

# MAC1147 – Precalculus Algebra and Trigonometry

## Summer B 2020 CALENDAR

Instructors: Dr. Alex York, Recep Celebi, and John Streese

WEEK 1			
July 6	Monday	L1-3	<b>Real numbers</b> and their properties, absolute value, interval notation, basic rules of algebra // properties of <b>exponents</b> and <b>radicals</b> , simplifying and combining radicals, rationalizing denominators // <b>Polynomials</b> : basic terminology, operations with polynomials, special products, removing common factor, factoring special polynomial forms, and other factoring methods
July 7	Tuesday	L4	Simplifying and operations with <b>rational expressions</b> , complex fractions, and difference quotient.
July 8	Wednesday	L5	<b>Solving equations</b> : solving linear equations in one variable, quadratic equations (quadratic formula and completing the square), polynomial equations of higher degree, equations involving radicals and absolute values, identifying extraneous roots
July 9	Thursday	L6-8	<b>Solving linear equalities</b> // <b>rectangular coordinates</b> , plotting points in the Cartesian plane, using distance and midpoint formulas, <b>graphs of equations</b> (lines and circle), x- and y-intercepts // <b>linear equations in two variables</b> , slope, vertical and horizontal lines, identifying parallel and perpendicular lines, slope as ratio or rate of change
July 10	Friday	L9	<b>Introduction to functions</b> , function vs relation, basic terminology, domain and range of a function, function notation and evaluating functions, piecewise functions, difference quotients, <b>analyzing graphs of functions</b> , vertical line test, zeros of a function, increasing/decreasing/constant functions, even and odd functions, average rate of change, <b>recognizing parent functions</b>
WEEK 2			
July 13	Monday	L10	<b>Transformations</b> of functions
July 14	Tuesday	L11	Arithmetic <b>combination</b> of functions, <b>composition</b> of two (and more) functions, domain analysis
July 15	Wednesday	L12	<b>Inverse functions</b> , finding the inverse of a function algebraically and geometrically, one-to-one functions, horizontal line test
July 16	Thursday	L13	<b>Quadratic functions</b> , the standard form, vertex of a parabola, real-life applications
July 17	Friday	L14	<b>Polynomial functions of higher degree</b> , using the Leading Coefficient Test to determine the end behavior, finding zeros, sketching graphs of polynomial functions, long and synthetic division, the Remainder Theorem, the Factor Theorem
<b>July 17</b>	<b>Friday</b>	<b>X</b>	<b>EXAM #1 (L1-12)</b>
WEEK 3			
July 20	Monday	L15	<b>Complex numbers</b> , complex conjugates, complex solutions of quadratic equations
July 21	Tuesday	L16	<b>Zeros of polynomial functions</b> , the Fundamental Theorem of Algebra, the Linear Factorization Theorem, the Rational Zero Test
July 22	Wednesday	L17	<b>Rational functions</b> , vertical and horizontal asymptotes, sketching graphs of rational functions
July 23	Thursday	L18	<b>Nonlinear inequalities</b> (polynomial and rational inequalities)
July 24	Friday	L19	Linear and nonlinear <b>systems of equations</b>

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**WEEK 4**

<b>July 27</b>	<b>Monday</b>	<b>X</b>	<b>EXAM #2 (L13-19)</b>
July 27	Monday	L20	<b>Exponential functions</b> , recognizing, evaluating, and graphing exponential functions
July 28	Tuesday	L21	<b>Logarithmic functions</b> , recognizing, evaluating, and graphing logarithmic functions
July 29	Wednesday	L22	<b>Properties of logarithms</b> , product, quotient, power properties, change of basis, rewriting, evaluating, expanding, and condensing logarithmic expressions
July 30	Thursday	L23	<b>Solving exponential and logarithmic equations</b>
July 31	Friday	L24	<b>Exponential and logarithmic models</b> , exponential growth/decay, Gaussian models, logistic growth models, logarithmic models

