SCHOOL DISTRICT U-46
Honors Precalculus

Teacher Companion for Pacing Guide

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Chapter	Subject
Semester 1	
Chapter 4	**Trigonometric Functions**
Chapter 5	**Analytic Trigonometry**
Chapter 6	**Applications of Trigonometry**
Chapter 8	**Analytic Geometry in 2 and 3 Dimensions**
Semester 2	

P.1 and P.2 should be done before Chapter 1

Chapter 1	**Functions and Graphs**
Chapter 2	**Polynomial, Power, and Rational Functions**

Sections A.3, 7.4 are done with Chapter 2 A.1 is done after Chapter 2, before Chapter 3

Chapter 3	**Exponential, Logic, and Logarithmic Functions**
Chapter 9	**Discrete Mathematics**
Chapter 10	**An Introduction to Calculus: Limits, Derivatives, and Integrals**

Semester 1: Quarter 1

Review and Warm Up

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
Summer Packet	Review of Algebra 3-4 skills	3 - 4 days with quiz	
Graphing Calculator skills	Finding rots, max, min, intersect, adjusting window, shading inequalities, calculate menu, trace, mode setting, axes on/ axes off, stat plot off, graph on/off, VARS menu, math menu, catalog, 2^{nd} entry, 2^{nd} answer	3-4 days with quiz	

Chapter 4 Trigonometric Functions

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
4.1 (7.11.02)	**Angles and Their Measures** Concept of Radicals Degrees → radians → degrees Arc length, Angular speed Degrees, minutes, seconds	Start chart Discretion of teacher 2-3 Days	
4.2 (9.11.19, 9.11.20, 9.1122)	**Trigonometry Functions of Acute Angles** Right Triangle Trig Trig Function Special Right Triangle	Review of Geometry First exposure to reciprocal function 1-2 Days	
Quiz	**Partial period**		
4.3 (9.11.20)	**Trigonometry Functions of Acute Angles** Unit Circle	First exposure to unit circle, coterminal angles, quadratal, and reference angles 2-3 Days	
Quiz	**Unit Circle Quiz**		
4.4 (9.11.21)	**Graphs of Sine and Cosine: Sinusoids** Sine/Cosine graph stretches, shrinks, phase shift, and period change	Do discovery thing with and without GC. Spend a lot of time on marking axis 3-4 Days	

4.5 (9.11.21)	**Graphs of Tangent, Cotangent, secant, and Cosecant**	Focus on graphing, solving equations Don't assign 29-40 1-2 Days	
4.6 (9.11.21) (Optional)	**Graphs of Composite trig Functions**	Optional With GC if time	
Quiz	**Trig Graphs**	1 Period 1 Day	
1.5	**Inverses**	Just inverses, not parametric 1 Day	
4.7 (9.11.21, 9.11.22)	**Inverse Trig functions** Graphing inverse functions Finding slices and restrictions	Need to work on domains/restrictions Deemphasize graphing 2-3 Days	
4.8 (8.11.19)	**Solving Problems with Trig Applications**	Angle elevation/depression (Harmonic motion – Optional) 1 Day	
Review/Test	**Chapter 4 – Trigonometric Functions**	Review - 2 periods Test – 1 period 3 Days	

Quarter 2 starts with section 5.3

Chapter 5 Analytic Trigonometry

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Homework and Teacher Notes*
5.1 (9.11.23)	**Fundamental Identities** • Reciprocal identities • Quotient identities • Pythagorean Identities • Odd/Even Identities •	Separate identities and equations; go back after 5.2 2 Days Short Quiz	
5.2 (9.11.23)	**Proving Trigonometric Identities**	Worksheet in packet 3 to 4 days	
Quiz	**Section 5.1 and 5.2**	1 Day	

5.1 (cont.) (9.11.23, 8.11.19)	**Solving Equations**	# 51 – 68 Worksheet in packet 2 Days	
5.3 (9.11.23)	**Sum and Difference Identities**	Worksheet in packet 2 Days	
5.4 9.11.23	**Multiple Angle Identities**	Use regular Precalculus book for worksheet Power reducing - optional 3 Days	
Quiz	**Sections 5.3-5.4**	1 Day	
5.5 (9.11.19)	**Law of Sines**	Ambiguous case (SSA) 2 Days	
5.6 (9.11.19)	**Law of Cosines**	Area Formulas 3 Days (1 day for area) Quiz	
Review/Test	**Chapter 5 – Analytic Trigonometry**	Review - 1 period Test – 2 periods - separate calculator/no calculator tests 3 Days	

Chapter 6 Applications of Trigonometry

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
6.1 (9.C.5b)	**Vectors in a Plane**	* Check with Physics teachers 1-2 Days	
6.2 (9.C.5b)	**Dot Products of Vectors**	1-2 Days	
Quiz	**Section 6.1 and 6.2**	1 Day	
1.5 (8.11.19, 9.11.15)	**Parametric Equations** Only parametric equations (From chapter 1)	Start 6.3 same day ½ Day	

