functions;	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.2.B	perform operations including composition on functions, find inverses, and describe these procedures and results verbally, numerically, symbolically, and graphically; and	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.2.C	investigate identities graphically and verify them symbolically, including logarithmic properties, trigonometric identities, and exponential properties.	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.3	The student uses functions and their properties, tools and technology, to model and solve meaningful problems.		
111.35.P.3.A	investigate properties of trigonometric and polynomial functions;	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.3.B	use functions such as logarithmic, exponential, trigonometric, polynomial, etc. to model real-life data;	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.3.C	use regression to determine the appropriateness of a linear function to model real-life data (including using technology to determine the correlation coefficient);	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.3.D	use properties of functions to analyze and solve problems and make predictions; and	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.3.E	solve problems from physical situations using trigonometry, including the use of Law of Sines, Law of Cosines, and area formulas and incorporate radian measure where needed.	Limits and Their Properties	Functions, Graphs of Functions, and Finding Models to Data
111.35.P.4	The student uses sequences and series as well as tools and technology to represent, analyze, and solve real-life problems.		
111.35.P.4.A	represent patterns using arithmetic and geometric sequences and series;		
111.35.P.4.B	use arithmetic, geometric, and other sequences and series to solve real-life problems;		
111.35.P.4.C	describe limits of sequences and apply their properties to investigate convergent and divergent series; and		



AVENTA LEARNING

111.35.P.4.D	apply sequences and series to solve problems including sums and binomial expansion.		
111.35.P.5	The student uses conic sections, their properties, and parametric representations, as well as tools and technology, to model physical situations.		
111.35.P.5.A	use conic sections to model motion, such as the graph of velocity vs. position of a pendulum and motions of planets;		
111.35.P.5.B	use properties of conic sections to describe physical phenomena such as the reflective properties of light and sound;		
111.35.P.5.C	convert between parametric and rectangular forms of functions and equations to graph them; and		
111.35.P.5.D	use parametric functions to simulate problems involving motion.		
111.35.P.6	The student uses vectors to model physical situations.		
111.35.P.6.A	use the concept of vectors to model situations defined by magnitude and direction; and		
111.35.P.6.B	analyze and solve vector problems generated by real-life situations.		