

East Penn School District
Secondary Curriculum

A Planned Course Statement
for

Algebra III/Trigonometry CP

Course # 330 Grade(s) 10,11,12

Department: Mathematics

Length of Period (mins.) 42 Total Clock Hours: 126

Periods per Cycle: 6 Length of Course (yrs.) 1

Type of Offering: required elective

Credit: 1

Adopted: 6/28/10

Developed by:

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Description of Course #330

Course Title: Algebra III/Trigonometry (C.P)

Description: The course is designed primarily for those students with better than average backgrounds in mathematics who intend to continue study in the areas of science and mathematics. It involves a comprehensive study of real numbers, algebraic manipulations, logarithms, trigonometric and circular functions, graphing functions, and sequences and series.

Goals: To provide a comprehensive study of real numbers, algebraic manipulations, logarithms, trigonometric and circular functions, graphing functions and sequences and series.

Requirements: Scientific or graphing calculator, Geometry 330 (84% or better) and Algebra II (84% or better)

Text: Precalculus, Blitzer, Prentice Hall, 2010 4th Edition

***** A graded project will be completed during each semester in this course.**

***** Careers that utilize the mathematics taught in this course will be discussed during the first semester.**

Key to Levels of Achievement (Listed with each learning objective)

Awareness (A):	Students are introduced to concepts, forms, and patterns.
Learning (L):	Students are involved in a sequence of steps and practice activities which involved further development and allow evaluation of process.
Understanding (U):	Students demonstrate ability to apply acquired concepts and skills to individual assignments and projects on an independent level.
Reinforcement (R):	Students maintain and broaden understanding of concepts and skills to accomplish tasks at a greater level of sophistication.

Unit	Num	Objective	Level	Content	Evaluation	Standard
Algebra Review	1	Student will be able to order real numbers, use inequalities, and evaluate algebraic expressions	L	<ul style="list-style-type: none"> • Represent, classify, and order real numbers and use inequalities • Find the absolute value of real numbers and find the distance between two real numbers • Evaluate algebraic expressions • Use basic rules and properties of algebra 	<ul style="list-style-type: none"> • Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments 	2.2.A2.C
	2	Students will be able to add, subtract, multiply, and factor polynomials	L	<ul style="list-style-type: none"> • Use properties of exponents • Use scientific notation to represent real numbers • Use properties of radicals to simplify and combine radicals • Rationalize denominators and numerators • Use properties of rational exponents 	<ul style="list-style-type: none"> • Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments 	2.1.A2.D
	3	Students will determine the domains of algebraic expressions and simplify rational expressions	L	<ul style="list-style-type: none"> • Write polynomials in standard form • Simplify, add, subtract, multiply, and divide rational expressions • Simplify complex fractions 	<ul style="list-style-type: none"> • Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments 	
	4	Students will solve linear, quadratic, polynomial, radical, and absolute value equations and inequalities	R	<ul style="list-style-type: none"> • Identify different types of equations • Solve linear equations in one variable • Solve polynomial equations • Solve equations involving radicals and absolute values • Recognize solutions of linear inequalities • Use properties of linear inequalities to solve linear inequalities • Solve inequalities using absolute values • Solve polynomial and rational inequalities 	<ul style="list-style-type: none"> • Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments 	2.8.A2.B 2.8.A2.F

Unit	Num	Objective	Level	Content	Evaluation	Standard
	5	Students will plot points in the coordinate plane and find the distance between two points	U	<ul style="list-style-type: none"> Plot points in the Cartesian plane Use distance formula and midpoint formula Use coordinate plane to model and solve real-life problems 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
Functions and Their Graphs	6	Students will be able to sketch the graphs of equations	L	<ul style="list-style-type: none"> Sketch graphs of equations Use intercepts and symmetry to sketch graphs of equations Find equations and sketch graphs of circles Use graphs of equations in real-life problems 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	7	Students will find and use the slopes of lines to write and graph linear equations in two variables	L	<ul style="list-style-type: none"> Calculate slope and use slope to graph linear equations Write linear equations and identify parallel and perpendicular lines Use linear equations to model and solve real-life problems 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	2.9.A2.A
	8	Students will be able to evaluate functions and find their domain	U	<ul style="list-style-type: none"> Decide whether relations between two variables are functions Use function notation and evaluate functions Find domain of functions Use functions to model and solve real-life problems 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	2.8.A2.D
	9	Students will be able to analyze graphs of functions	L	<ul style="list-style-type: none"> Use Vertical Line Test and find the zeros of functions Determine intervals on which functions are increasing or decreasing Identify and graph linear and piecewise-defined functions Identify even and odd functions 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	10	Students will be able to identify and graph shifts, reflections, and nonrigid transformations of functions	L	<ul style="list-style-type: none"> Recognize graphs of common functions Use transformations to sketch graphs of functions 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	