6.3 (8.11.19, 9.11.15)	**Parametric Equations**	½ Day	
6.4 (9.11.11)	**Polar Coordinates**	- Polar - Rectangular - Battleship Game 2-3 Days * Short Quiz	
6.5 (9.11.11)	**Graphs of Polar Equations**	3 Days	
Prerequisite 6 (8.11.18)	**Complex Numbers** (From Prerequisite chapter)	+/-/x/÷ conjugates See prerequisite section 1 Day	
6.6 (8.11.18)	**DeMoivre's Theorem and nth Roots**	Roots of Unity 2-3 Days (Do roots second day)	
Review/Test	**Chapter 6 – Applications of Trigonometry**	Review – 1-2 periods Test – 1 period 2-3 Days	

Chapter 8 Analytic Geometry in 2 and 3 Dimensions

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
8.1 (8.11.20)	**Conic Sections and Parabolas**	- Focus and Directix - Green Globs 1 Day	
8.2 (8.11.20)	**Ellipses**	- Foci - Circles on page 18 1 Day	
8.3 (8.11.20)	**Hyperbolas**	- Foci - Green Globs 1 Day	
8.4, 8.5, 8.6	Optional		

Review/Test	**Chapter 8 – Analytic Geometry in Two and Three Dimensions**	Green globs is a good review for conic sections. Review – 1-2 periods Test – 1 period 2-3 Days	

FIRST SEMESTER REVIEW AND FINAL

SEMESTER 2: QUARTER 3

Prerequisites

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
P 1 (6.11.05)	**Real Numbers**	These could be done at any time. Beginning of the year? As an after test assignment. 1 day	
P 2 (9.11.01)	**Cartesian Coordinate System**	See above.	

Chapter 1 Functions and Graphs

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
1.1 (8.11.14)	**Modeling and Equation Solving** • Numerical models • Algebraic models • Graphical models • Zero Product Property • Problem solving • Grapher failure and hidden behavior • A word about proof	1 Day	
1.2 (8.11.11, 8.11.13, 8.11.19)	**Functions and Their Properties** • Function definition and notation • Domain and Range • Continuity • Increasing and decreasing functions • Boundedness • Local and absolute extrema • Symmetry • Asymptotes • End behavior	Domain and Range a problem for students (we will have touched on Domain, Range and symmetry first semester) Maybe quiz 2 - 3 days	
1.3 (8.11.08, 8.11.11)	**Twelve Basic Functions** • What graphs can tell us • Twelve basic functions • Analyzing Functions Graphically	Matching activity Students struggle with piecewise 1.5 day	

1.4 (8.11.22)	**Building Functions From Functions** • Combining functions algebraically • Composition of functions • Relations and Implicitly defined functions	Composition Calisthenics Exploration (1.5 days	
Quiz			
1.5 (9.11.02)	**Parametric relations and Inverses**	Already covered first semester	
1.6 (8.11.14)	**Graphical Transformations** • Transformations • Vertical and horizontal translations • Reflections across the x-axis • Vertical and horizontal stretches and shrinks • Combining transformations	We have already done this with Trig 1 day	
1.7 (8.11.14)	**Modeling with functions** • Functions from formulas • Functions from graphs • Functions from verbal descriptions • Functions from data	Matching Activity 1 to 2 days	

Chapter 2 Polynomial, Power, and Rational Functions

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
2.1 (8.11.05, 8.11.14, 8.11.20)	**Linear and Quadratic Functions and Modeling** • Polynomial functions • Linear functions and their graphs • Average rate of change • Linear correlation and modeling • Quadratic functions and their graphs • Applications of quadratic functions	2 days	
2.2 (8.11.14)	**Power Functions with Modeling** • Power functions and variation • Monomial functions and their graphs • Graphs of power functions • Modeling with power functions	1 day	
2.3 (8.11.14)	**Polynomial Functions of Hgher Degree with Modeling** • Graphs and end behavior of polynomial functions • Zeros of polynomial functions • Intermediate value theorem • Modeling	2 days first exposure to limits	
Quiz			

