

KNOX COUNTY PACING GUIDE PRECALCULUS 3126

2006 – 2007

COURSE DESCRIPTION

PreCalculus is an advanced mathematics course that uses meaningful problems and appropriate technologies to build upon previously learned mathematical concepts to develop the underpinnings of calculus.

ASSIGNMENTS

The problems listed are suggested problems only. Teachers may delete or add problems as needed.

PRIORITY OBJECTIVES KEY

C – COMPACT

Objectives Identified in Previous Courses

A – ASSESSED

Objectives Assessed By Knox County

I – IMPORTANT

Objectives Providing Enrichment Skills or Support to Subsequent Mathematics Courses (Optional)

RW	1.0	Models for Real-World Phenomena
AF	2.0	Algebraic Functions
TF	3.0	Trigonometric Functions
SS	4.0	Sequence and Series

**KNOX COUNTY PACING GUIDE
PRECALCULUS HONORS (3126)**

**CHAPTER 1
FUNCTIONS AND THEIR GRAPHS**

DAY	SECTION	KEY	TOPIC	PAGES	ASSIGNMENT	
					Page	Suggested Assignment
NUMBER OF DAYS		VOCABULARY		WRITING PROMPTS		
11		Slope, Point-Slope Form of a Linear Equation, Slope-Intercept Form of a Linear Equation, General Form of a Linear Equation, Function, Domain, Range, Independent Variable, Dependant Variable, Function Notation, Implied Domain, Difference Quotient, Vertical Line Test, Increasing, Decreasing, Constant, Relative Minimum, Relative Maximum, Step Function, Piece-wise Defined Function, Even and Odd Functions, Vertical and Horizontal Shifts, Reflection, Vertical Stretch and Shrink, Horizontal Stretch and Shrink, Composition of Functions, Inverse and One-to-One Functions		-Explain the meaning of domain and range. -Compare and contrast rigid transformations and nonrigid transformations. -What is an inverse function? When given a function, how do you find the inverse? -What is a Correlation Coefficient and why is it important to data analysis?		
1			GENERAL INFORMATION-BOOKS-NOTES			
2	1.1	C	LINES IN THE PLANE	3 - 15	11	3,7,11,15, 19, 23,27,31,35,39,43,47, 51, 55,59,63, 68,71
3	1.2	C/A*	FUNCTIONS Interval notation should be emphasized.	16 - 29	25	3, 5, 9, 17 - 23 (odd), 26, 29, 33, 35, 37, 49 - 61 (odd), 70, 72, 83 - 87
4	1.2	C/A*	FUNCTIONS Interval notation should be emphasized.			Supplement as necessary. Refer to pp. 46-47 in Sullivan Precal book for interval notation summary.
5	1.3	C/A*	GRAPHS OF FUNCTIONS	30 - 41	38	3, 7, 9, 12, 13, 19, 20, 23, 25, 43 - 53 (odd), 83, 85
6	1.4	C/A*	TRANSFORMATIONS	42 - 50	48	3, 9, 11, 13, 17, 21, 25, 27, 29, 33, 37, 45, 51, 55, 59, 63, 71, 72
7	1.5	C/A*	COMBINATIONS OF FUNCTIONS	51 - 61	58	1, 3, 7, 11, 15, 19, 25, 29, 33, 35, 41, 47, 51, 53, 55, 59, 65, 69, 71, 77, 80
8	1.6	A	INVERSE FUNCTIONS	62 - 71	69	5, 9, 17, 21-24, 27, 31, 33, 43, 47, 61-81 (odd)
9	1.7	C	LINEAR MODELS /SCATTER PLOTS	72 - 80	77	1, 7,11, 13, 14, 16
10			REVIEW	81 - 85	82	3, 11, 15, 17, 21, 23, 25, 29, 33, 35, 37, 39, 41, 43, 47, 51, 55, 57, 66, 68, 71, 77, 87, 91, 99, 103, 106, 111+G6
11			CHAPTER 1 TEST	Cumulative Review		Pg. 15: 105-108; Pg. 29: 95-98; Pg. 41: 106, 107, 109, 110; Pg. 50: 75, 77; Pg. 61: 95, 99, 101; Pg. 71: 89 - 92; Pg. 80: 23 - 29, 31

* See the curriculum guide for specific objectives when more than one letter is given as a key.