Unit	Num	Objective	Level	Content	Evaluation	Standard
	11	Students will be able to find arithmetic combinations and compositions of functions	L	<ul style="list-style-type: none"> Add, subtract, multiply, and divide functions Find compositions and combinations of functions 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	2.8.A2.E
	12	Students will be able to find inverses of functions graphically and algebraically	L	<ul style="list-style-type: none"> Find inverses functions informally Use Horizontal Line Test to determine if inverses exist Use graphs of functions to decide whether functions have inverses Find inverse functions algebraically 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	13	Students will be able to write algebraic models	U	<ul style="list-style-type: none"> Write mathematical models for direct variation, inverse variation, and joint variation 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
Polynomial and Rational Functions	14	Students will be able to sketch and analyze graphs of functions	L	<ul style="list-style-type: none"> Analyze graphs of quadratic functions Write quadratic functions in standard form and sketch their graphs Use quadratic functions to model and solve real-life problems 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	15	Students will be able to use long division and synthetic division to divide polynomials by other polynomials	L	<ul style="list-style-type: none"> Use transformations to sketch the graphs of polynomial functions Use the Leading Coefficient Test to determine the end behavior of graphs of polynomial functions Use zeros of polynomial functions as sketching aids 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	16	Students will be able to perform operations with complex numbers	L	<ul style="list-style-type: none"> Use long division to divide polynomials by other polynomials Use synthetic division to divide polynomials by other polynomials Use the remainder theorem and the factor theorem Use polynomial division to answer questions about real-life problems 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	

Unit	Num	Objective	Level	Content	Evaluation	Standard
	17	Students will be able to determine the numbers of rational and real zeros of polynomial functions and then find the zeros	L	<ul style="list-style-type: none"> Use the imaginary unit i to write complex numbers Add, subtract, multiply, and divide complex numbers Use the Quadratic formula to find complex solutions of quadratic equations 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	2.1.A2.A
	18	Students will be able to determine the domains of rational functions and find the asymptotes of rational functions	L	<ul style="list-style-type: none"> Use the Fundamental Theorem of Algebra to determine the numbers of zeros of polynomial functions Find rational zeros of polynomial functions Find the conjugate pairs of complex zeros Find the zeros of polynomials by factoring and using Descartes' Rules of Signs 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	19	Students will be able to sketch the graphs of rational functions	L	<ul style="list-style-type: none"> Find the domains of rational functions Find the horizontal and vertical graphs of rational functions Analyze and sketch graphs of rational functions 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
Exponential and Logarithmic Functions	20	Students will be able to recognize and evaluate exponential and logarithmic functions	U	<ul style="list-style-type: none"> Recognize and evaluate exponential functions with base a Graph exponential functions Recognize and evaluate exponential functions with base e Use exponential functions to model and solve real-life applications 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	2.1.A2.F
	21	Students will be able to graph exponential and logarithmic functions	U	<ul style="list-style-type: none"> Recognize and evaluate logarithmic functions with base a Graph logarithmic functions Recognize and evaluate natural logarithmic functions Use logarithmic functions to model and solve real-life applications 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	

Unit	Num	Objective	Level	Content	Evaluation	Standard
	22	Students will be able to rewrite logarithmic functions with different bases	L	<ul style="list-style-type: none"> Use the change of base formula to rewrite logarithmic functions with a different base 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	23	Students will be able to use properties of logarithms to evaluate, rewrite, expand, or condense logarithmic expressions	U	<ul style="list-style-type: none"> Use properties of logarithms to evaluate or rewrite logarithmic expressions Use properties of logarithms to expand or condense logarithmic expressions Use logarithmic functions to model and solve real-life applications 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	2.1.A2.F
	24	Students will be able to solve exponential and logarithmic equations	U	<ul style="list-style-type: none"> Solve the simple exponential and logarithmic equations Solve more complicated exponential and logarithmic equations Use exponential and logarithmic equations to model and solve real-life applications 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
Trigonometry	25	Students will be able to describe an angle and convert between radian and degree measure.	U	<ul style="list-style-type: none"> Describe angles Use radian and degree measure Use angles to model and solve real-life problems 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	26	Students will be able to identify a unit circle and its relationship to real numbers.	L	<ul style="list-style-type: none"> Identify a unit circle and its relationship to real numbers. Evaluate trigonometric functions using the unit circle. Use the domain and period to evaluate sine and cosine functions. Use a calculator to evaluate Trigonometric functions. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	

