Pine Hill Public Schools			
Content Area:	**Mathematics**		
Course Title/ Grade Level:	**Honors Trigonometry/ Pre-Calculus**		
Unit 1:	**Relations , Functions and Graphs**	Month:	**September/October**
Unit 2:	**Polynomials and Rational Functions**	Month:	**November/December**
Unit 3:	**Trigonometric Functions**	Month:	**December/January**
Unit 4:	**Graphs and Inverses of the Trigonometric Functions**	Month:	**February/March**
Unit 5:	**Trigonometric Identities and Trigonometric Equations**	Month:	**March/April**
Unit 6:	**Vectors, Polar Coordinates and Complex Numbers**	Month:	**May/ June**
BOE Approval Date:	August 28, 2012		

Pine Hill Public Schools Curriculum		
Unit Title: Relations, Functions and Graphs		**Unit #: 1**
Course or Grade Level: Trig. Advanced Concepts	**Length of Time: 39 days**	
Date Created: 05/10/2012	**BOE Approval Date:**	

Pacing	39 days, 2-3 days per section, covering sections 1,2,3,4,5,6, in chapter 1, sections 2,3,4,5,6 in chapter 2, 4 review days and 4 summative assessment days
Essential Questions	• How do we determine whether a given relation is a function? • How do we identify the domain and range of any relation or function? • What are composite functions? • How do we graph linear equations and inequalities? • How do we write linear equations using point-slope form and slope-intercept form? • How do we add, subtract and multiply matrices? • How do we solve systems of equations graphically and algebraically? • How do we use linear programming procedures to solve problems?
Content	• Relations • Linear functions and Inequalities • Linear Equations like point-slope form, slope-intercept form • Matrices • Systems of linear equations • Linear programming
Skills	• Identify the domain and range of relations or functions. • Graph linear functions and inequalities • Write linear equations in different forms. • Add, subtract and multiply matrices • Use linear programming procedure to solve real life problems.
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board Summative: • Quizzes, tests, projects and benchmark
Interventions / differentiated instruction	• Pair or group work • Students given typed up notes • Students play games against each other. • Students given website links for more practice
Inter-disciplinary Connections	• Students make up math word search. • Students do research papers on famous mathematicians • Students do math projects
Lesson resources / Activities	• Merrill Advanced Mathematical Concepts, copyright 1997 • Power Point Resources • Textbook Practice worksheets • Activities Book Worksheets

Common Core State Standards
Grade or Conceptual Category (HS only): Number and Quantity; Algebra; Functions
Domain (name and #): Vector and Matrix Quantities; Reasoning with Equations and Inequalities; Interpreting Functions; Creating Equations

Cluster:	#. Standard:
Perform operations on matrices and use matrices in applications.	N-VM 7
	N-VM 8
	N-VM 9
Solve equations and inequalities in one variable	A-REI 3
Solve systems of equations	A-REI 5 , 6, 9
Represent and solve equations and inequalities graphically	A-REI 10,11,12
Understand the concept of a function and use function notation	F-IF 1,2,3
Analyze functions using different representations	F-IF 7A
Build a function that models a relationship between two quantities	F-BF1
Create equations that describe numbers or relationships	A-CED 1,2,3

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: Polynomials and Rational Functions		**Unit #: 2**
Course or Grade Level: Trig. Advanced Concepts	**Length of Time: 25 days**	
Date Created: 05/10/2012	**BOE Approval Date:**	

Pacing	25 days, 3 days per section, covering sections 1,2,3,4,5,6,7 in chapter 4, 2 review days and 2 summative assessment days
Essential Questions	• How do we find the roots of polynomial functions? • How many different ways are there to solve quadratic equations? • How do we graph quadratic equations and inequalities? • What is the strategy to find all possible rational roots of a polynomial equation? • How do we graph polynomial equations? • What are the steps to decompose a fraction into partial fractions?
Content	• Rational equations and inequalities • Polynomial equations and inequalities • Real zeros of a polynomial function
Skills	• Solve quadratic equations • Find all possible rational roots of a polynomial equation • Graph polynomial equations • Decompose a fraction into partial fractions • Find the roots of polynomial functions
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board Summative: • Quizzes, tests, projects and benchmark
Interventions / differentiated instruction	• Pair or group work • Students given typed up notes • Students play games against each other. • Students given website links for more practice
Inter-disciplinary Connections	• Students make up math word search. • Students do research papers on famous mathematicians
Lesson resources / Activities	• Merrill Advanced Mathematical Concepts, copyright 1997 • Power Point Resources • Textbook Practice worksheets • Activities Book Worksheets