CHAPTER 2
POLYNOMIAL AND RATIONAL FUNCTIONS

NUMBER OF DAYS 12	VOCABULARY	WRITING PROMPTS
	Polynomial, Quadratic, & Linear Functions, Parabola, Leading Coefficient Test, Extrema, Minima, Maxima, Intermediate Value Theorem, Synthetic Division, Remainder Theorem, Factor Theorem, Rational Zero Test, Descartes' Rule of Signs, Upper and Lower Bounds, Complex Numbers, Complex Conjugates, Complex Plane, Imaginary Axis, Real Axis, Bounded, Unbounded, Fundamental Theorem of Algebra, Linear Factorization Theorem, Conjugate Pairs, Vertical Asymptote, Horizontal and Slant (Oblique) Asymptotes	-How do you find vertical and horizontal asymptotes of a function? -Discuss the various techniques for factoring polynomials. -What are the upper and lower bounds of a function and why are they important? -You do not have a calculator. You are given a polynomial function of degree five and must find the zeros, the shape, and the end behavior. Discuss your plan of action.

DAY	SECTION	KEY	TOPIC	PAGES	ASSIGNMENT	
					Page	Problems
12	2.1	C/A*	QUADRATIC FUNCTIONS	88 - 98	95	1-9, 16, 17, 29, 31, 35, 37, 39, 43, 45, 49, 63
	2.8	C	DATA: QUADRATIC MODELS	161 - 167	165	9, 13, 15
13	2.2	A	HIGHER DEGREE POLYNOMIALS	99 - 111	108	9, 11, 13, 15, 17-19,25,27,29, 39, 47, 63, 65, 79, 85, 93-98
14	Appendix B-4	A	SOLVING INEQUALITIES	A 63	A72	15, 17, 29, 31, 35, 37, 39, 47, 49, 51, 52, 53, 57, 59, 63, 65
15	2.3	C	REAL ZEROS	112 - 126	123	7,8,13,19,23,25,31(a & b),35,39,45,49,53,57,61,63,65,79
16	2.4	C/A*	COMPLEX NUMBERS	127 - 134	133	15, 19, 25, 27, 29, 31, 33, 35, 37, 43, 45, 47, 51, 53, 55, 57, 61, 65, 67, 69, 71
17	2.5	C/A*	FUNDAMENTAL THEOREM OF ALGEBRA	135 - 141	140	11, 13, 15, 21, 23, 27, 31, 35, 39, 43, 45, 49, 53, 55, 57
18	2.6	A	RATIONAL FUNCTIONS	142 - 151	148	13-35 (odd)
19	2.6	A	RATIONAL FUNCTIONS DAY TWO	143 - 151	149	Use even problems or a teacher-made worksheet.
20	2.7	A	GRAPHS-RATIONAL FUNCTIONS	152 - 160	157	9-49 (every other odd), 51-61 (odd), 65, 69
21	7.3	A	PARTIAL FRACTION DECOMPOSITION	479 - 488	484	47, 48, 53-59+A7
22			REVIEW	168 - 173	169	1, 3, 7, 11, 13, 17, 19, 23, 29, 33, 35 43, 49, 51, 55, 57, 61, 65, 69, 77, 81, 87, 91, 95, 101, 105, 109, 123, 131
23			CHAPTER 2 TEST	Cumulative Review		Pg. 111:103-105,107; Pg. 126: 89,91,93; Pg. 134: 81,82,84; Pg.141: 63,65; Pg.151: 49,53; Pg.160: 79-87(odd); Pg.167: 25-35

* See the curriculum guide for specific objectives when more than one letter is given as a key.

