Overview of Year

PreCalculus Mathematics Curriculum

SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE
Unit 1 Functions: Polynomial and Rational - 15 classes	Unit 2 Circular Motion and Periodic Functions - 10 classes	Unit 3 Inverse Functions -14 classes	Unit 4 Families of Functions -24 classes	Unit 5 Trigonometric Functions and Equations -20 classes	Unit 6 Exponential Functions and Logarithms -7 classes				

Unit 1	**Understanding**	**Essential Question**
Functions: Polynomial and Rational	• Model problems using polynomial or rational functions • Identify patterns relating rules and graphs of polynomial functions • Review operations with polynomial expressions • Find zeroes of polynomial functions and write rules give the zeroes • Analyze graphs of rational functions and asymptotes	How can problem situations be modeled and analyzed using polynomial or rational functions? How can multiple representation be used to analyze polynomial or rational functions?
Performance Task:		

Unit 2	**Understanding**	**Essential Question**
Circular Motion and Periodic Functions	• Determine values of sine, cosine and tangent of an angle in standard position in the coordinate plane using (x,y,r) • Determine the sine, cosine, tangent of an acute angle in a right triangle and determine the angle if given one of the trig values • Analyze linear and angular velocity	How are angular and linear measure related? How can sine, cosine and tangent be defined in terms of x, y and r? How can symmetry and the coordinate grid be used to justify properties of trig functions?

	• Understand what a radian is and how it can be used • Define sine and cosine as functions of real numbers and analyze the resulting periodic graphs • Use sine and cosine functions to model periodic patterns of change	How are angular and linear velocity related? What is radian measure and why is it important? How can sine and cosine be used to model periodic patterns of change in physical phenomena?
Performance Task:		

Unit 3	**Understanding**	**Essential Question**
Inverse Functions	• Understand inverse functions • Solve problems with direct and indirect variation • Use multiple representation to make sense of functions • Define and evaluate common logarithms • Use logarithms to solve exponential equations • Develop and use the properties of logarithmic functions • Define and use the inverse trig functions • Express the general solution of a trig equation • Use trig equation and their solutions to answer questions about periodic phenomena	What is the inverse of a functions and how is it used? How can common logarithms be used to solve exponential equations? How can the properties of logarithms be used to express relationships?
Performance Task:		

Unit 4	**Understanding**	**Essential Question**
Families of Functions	• Multiple Representation • Families of Functions • Patterns of Change • Transformations of Functions	How can multiple representation be used to analyze families of functions? How can transformations be used to modify functions and how do

	• Combining Functions—arithmetic and composition	the affect the properties of the functions? How can functions be combined and what does it mean?
Performance Task:		

Unit 5	**Understanding**	**Essential Question**
Trigonometric Functions and Equations	• Know and be able to use the definitions of the six trigonometric functions • Use the fundamental trigonometric identities • Solve trigonometric equations • Represent complex numbers geometrically and interpret multiplication and division of these numbers geometrically • Use DeMoivre"s Theorem to find roots and powers of complex numbers	How can trigonometric identities be used to transform relationships? How can trigonometric equations be solve symbolically? How can complex numbers be represented geometrically? How can calculations with complex numbers be represented geometrically? How can quadratic expressions be written in equivalent forms?
Performance Task:		

Unit 6	**Understanding**	**Essential Question**
Exponential Functions and Logarithms	• Understand e as a limit • Use exponential functions with a base of e to solve growth and decay problems • Rewrite exponential equations with a base of e and logarithms with a base of 10 or e • Use properties of exponents and logarithms to solve problems	What is e and how is it used in mathematics? How care exponential and logarithmic equations related? How can exponents and logarithms be used to solve problems?
Performance Task:		