Course Description
The learning opportunities and instruction in Pre-Calculus with Trigonometry (text: *Pre-Calculus with Trigonometry*, College Preparatory Mathematics © 2009) are designed to help students grow into more confident and competent practitioners of 21st century mathematics. Course content is aligned with the Colorado Academic Standards. These standards describe what all high school graduates should know and be able to do to ensure success in postsecondary and workforce settings.

In addition to covering all of the key concepts found in traditional trigonometry, pre-calculus, or math analysis courses, it emphasizes several big ideas that form a foundation for calculus and other college mathematics curricula.

The key concepts presented are:

- Transformations of functions
- Periodic functions and their graphs
- Area under a curve as a foundation for integration
- Inverses, exponential, and logarithmic equations and applications
- Limits to infinity and at a point
- Properties of functions including continuity, increasing vs. decreasing, and concavity
- Average rates of change and instantaneous rates of change as a foundation for derivatives
- Other graphical systems including polar and parametric
- Applications of vectors and trigonometric functions
- Algebraic fluency and simplification techniques
- Modeling using a variety of functions

This course is structured around investigations and problem solving. Students will explore concepts and develop mathematical relationships through observation, application, and both formal and informal proof. Lessons are designed to facilitate teamwork and encourage students to pose conjectures, justify solutions and defend their thinking.

Some lessons are specifically designed to be teacher-directed, but most have strong components that require students to work in study teams. We expect that the lesson objectives found at the start of each lesson will provide valuable guidance. Concepts are developed over time so that students can master key ideas with conceptual understanding, not merely memorization.

Each chapter is divided into sections that focus on a major concept for the chapter. Individual lessons are focused on one or two key ideas that build into a core concept for the chapter. Students will investigate a concept or property and have the ideas summarized in the form of a “Math Note.” These notes allow students easy access for review if they struggle with a particular concept. Homework is designed as both a review of the day’s lesson as well as practice with concepts previously introduced. Each chapter concludes with a closure section that has review problems and often a “merge problem” that pulls together several ideas learned in the chapter.
Classroom Behavior Requirements

❖ Students must be in their seats when both the starting and exit bells ring to avoid tardiness and late dismissal from class.
❖ Electronic devices must be used only with teacher permission for calculation, math research, and/or note-taking purposes. No social networking. Only graphing calculators can be used on tests.
❖ No eating or flavored drinks allowed in the classroom. Water only.
❖ Sit quietly; wait for instructions. Check board for and listen carefully to instructions.
❖ Take turns talking during whole group discussions. Raise your hand for attention.
❖ Work cooperatively in teams according to your team role to accomplish the team task.
❖ Respect others’ property, space, and opportunity to learn. No disruptions.
❖ Students must bring their textbook, pencil, designated math notebook, graph paper, and calculator (TI-83 graphing calculator recommended for all classes).

Grading

In Pre-Calculus with Trigonometry, we value:

- **Mathematical Understanding:** Understanding is a prerequisite to remembering, connecting, and using mathematics.
- **Skill Proficiency:** Skills are necessary to succeed at the mathematical tasks that students will encounter in these courses and beyond.
- **Problem Solving:** Our students need to learn to use what they know and think logically about problems to devise effective strategies to find solutions.
- **Communication:** Our students need to be able to use mathematical language and talk and write about their ideas effectively.
- **Justification:** Our students should be able to give logical arguments to defend their reasoning both orally and in writing.
- **Mastery Over Time:** We expect our students to continue to build broader and deeper understanding of the ideas in each course as the year progresses.
- **Multiple Ways of Seeing:** We value breadth of thinking. Our students should seek, find, hear, and understand multiple ways to think about a given mathematical task.
- **Effective Team Work:** In order to achieve many of the above-mentioned goals, our students need to work together. They need practice talking about mathematics and building deeper understanding by listening to the reasoning of other students. Therefore, it is essential that we place high value on students learning to work cooperatively.

A broad range of values necessitates a broad range of assessment tools with the indicated weights:

- **Individual Tests/Quizzes – 40% of semester grade** (Semester tests are 10% of the semester grade)
- **Team Tests/Quizzes – 30%** (Individual test score replaces team score if the individual score is higher)
- **Homework and Individual Projects** (including Learning Log and Math Notes) – **30%**
Homework is **due the day after** it is assigned. Work turned in after one week from assignment date will receive 80% of the homework score. **Grade summaries** are available online at [www.goedustar.com](http://www.goedustar.com). The counselor will help students set up their goedustar account. Extra credit is available to all students at the teacher’s discretion.

In addition to help at a prearranged time before or after school, students are encouraged to explore the homework and extra practice resources available online at [www.cpm.org](http://www.cpm.org) under Student Support, Homework Help, Advanced High School, *Pre-Calculus with Trigonometry*. Parent e-books containing problem-solving explanations, examples, practice problems, and answers are available for purchase on the CPM website. Other helpful math websites include Purple Math, Khan Academy, Math Warehouse, and the West Custer County Library.

Below is the 5-point rubric with which homework sets and test problems will be scored:

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<tr>
<th>Score</th>
<th>Criteria</th>
<th>Minimum % Score</th>
<th>Letter Grade</th>
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| 5     | • Fully Accomplishes the Purpose of the Task  
      • Student work shows full grasp and use of the central mathematics idea(s)  
      • Recorded work communicates thinking clearly using some combination of written, symbolic, or visual means. | 89.60 | A |
| 4     | • Substantially Accomplishes the Purpose of the Task  
      • Student works shows essential grasp of the central mathematics idea(s)  
      • Recorded work in large part communicates the thinking. | 79.60 | B |
| 3     | • Partially Accomplishes the Purpose of the Task  
      • Student work shows partial but limited grasp of the central mathematics idea(s)  
      • Recorded work may be incomplete, somewhat misdirected, or not clearly presented. | 69.60 | C |
| 2     | • Makes Little Progress Toward Accomplishing the Task  
      • Shows little or no grasp of the central mathematics idea(s)  
      • Recorded work is barely comprehensible, frequently incomplete, or occasionally missing. | 59.60 | D |
| 1     | • Makes No Progress Toward Accomplishing the Task  
      • Shows no grasp of the central mathematics idea(s)  
      • Recorded work is incomprehensible, consistently incomplete, or frequently missing. | 0 | F |