Course Title: Precalculus		
School:THS	**Grade: 11-12**	**Curriculum Pacing: 36 weeks**
Unit One: Functions (Graphs and Zeros)	**Unit Two: Polynomial and Rational Functions**	**Unit Three: Radical Functions and Rational Exponents**
Unit Pacing: 6 weeks	**Unit Pacing: 4 weeks**	**Unit Pacing: 4 weeks**
Unit Overview: Students begin this first unit of Pre-Calculus by reviewing connections to Algebra I and Advanced Algebra and looking at functions. Students will re-familiarize themselves with the functions they have learned from Algebra I and Advanced Algebra and how they will connect with functions in Pre-Calculus. Students are also re-introduced to piecewise functions and connecting piecewise functions with the parent functions.	**Unit Overview:** In this unit, students will be building on students' knowledge of polynomial functions learned in previous math courses, this unit focuses on useful properties of polynomial and rational functions that will be used often in later units	**Unit Overview:**: In this unit, students will be building on students' knowledge of radical functions and solving equations with rational exponents learned in previous math courses. This unit focuses on useful properties of radical functions and rational exponents that will be used often in later units and courses.
Compelling Questions 1. How do you graph functions consisting of various functions with restricted domains? 2. How do you model a scenario that behaves differently at various intervals?	**Compelling Questions** 1. How do we find solutions of polynomial and power functions? 2. How can long division of polynomials be used to find intercepts, asymptotes, and the general behavior of rational functions? 3. How are solutions, zeros, and x-intercepts related?	**Compelling Questions** 1. To simplify the nth root of an expression, what must be true about the expression? 2. How are a function and its inverse function related?
Priority Learning Targets 1. I can interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship of a function that models a relationship between two quantities.	**Priority Learning Targets** 1. I can describe a polynomial based on its degree, number of terms, even/odd properties, end behavior, and zeros. 2. I can graph a rational function and analyze	**Priority Learning Targets** 1. I can graph a radical function. 2. I can solve an equation using properties of exponents and properties of inverses.

2. I can understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. 3. I can relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. CCSS.MATH.CONTENT.HSF.IF.B.4 CCSS.MATH.CONTENT.HSF.IF.A.1 CCSS.MATH.CONTENT.HSF.IF.B.5 CCSS.MATH.CONTENT.HSF.BF.3,4a,4b, 4c, 4d, 5	its behavior and discontinuities. 3. I can simplify rational expressions through multiplication, division, addition, subtraction, and factoring. CCSS.MATH.CONTENT.HSF.IF.C.7.C CCSS.MATH.CONTENT.HSA.APR.A.1 CCSS.MATH.CONTENT.HSA.APR.B.3 CCSS.MATH.CONTENT.HSF.IF.C.7.D	3. CCSS.MATH.CONTENT.HSA.REI.2 CCSS.MATH.CONTENT.HSA.REI.11
Unit Four: Exponential and Logarithmic Functions	**Unit Five: Unit circle and Trigonometric Graphs**	**Unit Six: Trigonometric Triangles and Applications**
Unit Pacing: 4 weeks	**Unit Pacing: 6 weeks**	**Unit Pacing: 4 weeks**
Unit Overview: In this unit, students will be building on students' knowledge of exponential and logarithmic functions learned in previous math courses, this unit focuses on useful properties that will be used often in later units and courses.	**Unit Overview**: In this unit, students will be using knowledge learned from geometry regarding right triangles and their angles and relating it to the unit circle. They will be exploring the behavior of trigonometric functions and their graphs.	**Unit Overview**:In this unit, students will be expanding on the relationships between the angle measures of triangles and their side lengths. They will be applying their knowledge of right triangles and sinusoidal behavior to real world scenarios.
Compelling Questions 1. How are exponential and logarithmic relationships related? 2. How are exponential and logarithmic	**Compelling Questions** 1. How are degrees and radians related to each other and how do they help us measure angles?	**Compelling Questions** 1. How can I apply the Pythagorean Theorem and trig functions to find missing lengths of sides and measurements of angles?