CHAPTER 3
EXPONENTIAL AND LOGARITHMIC FUNCTIONS

NUMBER OF DAYS		VOCABULARY			WRITING PROMPTS	
8		Algebraic Function, Transcendental Functions, Exponential Function, Natural Base e, Natural Exponential Function, Continuous Compounding, Logarithmic Function, Natural Logarithmic Function, Change-of-Base Formula, Exponential Growth Model, Exponential Decay Model, Gaussian Model, Logistic Growth Model, Logarithmic Model			<p>-How does the graph of the exponential function help you graph the logarithmic function? Discuss the domain, range, and asymptotes of each function.</p> <p>- State the general guidelines that you follow when solving exponential equations.</p> <p>- State the general guidelines that you follow when solving logarithmic equations.</p>	
DAY	SECTION	KEY	TOPIC	PAGES	ASSIGNMENT	
					Page	Problems
24	3.1	C/A*	EXPONENTIAL FUNCTIONS	176 - 187	185	7, 11, 15, 17, 19, 21, 23, 27, 31, 33, 37, 41, 43, 55, 57, 65, 71, 73, 75, 76
25	3.2	A	LOGARITHMIC FUNCTIONS	188 - 198	195	17, 19, 21, 23, 25-39 (odd), 43-63 (odd), 69, 77, 79
26	3.3	A	PROPERTIES OF LOGARITHMS	199 - 205	203	17, 21, 25, 29-43 (odd), 47-67 (odd), 71, 75, 79
27	3.4	A	SOLVING EQUATIONS	206 - 216	213	17-97 (every other odd), 103, 121, 123
28	3.5	A/I*	EXPONENTIAL & LOGARITHMIC MODELS	217 - 228	224	7, 11, 13, 15, 19, 21, 27, 29, 31, 33
29	3.6	A/I*	DATA: NONLINEAR MODELS	161 - 167	234	15, 19, 23, 27, 29, 33, 36
30			REVIEW	238 - 243	239	9, 11, 13, 17, 31, 33, 37, 43, 51, 59, 65, 69, 73, 75, 79, 83, 87, 91, 97, 101, 105, 107, 117, 131, 137, 139
31			CHAPTER 3 TEST	Review		Pg. 187: 77, 79, 81; Pg. 198: 85, 87, 89, 91, 95, 99, 101, 105; Pg. 205: 103, 105, 107, 109, 111; Pg. 216: 126, 128, 130

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CHAPTER 4
TRIGONOMETRIC FUNCTIONS

