MONTE VISTA CHRISTIAN SCHOOL
MATH 3320, Pre-Calculus/Trigonometry
Course Syllabus

Course Description:
Precalculus/Trigonometry is a course covering advanced material which is dependent upon solid understandings of advanced Algebra and Geometry. 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. 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 expand their knowledge of these topics as we delve deeper into the application and problem solving in these mathematical subjects. Students will 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:
1. Work effectively with polynomial, rational, exponential, logarithmic, and trigonometric functions and their graphs
2. Fit exponential, logarithmic, power, and logistic models to sets of data
3. Work effectively with trigonometric functions and their identities
4. Represent vectors and perform mathematical operations on vectors
5. Solve systems of equations by Gaussian elimination and graphically
6. Write matrices, identify their order, and perform elementary row operations
7. Recognize, write, and use arithmetic and geometric sequences
8. Solve counting problems using the Fundamental Counting Principle, permutations, and combinations
9. Work effectively with equations of conic sections
10. Be comfortable with the polar coordinate system
11. .Estimate limits and use properties and operations of limits
12. Find limits by direct substitution, and by using dividing out and rationalizing techniques
13. Approximate slopes of tangent lines, use the limit definition of slope, and use derivatives to find slopes of graphs
14. Evaluate limits at infinity

15. Find limits of summations and use them to find areas of regions bounded by graphs of functions.

Textbook:
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.

Prerequisites:
Students taking this course must have records of previous passing both Geometry and Algebra 2, or their equivalent, with a minimum grade of C-.

Course Outline:
Unit One: Functions and their graphs
Lines in the plane; functions; graphs of functions; shifting, reflecting, and stretching graphs; combination functions; inverse functions; linear models and scatterplots

Unit Two: Trigonometric Functions
Radian and degree measure; the unit circle; right triangle trigonometry; trigonometric functions of any angle; graphs of sine, cosine, tangent, cotangent, secant, and cosecant functions; inverse trigonometric functions; applications and models

Unit Three: Analytical Trigonometry
Using fundamental identities; verifying trigonometric identities; solving trigonometric equations; sum, difference, half and double angle formulas

Unit Four: Additional Topics in Trigonometry
Law of sines; law of cosines; vectors in the plane; vectors and dot products

Unit Five: Analytical Geometry in Three Dimensions
The three-dimensional coordinate system; vectors in space; 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 Analytical Geometry
Parabolas; ellipses; hyperbolas; parametric equations; polar coordinates; graphs of polar
equations

Unit Eight: Exponential Functions and Their Graphs
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 Probabilities
Sequences and series; arithmetic sequences and partial sums; geometric sequences and series; the
binomial theorem; counting principles; probability

Unit Eleven: Limits and 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**	
Homework	20%	Quarter	40%
Quizzes	30%	Quarter	40%
Tests	50%	Final	20%

Homework Expectations: On average, homework should take 30 minutes to complete.

Class Policies:
1.Tardiness: Class starts at the bell. Students are expected to have their pencils sharpened, have
all required materials out on their desk, and be seated and ready for class when the bell rings. If
a student is over fifteen minutes late without a note, an "unexcused absence" will be marked on
the attendance record.
2.Absences and Homework: Students may make up homework for full credit for each day they
have an excused absence or student activity. For students with unexcused absences, work not

turned in on the due date is considered late (see the late homework policy below). Homework packets are due for each chapter on the chapter test day.

3 Late Homework: Homework is due *when the bell rings* on the due dates stated by the instructor and on Focus. If turned in ONE DAY LATE, you may receive 50% credit for that assignment.

4. Test Etiquette: all quizzes and tests are to be done in pencil. During tests and quizzes, talking, not keeping answers/work covered, or looking at someone else's paper may result in a zero grade for that test or quiz.

5. Test Absences: Being absent one day before a test/quiz does not excuse you from taking that test/quiz along with the rest of your class. If you are absent the day of a test/quiz, you will be expected to make up that test/quiz on the day you return to class.

6. Class Etiquette: Above all, students must remain respectful of all other people in the classroom. To foster this respect, only one person should be talking at a time in a group, whether that group be the whole class or small groups within the class. Students should raise their hand when they have a question or want to say something when the teacher is instructing. Students should also not bring food or drink into the classroom, except for bottled water. Any other food spotted in class may be confiscated by the teacher until the end of the period. Students should also respect the teacher by resisting the urge to do work from other classes during this class. If this is observed, the teacher will confiscate the materials utilized until the end of the period. An offense of class etiquette will result in a warning, and a repeat offense during the same period will result in a referral.

7. Referrals: these are immediately administered for the following activities: disruptive behavior (after warning), inappropriate iPad or computer use (social networking, messaging, surfing inappropriate sites), any cell phone use, inappropriate language, verbal or physical disrespect to the instructor or students, and all other actions deemed eligible for referral in the student handbook.

School Policies and Expected Student Learning Results (ESLRs):
Students are subject to all academic policies of the school as printed in the 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.

Tips for Students:
It is important that you stay focused in class, taking detailed notes of class lectures. Please bring the following each day: graphing calculator (TI-Nspire or TI-84), binder paper and graph paper, pencil. I recommend you do not get behind in your homework. Keep your work organized and in order in a binder, titling every page with the date and section covered. Lastly, work with other students when things get challenging. However, do not ever copy another student's work.