

Trigonometry

Course Syllabus

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Course description

Goal: The main focus of Trigonometry is on nonlinear functions, right triangle properties, trigonometric functions, and advanced algebra. Through the study of trig, the student will:

- Develop proficiency in using mathematics to solve problems in everyday life.
- Expand his/her understanding of mathematical concepts.
- Improve his/her logical thinking skills
- Gain an understanding of trigonometry as a study of triangle and angle relationships using radians and/or degrees
- Apply advanced algebra techniques to solve problems including identities, logarithms and exponents
- Apply statistical methods to analyze data and make predictions
- Develop proficiency with combinatorics and probability
- Gain an appreciation of how advanced mathematics relates to the world of work.

Grade Level: 11-12

Prerequisites: Successful completion of Algebra 2

Topics covered: by section/topic (Glencoe *Advanced Mathematics Concepts* © 2006)

Chapter 1

1.1 Relations and Functions

1.2 Composition of Functions

1.3 Graphing Linear Equations

1.4 Writing Linear Equations

1.5 Writing Equations of Parallel and Perpendicular Lines

1.6 Modeling Real World Data with Linear Functions

1.7 Piecewise Functions

1.8 Graphing Linear Inequalities

Chapter 2

2.1 Solving Systems of Equations in Two Variables

- 2.2 Solving Systems of Equations in Three Variables
- 2.3 Modeling Real World Data with Matrices
- 2.4 Modeling Motion with Matrices
- 2.5 Determinates and Multiplicative Inverses of Matrices
- 2.6 Solving Systems of Linear Inequalities
- 2.7 Linear Programming

Chapter 3

- 3.1 Symmetry and Coordinate Graphs
- 3.2 Families of Graphs
- 3.3 Graphs of Nonlinear Inequalities
- 3.4 Inverse Functions and Relations
- 3.5 Continuity and End Behavior
- 3.6 Critical Points and Extrema
- 3.7 Graphs of Relational Functions
- 3.8 Direct, Inverse, and Joint Variation

Chapter 4

- 4.1 Polynomial Functions
- 4.2 Quadratic Equations
- 4.3 The Remainder and Factor Theorems
- 4.4 The Rational Root Theorem
- 4.5 Locating Zeros of a Polynomial Function
- 4.6 Rational Equations and Partial Fractions
- 4.7 Radical Equations and Inequalities
- 4.8 Modeling Real World Data with Polynomial Functions

Chapter 5

- 5.1 Angles and Degree Measure
- 5.2 Trigonometric Ratios in Right Triangles
- 5.3 Trigonometric Functions on the Unit Circle
- 5.4 Applying Trigonometric Functions
- 5.5 Solving Right Triangles
- 5.6 The Law of Sines
- 5.7 The Ambiguous Case for the Law of Sines
- 5.8 The Law of Cosines

Chapter 6

- 6.1 Angles and radian Measure
- 6.2 Linear and Angular Velocity
- 6.3 Graphing Sine and Cosine Functions
- 6.4 Amplitude and Period of Sine and Cosine Functions
- 6.5 Translations of Sine and Cosine Functions
- 6.6 Modeling Real World Data with Sinusoidal Functions
- 6.7 Graphing Other Trigonometric Functions
- 6.8 Trigonometric Inverses and Their Graphs

Chapter 7

- 7.1 Basic Trigonometric Identities
- 7.2 Verifying Trigonometric Identities
- 7.3 Sum and Difference Identities
- 7.4 Double-Angle and Half-Angle Identities
- 7.5 Solving Trigonometric Equations
- 7.6 Normal Form of a Linear Equation
- 7.7 Distance From a Point to a Line

Instructional Philosophy:

All students can and should learn mathematics. An algebraic way of thinking and problem solving is important for everyone. Trigonometry is often considered a “gateway” course because its content is necessary for further study in upper level mathematics and the sciences. Students will be provided with as much help and support as possible to ensure success in the course. Students are urged to attend extra help study groups which meet weekly, and to seek extra help from the instructor whenever necessary.

Expectation: Students will be expected to meet all the course goals by demonstrating their understanding of the basic concepts of each unit/area/topic. In order to pass the course, students must attain a minimum grade of 70%.

Delivery Method: Class activities will include lecture presentations, teacher-student discussions, small group instruction, individual instruction, question and answer sessions, demonstrations, hands-on activities, guided practice, and oral exercises. Written assignments will include problem sets, quizzes, test, projects, and short essays.

Assessment: Students will be assessed regularly through the use of homework, daily quizzes, unit tests, and chapter quizzes. Bonus points can be earned through the completion of optional extra-credit projects.

Course Standards- State Standards (9-12 Mathematics)

9-12.A.1 Use procedures to transform algebraic expressions

9-12.A.2 Use a variety of algebraic concepts and methods to solve equations and inequalities

9-12.A.3 Interpret and develop mathematical models

9-12.A.4 Describe and use properties and behaviors of relations, functions, and inverses

9-12.G.1 Use deductive and inductive reasoning to recognize and apply properties of geometric figures

9-12.G.2 Use properties of geometric figures to solve problems from a variety of perspectives

9-12.M.1 Apply measurement concepts in practical applications

9-12.N.1 Analyze the structural characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.

9-12.N.2 Apply operations within the set of real numbers.

9-12.S.1 Use statistical models to gather, analyze, and display data to draw conclusions

9-12.S.2 Apply the concepts of probability to predict events/outcomes and solve problems.

Assessment Plan & Grading Scale

Grading Scale Description of Work

- A 94-100% Consistently demonstrates an exceptional level of quality of work and effort. Has all work in on time and completed to exceed expectations. Shows mastery in evaluating, synthesizing, and applying the knowledge.
- B 87-93% Consistently demonstrates proficient knowledge with a good effort and quality of work. All assignments are completed on time. Demonstrates the ability to evaluate, analyze, synthesize and apply the principles.
- C 80-86% Demonstrates proficient knowledge and the ability to apply knowledge. Work shows average effort. A few assignments may be missing or late.
- D 70-79% Work shows minimal effort and some late assignments. Demonstrates a basic understanding of recalling or comprehending knowledge.
- F 69% and below Understanding is below basic. Work is of poor quality and does not meet standards or expectations.

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