Pine Hill Public Schools Curriculum			
Content Area:	**Mathematics**		
Course Title/ Grade Level:	**Trigonometry Pre-Calculus**		
Unit 1:	**Functions and Graphing Functions**	Month:	**September/October**
Unit 2:	**Trigonometric Functions**	Month:	**October/November/ December**
Unit 3:	**Applications of Trigonometry**	Month:	**January**
Unit 4:	**Trigonometric Identities and Equations**	Month:	**January/February**
Unit 5:	**Polynomial Functions**	Month:	**February/March**
Unit 6:	**Inequalities and Linear Programming**	Month:	**April/May**
Unit 7:	**Exponential and Logarithmic Functions**	Month:	**May/June**
Date Created or Revised:	05/10/12		
BOE Approval Date:	8/28/12		

Pine Hill Public Schools Curriculum		
Unit Title: Functions and Graphing Functions		**Unit #: 1**
Course or Grade Level: Trigonometry Pre Calculus	**Length of Time: September to October (21 days)**	
Date Created: 5/10/12	**BOE Approval Date:**	
Pacing	(1 day) -Introduction to Modeling, (1 days) The Real Number System, (1 day) The Cartesian Coordinate System, (2 days) Relations and Functions, (2 days) Algebra of Functions, (2 days) Quiz Review and Quiz, (2 days) Inverse Functions, (2 days) Absolute Value/Greatest Integer/Piecewise Functions, (2 days) Test Review and Test, (2 day) Reflections and Transformations, (2 days) Solving Quadratic and Polynomial Equations, (2 days) Quiz Review and Quiz	
Essential Questions	• Are graphs useful in representing data and solving equations? • What factors can be used to determine whether an analytic or graphical strategy is most advantageous in solving a problem? • Why are relations and functions represented in multiple ways? • How are the properties of functions and functional operations useful?	
Content	Plotting Points. Domain and Range. Evaluating sums, differences, products, and quotients of functions. Inverse Functions. Graphing functions. Reflecting and transforming functions. Finding roots and solutions to quadratic equations graphically and analytically.	
Skills	• Determine whether a given relation is a function. Determine the domain of range of any given function or relation. Perform operations with functions. Find composite functions. Find and recognize inverse functions. Graph linear equalities and inequalities with and without graphing calculators. Find the zeros of a linear function. Define the sum, difference, product, and quotient of functions. Form and evaluate composite functions. Define and graph special functions. Determine the symmetry of a graph. SWBAT use symmetry to sketch a graph. Graph functions using reflections in the x-axis, y-axis, and the line y=x. Graph functions using translations and dilations.	
Assessments	• Summative: Tests and benchmark • Formative: Teacher observation, Classwork, Homework	
Inter-disciplinary Connections	• Science	
Lesson resources / Activities	• personally made worksheets • Assorted resources found online • *Advanced Mathematics: A Pre-Calculus Approach* – Prentice Hall	

Common Core State Standards	
Grade or Conceptual Category (HS only): Trigonometry/Pre-Calc	
Domain (name and #): Interpreting Function	
Cluster: Analyze functions using different representations	**#. Standard:** F-IF-7.A and B

21st Century Themes							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
	Creativity and		Critical Thinking and Problem		Communication and		Information Literacy

	Innovation		Solving		Collaboration		
	Media Literacy		ICT Literacy		Life and Career Skills		