**WEEK 5**

August 3	Monday	L25-26	<b>Radian and degree measure // Trigonometric functions &amp; the unit circle</b>
August 4	Tuesday	L27	<b>Right triangle trigonometry &amp; trigonometric functions of any angle</b>
August 5	Wednesday	L28-29	<b>Graphs of sine and cosine functions // Graphs of other trigonometric functions</b>
August 6	Thursday	L30-31	<b>Inverse trigonometric functions // Trigonometric applications and models</b>
August 7	Friday	L32-33	Using <b>fundamental identities</b> // <b>verifying</b> trigonometric identities
<b>August 7</b>	<b>Friday</b>	<b>X</b>	<b>EXAM #3 (L20-29)</b>

**WEEK 6**

August 10	Monday	L34	<b>Solving trigonometric equations</b>
August 11	Tuesday	L35	<b>Sum and difference formulas</b>
August 12	Wednesday	L36	<b>Multiple-angle and product-to-sum formulas</b>
August 13	Thursday	X	Review
<b>August 14</b>	<b>Friday</b>	<b>X</b>	<b>FINAL EXAM (L1-36 CUMULATIVE)</b>

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## **List of lectures**

- L1: Real numbers and their properties
- L2: Exponents and radicals
- L3: Polynomials and factoring
- L4: Rational expressions and complex fractions
- L5: Solving equations
- L6: Solving linear inequalities
- L7: Rectangular coordinates and graphs
- L8: Linear equations
- L9: Introduction to functions, analyzing graphs of functions, and a library of parent functions
- L10: Transformations of functions
- L11: Combination of functions & composite functions
- L12: Inverse functions
- L13: Quadratic functions
- L14: Polynomial functions of higher degree
- L15: Complex numbers
- L16: Zeros of polynomial functions
- L17: Rational functions
- L18: Nonlinear inequalities
- L19: Linear and nonlinear systems of equations
- L20: Exponential functions
- L21: Logarithmic functions
- L22: Properties of logarithms
- L23: Solving exponential and logarithmic equations
- L24: Exponential and logarithmic models
- L25: Radian and degree measure
- L26: Trigonometric functions & the Unit Circle
- L27: Right triangle trigonometry & trigonometric functions of any angle
- L28: Graphs of sine and cosine functions
- L29: Graphs of other trigonometric functions
- L30: Inverse trigonometric functions
- L31: Trigonometric applications and models
- L32: Using fundamental identities
- L33: Verifying trigonometric identities
- L34: Solving trigonometric equations
- L35: Sum and difference formulas
- L36: Multiple-angle and product-to-sum formulas

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## **Lecture-Textbook Correspondence**

<b>Lecture</b>	<b>Abramson</b>	<b>Larson</b>		<b>Lecture</b>	<b>Abramson</b>	<b>Larson</b>
1	X	A1		19	9.1, 9.3	7.1, 7.2
2	X	A2		20	4.1, 4.2	3.1
3	X	A3		21	4.3, 4.4	3.2
4	X	A4		22	4.5	3.3
5	X	A5		23	4.6	3.4
6	X	A6		24	4.7	3.5
7	X	1.1, 1.2		25	5.1	4.1
8	2.1, 2.2	1.3		26	5.2	4.2
9	1.1, 1.2, 1.3	1.4, 1.5, 1.6		27	5.3, 5.4	4.3, 4.4
10	1.5	1.7		28	6.1	4.5
11	1.4	1.8		29	6.2	4.6
12	1.7	1.9		30	6.3	4.7
13	3.2	2.1		31	5.4, 6.1, 6.2	4.8
14	3.3, 3.4, 3.5	2.2, 2.3		32	7.1	5.1
15	3.1	2.4		33	7.1	5.2
16	3.6	2.5, 2.6		34	7.5	5.3
17	3.7	2.6		35	7.2	5.4
18	9.3	2.7		36	7.3, 7.4	5.5