Class: MATH 1112 Spring 2020 - MWF - 11:15am - Ritter - Sec 52

Class Code: RHAGP-G969G

Subject: College Algebra with Trigonometry

Instructor: Ritter

Class Dates: 12/01/2019 - 05/31/2020

Class Content: 204 topics / 148 accessible topics

Textbook: Miller: College Algebra & Trigonometry, 1st Ed. (McGraw-Hill)

Objectives	Dates
1. HW 1: Functions (22 topics)	12/01/2019 12:00 AM - 01/12/2020 11:59 PM
2. HW 2: Graphs of Functions (25 topics)	01/13/2020 12:00 AM - 01/19/2020 11:59 PM
3. HW 3: Function Operations (22 topics)	01/20/2020 12:00 AM - 01/26/2020 11:59 PM
4. Post Access HW 1-3 (1 topics)	01/27/2020 12:00 AM - 01/29/2020 11:59 PM
5. HW 4: Inverse/Exp Funct (19 topics)	01/30/2020 12:00 AM - 02/03/2020 11:59 PM
6. HW 5: Log Funct/Equations (18 topics)	02/04/2020 12:00 AM - 02/09/2020 11:59 PM
7. HW 6: Angles/Trig Ratios (17 topics)	02/10/2020 12:00 AM - 02/16/2020 11:59 PM
8. Post Access HW 1-6 (1 topics)	02/17/2020 12:00 AM - 02/19/2020 11:59 PM
9. HW 7: Trig Functions (15 topics)	02/20/2020 12:00 AM - 02/24/2020 11:59 PM
10. HW 8: Trig Funct Graphs (13 topics)	02/25/2020 12:00 AM - 03/01/2020 11:59 PM
11. HW 9: Inverse Trig Funct (9 topics)	03/02/2020 12:00 AM - 03/08/2020 11:59 PM
12. HW 10: Trig Identities 1 (14 topics)	03/09/2020 12:00 AM - 03/15/2020 11:59 PM
13. Post Access HW 1-10 (1 topics)	03/16/2020 12:00 AM - 03/18/2020 11:59 PM
14. HW 11: Trig Identities 2 (9 topics)	03/19/2020 12:00 AM - 03/23/2020 11:59 PM
15. HW 12: Trig Equations (12 topics)	03/24/2020 12:00 AM - 04/06/2020 11:59 PM
16. HW 13:Laws of Sine/Cosine (9 topics)	04/07/2020 12:00 AM - 04/13/2020 11:59 PM
17. Post Access HW 1-13 (1 topics)	04/14/2020 12:00 AM - 04/17/2020 11:59 PM

Accessible Topic - Topics accessible to visually impaired students using a screen reader.

HW 1: Functions (22 Topics, due on 01/12/2020 11:59 PM)

Course Readiness (1 Topic)

- Graphing a compound inequality on the number line

Section R.1 (2 Topics)

- Set-builder and interval notation
- Union and intersection of intervals

Section R.4 (2 Topics)

- Multiplying conjugate binomials: Univariate
- Squaring a binomial: Univariate

Section R.5 (2 Topics)

- Factoring a quadratic with leading coefficient 1
- Factoring a difference of squares in one variable: Basic

Section R.6 (1 Topic)

- Restriction on a variable in a denominator: Linear

Section 1.1 (1 Topic)

- Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution

Section 1.7 (2 Topics*)

- Graphing a compound inequality on the number line
- Solving a two-step linear inequality: Problem type 2

Section 2.1 (1 Topic)

- Naming the quadrant or axis of a point given the signs of its coordinates

Section 2.3 (8 Topics)

- Vertical line test
- Evaluating functions: Absolute value, rational, radical
- Variable expressions as inputs of functions: Problem type 2
- Domain of a square root function: Basic
- Finding the domain of a fractional function involving radicals
- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
- Finding inputs and outputs of a function from its graph
- Domain and range from the graph of a piecewise function

Section 2.4 (1 Topic)

- Graphing a vertical or horizontal line

Section 2.7 (1 Topic)

- Evaluating a piecewise-defined function

Chapter 2 Supplementary Topics (1 Topic)

- Finding domain and range from a linear graph in context

(*) Some topics in this section are also covered in a previous section of this Objective. Topics are only counted once towards the total number of topics for this Objective.