Unit	Num	Objective	Level	Content	Evaluation	Standard
	27	Students will be able to evaluate trigonometric functions of any angle.	U	<ul style="list-style-type: none"> Evaluate trigonometric functions of acute angles. Use the fundamental trigonometric identities. Use a calculator to evaluate trigonometric functions. Use trigonometric functions to model and solve real-life problems. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	28	Students will be able to use fundamental trigonometric identities	L	<ul style="list-style-type: none"> Evaluate trigonometric functions of any angle. Use reference angles to evaluate trigonometric functions. Evaluate trigonometric functions of real numbers. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	29	Students will be able to sketch the graphs of trigonometric functions and translations of graphs of sine and cosine functions	L	<ul style="list-style-type: none"> Use the amplitude and period to sketch the graphs of sine and cosine functions. Sketch translations of graphs of sine and cosine functions. Use sine and cosine functions to model real-life data. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	2.10.A2.B
	30	Students will be able to evaluate the inverse trigonometric functions.	L	<ul style="list-style-type: none"> Sketch the graphs of tangent and cotangent functions. Sketch the graphs of secant and cosecant functions. Sketch the graphs of damped trigonometric functions. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	2.10.A2.B
	31	Evaluate the compositions of trigonometric functions and inverse trigonometric functions.	L	<ul style="list-style-type: none"> Evaluate the inverse sine function and all the other inverse trigonometric functions. Evaluate the compositions of trigonometric functions. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	32	Students will be able to use fundamental trigonometric identities to evaluate trigonometric functions and simplify trigonometric expressions.	L	<ul style="list-style-type: none"> Recognize and write fundamental trigonometric identities. Use the fundamental trigonometric identities to evaluate trigonometric functions, simplify trigonometric expressions, and rewrite trigonometric expressions. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	

Unit	Num	Objective	Level	Content	Evaluation	Standard
	33	Students will be able to verify trigonometric identities.	L	<ul style="list-style-type: none"> Plan a strategy for verifying trigonometric identities. Verify trigonometric identities. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessment 	
	34	Students will be able to use standard algebraic techniques and inverse trigonometric functions to solve trigonometric equations.	L	<ul style="list-style-type: none"> Use standard algebraic techniques to solve trigonometric equations. Solve trigonometric equations of quadratic type. Solve trigonometric equations involving multiple angles. Use inverse trigonometric functions to solve trigonometric equations. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	35	Students will be able to use sum and difference formulas, multiple-angle formulas, power-reducing formulas, half-angle formulas, and product - to- sum formulas to rewrite and evaluate trigonometric functions.	L	<ul style="list-style-type: none"> Use sum and difference formulas to evaluate trigonometric functions. Use sum and difference formulas to verify identities and solve trigonometric equations. Use multiple-angle formulas to rewrite and evaluate trigonometric functions. Use power-reducing formulas to rewrite and evaluate trigonometric functions. Use half-angle formulas to rewrite and evaluate trigonometric functions. Use product-to-sum formulas to rewrite and evaluate trigonometric functions. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	36	Students will be able to use the Law of Sines and the Law of Cosines to solve oblique triangles.	U	<ul style="list-style-type: none"> Use the Law of Sines and Law of Cosines to solve oblique triangles. Use the Law of Sines and the Law of Cosines to model and solve real-life problems. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	

Unit	Num	Objective	Level	Content	Evaluation	Standard
	37	Students will be able to find areas of oblique triangles.	L	<ul style="list-style-type: none"> Use Law of Sines and Heron's area Formula to find area of triangles. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
Sequences	38	Students will be able to use sequence, factorial, and summation notation to write the terms and sum of a sequence.	U	<ul style="list-style-type: none"> Use sequence notation to write the terms of a sequence. Use factorial notation. Use summation notation to write sums. Find the sum of an infinite series. Use sequence and series to model real-life problems. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	
	39	Students will be able to recognize, write, and manipulate arithmetic sequences and geometric sequences.	U	<ul style="list-style-type: none"> Recognize and write arithmetic and geometric sequences. Find the nth partial sum of an arithmetic and geometric sequence. Find the infinite sum of a geometric sequence. Use arithmetic and geometric sequences to model and solve real-life problems. 	<ul style="list-style-type: none"> Teacher Observation Assignments Quizzes Tests Alternative Assessments 	