

**CANON CITY HIGH SCHOOL  
COURSE GUIDE**

**Department:** Mathematics

**Course Title:** Trigonometry

**Date:** Fall, 2003

**Grade Level:** 11 /12

**Prerequisite/Requirements:** C or better in Algebra II

**Costs to Students:** graphing calculator, 3 ring binder, protractor, ruler, graph paper, paper, and pencils

**Course Description:**

This course will cover the trigonometric concepts of trigonometric functions, circular functions and their inverses, trigonometric identities, solving triangles by application of law of sines and cosines, vectors and their applications, polar coordinates, complex numbers and conic sections.

**General Course Outcomes:**

**Upon completion of this course the proficient student will know and be able to: (core concepts/essential skills).**

- define and apply the six trigonometric functions of right triangles
- apply both degree and radian measure of angles
- define and apply the circular trigonometric functions
- find value of standard trigonometric measures (30,45,60,90)
- graph trigonometric functions and their inverses
- find values of trigonometric functions over their domains
- prove trigonometric properties/identities and apply them in finding values
- solve trigonometric equations
- solve oblique triangles by application of Law of Sine and Law of Cosine
- apply variations to graphs of the trigonometric functions
- apply principles of simple harmonic motion in problem solving
- apply principles of vectors in problem solving in navigations, force, work and energy
- apply coordinates in polar form and graph polar equations
- simplify expressions in complex form
- identify and apply critical components of conic sections

**Standards:**

**List State Standards addressed in this course. (Identify the course outcomes that support those standards.)**

**Colorado State Standards for Mathematics:**

**Standard 1:** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.

**Standard 2:** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.

**Standard 3:** Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.

**Standard 4:** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.

**Standard 5:** Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems

**Standard 6:** Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.

**Standards Addressed by General Course Outcome:**

<b>Course Outcome</b>	<b>State Standard</b>
1. Define and apply the six trigonometric functions of right triangles.	1, 4, 5, 6
2. Apply both degree and radian measure of angles	1, 2, 4, 5, 6
3. Define and apply the circular trigonometric functions	1, 2, 4, 5, 6
4. Find Value of standard trigonometric measures (30,45,60,90)	1, 2, 4, 5, 6
5. Graph trigonometric functions and their inverses	1, 2, 4, 5, 6
6. Find values of trigonometric functions over their domain	1, 4, 5, 6
7. Prove trigonometric properties/identities and apply them in finding values	1, 4, 5, 6
8. Solve oblige triangles by application of Law of Sine and Law of Cosine	1, 2, 4, 5, 6
9. Apply variations to graphs of the trigonometric functions	1, 2, 4, 5, 6
10. Apply principles of simple harmonic motion in problem solving	1, 4, 5, 6
11. Apply coordinates in polar form and graph polar equations	1, 2, 4, 5, 6
12. Simplify expressions in complex form	1, 4, 5, 6
13. Identify and apply critical components of conic sections	1, 2, 4, 5, 6

**Required Unit of Study:**

**Themes within the course/Specific concepts being targeted**

- trigonometric functions, circular functions, graphing and inverses, trigonometric properties and identities, solving triangles, sinudoids, vectors, polar coordinates, complex numbers and conic sections

### **Unit Modifications/Enrichments:**

- **Assistance to students having difficulty and/or special needs**
  - peer tutoring within the classroom environment, teacher available office hours (before school, during lunch, and after school), guided notes and examples, study guides
- **Additional experiences for students capable of advanced work (cooperative learning, adaptive materials, re-teaching, second chance, etc.**
  - individual and group learning projects, cooperative learning and self discovery within the classroom setting, challenge level questions

### **Materials/Resources:**

- **Textbook (CORE and Supplemental) (Publisher, Edition, Year Adopted)**  
Trigonometry with Applications, Houghton Mifflin Company, 1990,  
adopted in 1996
- **Media materials used**
- **Technology needs**
  - graphing calculator
- **Other resources (guest speakers, field trips)**

### **Assessment Program**

- **Tests and Quizzes, Homework**
  - daily homework assignments are given: 45-75 minutes in length
  - in class quizzes generated by instructors based on state/district standards and are constructed response and criterion reference
- **Notebooks:**
  - students are required to keep an organized notebook with daily notes, assignments and any assigned class projects
- **Authentic production**
- **Proficiency Test Requirement**

### **Instructional time:**

**List units or interdisciplinary themes and approximate length of time (actual or percent, etc.)**

trigonometric functions: 9-10 days

circular functions: 6-7 days

graphs and inverses: 5-6 days

trigonometric properties and identities: 10-11 days

solving triangles: 7-8 days

sinusoids: 11-12 days

vectors: 11-12 days

polar coordinates: 5-6 days

complex numbers: 9-10 days

conic sections: 7-8 days