NUMBER OF DAYS 14		VOCABULARY			WRITING PROMPTS	
		Trigonometry, Angle, Initial Side, Terminal Side, Vertex, Standard Position, Positive & Negative Angles, Coterminal, Central Angle, Radian, Acute, Obtuse, Complementary, Supplementary, Degrees, Angular Speed, Linear Speed, Unit Circle, Sine, Cosine, Tangent, Cotangent, Secant, Cosecant, Period, Angle of Elevation, Angle of Depression, Reference Angle, Amplitude, Inverse Sine Function, Inverse Cosine Function, Inverse Tangent Function, Inverse Cotangent Function, Inverse Secant Function, Inverse Cosecant Function, Simple Harmonic Motion			<p>-Explain angle of elevation and angle of depression in your own words.</p> <p>-What is a radian? Compare radians and degrees.</p> <p>-Create a table of the six trigonometric functions comparing their domains, ranges, periods, and zeros. Write a short paragraph describing the patterns in the trigonometric functions.</p> <p>-Compare the sine of 30 degrees, the sine of 150 degrees, the sine of 210 degrees, and the sine of 300 degrees.</p>	
DAY	SECTION	KEY	TOPIC	PAGES	ASSIGNMENT	
					Page	Problems
32	4.1	A	RADIAN & DEGREE MEASURE	248 - 258	255	9, 13, 17, 19, 27, 29, 33, 35, 41, 45, 49, 53, 59, 67, 71, 73, 77, 79, 81, 83, 85, 87, 91, 95 - 98
33	4.1	A	RADIAN & DEGREE MEASURE	248 - 258	258	95 - 98
34	4.2	A	THE UNIT CIRCLE	259 - 266	264	1-41 (odd)
35	4.3	A	RIGHT TRIANGLE TRIG	267 - 277	274	3, 5, 9, 13, 17, 19, 21, 25, 27, 31, 35, 37, 39, 41, 43, 47, 49, 51, 53, 55, 59, 61, 63,
36	4.4	A	TRIG FUNCTIONS OF ANY ANGLE	278 - 286	284	3, 7, 11, 13, 15, 17, 19, 21, 23, 27, 31, 35, 39, 41, 45, 49, 53, 59, 63, 69, 73, 77, 83, 87, 91, 95
37			REVIEW			Review of sections 4.1 - 4.4
38			TEST or QUIZ			Sections 4.1 - 4.4
39	4.5	A	SINE & COSINE GRAPHS	287 - 297	294	3-71 (every other odd), 73, 75
40	4.6	A/I*	OTHER TRIG GRAPHS	298 - 308	305	7, 11, 15, 19, 23, 31, 33, 37, 41, 43, 45, 47, 49 - 52
41	4.7	A	INVERSE TRIG FUNCTIONS	309 - 319	316	1-15 (odd), 21, 25, 27, 29, 33, 37, 39, 41, 43, 45, 49, 51
42	4.7	I	INVERSE SECANT, INVERSE COSECANT, INVERSE COTANGENT			Supplement as necessary. Refer to section 6.2 in Sullivan Precal book. Emphasize graphs.
43	4.8	A/I*	APPLICATIONS	320 - 331	326	1-39 (odd), 49
44			REVIEW		333	3-35 (every other odd), 37, 39, 40, 41-65 (odd), 67, 69, 75-103 (odd), 115, 123, 146, 149, 159, 165, 169
45			CHAPTER 4 TEST	Cumulative Review		Pg. 258: 109, 113; Pg. 266: 75, 79; Pg. 277: 75, 79, 83; Pg. 286: 109, 111, 113; Pg. 297: 89; Pg. 308: 86, 87; Pg. 319: 87, 91; Pg. 331 :73-83 (odd)

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CHAPTER 5
ANALYTIC TRIGONOMETRY

NUMBER OF DAYS 11		VOCABULARY			WRITING PROMPTS	
		Sum and Difference Formulas, Reduction Formulas, Double-Angle Formulas, Power-Reducing Formulas, Half-Angle Formulas			In a paragraph, discuss what it means to "verify" an identity.	
DAY	SECTION	KEY	TOPIC	PAGES	ASSIGNMENT	
					Page	Problems
46	5.1	A	USING FUNDAMENTAL IDENTITIES	340 - 347	345	5, 11, 15, 17, 23-47 (<i>odd</i>), 51-71(<i>odd</i>), 77, 81, 85, 89, 101, 103, 105, 107
47	5.1	A	USING FUNDAMENTAL IDENTITIES DAY TWO			
48	5.2	A	VERIFYING TRIG IDENTITIES	348 - 355	353	5, 7, 11, 15, 21, 25, 29, 31, 33, 39, 41, 45, 47, 49, 53, 55, 59, 61, 63
49	5.2	A	VERIFYING TRIG IDENTITIES DAY 2	348 - 355	353	Worksheet
50			TEST or QUIZ			Trig Identities
51	5.3	A	SOLVING TRIG EQUATIONS	356 - 366	364	3, 7, 9, 13, 15, 21, 23, 27, 29, 33, 37, 39, 41, 45, 47, 51, 57, 61, 67, 71, 73, 75
52	5.3	A	SOLVING TRIG EQUATIONS DAY 2	356 - 366	364	Worksheet
53	5.4	A	SUM AND DIFFERENCE	368 - 374	372	3, 5, 11, 15, 17, 19, 23, 25, 29, 33, 35, 39, 45, 47, 49, 53, 55, 57, 61, 65
54	5.5	A/I*	DOUBLE AND HALF ANGLE	375 - 385	382	3, 5, 9, 11, 13, 17, 19, 21, 23, 25, 33, 37, 41, 45, 49, 51, 55, 61, 87, 91
55			REVIEW	386 - 391	387	5, 7, 11, 13, 17, 19, 25, 27, 33, 37, 41, 44, 47, 49, 51, 53, 59, 61, 67, 69, 73, 77, 87, 89, 103
56			CHAPTER 5 TEST	Cumulative Review		P. 347: 111, 112; P. 355: 77 - 91 (<i>odd</i>); P 367: 81, 85, 87; P. 374: 81 - 87 (<i>odd</i>); P. 385: 125, 127, 129, 131, 133

