Pre-calculus

Course Syllabus

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Course description

Goal: The main focus of pre-calculus is on the concept of function. Trig identities are re-examined, and algebraic methods are reviewed and practiced. Students are also introduced to discrete mathematics and probability/statistics. The course concludes with an introduction to integral and differential calculus. Through the study of precalc, the student will:

- Expand proficiency in using trig to solve problems in everyday life.
- Expand his/her understanding of mathematical concepts.
- Develop proficiency with proofs
- Improve his/her logical thinking skills
- Gain an understanding of trig as a study of the algebraic relationships of objects in the world around us.
- Gain an appreciation of how mathematics relates to the world of work.
- Prepare for entry into a calculus course of study
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Grade Level: 12

Prerequisites: Successful completion of Trigonometry

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

Chapter 9

9.1 Polar Coordinates

9.2 Graphs of Polar Equations

9.3 Polar and Rectangular coordinates

9.4 Polar Form of a Linear Equation

9.5 Simplifying Complex Numbers

9.6 The Complex Plane and Polar Form of Complex Numbers

9.7 Products and Quotients of Complex Numbers in Polar Form

9.8 Powers and Roots of Complex Numbers

Chapter 10

10.1 Introduction to Analytic Geometry

Chapter 13

13.1 Permutations and Combinations

13.2 Permutations with Repetitions and Circular Permutations

13.3 Probability and Odds

13.4 Probabilities of Compound Events

13.5 Conditional Probability

13.6 The Binomial theorem and Probability

Chapter 14

14.1 The Frequency Distribution

14.2 Measures of Central Tendency

14.3 Measures of Variability

14.4 The Normal Distribution

14.5 Sample Sets of Data

Chapter 15

15.1 Limits

15.2 Derivatives and Antiderivatives

15.3 Area Under a Curve

15.4 The Fundamental Theorem of Calculus

Instructional Philosophy:

All students can and should learn mathematics. An algebraic way of thinking and problem solving is important for everyone. Precalculus is often considered a capstone course because its content is ties together the ideas from algebra, geometry, and trig while preparing students for college 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.

Course Projects: Students will complete projects dealing with combinatorics, and write a reaction paper after viewing “Stand and Deliver.”

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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