

Math 4C-56107

Mr. Jim Gilmore

Office: FEM

Office Hours: M, Th 11:00-11:50; W 9:00-9:50

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Trigonometry/Precalculus

REEDLEY COLLEGE

Spring 2010

EXT. 3365

Meeting Room: CCI 206

Meeting Days: Daily

Course Description: This course is an analytic and comprehensive study of algebra, analytic geometry and trigonometry designed to prepare students for calculus. Topics include linear, quadratic, and rational equations and inequalities, functions and their graphs, exponential and logarithmic functions, systems of linear and quadratic equations and inequalities, matrices and determinants, conic sections, angles, trigonometric and inverse trigonometric functions, right and oblique triangles, graphs, identities, trigonometric equations, vectors, polar coordinates, DeMoivre's theorem and applications.

Basic Skills Advisories: Eligibility for ENGL 125 AND ENGL 126

Subject Prerequisites: MATH 102 and MATH 103 or equivalent

TEXT: Algebra and Trigonometry: An Early Functions Approach Plus MyMathLab Student Access Kit by Blitzer © 2010 | ISBN-10: 0321614739

REQUIRED NOTES: Math 5C Notes are to be printed before each class.

Required Web Access: MyMathLab

ATTENDANCE: Students are expected to attend all class meetings, be on time, and be in class the entire class session. Calling me to tell me you will be absent **does not** excuse you. **STUDENTS LEAVING CLASS BEFORE THE END OF CLASS WILL BE COUNTED AS BEING ABSENT!** **Three (3) absences** may result in a drop from the course. However, if you decide to drop the course, it is **your** responsibility to make the drop official in the Administrations and Records office or else possibly receive a grade of **F**.

Behavioral Standards: Your classmates and I would greatly appreciate that students in the class take care of any personal needs (i.e., using the restroom, getting a drink, sharpening a pencil) before class begins. Please turn your phone off when entering the class. You may not use your phone as a calculator. I would appreciate that you not bring guests to class.

NOTE: The drop deadline is **March 12, 2010**.

TARDIES: Students are expected to be on time. It is distracting, rude and unfair to fellow classmates and to the instructor when a student is late. If you are not present when roll is taken you will be counted as absent.

HOMEWORK: Homework is done from the book and in MyMathLab. **NO LATE HOMEWORK WILL BE ACCEPTED!**

Note: Being absent the day homework is collected does not entitle you to turn it in late!

TESTS: There are no makeup exams for missed tests.

FINAL EXAM: A two-hour comprehensive final exam worth 1 test will be given at the end of the semester during finals week. You are required to take the final exam, however the final exam will replace your lowest test score.

Students are required to participate in all class discussions and activities. You may not start the homework during class. You may not study for another class or read a book during class.

GRADING:

- *Homework:* All of your homework scores will be worth the same percentage. So homework worth 10 points and homework worth 15 points will count the same. Homework percentages will be averaged to obtain a total homework percentage.
- *Online Tests:* All of your test percentages will be averaged. This will give you a score between 0 and 100.
- *In Class Tests:* All of your test percentages will be averaged. This will give you a score between 0 and 100.
- Your homework grade is worth 25% of your grade. Your online test grade is worth 5% of your grade and the in class test grade is worth 70% of your grade

Example: If your homework grade is 75, your online test grade is grade is 85, and your in class test grade is 70%, then you would compute your grade as follows:

$$(.25)(75) + (.05)(85) + (.70)(70) = 18.75 + 4.25 + 49 = 72\%$$

<u>Percent of Total Points</u>	<u>Grade</u>
89-100	A
78-88	B
65-77	C
55-64	D
0-54	F

WHERE TO FIND YOUR GRADE:

Available at <http://sc.webgrade.classmanager.com/ReedleyCollege/> Your class will be identified by schedule number. Username and password is sent to your email that you have on record with Blackboard.

SPECIAL NEEDS REQUESTS: If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

Academic Dishonesty

Students at Reedley College are entitled to the best education that the college can make available to them, and they, their instructors, and their fellow students share the responsibility to ensure that this education is honestly attained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to exert an entirely honest effort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences.

Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner, such as having improper access to answers, in an attempt to gain an unearned academic advantage. Cheating may include, but is not limited to, copying from another's work, supplying one's work to another, giving or receiving copies of examinations without an instructor's permission, using or displaying notes or devices inappropriate to the conditions of the examination, allowing someone other than the officially enrolled student to represent the student, or failing to disclose research results completely.

Plagiarism is a specific form of cheating: the use of another's words or ideas without identifying them as such or giving credit to the source. Plagiarism may include, but is not limited to, failing to provide complete citations and references for all work that draws on the ideas, words, or work of others, failing to identify the contributors to work done in collaboration, submitting duplicate work to be evaluated in different courses without the knowledge and consent of the instructors involved, or failing to observe computer security systems and software copyrights.

Incidents of cheating and plagiarism may result in any of a variety of sanctions and penalties, which may range from a failing grade on a particular examination, paper, project, or assignment in question to a failing grade in the course, at the discretion of the instructor and depending on the severity and frequency of the incidents.

Course Objectives

- A. graph linear, quadratic and rational equations and inequalities.
- B. identify the characteristics of a function, both from its equation and its graph and perform operations on functions once identified.
- C. graph and solve quadratic, polynomial and rational functions and apply these skills to solve direct, inverse and combined variation problems.
- D. set up and solve exponential and logarithmic functions.
- E. solve systems of both linear and non-linear equations and inequalities in two and three variables.
- F. use matrices to solve linear systems, perform matrix operations, solve matrix equations through the use of multiplicative inverses and use determinants and Cramer's Rule to solve linear systems.
- G. identify and graph the conic sections (Ellipse and Circles, Parabola, Hyperbola).
- H. evaluate trigonometric function values of both acute and obtuse angles using both special angle values and calculator values.
- I. use the unit circle to determine the radian measure of angles and convert from radian to degree measure and vice versa.
- J. derive the basic trigonometric identities, sum and difference formulas, and double-angle and half-angle formulas.
- K. use the Law of Sines and Law of Cosines to solve both acute and obtuse triangles.
- L. use polar coordinates to represent points and to graph polar equations.
- M. represent vectors in the rectangular coordinate system and identify their magnitude and direction; perform operations (addition, subtraction, scalar multiplication and dot product) with vectors.

