Scope and Sequence
Mathematics
PreCalculus 400

Description: Students will study functions (linear, quadratic, nth degree, rational, irrational, exponential, logarithmic, sinusoidal and parametric), sequences and series and conic sections. They will also study inverse functions,circular functions, vector spaces, the solution of triangles, the law of sines and cosines, and applications. Designed to prepare students for the study of Calculus. A Texas Instruments graphing calculator is required.

Departmental assessments are given to measure individual student, class, and grade level achievement in math. Data are collected by each teacher and used to monitor progress and make plans for instruction. At the grade level, the data are used to monitor and adjust curriculum and instruction. End of quarter, end of semester, and/or end of course exams may be used.

Unit Name/Description	Content and/or Skills
Trigonometric Functions	Finding the measure of an angle in either degrees or radian and finding coterminal angles
	Finding the arc length and area of a sector of a circle and solving problems involving apparent size
	Using the definitions of sine and cosine to find values of these functions and solving simple trigonometric equations
	Using reference angles, calculators, and special angles to find values of the sine and cosine functions and sketching the graphs of these functions
	Finding values of the tangent, cotangent, secant and cosecant functions and and sketching graphs of these functions
	Finding values of the inverse trigonometric functions

Trigonometric Equations and Applications	Solving and applying simple trigonometric equations
	Finding and applying equations of different sine and cosine curves
	Using trigonometric functions to model periodic behavior
	Simplifying trigonometric expressions and proving trigonometric identities
	Using trigonometric identities to solve more difficult trigonometric equations
Triangle Trigonometry	Using trigonometry to find unknown sides or angles of a right triangle
	Finding the area of a triangle given the lengths of two sides and the measure of the included angle
	Using the law of sines to find the unknown parts of a triangle
	Using the law of cosines to find the unknown parts of a triangle
	Using trigonometry to solve navigation and surveying problems
Trigonometric Addition Formulas	Deriving and applying the sum and difference formulas for sine, cosine, and tangent
	Deriving and applying the double and half angle formulas for sine, cosine, and tangent
	Using identities to solve trigonometric equations
Polar Coordinates	Graphing polar coordinates
	Converting rectangular coordinates into polar coordinates and vice versa
	Graphing polar equations
	Converting rectangular equations into polar equations and vice versa
Parametric Equations	Using parametric equations to describe motion in a plane; this motions includes lines, circles, and parabolas
	Solving word problems by analyzing objects in motion using parametrics and determining how close the objects get to one another
Midterm Exam	

Functions	Identifying functions, determining domain, range, and zeros of the function, and graphing the function
	Performing operations on functions and determining the domains of the resulting function
	Reflecting graphings and using symmetry to sketch graphs
	Determining periodicity and amplitude from graphs, stretching and shrinking graphs both horizontally and vertically, and translating graphs
	Finding the inverse of a function, if the inverse exists, and if the inverse does exist, finding its domain and range
	Forming a function of one variable from a verbal description and, when appropriate, determining the minimum or maximum value of the function
Exponents and Logarithms	Defining and applying integral and rational exponents
	Defining and using exponential functions
	Defining and applying logarithms and the laws of logarithms
	Solving exponential equations and changing the base of logarithms
Analytic Geometry (Conics)	Finding the equation of circles and finding the points of intersection of circles and lines
	Finding the equations of ellipses, hyperbolas and parabolas, and graphing them
	Finding the equations of all of the conic sections from the general second degree equation by completing the square
Vectors	Performing basic operations of vectors
	Breaking vectors down into horizontal and vertical components
	Using vector components to solve word problems
Sequences and Series	Identifying an arithmetic or geometric sequence and finding the formula for its n-th term
	Using sequences defined recursively to solve problems
	Finding the sum of the first n terms of arithmetic or geometric series
	Finding the limit of an infinite sequence or determining that the limit does not exist
	Finding the sum of an infinite geometric series
	Representing series using sigma notation

Limits, Continuity, Rational Functions	Finding the limit of a function or the quotient of two functions and determining whether the function is continuous
	Sketching the graph of rational functions