MONTE VISTA CHRISTIAN SCHOOL
MATH 3340, Precalculus/Trigonometry Honors
Course Syllabus

Course Description

An important bridge between Algebra II and calculus, honors precalculus equips the student with the tools necessary to succeed in higher mathematics. Topics such as functions, families of graphs, logarithms, trigonometric functions and identities, systems of equations and inequalities, analytic geometry, limits, and basic derivatives are studied in depth. Students are challenged to show their proficiency both with and without the use of a graphing calculator. In addition, students deal with real-life applications and problem solving, and must communicate orally and symbolically about mathematics.

Curricular Mapping

Having a skeletal framework of understanding of functions, graphs, inequalities, and conic sections from Algebra 2, students will flesh out their knowledge of these and related topics as they delve deeper into the application, kinds, and problem solving related to these mathematical subjects. Students will also be introduced to the concept of a limit and of a derivative in preparation for calculus.

Course Objectives

Upon successful completion of this course, the student will be able to:

- Work effectively with polynomial, rational, exponential, logarithmic, and trigonometric functions and their individual graphs
- Fit exponential, logarithmic, power, and logistic models to sets of data.
- Work effectively with trigonometric functions and their identities.
- Represent vectors as directed line segments and perform mathematical operations on vectors.
- Solve systems of equations by Gaussian elimination and graphically.
- Write matrices, identify their order, and perform elementary row operations
- Recognize, write, and use arithmetic sequences and geometric sequences.
- Solve counting problems using the Fundamental Counting Principle, permutations, and combinations.
- Work effectively with equations of basic conics.
- Be comfortable with the polar coordinate system.
- Estimate limits and use properties and operations of limits.
- Find limits by direct substitution and by using the dividing out and rationalizing techniques.

- Approximate slopes of tangent lines, use the limit definition of slope, and use derivatives to find slopes of graphs.
- Evaluate limits at infinity.
- Find limits of summations and use them to find areas of regions bounded by graphs of functions.

Text:

Your necessary digital texts for this class will be part of a "Required Course Materials Fee" thru the EdTech bookstore. This is a bundle purchase of digital texts for your full schedule of classes and will be available for purchase after 7/18/16. For further instructions please visit the 16-17 School Year icon on the MVCS homepage. Please note: some courses may require additional purchases outside of the course materials fee.

Prerequisite

Students must complete Algebra 2 before enrolling in this course. An A in regular Algebra 2 or a B or higher in Honors Algebra 2 is recommended.

Course Outline

Unit One: Functions and Their Graphs

- Lines in the Plane
- Functions
- Graphs of Functions
- Shifting, Reflecting, and Stretching Graphs
- Combinations of Functions
- Inverse Functions
- Linear Models and Scatter Plots

Unit Two: Trigonometric Functions

- Radian and Degree Measure
- The Unit Circle
- Right Triangle Trigonometry
- Trigonometric Functions of Any Angle
- Graphs of Sine and Cosine Functions
- Graphs of Other Trigonometric Functions
- Inverse Trigonometric Functions
- Applications and Models

Unit Three: Analytic Trigonometry

- Using Fundamental Identities
- Verifying Trigonometric Identities
- Solving Trigonometric Equations

- Sum and Difference Formulas
- Double Angle and Half Angle Formulas

Unit Four: Additional Topics in Trigonometry

- Law of Sines
- Law of Cosines
- Vectors in the Plane
- Vectors and Dot Products

Unit Five: Analytic Geometry in Three Dimensions

- The Three-Dimensional Coordinate System
- Vectors in Space
- The Cross Product of Two Vectors

Unit Six: Polynomial and Rational Functions

- Quadratic Functions
- Polynomial Functions of Higher Degree
- Real Zeros of Polynomial Functions
- Complex Numbers
- The Fundamental Theorem of Algebra
- Rational Functions and Asymptotes
- Graphs of Rational Functions
- Quadratic Models

Unit Seven: Topics in Analytic Geometry

- Parabolas
- Ellipses
- Hyperbolas
- Parametric Equations
- Polar Coordinates
- Graphs of Polar Equations

Unit Eight: Exponential and Logarithmic Functions

- Exponential Functions and Their Graphs
- Logarithmic Functions and Their Graphs
- Properties of Logarithms
- Solving Exponential and Logarithmic Equations
- Exponential and Logarithmic Models
- Nonlinear Models

Unit Nine: Linear Systems and Matrices

- Solving Systems of Equations
- Multivariable Linear Systems
- Matrices and Systems of Equations
- Operations with Matrices

- The Inverse of a Square Matrix
- Cryptography

Unit Ten: Sequences, Series, and Probability

- Sequences and Series
- Arithmetic Sequences and Partial Sums
- Geometric Sequences and Series
- The Binomial Theorem
- Counting Principles
- Probability

Unit Eleven: Limits and an Introduction to Calculus

- Introduction to Limits
- Techniques for Evaluating Limits
- The Tangent Line Problem
- Limits at Infinity
- The Area Problem

Grading:

Grade Book Categories		**Semester Weighted Grading Configuration**	
Assignments and Binder	15%	Quarter	40%
Quizzes	35%	Quarter	40%
Tests	50%	Final Exam	20%

High School Standard Grading Policy:
Please refer to the policy and procedures posted online in our Student Handbook.

Assignments

1. Notes and assignments are to be kept together. Draw a line between the end of your notes each day, and then begin your assignment below that line.
2. Students are allowed one no penalty, day late assignment each week.
3. Show all work in order to receive full credit. Giving "answers only" earns no credit.
4. If absent, a student is required to obtain notes, corrections, and/or other instructions from classmates.

5. Binders are due at the beginning of the period on the day of a chapter test. Please make sure your name is on the front of your binder.
6. Students can expect an average of 30 minutes of homework each day.

Class Policies

1. From August to May, apply discipline, determination, and desire in order to do your best.
2. Be responsible for your attitude. We need positive, respectful encouragers to spur us toward a successful year.
3. Bring your precalculus binder, pencils, red or blue pen, graphing calculator, and lined paper to class each day. (TI-84+ or TI-nspire calculators are recommended.)
4. Be seated in your desk, ready to correct your assignment, before the tardy bell rings or you will be considered tardy

Testing Policy

1. Being absent one day before a test does not excuse you from taking that test along with the rest of your class.
2. Calculators may not be shared on the day of a test.
3. If you are absent the day of a test, you will be expected to make up that test on the day you return to class.
4. Work must be shown in order to receive full credit.
5. This testing policy also applies to quizzes.

English Only Policy

Every student will begin each quarter with 15 English Only Assignment points. They will keep all 15 points if they always speak English in the classroom. They will lose one point per incident of speaking another language in the classroom.

School Policies and Expected Student Learning Results (ESLRs):

Students are subject to all academic policies of the school as found in the Parent-Student Handbook. Furthermore, it is each student's responsibility to read and follow all academic policies of Monte Vista Christian School. In addition to addressing each ESLR every year, we target a specific ESLR each academic year for particular focus.