Course: Math 1113 Precalculus
MW 12:30 PM-2:15 PM
Hours Credit: 4 hours

Jim Storey
Office Hours: 11AM – 12Noon

(Let me know you are coming by so that I do not walk away to the copier.)

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Prerequisites: Four years of high school mathematics including algebra and trigonometry OR MATH 1111.

Courses Description: This course is designed to prepare students for calculus, physics and related technical subjects. Topics include an intensive study of algebraic and transcendental functions.


Learning Outcomes: Students should be able to demonstrate:
1. An understanding of functions and how to graph functions
2. An understanding of operations on functions including function composition
3. An understanding of polynomial and rational graphs, including intercepts and asymptotes
4. An understanding of how to find the zeros of a polynomial and how to factor polynomials
5. An understanding of inverse functions and how to find them graphically and algebraically
6. An understanding of the properties of exponential and logarithmic equations
7. An understanding of how to solve exponential and logarithmic equations
8. An understanding of how to find the values of the trigonometric functions from right triangles and circles
9. An understanding of how to graph the trigonometric functions
10. An understanding of how to prove trigonometric identities
11. An understanding of how to use the sum, difference, double-angle and half-angle formulas for sine and cosine
12. An understanding of how to solve triangle using the law of sines and law of cosines
13. An understanding of polar coordinates and graphs
14. An understanding of how to analyze and solve applied problems

Attendance: Regular attendance is required for success in this course. If you decide to stop attending class, be sure that you withdraw with the registrar’s office. Starting with the 4th absence your grade may be affected dependent on the nature of the absence.
Proper documentation from a doctor, court, etc. must be provided. All absences must have the proper documentation provided, even the first three (3)

Tardies: Please do not arrive late to class and/or leave early. This is a major distraction. If it is excessive or a problem those late arrivals/early outs will be counted as absences. You may not be allowed in the class late.

Please do not go out and come back in during a class. If you need to leave because of an emergency, then take your things and do not return.

Test Policy: NO make-up tests will be given. The lowest of the four scheduled test grades will be dropped. If a test is missed it will be the one dropped. A second test should not be missed! The final exam will account for 25% of the student’s grade.

Homework: Homework will be collected ten (10) times during the course. Be sure to have yours ready and completed for the next class. It may be collected any time during the semester. There will be a homework/attendance grade given. Homework is not accepted late unless you are absent and then it is due on the day you return. You are advised to do all assigned homework problems. Solution manuals are available through various sources. The Math lab is located on the 2nd floor of the Boyd building. They provide free tutoring. The Excel Center also offers free tutoring. Start early getting extra help and keeping your work up to date. The homework/attendance grade will be averaged with the three test grades and the average of the quiz grades.

Quizzes: Expect quizzes throughout the course. They may be scheduled or unscheduled. The quiz average will be averaged with the three best test grades and the homework/attendance grade to obtain 75% of your grade.

Exam: The final exam will be given during exam week on the assigned date. Check the schedule in “The Scoop”.

Calculator Policy: A graphing calculator is required.

Grading Scale: 90 – 100 A
   80 – 89 B
   70 – 79 C
   60 – 69 D
   0 – 59 F

Cell Phones and Electronic Devices: Cell phones and electronic devices should NOT be used in class and should not be out during class. Please do not go in and out of class to talk on the phone. This was a major problem and distraction one year. There should be NO side conversations in class! There should be NO visitors in class!

Please refer to the link below for common syllabi information.
Any student having difficulties during the review sections, Ch P sec 1-6 and Ch 2 sec 1-5, should consider changing to Math 1111.
STANDARD TOPICS and OUT OF CLASS WORK

1.7 Combinations of Functions/Composite Functions
- Find the domain of a function (#1-30)
- Find the sum, difference, product and quotient of 2 functions and their domains (#31-48)
- Find the composition of 2 functions (#51-66, #67-74 with domain)
- Break a composition into its parts (#75-82)
- Applications (#97-102)

1.8 Inverse Functions
- Determining if 2 functions are inverses (#1-10)
- Find an equation for the inverse and verify (#11-28)
- Horizontal line test (#29-34)
- Graphing inverses (#35-38)
- Inverses with domain/range (#39-52)
- Applications (#65-69)

2.6 Rational Functions
- Find domain (#1-8)
- Limits from graph (#9-20)
- Vertical asymptotes (#21-36)
- Horizontal asymptotes (#37-44)
- Students should know how to use a graphing calculator to obtain the graphs given in #45-88.