HW 2: Graphs of Functions (25 Topics, due on 01/19/2020 11:59 PM)

Section 1.1 (1 Topic)

- Solving for a variable in terms of other variables in a linear equation with fractions

Section 2.4 (7 Topics)

- Finding x- and y-intercepts of a line given the equation: Advanced
- Finding slope given the graph of a line on a grid
- Finding the slope and y-intercept of a line given its equation in the form Ax + By = C
- Writing the equation of the line through two given points
- Writing the equations of vertical and horizontal lines through a given point
- Finding the average rate of change of a function
- Word problem involving average rate of change

Section 2.5 (4 Topics*)

- Writing the equation of the line through two given points
- Writing the equations of vertical and horizontal lines through a given point
- Writing equations of lines parallel and perpendicular to a given line through a point
- Writing and evaluating a function that models a real-world situation: Advanced

Section 2.6 (5 Topics)

- Matching parent graphs with their equations
- Transforming the graph of a function by shrinking or stretching
- Transforming the graph of a function using more than one transformation
- Transforming the graph of a quadratic, cubic, square root, or absolute value function
- Writing an equation for a function after a vertical and horizontal translation

Section 2.7 (7 Topics)

- Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin
- Finding where a function is increasing, decreasing, or constant given the graph: Interval notation
- Finding local maxima and minima of a function given the graph
- Graphing a piecewise-defined function: Problem type 1
- Graphing a piecewise-defined function: Problem type 2
- Graphing a piecewise-defined function: Problem type 3
- Even and odd functions: Problem type 1

Section 4.5 (1 Topic)

- Graphically solving a system of linear equations

Section 8.4 (1 Topic)

- Solving a system of linear equations using elimination with addition

Section 9.1 (3 Topics*)

- Graphically solving a system of linear equations
- Solving a system of linear equations using elimination with addition
- Classifying systems of linear equations from graphs

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HW 3: Function Operations (22 Topics, due on 01/26/2020 11:59 PM)

Section R.2 (1 Topic)

- Evaluating an expression with a negative exponent: Negative integer base

Section R.6 (4 Topics)

- Adding rational expressions with linear denominators with common factors: Basic
- Adding rational expressions with denominators ax-b and b-ax
- Complex fraction involving univariate monomials
- Complex fraction made of sums involving rational expressions: Problem type 3

Section 1.4 (2 Topics)

- Solving an equation written in factored form
- Finding the roots of a quadratic equation with leading coefficient 1

Section 1.6 (1 Topic)

- Solving a radical equation that simplifies to a linear equation: One radical, basic

Section 2.3 (1 Topic)

- Domain of a rational function: Interval notation

Section 2.8 (13 Topics)

- Combining functions to write a new function that models a real-world situation
- Finding a difference quotient for a linear or quadratic function
- Sum, difference, and product of two functions
- Quotient of two functions: Basic
- Quotient of two functions: Advanced
- Combining functions: Advanced
- Introduction to the composition of two functions
- Composition of two functions: Basic
- Composition of a function with itself
- Expressing a function as a composition of two functions
- Composition of two functions: Domain and range
- Composition of two functions: Advanced

- Word problem involving composition of two functions

Post Access HW 1-3 (1 Topic, due on 01/29/2020 11:59 PM)

Section R.5 (1 Topic)

- Factoring a difference of squares in one variable: Basic

HW 4: Inverse/Exp Funct (19 Topics, due on 02/03/2020 11:59 PM)

Section R.2 (1 Topic)

- Power, product, and quotient rules with negative exponents

Section R.3 (5 Topics)

- Finding n^{th} roots of perfect n^{th} powers with signs
- Converting between radical form and exponent form
- Rational exponents: Powers of powers with negative exponents
- Simplifying a product of radical expressions: Univariate
- Simplifying products or quotients of higher radicals with different indices: Univariate

Chapter 2 Supplementary Topics (1 Topic)

- Finding values and intervals where the graph of a function is zero, positive, or negative

Section 4.1 (4 Topics)

- Horizontal line test
- Determining whether two functions are inverses of each other
- Inverse functions: Linear, discrete
- Finding, evaluating, and interpreting an inverse function for a given linear relationship

Section 4.2 (4 Topics)

- The graph, domain, and range of an exponential function
- Evaluating an exponential function with base e that models a real-world situation
- Finding the final amount in a word problem on compound interest
- Finding the final amount in a word problem on continuous compound interest

Section 4.3 (4 Topics)

- Converting between logarithmic and exponential equations
- Converting between natural logarithmic and exponential equations
- Evaluating logarithmic expressions
- The graph, domain, and range of a logarithmic function