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CHAPTER 6
ADDITIONAL TOPICS IN TRIGONOMETRY

DAY		SECTION	KEY	TOPIC	PAGES	ASSIGNMENT	
						Page	Problems
NUMBER OF DAYS		11	VOCABULARY Oblique Triangles, Law of Sines, Law of Cosines, Heron's Area Formula, Trigonometric Form of a Complex Number, DeMoivre's Theorem, Nth Root of a Complex Number, Nth Root of Unity, modulus, argument, polar axis, pole, polar coordinates			WRITING PROMPTS -Can the Law of Sines be used to solve a right triangle? Is there an easier way to solve the triangle? Explain.	
57	6.1	A	LAW OF SINES / AREA	392 - 400	398	3, 7, 11, 15, 19, 21, 23, 25, 27, 29, 31, 35, 37, 39, 41	
58		A	LAW OF SINES / AREA (Day 2)	392 - 400	398	Worksheet	
59	6.2	A	LAW OF COSINES / AREA	401- 408	405	3, 7, 11, 13, 15, 19, 21, 23, 27, 31, 37, 39, 41	
60			REVIEW INCLUDING RIGHT TRIANGLE TRIG				
61			TEST			Law of Sines, Law of Cosines and Right Triangle Trig	
			Note: Section 9.6 and 9.7 may be taught before section 6.5				
62	6.5	A	TRIGONOMETRIC FORM OF A COMPLEX NUMBER	432 - 442	440	1-47 (odd)	
63	6.5	A	TRIGONOMETRIC FORM OF A COMPLEX NUMBER	432 - 442	440	49-63 (odd), 67, 75, 79, 83, 85, 91, 93, 95, 97, 101, 105, 111, 113, 119, 121, 123	
	9.5	I	PARAMETRIC EQUATIONS	668-675	673	1 - 39 (odd)	
64	9.6	A	POLAR COORDINATES	676-681	680	5, 7, 11, 13, 15, 19, 21, 23, 25, 29, 33, 37, 39, 43, 47, 51, 59, 61, 63, 65, 73, 77	
65	9.7	A/I*	GRAPHS OF POLAR EQUATIONS	682 - 689	689	1 - 35 (odd); 39, 43, 47	
66			REVIEW		444	1, 3, 7, 9, 11, 13, 15, 17, 19, 21, 25, 27, 31, 33, 35, 99, 103, 107, 109, 111, 113, 115, 119, 125, 126	
					699	1-9 (odd), 17, 19, 25, 27, 31, 33, 59, 61, 63, 65, 67, 69, 71, 73, 77, 79, 83, 89, 93, 99	
67			CHAPTER 6 and CHAPTER 9 TEST Sections 6.5, 9.6, and 9.7	Cumulative Review		Pg. 400: 43, 46; Pg. 407: 43, 45; Pg. 421: 95-98, 101, 103, 105, 107; Pg. 431: 69 - 83 (odd)	