2.7 Polynomial and Rational Inequalities
- Solving polynomial inequalities (#1-42)
- Solving rational inequalities (#43-60)
- Applications (#75-80)

3.1 Exponential Functions
- Graphing exponential equation (#11-18)
- Identifying equation using vertical/horizontal shifts and reflections (#19-24)
- Graphing using horizontal/vertical shifts and reflections (#25-46)
- Compound interest (#53-56)
- Students should be able to use a graphing calculator to graph the functions given in #11-18,25-52.
- Applications (#65-76)

3.2 Logarithmic Functions
- Switching between exponential and logarithmic form (#1-20)
- Evaluating logs using definition and inverse properties (#21-42)
- Identifying equations using vertical/horizontal shifts and reflections (#47-52)
3.3 Properties of Logarithms
- Expand logarithmic expressions (#1-40)
- Condense logarithmic expressions (#41-70)
- Change of Basis formula (#71-78)
- Applications (#103-104)

3.4 Exponential and Logarithmic Equations
- Solve exponential equations (#1-43)
- Solve logarithmic equation involving single log (#49-66)
- Solve logarithmic equation involving multiple logs (#67-92)
- Applications (#103-120)

3.5 Modeling with Exponential and Logarithmic Functions
- Exponential growth and population models (#1-14)
- Exponential decay and half lives (#15-36)
- Logistic growth (#37-46)
- Newton’s Law of Cooling (#47-50)

4.1 Angles and Radian Measure
- Convert between radians and degrees (#13-40)
- Draw angles in standard position (#41-56)
- Finding coterminal angles (#57-70)
- Finding arc length (#71-74)
- Applications (#87-100)

4.2 Trigonometric Functions: The Unit Circle
- Find values of the 6 trig functions from a unit circle point (#1-4)
- Find common trig values given the unit circle points (#5-24, 53-60)
- Using basic identities to find trig values (#25-28)
- Using Pythagorean identity to find other trig values (#29-32)
- Using basic identities to evaluate expressions (#33-38)
- Using properties to evaluate a trig expression (#39-52)
- Applications (#81-84)

4.3 Right Triangle Trigonometry
- Finding values of 6 trig functions given 2 sides of a right triangle (#1-8)
- Properties of cofunctions (#21-28)
- Finding common trig values using right triangles (#9-20)
- Using trig to find the length of a side of a right triangle (#29-34)
4.4 Trigonometric Functions of Any Angle
- Finding 6 trig values given point on a circle (#1-8)
- Finding the quadrant given signs of trig functions (#17-22)
- Finding trig values given one value and quadrant (#23-34)
- Finding reference angles (#35-60)
- Finding exact values using reference angles (#61-86)

4.5 Graphs of Sine and Cosine
- Finding amplitude and period (#7-16, 35-42)
- Finding amplitude, period and phase shift (#17-30, 43-52)
- Applications (#75-88)
- STUDENTS SHOULD KNOW HOW TO USE A GRAPHING CALCULATOR TO OBTAIN THE GRAPHS GIVEN IN #7-30, 35-52.

4.6 Graphs of Other Trigonometric Functions
- STUDENTS SHOULD KNOW HOW TO USE A GRAPHING CALCULATOR TO OBTAIN THE GRAPHS GIVEN IN #5-12, 17-24, 29-44.
- Using graph of sine/cosine to obtain graph of sec/csc (#25-28)

4.7 Inverse Trigonometric Functions
- Finding exact values (#1-18)
- Using calculator to obtain values (#19-30)
- Inverse properties (#31-46)
- Making sketch to evaluate expressions involving trig and inverse trig functions (#47-62)
- Writing an expression involving trig and inverse trig function as an algebraic expression (#63-72)
- Applications (#93-98)

4.8 Applications of Trig Functions.
- Solving triangles (#1-12)
- Harmonic motion (#17-28)
- Applications (#41-50, 59-62)

5.1 Verifying Identities
- Verify Identities (#1-60)

5.2 Sum and Difference Formulas
- Using sum/difference formulas (#1-8, 13-24)
- Rewriting an expression using sum/difference formulas (#25-32)
5.3 Double Angle, Power Reducing and Half-Angle Formulas
- Using Double Angle Formulas (#1-22)
- Verifying Identities (#23-34)
- Use Half-Angle Identities (#39-54)

5.5 Solving Trigonometric Equations
- Determine if an x-value is a solution to a trig equation (#1-10)
- Find all solutions to a trig equation (#11-24)
- Find all solutions on a given interval (#25-62)

6.1 The Law of Sines
- Solve a triangle (#1-16)
- Determine of the given info produces 0, 1 or 2 triangles (#17-32)
- Applications (#43-56)

6.2 The Law of Cosines
- Solve a triangle (#1-24)
- Heron’s area formula (#25-30)
- Applications (#37-52)

6.3 Polar Coordinates
- Plotting points in polar coordinates (#1-20)
- Switch between polar and Cartesian coordinates of a point (#33-48)
- Switch equations between polar and rectangular coordinates (#49-74)

6.4 Graphs of Polar Equations
- STUDENTS SHOULD KNOW HOW TO USE A GRAPHING CALCULATOR TO OBTAIN THE GRAPHS GIVEN IN #13-34.

7.1 Systems of Linear Equations in Two Variables
- Show a particular ordered pair is (not) a solution to a 2x2 system (#1-4)
- Solve a 2x2 system by substitution (#5-18)
- Solve a 2x2 system by addition method (#19-30)
- Solve a 2x2 system by any method (#31-42)
- Word problems (#43-46)
- Applications (#55-94)

7.2 Systems of Linear Equations in Three Variables
- Show an ordered triple is (not) a solution to a 3x3 system (#1-4)
- Solve a 3x3 system (#5-18)
- Word problems (#23,24)
- Find a quadratic passing thru 3 points (#19-22)
- Applications (#31-41)