HW 5: Log Funct/Equations (18 Topics, due on 02/09/2020 11:59 PM)

Section 4.4 (6 Topics)

- Basic properties of logarithms
- Expanding a logarithmic expression: Problem type 1
- Expanding a logarithmic expression: Problem type 2
- Expanding a logarithmic expression: Problem type 3
- Writing an expression as a single logarithm
- Change of base for logarithms: Problem type 1

Section 4.5 (10 Topics)

- Solving an equation of the form $\log_b a = c$
- Solving a multi-step equation involving a single logarithm: Problem type 1
- Solving a multi-step equation involving a single logarithm: Problem type 2
- Solving a multi-step equation involving natural logarithms
- Solving an equation involving logarithms on both sides: Problem type 1

- Solving an equation involving logarithms on both sides: Problem type 2
- Solving an exponential equation by finding common bases: Linear exponents
- Solving an exponential equation by using natural logarithms: Decimal answers
- Solving an exponential equation by using logarithms: Exact answers in logarithmic form
- Finding the rate or time in a word problem on continuous exponential growth or decay

Section 4.6 (1 Topic)

- Finding the time given an exponential function with base e that models a real-world situation

Chapter 4 Supplementary Topics (1 Topic)

- Change of base for logarithms: Problem type 2

HW 6: Angles/Trig Ratios (17 Topics, due on 02/16/2020 11:59 PM)

Section 1.4 (1 Topic)

- Pythagorean Theorem

Section 5.1 (5 Topics)

- Converting between degree and radian measure: Problem type 1
- Sketching an angle in standard position
- Coterminal angles
- Arc length and central angle measure
- Angular and linear speed

Section 5.2 (5 Topics)

- Sine, cosine, and tangent ratios: Numbers for side lengths
- Using the Pythagorean Theorem to find a trigonometric ratio
- Finding trigonometric ratios given a right triangle
- Using trigonometry to find a length in a word problem with one right triangle
- Using cofunction identities

Chapter 5 Supplementary Topics (3 Topics)

- Special right triangles: Exact answers
- Relationship between the sines and cosines of complementary angles
- Using similar right triangles to find trigonometric ratios

Section 7.1 (4 Topics*)

- Using trigonometry to find a length in a word problem with one right triangle
- Using trigonometry to find angles of elevation or depression in a word problem
- Solving a right triangle
- Using trigonometry to find a length in a word problem with two right triangles

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Post Access HW 1-6 (1 Topic, due on 02/19/2020 11:59 PM)

Section R.5 (1 Topic)

- Factoring a difference of squares in one variable: Basic

HW 7: Trig Functions (15 Topics, due on 02/24/2020 11:59 PM)

Section 5.3 (7 Topics)

- Reference angles: Problem type 1
- Reference angles: Problem type 2
- Determining the location of a terminal point given the signs of trigonometric values
- Finding values of trigonometric functions given information about an angle: Problem type 1

- Finding values of trigonometric functions given information about an angle: Problem type 2
- Finding values of trigonometric functions given information about an angle: Problem type 3
- Finding values of trigonometric functions given information about an angle: Problem type 4

Section 5.4 (7 Topics)

- Finding coordinates on the unit circle for special angles
- Trigonometric functions and special angles: Problem type 1
- Finding trigonometric ratios from a point on the unit circle
- Trigonometric functions and special angles: Problem type 2
- Trigonometric functions and special angles: Problem type 3
- Evaluating expressions involving sine and cosine
- Even and odd properties of trigonometric functions

Chapter 5 Supplementary Topics (1 Topic)

- Finding a point on the unit circle given one coordinate

HW 8: Trig Funct Graphs (13 Topics, due on 03/01/2020 11:59 PM)

Section 5.5 (10 Topics)

- Sketching the graph of y= a sin(x) or y= a cos(x)
- Sketching the graph of y= sin(bx) or y= cos(bx)
- Sketching the graph of y= sin(x)+ d or y= cos(x)+ d
- Sketching the graph of y= sin(x+ c) or y= cos(x+c)
- Sketching the graph of y= a sin(bx) or y= a cos(bx)
- Sketching the graph of y= a sin(bx+c) or y= a cos(bx+c)
- Sketching the graph of y= a sin(bx)+ d or y= a cos(bx)+ d
- Amplitude and period of sine and cosine functions
- Amplitude, period, and phase shift of sine and cosine functions
- Writing the equation of a sine or cosine function given its graph: Problem type 1