Common Core State Standards

Grade or Conceptual Category (HS only):Number and Quantity; Algebra

Domain (name and #): The complex number system; Seeing Structure in Expressions; Arithmetic with Polynomials and Rational Expressions

Cluster:	**#. Standard:**
Use complex numbers in polynomial identities and equations.	N-CN 7,8,9
Write expressions in equivalent forms to solve problems	A-SSE 3

Perform arithmetic operations on polynomials	A-APR 1
Understand the relationship between zeros and factors of Polynomials	A-APR 2,3
Rewrite rational expressions	A-APR 6,7

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 Functions		**Unit #: 3**
Course or Grade Level: Trig. Advanced Concepts	**Length of Time: 25 days**	
Date Created: 08/13/2012	**BOE Approval Date:**	

Pacing	25 days, 3 days per section, covering sections 1,2,3,4,5,6,7 in chapter 5, 2 review days and 2 summative assessment days
Essential Questions	• How do we change from radian to degree measure and vice versa? • What is the difference between coterminal and reference angles? • How do we use the value of 6 trig. functions to solve problems? • How do we solve triangles using laws of sine and cosine?
Content	• Angle and their measure • Circular functions • Trigonometric functions in right triangles and special angles • Laws of sines and cosines
Skills	• Change from radian to degree measure and vice versa • Find angles that are coterminal with or the reference angle for a given angle. • Find the value of 6 trig. functions. • Solve triangles by using the law of sines and cosines.
Assessments	Formative: • Teacher observation and questioning • Pair and or group work • Homework • Student participation at board Summative: • Quizzes, tests, projects and benchmark
Interventions / differentiated instruction	• Pair or group work • Students given typed up notes • Students play games against each other. • Students given website links for more practice
Inter-disciplinary Connections	• Students make up math word search. • Students do research papers on famous mathematicians
Lesson resources / Activities	• Merrill Advanced Mathematical Concepts, copyright 1997 • Power Point Resources • Textbook Practice worksheets • Activities Book Worksheets

Common Core State Standards

Grade or Conceptual Category (HS only): Geometry

Domain (name and #): Similarity, right triangles, and trigonometry.

Cluster:	**#. Standard:**
Define trigonometric ratios and solve problems involving right triangles.	
	G-SRT 6, 7,8
Apply trigonometry to general triangles.	G-SRT 9,10,11

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: Graphs and Inverses of Trigonometric Functions		**Unit #: 4**
Course or Grade Level: Trig. Advanced Concepts	**Length of Time:28 days**	
Date Created: 08/13/2012	**BOE Approval Date:**	
Pacing	28 days, 3-4 days per section, covering sections 1,2,3,4,5,6, in chapter 6, 2 review days and 2 summative assessment days	
Essential Questions	• How can we find the amplitude, period, and phase shift for a trigonometric function? • What is the procedure to graph various functions as well as inverses of trig. functions? • How can we write equations of trig. functions given the amplitude, period and the phase shift?	
Content	• Graphs of the trigonometric functions. • Graphing trigonometric functions. • Inverse trigonometric functions. • Graphing inverses of trig. functions.	
Skills	• Use the graphs of the trig. functions to find the amplitude, period and the phase shift. • Write equations of trig. functions given the amplitude, period and the phase shift. • Graph trig. functions and their inverses.	
Assessments	Formative: • Teacher observation and questioning • Pair and or group work • Homework • Student participation at board	Summative: • Quizzes, tests, projects and benchmark
Interventions / differentiated instruction	• Pair or group work • Students given typed up notes • Students play games against each other. • Students given website links for more practice	
Inter-disciplinary Connections	• Students make up math word search. • Students type up their findings of a project and present it to the class.	
Lesson resources / Activities	• Merrill Advanced Mathematical Concepts, copyright 1997 • Power Point Resources • Textbook Practice worksheets • Activities Book Worksheets	

Common Core State Standards	
Grade or Conceptual Category (HS only): Functions	
Domain (name and #): Building functions, Trigonometric functions	
Cluster:	**#. Standard:**
Build new functions from existing functions	F-BF 4
Extend the domain of trigonometric functions using the unit circle.	F-TF 4