Pine Hill Public Schools Curriculum		
Unit Title: Trigonometric Functions		**Unit #: 2**
Course or Grade Level: Trigonometry Pre-Calculus	**Length of Time: October to December (41 days)**	
Date Created: 5/10/12	**BOE Approval Date:**	
Pacing	(2 days) - Angles in the Coordinate Plane, (1 day) - Angle Measures in Degrees and Radians, (2 days) - Applications: Angular and Linear Velocity, (3 days) Circular Functions, (3 days) The Trigonometric Functions, (3 days) - Quiz Review and Quiz, (2 days) Functions of Special and Quadrantal Angles, (1 day) - Evaluating Trigonometric Functions, (3 days) - Fundamental Identities, (2 days) - Proving Trigonometric Identities, (3 days) - Test Review and Test, (2 days) - Graphs of the Sine and Cosine Functions, (2 days) - Period/Amplitude/and Phase Shift, (2 days) - Graphing other Trigonometric Functions, (2 days) - Quiz Review and Quiz, (3 days) - The Inverse Sine and Cosine Functions, (2 days) - Other Inverse Trigonometric Functions, (3 days) - Test Review and Test	
Essential Questions	• How do trigonometric and circular functions model real-world problems and their solutions? • How are the circular functions related to the trigonometric functions?	
Content	• Measuring angles in the coordinate plane. Unit conversions for angles. Angular and linear velocity. Evaluating and graphing (with transformations) trigonometric and inverse functions. Proving the fundamental trigonometric identities. Harmonic motion.	
Skills	• Solve problems involving angular velocity and linear velocity. Define the sine and cosine functions. Evaluate the sine and cosine functions of an angle given a point on its terminal side. Define the trigonometric functions. Evaluate the trigonometric functions of angles. Find the six trigonometric functions of special angles and quadrantal angles. Solve problems involving percents. Introduce and prove the reciprocal, ratio, Pythagorean, and odd-even identities. Use the fundamental identities to prove other trigonometric identities. Graph sine and cosine functions. Find the amplitude, period, and phase shift of a sine or cosine functions from its equation. Graph a sine or cosine function with a given phase shift, period, and amplitude. Graph the tangent, cotangent, secant, and cosecant functions.	
Assessments	• Summative: Tests and benchmark • Formative: Teacher observation, Classwork, Homework	
Inter-disciplinary Connections	• Science, English	
Lesson resources / Activities	• personally made worksheets • Assorted resources found online • *Advanced Mathematics: A Pre-Calculus Approach* – Prentice Hall	
Common Core State Standards		
Grade or Conceptual Category (HS only): Trigonometry/Pre-Calc		
Domain (name and #): Trigonometric Functions		
Cluster: Model periodic phenomena with trigonometric functions	**#. Standard:**	
	F-TF-5, 6, and 7	
Domain (name and #): Trigonometric Functions		
Cluster: Extend the	**#. Standard:**	

domain of trigonometric functions using the unit circle	F-TF-1,2,3 and 4
Domain (name and #): Interpreting Function	
Cluster: Analyze functions using different representations	**#. Standard:** F-IF-7.E

21st Century Themes							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

Pine Hill Public Schools Curriculum		
Unit Title: Applications of Trigonometry		**Unit #: 3**
Course or Grade Level: Trigonometry Pre-Calculus	**Length of Time: January (12 days)**	
Date Created: 5/10/12	**BOE Approval Date:**	
Pacing	(1 days) - Solving Right Triangles, (1 day) - The Law of Sines, (2 days) - The Ambiguous Case, (2 days) - Quiz Review and Quiz, (2 days) -The Law of Cosines, (1 day) - The Area of a Triangle, (3 days) -Test Review and Test	
Essential Questions	• How can we use trigonometric properties and laws to find values within a triangle? What are some situations where it would be useful to find a specific value in a triangle without actually measuring?	
Content	• Solving right triangles. Law of Sines. Law of Cosines. Area of a triangle.	
Skills	• Solve a right triangle given the measures of one angle and one side or the measure of two sides. Solve an isosceles triangle. Use the law of sines to solve a triangle when two angles and one side are given. Use the law of sines to solve a triangle when two sides and the opposite angle is given. Use the law of cosines to solve triangles. Find the area of a triangle given the measures of two sides and the included angle or one side and two angles. Find the area of a triangular segment of a circle given the radius of the circle and the central angle of the segment.	
Assessments	• Summative: Tests and benchmark • Formative: Teacher observation, Classwork, Homework	
Inter-disciplinary Connections	• Science	
Lesson resources / Activities	• personally made worksheets • Assorted resources found online • *Advanced Mathematics: A Pre-Calculus Approach* – Prentice Hall	
Common Core State Standards		
Grade or Conceptual Category (HS only): Trigonometry		
Domain (name and #): Similarity, Right Triangle, and Trigonometry		
Cluster: Apply trigonometry to general triangles	**#. Standard:**	
	G-SRT-10, 11	
Domain (name and #): Similarity, Right Triangle, and Trigonometry		
Cluster: Define trigonometric ratios, and solve problems involving right triangles.	**#. Standard:**	
	G-SRT-6,7 and 8	
Domain (name and #): Trigonometric Functions		
Cluster: Prove and apply trigonometric identities	**#. Standard:**	
	F-TF-8, and 9	