Section 5.6 (3 Topics)

- Domains and ranges of trigonometric functions
- Matching graphs and equations for secant, cosecant, tangent, and cotangent functions
- Sketching the graph of a tangent or cotangent function: Problem type 2

HW 9: Inverse Trig Funct (9 Topics, due on 03/08/2020 11:59 PM)

Section 5.7 (8 Topics)

- Values of inverse trigonometric functions
- Composition of a trigonometric function with its inverse trigonometric function: Problem type 1
- Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 1
- Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 2
- Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 3
- Composition of trigonometric functions with variable expressions as inputs: Problem type 1
- Composition of trigonometric functions with variable expressions as inputs: Problem type 2
- Using a calculator to approximate inverse trigonometric values

Chapter 5 Supplementary Topics (1 Topic)

- Composition of a trigonometric function with its inverse trigonometric function: Problem type 2

HW 10: Trig Identities 1 (14 Topics, due on 03/15/2020 11:59 PM)

Section R.6 (2 Topics)

- Simplifying a ratio of linear polynomials: 1, -1, and no simplification
- Simplifying a ratio of polynomials: Problem type 2

Section 6.1 (6 Topics)

- Simplifying trigonometric expressions
- Verifying a trigonometric identity
- Proving trigonometric identities: Problem type 1
- Proving trigonometric identities: Problem type 2
- Proving trigonometric identities: Problem type 3
- Proving trigonometric identities using odd and even properties

Section 6.2 (6 Topics)

- Sum and difference identities: Problem type 1
- Sum and difference identities: Problem type 2
- Sum and difference identities: Problem type 3
- Sum and difference identities: Problem type 4
- Proving trigonometric identities using sum and difference properties: Problem type 1
- Proving trigonometric identities using sum and difference properties: Problem type 2

Post Access HW 1-10 (1 Topic, due on 03/18/2020 11:59 PM)

Section R.5 (1 Topic)

- Factoring a difference of squares in one variable: Basic

HW 11: Trig Identities 2 (9 Topics, due on 03/23/2020 11:59 PM)

Section R.5 (1 Topic)

- Factoring with repeated use of the difference of squares formula

CR and Chapter R Supplementary Topics on Real Numbers Supplementary Topics (2 Topics)

- Signed fraction multiplication: Advanced
- Adding rational expressions with linear denominators with common factors: Advanced

Section 6.3 (6 Topics)

- Double-angle identities: Problem type 1
- Double-angle identities: Problem type 2
- Double-angle identities: Problem type 3
- Half-angle identities: Problem type 1
- Half-angle identities: Problem type 2
- Proving trigonometric identities using double-angle properties

HW 12: Trig Equations (12 Topics, due on 04/06/2020 11:59 PM)

Section 6.5 (12 Topics)

- Finding solutions in an interval for a basic equation involving sine or cosine
- Finding solutions in an interval for a basic tangent, cotangent, secant, or cosecant equation
- Solving a basic trigonometric equation involving sine or cosine
- Solving a basic trigonometric equation involving tangent, cotangent, secant, or cosecant
- Finding solutions in an interval for a trigonometric equation in factored form
- Finding solutions in an interval for a trigonometric equation with a squared function: Problem type 1
- Finding solutions in an interval for a trigonometric equation with a squared function: Problem type 2
- Finding solutions in an interval for a trigonometric equation using Pythagorean identities: Problem type 1
- Finding solutions in an interval for an equation with sine and cosine using double-angle identities
- Solving a trigonometric equation modeling a real-world situation
- Solving a trigonometric equation involving an angle multiplied by a constant
- Finding solutions in an interval for a trigonometric equation with an angle multiplied by a constant

HW 13:Laws of Sine/Cosine (9 Topics, due on 04/13/2020 11:59 PM)

Section 7.2 (3 Topics)

- Solving a triangle with the law of sines: Problem type 1
- Solving a triangle with the law of sines: Problem type 2
- Solving a word problem using the law of sines

Section 7.3 (4 Topics)

- Solving a triangle with the law of cosines
- Solving a word problem using the law of cosines
- Using trigonometry to find the area of a right triangle
- Finding the area of a triangle using trigonometry

Chapter 7 Supplementary Topics (2 Topics)

- Proving the law of sines
- Proving the law of cosines

Post Access HW 1-13 (1 Topic, due on 04/17/2020 11:59 PM)

Section R.5 (1 Topic)

- Factoring a difference of squares in one variable: Basic