Model periodic phenomena with trig. functions.	F-TF 5,6,7

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		**Unit #: 5**
Course or Grade Level: Trig. Advanced Concepts	**Length of Time: 11 days**	
Date Created: 11/30/12	**BOE Approval Date:**	
Pacing	11 days, 2 days per section, covering sections 1,2,3,4, in chapter 7,1 review day and 1 summative assessment day	
Essential Questions	• Describe the process you use to verify a trigonometric function. • How do you find numerical values of trigonometric functions? • How do you use the sum and difference identities to find the exact value of a function? • How do you use the double and half angle identities to find the exact value of a function? • How do you verify a trigonometric identity using the sum and the difference identities or the double and half angle identities?	
Content	• Sum and difference identities. • Half and double angle identities. • Trigonometric equations.	
Skills	• Identify and use reciprocal identities, quotient identities, Pythagorean identities and symmetry identities. • Use basic trig. Identities to verify other identities. • Find numerical values of trig. Functions. • Use the sum and difference identities for sine, cosine and tangent functions. • Use the double and half angle identities for sine, cosine and tangent functions.	
Assessments	Formative: • Teacher observation and questioning • Pair and or group work • Homework • Student participation at board	Summative: • Quizzes, tests, projects and benchmark
Interventions / differentiated instruction	• Pair or group work • Students are given typed up notes • Students play games against each other. • Students given website links for more practice	
Inter-disciplinary Connections	• Students make up math word search. • Students type up their findings of a project and present it to the class.	
Lesson resources / Activities	• Merrill Advanced Mathematical Concepts, copyright 1997 • Power Point Resources • Textbook Practice worksheets • Activities Book Worksheets	

Common Core State Standards	
Grade or Conceptual Category (HS only): Functions	
Domain (name and #): Trigonometric Functions	
Cluster: **Prove and apply trigonometric functions**	**#. 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: Trigonometric Equations and Vectors		**Unit #: 6**
Course or Grade Level: Trig. Advanced Concepts	**Length of Time: 37 days**	
Date Created:11/30/12	**BOE Approval Date:**	

Pacing	37 days, 3 days per section, covering section 5 in chapter 7, sections 1,3,4,5 in chapter 8,sections 1,2,3 in chapter 9, 5 review days ,3 summative assessment days and 5 days for projects on vectors and 4D exploration.
Essential Questions	• Compare and contrast solving a trig. Equation and verifying a trig. Identity. • What is the procedure to solve a trig. Equation? • How do you find equal, opposite, and parallel vectors? • How do you add and subtract vectors geometrically in two-dimensional and three-dimensional space? • How do you find the inner and cross product of two vectors? • How do you determine whether two vectors are perpendicular? • How do you graph polar coordinates and simple polar equations? • How do you convert from polar coordinates to rectangular coordinates and vice versa?
Content	• Trigonometric equations. • Equal, opposite, and parallel vectors. • Inner and cross products of 2 vectors. • Polar coordinate plane.
Skills	• Solving a trig. Equation • Find equal, opposite, and parallel vectors • Add and subtract vectors geometrically in two-dimensional and three-dimensional space • Find the inner and cross product of two vectors • Graph polar coordinates and simple polar equations • Convert from polar coordinates to rectangular coordinates and vice versa?
Assessments	Formative: • Teacher observation and questioning • Pair and or group work • Homework • Student participation at board Summative: • Quizzes, tests, projects and benchmark
Interventions / differentiated instruction	• Pair or group work • Students are given typed up notes • Students play games against each other. • Students given website links for more practice
Inter-disciplinary Connections	• Students make up math word search. • Students use posters to display their findings of a project and present it to the class.
Lesson resources / Activities	• Merrill Advanced Mathematical Concepts, copyright 1997 • Power Point Resources • Textbook Practice worksheets • Activities Book Worksheets

Common Core State Standards

Grade or Conceptual Category (HS only): Functions, Number and Quantity, Number and Quantity

Domain (name and #): Trigonometric Functions, Vector and Matrix Quantities, the Complex Number System	
Cluster:	**#. Standard:**
Prove and apply trigonometric functions.	F-TF 8,9
Represent and model with vector quantities.	N-VM 1,2,3
Perform operations on vectors.	N-VM 4,5
Perform arithmetic operations with complex numbers.	N-CN 1,2,3
Represent complex numbers and their operations on the complex plane.	N-CN 4,5

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		

Revised: December 18, 2012