Pre-Calculus Honors Curriculum

Students can expect more rigor, proof and abstraction in this course as compared to the Pre-Calculus (CP) course. Students will be able to analyze and synthesize the mathematical concepts presented in the course, perform operations quickly and accurately, be self-motivated, and be risk takers willing to do challenging work. Pre-Calculus Honors is an intensive study of algebraic (polynomial and rational) and transcendental (exponential, logarithmic, trigonometric) functions. Emphasis is placed on the integration of algebraic and geometric processes for solving problems while functional theory is stressed throughout the course. Topics include graphs, polynomial and rational functions, exponential and logarithmic functions, and analytic trigonometry.

Review of algebraic concepts:
This unit will review concepts from previous Algebra courses, including real numbers, properties of exponents and radicals, operations with polynomials, including factoring polynomials, operations with rational expressions, solving equations and inequalities, and Calculus error prevention.

Functions and Their Graphs:
This unit will explain how to find the distance and midpoint between two points, how to write an equation of a line and graph an equation of a line, how to find x-intercepts and y-intercepts, how to identify the type of symmetry that a graph might have, how to analyze graphs of equations, how to graph the parent functions and how to graph transformations, how to find composite functions, and how to find inverse functions.

Polynomial and Rational Functions:
This unit show how to graphing and analyze quadratic functions and polynomial functions of higher degree, how to complete long and synthetic division, operations with complex numbers, how to find zeros of polynomial functions, how to factor polynomials completely using synthetic division and the rational zeros test, how to graph rational functions along with finding their asymptotes, and how to solve rational and non-linear inequalities.

Exponential and Logarithmic Functions:
This unit will explain how to graph and analyze logarithmic and exponential functions, properties of logarithms and exponentials, how to solve exponential and logarithmic equations, and their applications.

Trigonometry:
This unit will explain radian and degree measure, the unit circle, right triangle trigonometry, and trigonometric functions of any angle. Additionally, the unit will demonstrate how to graph trigonometric functions, how to determine a sine or cosine equation given a graph, how to evaluate inverse trigonometric functions, how to solve right triangles, and applications of trigonometry, including angles of elevation and depression, harmonic motion, and bearings.

Analytic Trigonometry:
This unit will explain the trigonometric identities, how to use the trigonometric identities to simplify trigonometric expressions, how to verify trigonometric identities, how to solve trigonometric equations, how to apply the sum and difference formulas, and how to apply double angle formulas.

Law of Sines and Cosines:
This unit will explain how to solve any type of triangle (not a right triangle) using Law of Sines or Law of Cosines and applications of these laws, such as bearings problems.