Class: MATH 1112 Spring 2019 Pilot - MWF 9:05 to 9:55 am   **Class Code:** WQJQT-3GQW4

Subject: College Algebra with Trigonometry   **Instructor:** Ritter

Class Dates: 01/04/2019 - 05/10/2019   **Class Content:** 223 topics / 138 accessible topics

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

Objectives	Dates
1. Unit 1 Coordinate Plane (15 topics)	01/04/2019 12:00 AM - 01/13/2019 11:59 PM
2. Unit 2 Functions 1 (24 topics)	01/14/2019 12:00 AM - 01/20/2019 11:59 PM
3. Unit 3 Functions 2 (14 topics)	01/21/2019 12:00 AM - 01/23/2019 11:59 PM
4. Test 1 Review (1 topics)	01/24/2019 12:00 AM - 01/25/2019 11:59 PM
5. Unit 4 Graphing (18 topics)	01/26/2019 12:00 AM - 01/31/2019 11:59 PM
6. Unit 5 Exponential Fncts (11 topics)	02/01/2019 12:00 AM - 02/06/2019 11:59 PM
7. Unit 6 Logarithm Function (23 topics)	02/07/2019 12:00 AM - 02/13/2019 11:59 PM
8. Unit 7 Log/Exp Equations (11 topics)	02/14/2019 12:00 AM - 02/16/2019 11:59 PM
9. Unit 8 Angle Measures (9 topics)	02/17/2019 12:00 AM - 02/20/2019 11:59 PM
10. Test 2 Review (1 topics)	02/21/2019 12:00 AM - 02/22/2019 11:59 PM
11. Unit 9 Trig Functions 1 (20 topics)	02/23/2019 12:00 AM - 03/08/2019 11:59 PM
12. Unit 10 Trig Functions 2 (15 topics)	03/09/2019 12:00 AM - 03/15/2019 11:59 PM
13. Unit 11 Inverse Trig Fnct (7 topics)	03/16/2019 12:00 AM - 03/20/2019 11:59 PM
14. Test 3 Review (1 topics)	03/21/2019 12:00 AM - 03/22/2019 11:59 PM
15. Unit 12 Trig Identities (24 topics)	03/23/2019 12:00 AM - 04/12/2019 11:59 PM
16. Unit 13 Trig Equations (13 topics)	04/13/2019 12:00 AM - 04/19/2019 11:59 PM
17. Test 4 Review (1 topics)	04/20/2019 12:00 AM - 04/22/2019 11:59 PM
18. Unit 14 Laws Sine/Cosine (19 topics)	04/23/2019 12:00 AM - 04/29/2019 11:59 PM

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

Unit 1 Coordinate Plane (15 Topics, due on 01/13/2019 11:59 PM)

- Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution ⤴
- Reading a point in the coordinate plane ⤴
- Plotting a point in the coordinate plane
- Distance between two points in the plane: Exact answers ⤴
- Midpoint of a line segment in the plane ⤴
- Graphing a line given its equation in standard form
- Finding slope given two points on the line ⤴
- Graphically solving a system of linear equations
- Solving a system of linear equations using substitution ⤴
- Solving a system of linear equations using elimination with addition ⤴
- Identifying the center and radius to graph a circle given its equation in standard form
- Identifying the center and radius to graph a circle given its equation in general form: Basic
- Writing an equation of a circle given its center and radius or diameter ⤴
- Writing an equation of a circle given its center and a point on the circle ⤴
- Classifying systems of linear equations from graphs

Unit 2 Functions 1 (24 Topics, due on 01/20/2019 11:59 PM)

- Solving for a variable in terms of other variables using addition or subtraction with division ⤴
- Solving for a variable inside parentheses in terms of other variables ⤴
- Graphing a linear inequality on the number line
- Graphing a compound inequality on the number line

- Set-builder and interval notation
- Solving a quadratic equation using the square root property: Exact answers, basic 📄
- Restriction on a variable in a denominator: Quadratic 📄
- Identifying functions from relations
- Vertical line test
- Evaluating functions: Linear and quadratic or cubic 📄
- Evaluating a rational function: Problem type 1 📄
- Evaluating a rational function: Problem type 2 📄
- Evaluating functions: Absolute value, rational, radical 📄
- Variable expressions as inputs of functions: Problem type 1 📄
- Variable expressions as inputs of functions: Problem type 2 📄
- Domain and range from ordered pairs 📄
- Domain of a rational function: Excluded values 📄
- Domain of a rational function: Interval notation 📄
- Determining whether an equation defines a function: Basic 📄
- Determining whether an equation defines a function: Advanced 📄
- Finding outputs of a one-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 continuous function
- Domain and range from the graph of a piecewise function