relationships used to model, solve, and understand real world situations?	2. How do special right triangles help us identify the exact values of trig functions? 3. How are the graphs of tangent, cotangent, cosecant and secant functions similar to and/or different form sine and cosine graphs?	2. How can I model periodic behavior as a sinusoidal function? 3. How can I apply the law of sines and law of cosines to a scenario?
Priority Learning Targets 1. I can model a scenario as an exponential and/or logarithmic function. 2. I can graph an exponential and logarithmic function. 3. I can interpret the parameters in a linear or exponential function in terms of a context. CCSS.MATH.CONTENT.HSF.IF.C.7.E CCSS.MATH.CONTENT.HSF.LE.B.5	**Priority Learning Targets** 1. I can graph a trigonometric function using transformations of functions. 2. I can evaluate trigonometric functions using trigonometric ratios and identities. 3. I can evaluate trigonometric functions using the unit circle. CCSS.MATH.CONTENT.HSF.TF.A.1 CCSS.MATH.CONTENT.HSF.TF.A.2 CCSS.MATH.CONTENT.HSF.TF.A.4 CCSS.MATH.CONTENT.HSF.TF.B.5 CCSS.MATH.CONTENT.HSF.TF.B.6 CCSS.MATH.CONTENT.HSF.TF.B.7	**Priority Learning Targets** 1. I can apply trigonometric ratios and properties to a scenario. 2. I can use right triangles to 3. I can use the law of sines and cosines to solve for parts of a triangle. CCSS.MATH.CONTENT.HSF.TF.A.3

Unit Seven: Trigonometric Identities and Composite Angles	**Unit Eight: Solving Trigonometric Equations and Inverse**	**Unit Nine: Vectors, Polar Coordinates, and Conic Sections**
Unit Pacing: 4 weeks	**Unit Pacing: 4 weeks**	**Unit Pacing: Enrichment**
Unit Overview: In this unit, students will be expanding on their use of trigonometric ratios and their relationships to each other. They will be using their knowledge of trigonometric identities to prove equivalent statements true.	**Unit Overview:** In this unit, students will be exploring solutions to trigonometric equations and how trigonometric functions relate to their inverses.	**Unit Overview:** In this unit, students will be expand on their knowledge of complex numbers and explore the relationships of their graphs on a new coordinate system. They will also explore new types of graphs in that of Parabolas, Circles, Ellipses and Hyperbolas.

Compelling Questions 1. What is the relationship between the Pythagorean Theorem and the fundamental identities? 2. How do you verify trigonometric identities?	**Compelling Questions** 1. How can we determine if an inverse trig function will yield multiple angles in a given interval? 2. What is the algebraic and graphical relationship between trig equations and quadratic/linear equations? 3. What is the relationship between trig functions and their inverses?	**Compelling Questions** 1. What is the benefit of rectangular and polar coordinates? 2. What is the importance of conic sections?
Priority Learning Targets 1. I can use trigonometric identities to prove an algebraic statement. 2. I can use trigonometric identities to simplify an algebraic expression. 3. I can evaluate trigonometric expressions using composite angles. CCSS.MATH.CONTENT.HSF.TF.C.8 CCSS.MATH.CONTENT.HSF.TF.C.9	**Priority Learning Targets** 1. I can solve a trigonometric equation 2. I can graph the inverse of a trigonometric function 3. I can evaluate an expression using properties of inverse trigonometric functions. CCSS.MATH.CONTENT.HSF.TF.6 CCSS.MATH.CONTENT.HSF.TF.7	**Priority Learning Targets** 1. I can graph a polar equation 2. I can graph a circle and an ellipse 3. I can graph a vector and vectors using properties of vectors. CCSS.MATH.CONTENT.HSF.TF. N.VM.1, 2, 3,4a, 4b, 4c, 5a, 5b CCSS.MATH.CONTENT.HSF.TF.N.CN.3,4,5,6 CCSS.MATH.CONTENT.HSF.TF.G.GPE.2