Classical Magnet School

Course Pre - Calculus

	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June
Themes	Trigonometric functions and their applications.			Exponential and Logarithmic Functions		Algebra Fundamentals	Functions and their graphs	Polynomial and Rational Functions	Analytic Trigonometry	Introduction to Calculus
Essential Questions	1. What are the effects of a relationship that is periodic or cyclical? 2. What makes for a good model?			1. How can you describe the nature of a relationship? 2. What makes for a good model? 3. Can every action be undone?					1. What are the effects of a relationship that is periodic or cyclical?	Why study Calculus?
Academic Standards, Student Expectations and Major Skills	1. Find coordinates on the unit circle. 2. Use the unit circle to evaluate trigonometric functions. 3. Find the measure of an angle either in degrees or in radians. 4. Find co-terminal angles.	1. Find the arc length and area of a sector of a circle. 2. Solve simple trigonometric equations. 3. Use references angles, calculators, tables, and special angles to fin the values of the sine and cosine functions and sketch the graph. 4. Find the values of the tangent, cotangent, secant and cosecant functions and sketch the graph of them. 5. Find the values of the inverse trigonometric functions.	1. Solve and apply simple trigonometric equations. 2. Find and apply equations of different sine and cosine curves. 3. Use trigonometric functions to model periodic behavior. 4. Use trigonometry to find unknown sides or angles of a right triangle. 5. Find the area of a triangle given the lengths of two sides and the measure of the included angle. 6.Use the Laws of Sines and Cosines to find unknown parts of a triangle.	1. Define and apply integral exponents. 2. Define and apply rational exponents. 3. Define and apply exponential functions. 4. Define and apply the natural exponential functions.	1. Define and apply logarithms. 2. Apply the laws of logarithms. 3. Solve exponential equations. 4. Change logarithms from one base to another.	1. Solve linear and quadratic equations. 2. Graph lines and find the intersection of two lines. 3. Find the slope of a line and its equation in various contexts. 4. Solve and graph linear inequalities in one variable, including absolute value inequalities. 5. Model real world situations using linear functions.	1. Identify a function, determine the domain, range, zeros and graph it. 2. Perform operations on functions and determine the domain of the resulting functions. 3. Reflect graphs and use symmetry to sketch graphs, stretch and shrink graphs both vertically and horizontally. 4. Translate graphs. 5. Define and graph quadratic functions. 6. Find minimum and maximum values of a quadratic function. 7. Model real world situations using quadratic functions. 8. Find the inverse of a function if it exists.	1. Use a graphing calculator to approximate the real roots of a polynomial equation. 2. Solve a polynomial equation by various factoring methods, including using the rational root method. 3. Apply all general theorems about polynomial equations. 4. Identify a polynomial, evaluate it using synthetic division and determine its zeros. 5. Graph a polynomial function and determine an equation for a polynomial graph. 6. Write a polynomial equation for a given situation and find the maximum or minimum value for the equation.	1. Simplify trigonometric expressions. 2. Solve trigonometric identities. 3. Derive and apply formulas for $\cos(\alpha \pm \beta)$ and $\sin(\alpha \pm \beta)$. 4. Derive and apply formulas for $\tan(\alpha \pm \beta)$. 5. Derive and apply double angle and half angle formulas. 6. Use identities to solve trigonometric equations.	1. Calculate limits of polynomial and rational functions. 2. Determine continuity of functions. 3. Find rates of change and some basic derivatives.
Textbook Chapters	Ch 5: Trigonometric Functions of Real Numbers Ch 6: Trigonometric Functions of Angles			Ch 4: Exponential and Logarithmic Functions		Ch 1: Fundamentals Ch 2: Functions	Ch 2: Functions	Ch 3: Polynomial and Rational Functions	Ch 7: Analytic Trigonometry	Ch 12: Limits: A Preview of Calculus
Coached Projects	1. Predator/Prey Cyclical Model 2. Biorhythm Project									
Seminars	Predator/Prey seminar.	Sawing a Wooden Beam seminar	Trigonometric Identities Seminar	Life Expectancy			Iteration and Chaos	Polynomial Investigation		Why Study Calculus?

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