Unit 3 Functions 2 (14 Topics, due on 01/23/2019 11:59 PM)

- Finding the LCD of rational expressions with linear denominators: Relatively prime 📄
- Solving a radical equation that simplifies to a linear equation: One radical, basic 📄
- Domain of a square root function: Basic 📄
- Domain of a square root function: Advanced 📄
- Finding a difference quotient for a linear or quadratic function 📄
- Finding a difference quotient for a rational function 📄
- Finding where a function is increasing, decreasing, or constant given the graph
- Finding local maxima and minima of a function given the graph
- Sum, difference, and product of two functions 📄
- Quotient of two functions: Basic 📄
- Composition of two functions: Basic 📄
- Expressing a function as a composition of two functions 📄
- Composition of two functions: Domain and range
- Composition of two functions: Advanced 📄

Test 1 Review (1 Topic, due on 01/25/2019 11:59 PM)

- Ordering real numbers 📄

Unit 4 Graphing (18 Topics, due on 01/31/2019 11:59 PM)

- Graphing an absolute value equation of the form y = A|x|
- Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin
- Testing an equation for symmetry about the axes and origin
- Graphing an absolute value equation in the plane: Basic
- Graphing an absolute value equation in the plane: Advanced
- Graphing a function of the form $f(x) = ax^2$
- Graphing a function of the form $f(x) = ax^2 + c$
- Graphing a square root function: Problem type 1
- Graphing a square root function: Problem type 3
- Matching parent graphs with their equations
- Even and odd functions: Problem type 1
- Even and odd functions: Problem type 2 📄

- Translating the graph of an absolute value function: Two steps
- Writing an equation for a function after a vertical translation 🔁
- Translating the graph of a function: Two steps
- Transforming the graph of a function by reflecting over an axis
- Transforming the graph of a function using more than one transformation
- Transforming the graph of a quadratic, cubic, square root, or absolute value function

Unit 5 Exponential Fncts (11 Topics, due on 02/06/2019 11:59 PM)

- Evaluating an expression with a negative exponent: Negative integer base 🔁
- Graphing a vertical or horizontal line
- Graphing an exponential function and its asymptote: $f(x)=b^x$
- Graphing an exponential function and its asymptote: $f(x) = a(b)^x$
- Graphing an exponential function and its asymptote: $f(x)=b^{-x}$ or $f(x)=-b^{ax}$
- The graph, domain, and range of an exponential function
- Transforming the graph of a natural exponential function
- Graphing an exponential function and its asymptote: $f(x) = a(e)^{x-b} + c$
- Using a calculator to evaluate exponential expressions involving base e 🔁
- Evaluating an exponential function with base e that models a real-world situation 🔁
- Comparing linear, polynomial, and exponential functions

Unit 6 Logarithm Function (23 Topics, due on 02/13/2019 11:59 PM)

- Power rules with positive exponents: Multivariate quotients 🔁
- Converting between radical form and exponent form 🔁
- Rational exponents: Negative exponents and fractional bases 🔁
- Solving a linear inequality with multiple occurrences of the variable: Problem type 1 🔁
- Finding the roots of a quadratic equation of the form $ax^2 + bx = 0$ 🔁
- Finding the roots of a quadratic equation with leading coefficient greater than 1 🔁
- Solving a quadratic equation needing simplification 🔁
- Solving a quadratic inequality written in factored form
- Solving a quadratic inequality
- Converting between logarithmic and exponential equations 🔁
- Converting between natural logarithmic and exponential equations 🔁
- Evaluating logarithmic expressions 🔁
- Solving an equation of the form $\log_b a = c$ 🔁
- Translating the graph of a logarithmic function
- Graphing a logarithmic function: Basic
- The graph, domain, and range of a logarithmic function
- Domain of a logarithmic function: Advanced
- 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 🔁