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CHAPTER 8
SEQUENCES, SERIES, AND PROBABILITY

DAY		SECTION	KEY	TOPIC	PAGES	ASSIGNMENT	
						Page	Problems
NUMBER OF DAYS 6		VOCABULARY Infinite Sequence, Finite Sequence, Recursively, Factorials, Summation Notation, Sigma Notation, Index of Summation, Upper Limit of Summation, Lower Limit of Summation, Series, Arithmetic Sequence, Common Difference, Nth Term of an Arithmetic Sequence, Sum of a Finite Arithmetic Sequence, Nth Partial Sum, Geometric Sequence, Common Ratio, Nth Term of a Geometric Sequence, Sum of a Finite Geometric Sequence, Infinite Geometric Series, Geometric Series, Sum of an Infinite Geometric Series			WRITING PROMPTS -Write a brief paragraph explaining how to use the first two terms of a geometric sequence to find the nth term.		
68	8.1	A/I*	SEQUENCES & SERIES	556 - 566	563	3, 7, 11, 21, 23, 25, 29, 31, 33, 39, 43, 47, 51, 53, 55, 57, 59, 61, 67, 69, 75, 79, 87, 89, 91, 95, 101, 103, 105, 107, 115, 117	
69	8.2	A/I*	ARITHMETIC SEQUENCES	567 - 575	573	3-35 (every other odd), 37, 39, 43, 47, 53, 57, 63, 67, 69, 71	
70	8.3	A/I*	GEOMETRIC SEQUENCES	576 - 585	582	3 - 39 (every other odd), 41, 43, 45-69 (every other odd)	
	8.4	I	MATHEMATICAL INDUCTION			OPTIONAL	
71	8.5	A	BINOMIAL THEOREM	594 - 601	599	3 - 35 (every other odd), 43 - 71(every other odd)	
72			REVIEW	625 - 630	626	1, 5, 9, 13, 17, 21, 23, 25, 31, 33, 35, 39, 41, 43, 47, 53, 57, 61, 65, 69, 73, 77, 95, 99, 103, 107	
73			CHAPTER 8 TEST	Cumulative Review		Pg. 566: 125; Pg. 575: 93; Pg. 585: 107; Pg. 592: 55, 59, 63, 65; Pg. 600: 101, 103; Pg. 611: 75, 77; Pg. 624: 59-65 (odd)	

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CHAPTER 11
LIMITS AND AN INTRODUCTION TO CALCULUS

NUMBER OF DAYS 6		VOCABULARY Limit, Direct Substitution, Dividing Out Technique, Indeterminate Form, One-Sided Limits, Tangent Line, Secant Line, Slope of a Graph, Difference Quotient, Derivative, Limits at Infinity, Limit of a Sequence			WRITING PROMPTS - Problem 62, page 752 - Problem 76, Page 762	
DAY	SECTION	KEY	TOPIC	PAGES	ASSIGNMENT	
					Page	Problems
74	11.1	A	INTRO TO LIMITS	742 - 752	750	3 - 21 (odd), 25, 27, 29, 33, 35, 37, 39, 43, 48, 53, 57
75	11.2	A	EVALUATING LIMITS	753 - 762	760	1 - 25 (odd)
76	11.2	A	EVALUATING LIMITS DAY 2	754 - 762	761	27, 31, 33, 35, 39, 41, 43, 45, 47, 49, 57, 59, 63, 65
77	11.3	I	TANGENT LINE PROBLEM	763 - 772	770	1 - 29 (odd), 31 - 37 (odd), 39, 43, 45, 47, 49
	11.4	I	LIMITS AT INFINITY AND OF SEQUENCES LIMITS	773 - 781	779	OPTIONAL
78			REVIEW	791 - 796	791	1, 5, 7, 11, 17, 21, 23, 25, 27, 31, 33, 39, 45, 47, 49, 51, 53, 59, 65, 67
79			CHAPTER 11 TEST			
80			FINAL REVIEW			