21st Century Themes							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

Pine Hill Public Schools Curriculum			
Unit Title: Trigonometric Identities and Equations			**Unit #: 4**
Course or Grade Level: Trigonometry Pre-Calculus		**Length of Time: January to February (19 days)**	
Date Created: 5/10/12		**BOE Approval Date:**	
Pacing	(3 days) - Sum and Difference Identities, (1 day) - Verifying Identities Graphically, (3 days) - Double-Angle and Half-Angle Identities, (2 days) - Product/Sum Identities, (2 days) Quiz Review and Quiz, (2 days) - Solving Trigonometric Equations and Inequalities, (3 days) -Solving Trigonometric Equations and Inequalities in Quadratic Form, (3 days) - Test Review and Test		
Essential Questions	• How are the six trigonometric and circular functions related to each other? • How does the recursive nature of the trigonometric functions affect their analytic values and graphical representations?		
Content	• Sum and Difference identities for trigonometric functions. Verifying identities graphically. Double angle and half angle identities for trigonometric functions. Product and sum identities for trigonometric functions. Solving trigonometric equations and inequalities.		
Skills	• Develop and use formulas for trigonometric functions of a sum and difference of two angle measures. Use a graphing utility to determine whether or note an equation is an identity. Develop and use the double-angle identities. Develop and use the half-angle identities. Develop and use product/sum identities. Develop and use product/sum identities. Solve trigonometric equations. Solve linear trigonometric inequalities. Solve quadratic trigonometric equations and inequalities.		
Assessments	• Summative: Tests and benchmark • Formative: Teacher observation, Classwork, Homework		
Inter-disciplinary Connections	• Science		
Lesson resources / Activities	• personally made worksheets • Assorted resources found online • *Advanced Mathematics: A Pre-Calculus Approach* – Prentice Hall		

Common Core State Standards	
Grade or Conceptual Category (HS only): Trigonometry	
Domain (name and #): Trigonometric Functions	
Cluster: Prove and Apply Trigonometric Identities	**#. Standard:** F-TF-8, 9

21st Century Themes							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

Pine Hill Public Schools Curriculum		
Unit Title: Polynomial Functions		**Unit #: 5**
Course or Grade Level: Trigonometry Pre-Calculus	**Length of Time: February to March (24 days)**	
Date Created:	**BOE Approval Date:**	
Pacing	(3 days) - Synthetic Division and the Remainder and Factor Theorems, (2 days) - Graphs of Polynomial Functions, (2 days) - Integral and Rational Zeros of Polynomial Functions, (2 days) - Quiz Review and Quiz, (3 days) - Descartes' Rule/Intermediate Value Theorem/Sum and Product of Zeros, (2 days) - Rational Functions, (2 days) - Radical Functions, (4 days) - Partial Fractions, (4 days) - Test Review and Test	
Essential Questions	• How do rational functions model real world problems and their solutions?	
Content	• Synthetic division. Graphing Polynomial functions. Intermediate value theorem for functions. Asymptotes of rational functions. Graphing and solving radical functions. Partial Fractions.	
Skills	• Evaluate a polynomial for a given value of a variable using synthetic substitution. Divide a polynomial by first degree binomials using synthetic division. Prove and apply the remainder and factor theorems. Graph polynomial functions. Identify equations of polynomial functions from their graphs. Determine the rational zeros of a polynomial function. State and apply the Fundamental Theorem of Algebra. Apply theorems about the zeros of polynomial functions. Approximate zeros of polynomial functions. Determine asymptotes and points of discontinuity. Graph rational functions. Graph radical functions. Solve radical equations.	
Assessments	• Summative: Tests and benchmark • Formative: Teacher observation, Classwork, Homework • *Advanced Mathematics: A Pre-Calculus Approach* – Prentice Hall	
Inter-disciplinary Connections	• Science	
Lesson resources / Activities	• personally made worksheets • Assorted resources found online	