Unit 7 Log/Exp Equations (11 Topics, due on 02/16/2019 11:59 PM)

- Power of a power rule with negative exponents 🔁
- Solving an equation of the form $\log_b a = c$ 🔁
- Using properties of logarithms to evaluate expressions 🔁
- Solving a multi-step equation involving a single logarithm: Problem type 1 🔁
- Solving a multi-step equation involving natural logarithms 🔁
- Solving an equation involving logarithms on both sides: Problem type 1 🔁

- 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 final amount in a word problem on continuous compound interest
- Finding half-life or doubling time

Unit 8 Angle Measures (9 Topics, due on 02/20/2019 11:59 PM)

- Circumference of a circle
- Solving a word problem with two unknowns using a linear equation
- Converting between degree and radian measure: Problem type 1
- Converting between degree and radian measure: Problem type 2
- Sketching an angle in standard position
- Coterminal angles
- Arc length and central angle measure
- Area of a sector of a circle
- Angular and linear speed

Test 2 Review (1 Topic, due on 02/22/2019 11:59 PM)

- Ordering integers

Unit 9 Trig Functions 1 (20 Topics, due on 03/08/2019 11:59 PM)

- Naming the quadrant or axis of a point given its coordinates
- Naming the quadrant or axis of a point given the signs of its coordinates
- 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
- Using a calculator to approximate sine, cosine, and tangent values
- 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 a trigonometric ratio to find a side length in a right triangle
- Using trigonometry to find a length in a word problem with one right triangle
- 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
- Using cofunction identities

Unit 10 Trig Functions 2 (15 Topics, due on 03/15/2019 11:59 PM)

- Solving a two-step equation with signed fractions
- Even and odd properties of trigonometric functions
- 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 $y = a\sin(x + c)$ or $y = a\cos(x + c)$
- 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 ⤢
- Domains and ranges of trigonometric functions
- Matching graphs and equations for secant, cosecant, tangent, and cotangent functions

Unit 11 Inverse Trig Fnct (7 Topics, due on 03/20/2019 11:59 PM)
- 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 ⤢

Test 3 Review (1 Topic, due on 03/22/2019 11:59 PM)
- Ordering integers ⤢

Unit 12 Trig Identities (24 Topics, due on 04/12/2019 11:59 PM)
- Factoring a difference of squares in one variable: Advanced ⤢
- Dividing rational expressions involving quadratics with leading coefficients of 1 ⤢
- Adding rational expressions with denominators ax and bx: Advanced ⤢
- Simplifying a quotient involving a sum or difference with a square root ⤢
- Rationalizing a denominator: Square root of a fraction ⤢
- Rationalizing a denominator using conjugates: Integer numerator ⤢
- 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
- 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
- Double-angle identities: Problem type 1 ⤢
- Double-angle identities: Problem type 2 ⤢
- Power-reducing identities ⤢
- Half-angle identities: Problem type 1 ⤢
- Half-angle identities: Problem type 2
- Product-to-sum and sum-to-product identities: Problem type 2 ⤢
- Proving trigonometric identities using double-angle properties

Unit 13 Trig Equations (13 Topics, due on 04/19/2019 11:59 PM)
- Evaluating expressions involving sine and cosine
- 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 a trigonometric equation using Pythagorean identities: Problem type 2 ⿻
- Finding solutions in an interval for an equation with sine and cosine using double-angle identities ⿻
- 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 ⿻

Test 4 Review (1 Topic, due on 04/22/2019 11:59 PM)

- Ordering integers ⿻

Unit 14 Laws Sine/Cosine (19 Topics, due on 04/29/2019 11:59 PM)

- Distance between two points in the plane: Exact answers ⿻
- 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 ⿻
- 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
- Proving the law of sines
- Solving a triangle with the law of cosines ⿻
- Proving the law of cosines
- Solving a word problem using the law of cosines
- Expressing the area of a triangle in terms of the sine of one of its angles
- Writing a vector in ai+bj form given its initial and terminal points ⿻
- Writing a vector in component form given its initial and terminal points ⿻
- Magnitude of a vector given in ai+bj form ⿻
- Vector addition and scalar multiplication: ai+bj form ⿻
- Linear combination of vectors: ai+bj form ⿻
- Vector addition and scalar multiplication: Component form ⿻
- Linear combination of vectors: Component form ⿻