



Alignment Document

State of Texas And Aventa Learning Pre-Calculus

Pre-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.	Exponential and Logarithmic Functions	Properties and Graphs
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.;	Exponential and Logarithmic Functions	Properties and Graphs
111.35.P.1.B	determine the domain and range of functions using graphs, tables, and symbols;		
111.35.P.1.C	describe symmetry of graphs of even and odd functions;		
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	Conics, Polar Coordinates and Complex Numbers	Conics: Circles, Ellipses, Hyperbolas, and Parabolas



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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.	Discrete Mathematics	Sequences and Series: Convergence, Divergence, and Applications
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;		
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		
111.35.P.2.C	investigate identities graphically and verify them symbolically, including logarithmic properties, trigonometric identities, and exponential properties.	Exponential and Logarithmic Functions	Properties and Graphs
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;		
111.35.P.3.B	use functions such as logarithmic, exponential, trigonometric, polynomial, etc. to model real-life data;	Exponential and Logarithmic Functions	Values and Applications
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);	Exponential and Logarithmic Functions	Values and Applications
111.35.P.3.D	use properties of functions to analyze and solve problems and make predictions; and	Exponential and Logarithmic Functions	Values and Applications
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.		



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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;	Discrete Mathematics	Sequences and Series: Terms, Sums, and Limits
111.35.P.4.B	use arithmetic, geometric, and other sequences and series to solve real-life problems;	Discrete Mathematics	Sequences and Series: Convergence, Divergence, and Applications
111.35.P.4.C	describe limits of sequences and apply their properties to investigate convergent and divergent series; and	Discrete Mathematics	Sequences and Series: Convergence, Divergence, and Applications
111.35.P.4.D	apply sequences and series to solve problems including sums and binomial expansion.	Discrete Mathematics	Sequences and Series: Convergence, Divergence, and Applications
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;	Conics, Polar Coordinates, and Complex Numbers	Polar Coordinates and Complex Numbers
111.35.P.5.B	use properties of conic sections to describe physical phenomena such as the reflective properties of light and sound;	Conics, Polar Coordinates, and Complex Numbers	Conics: Circles, Ellipses, Hyperbolas, and Parabolas
111.35.P.5.C	convert between parametric and rectangular forms of functions and equations to graph them; and	Conics, Polar Coordinates, and Complex Numbers	Parametric Equations
111.35.P.5.D	use parametric functions to simulate problems involving motion.	Conics, Polar Coordinates, and Complex Numbers	Parametric Equations
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.		