2.4 (8.11.11, 8.11.13)	**Real Zeros of Polynomial Functions** • Long division/ division algorithm • Remainder and factor theorem • Synthetic division • Rational zero theorem • Upper and lower bounds	Be sure to do problem 73 with upper/lower bounds, this is their only exposure to Descartes Rule of Signs. Students have problems with f(-x). 2 days	
2.5 (8.11.19, 8.11.11)	**Complex zeros and the fundamental theorem of Algebra** • Two major theorems • Complex conjugate zeros • Factoring with real number coefficients	They should be some what familiar with complex. Alternate to sum and product rule. (Karen)	
Quiz			
2.6 (8.11.11)	**Graphs of Rational Functions** • Rational functions • Transformations of the reciprocal function • Limits and asymptotes • Analyzing graphs of rational functions • Exploring relative humidity	Hard section for students. Analysis is important. Windows are difficult to find. These are big ideas in calculus. 2 to 3 days.	
A-3 p. 852 (8.11.01)	**Fractional Expressions**	1 day	
Quiz			
2.7 (8.11.19)	**Solving Equations in One Variable** • Solving rational equations • Extraneous solutions • Applications	1 day	
7.4 (8.11.01)	**Partial Fractions**	Notice that problems 5 - 8 and 9 - 12 have directions for matrices, these are good problems. Teacher should decide the difficulty of problems. 1 day	
2.8 (8.11.16, 8.11.17)	**Solving Inequalities in One Variable** • Polynomial inequalities • Rational inequalities • Other inequalities • Applications	Sign pattern method. 1 to 2 days	
Review and Test		2 days	

Quarter 4

Chapter 3 Exponential, Logic, and Logarithmic Functions

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
A.1 p. 839 (6.11.10)	**Radicals and Rational Expressions**	1 day	
3.1 (8.11.01, 8.11.08)	**Exponential and logistic** functions • Exponential functions and their graphs • The natural base *e* • Logistic functions and their graphs • Population models	e is relatively new e to any power in TI 83, TI 84 will sometimes give you a wrong graph/table.	
3.2 (6.11.07, 8.11.01, 8.11.08, 8.11.14)	**Exponential and Logistic Modeling** • Exponential Growth and decay models • Using Regression to model population • Other Logistic Models	2 days	
Quiz		Quiz before Logs	
3.3 (8.11.19)	**Logarithmic Functions and their Graphs** • Inverses of exponential functions • Common logarithms--base 10 • Natural logarithms--base *e* • Graphs of logarithmic functions • Measuring sound using decibels	Use calculator. 1 day	
3.4 (8.11.19)	**Properties of Logarithmic functions** • Properties of logarithms • Change of base • Graphs of logarithmic functions with base b • Re-expressing data	2 days including the quiz	
Quiz			
3.5 (8.11.19, 8.11.14)	**Equation Solving and Modeling** • Solving Exponential Equations • Solving Logarithmic equations • Orders of magnitude and logarithmic models • Newton's law of cooling • Logarithmic re-expression	1 day solving 1 day modeling (2 days)	

3.6 (8.11.19, 6.D.5)	Mathematics of finance • Interest compounded annually • Interest compounded *k* times per year • Interest compounded continuously • Annual percentage yield • Annuities--future value • Loans and mortgages--present value	2 days compounding, 1 day for annuities, mortgage. Add actual cost of house, first month's interest. Put formulas for present and future value on test and quiz.	
Review, Test		2 days	

Chapter 9 Discrete Mathematics

The committee suggests an order of 9.4, 9.5, 9.2 Quiz, 9.1, 9.3 Quiz
Or 9.1, 9.3 Quiz, then 9.4, 9.5, 9.2 Quiz

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
9.1 (10.11.10)	**Basic Combinatorics** • Discrete vs. continuous • The importance of counting • The multiplication principle of counting • Permutations • Combinations • Subsets of an n-set	2 days	
9.2 (10.11.10)	**The Binomial Theorem** • Powers of binomials • Pascal's Triangle • The binomial theorem • Factorial identities	1 day	
9.3 (10.11.07, 10.11.08, 10.C.5a-c)	**Probability** • Sample spaces and Probability functions • Determining probabilities • Venn diagrams and tree diagrams • Conditional Probability • Binomial Distributions	2 days	
9.4	**Sequences** • Infinite sequences • Limits of infinite sequences • Arithmetic and geometric sequences • Sequences and graphing calculators •	1.5 day (review)	

9.5 (8.11.04)	**Series** • Summation notation • Sums of arithmetic and geometric sequences • Infinite series • Convergence of geometric series	1.5 day review	
Review Test		2 days	
9.6 ,9.7, 9.8	optional		

Chapter 10 An Introduction to Calculus: Limits, Derivatives, and Integrals

This Chapter gets them ready for the first chapter in Calc.

Section (Standard)	*Math Skills and Concepts*	*Comments*	*Assignments and Teacher Notes*
10.1 (8.11.13)	**Limits and Motion: the Tangent problem** • Average velocity • Instantaneous velocity • Limits revisited • The connection to Tangent lines • The derivative	2 days New material. Stress formal definition.	
10.2	Optional		
10.3 (8.11.13)	**More on Limits** • A Little History • Defining a Limit Informally • Properties of Limits • Limits of Continuous functions • One-Sided and Two-sided limits • Limits Involving Infinity	3 days	
10.4	Optional		
Review Test or Quiz	2 days		

SECOND SEMESTER REVIEW AND FINAL