Course Outcomes

Upon completing this course students will demonstrate the ability to:

- A. apply the concepts graphing linear, quadratic and rational equations and inequalities to model real-world phenomena including but not limited to life expectancy, simple interest, heart rates, and velocity and height of a projectile.
- B. perform transformations on various functions, find the inverse of a given function and combine functions to make composite functions.
- C. apply the concepts of direct, inverse and combined variation to model real-world phenomena including but not limited to the relationships between two or more quantities such as an aircraft's speed and its Mach number, Earth's gravitational force on an object and the object's distance from the center of the Earth and a person's body-mass index and their height.
- D. apply the concepts of exponential and logarithmic functions to model real-world phenomena including but not limited to population growth rates, Carbon-14 dating of ancient artifacts and the spread of diseases in populations.
- E. apply the concepts of solving systems and linear programming to model classic management science problems of maximizing profits and minimizing costs.
- F. apply the concept of a matrix to understand and model digital images on a camera or computer screen.
- G. use the conic section curves to help model real-world phenomena including but not limited to ripples in water, the path the planets travel in the solar system and the shape of satellite tracking antennae.
- H. apply the trigonometric functions to solve for the parts (angles, sides) of a right triangle to solve classic surveying problems including but not limited to angle of elevation, angle of depression, height of a tree or building and distance across a river or valley.
- I. apply the concept of radian measure to graph the trigonometric functions and use some of these graphs to model real-world phenomenon including but not limited to ocean tidal patterns, biorhythms and number of hours of daylight on a given day of the year in a given city of the world.
- J. use the trigonometric identities and special formulas to simplify trigonometric expressions and solve trigonometric equations.
- K. use the Law of Sines and Law of Cosines to solve application problems including but not limited to determining the bearing and speed of a ship, determining the location of a fire and its distance from a specific fire station and the area of plots of land which can't be measured easily.
- L. apply the concept of polar coordinates and DeMoivre's Theorem to represent complex numbers in polar form.
- M. use vectors to model real-world phenomenon including but not limited to forces on an object, work done by a crane in lifting a boulder to a certain height, and the force which needs to be applied to a car's brakes to keep it from rolling down a hill.

COURSE CONTENT OUTLINE:

- A. Equations, Inequalities and Mathematical Models
 1. Graphs and graphing utilities
 2. Linear Equations
 3. Formulas and Applications
 4. Complex Numbers
 5. Quadratic Equations
 6. Other Types of Equations
 7. Linear Inequalities
 8. Quadratic and Rational Inequalities

- B. Functions and Graphs
 1. Lines and Slope
 2. Distance and Midpoint Formulas; Circles
 3. Basics of functions
 4. Graphs of functions
 5. Transformations of functions
 6. Combinations of functions; Composite functions
 7. Inverse functions

- C. Polynomial and Rational Functions
 1. Quadratic functions
 2. Polynomial functions and their graphs
 3. Dividing polynomials; Remainder and Factor Theorems
 4. Zeros of Polynomial Functions
 5. Rational Functions and their graphs
 6. Modeling using Variation

- D. Exponential and Logarithmic Functions
 1. Exponential functions
 2. Logarithmic functions
 3. Properties of Logarithms
 4. Exponential and Logarithmic Equations
 5. Modeling with Exponential and Logarithmic Functions

- E. Systems of Equations and Inequalities
 1. Systems of Linear Equations in two variables
 2. Systems of Linear Equations in three variables
 3. Systems of Nonlinear Equations in two variables
 4. Systems of Inequalities
 5. Linear Programming

- F. Matrices and Determinants
 1. Matrix solutions to Linear Systems
 2. Inconsistent and Dependent Systems and their applications
 3. Matrix Operations and their applications
 4. Multiplicative Inverses of Matrices and Matrix Equations
 5. Determinants and Cramer's Rule

- G. Conic Sections and Analytic Geometry
 1. The Ellipse and Circles
 2. The Hyperbola
 3. The Parabola
 4. Rotation of Axes

- H. Trigonometric Functions
 1. Angles and their measure
 2. Right Triangle Trigonometry
 3. Trigonometric Functions of any angle

 4. Trigonometric Functions of Real Numbers; Periodic Functions
 5. Graphs of Sine and Cosine Functions
 6. Graphs of Other Trigonometric Functions
 7. Inverse Trigonometric Functions
 8. Applications of Trigonometric Functions

- I. Analytic Trigonometry
 1. Verifying trigonometric identities
 2. Sum and Difference Formulas
 3. Double-Angle and Half-Angle Formulas
 4. Trigonometric Equations

- J. Additional Topics in Trigonometry
 1. The Law of Sines
 2. The Law of Cosines
 3. Polar Coordinates
 4. Graphs of Polar Equations
 5. Complex Numbers in Polar Form; DeMoivre's Theorem
 6. Vectors
 7. The Dot Product

Important Dates

January 11	Class Begins
January 18	Martin Luther King Jr. Day
February 12	Lincoln Day
February 15	Washington Day
March 12	Last day to drop
March 29-April 2	Spring Recess
May 17 (Monday)	Final day from 10:00-12:50 (The final is a test. Be sure you plan to be there!)
May 21	End of semester