Common Core State Standards	
Grade or Conceptual Category (HS only): Trigonometry	
Domain (name and #): Interpreting Function	
Cluster: Analyze functions using different representations	**#. Standard:** F-IF-7.C

21st Century Themes							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

Pine Hill Public Schools Curriculum		
Unit Title: Inequalities and Linear Programming		**Unit #: 6**
Course or Grade Level: Trigonometry Pre-Calculus	**Length of Time: April to May (19 days)**	
Date Created: 5/10/12	**BOE Approval Date:**	
Pacing	(1 day) - Systems of Equations, (2 days) - Linear Inequalities, (1 day) - Quadratic Inequalities, (2 days) - Quiz Review and Quiz, (3 days) - Solving Polynomial and Rational Inequalities, (3 days) - Systems of Inequalities, (2 days) - Linear Programming, (2 days) - Applications of Linear Programming, (3 days) - Test Review and Test	
Essential Questions	• How systems of equalities and inequalities model real world problems and their solutions?	
Content	• Systems of equations and inequalities. Solving quadratic, polynomial, and rational inequalities. Linear optimization.	
Skills	• Solve linear systems of equations in two variables. Nonlinear systems of equations in two variables. Solve linear inequalities in one variable algebraically and graphically. Solve absolute value inequalities. Graph linear inequalities in two variables. Solve quadratic inequalities. Solve polynomial inequalities and graph the solutions. Solve rational inequalities and graph the solutions. Solve systems of inequalities in two variables graphically.	
Assessments	• Summative: Tests and benchmark • Formative: Teacher observation, Classwork, Homework • *Advanced Mathematics: A Pre-Calculus Approach* – Prentice Hall	
Inter-disciplinary Connections	• TBD	
Lesson resources / Activities	• Summative: Tests and benchmark • Formative: Teacher observation, Classwork, Homework • *Advanced Mathematics: A Pre-Calculus Approach* – Prentice Hall	

Common Core State Standards	
Grade or Conceptual Category (HS only): Trigonometry	
Domain (name and #): Interpreting Function	
Cluster: Analyze functions using different representations	**#. Standard:** F-IF-7.D

21st Century Themes							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

Pine Hill Public Schools Curriculum		
Unit Title: Exponential and Logarithmic Functions		**Unit #: 7**
Course or Grade Level: Trigonometry Pre-Calculus	**Length of Time: May to June (20 days)**	
Date Created:	**BOE Approval Date:**	

Pacing	(1 day) - Rational Exponents, (3 days) - Exponential Functions, (4 days) - Logarithmic Functions, (2 days) - Quiz Review and Quiz, (2 days) - Properties of Logarithms, (2 days) - Exponential Equations and Inequalities, (3 days) - Exponential Growth and Decay Models, (3 days) - Test Review and Test
Essential Questions	• How do logarithmic functions model real-world problems and their solutions? • How do exponential functions model real-world problems and their solutions?
Content	• Simplifying expressions containing rational exponents. Graphs of logarithmic and exponential functions. Properties of exponents and logarithms. Solving exponential equations and inequalities. Exponential growth and decay.
Skills	• Express logarithms in expanded form and in condensed form. Solve equations involving logarithms. Use logarithms to solve exponential equations. Use a graphing calculator to solve exponential and logarithmic equations and inequalities. Solve real world problems using exponential and logarithmic equations.
Assessments	• Summative: Tests and benchmark • Formative: Teacher observation, Classwork, Homework • *Advanced Mathematics: A Pre-Calculus Approach* – Prentice Hall
Inter-disciplinary Connections	• Science
Lesson resources / Activities	• personally made worksheets • Assorted resources found online

Common Core State Standards	
Grade or Conceptual Category (HS only): Trigonometry	
Domain (name and #): Interpreting Function	
Cluster: Analyze functions using different representations	**#. Standard:** F-IF-7.E

21st Century Themes							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		