



**SAINT GEORGE
SCHOOL**
FOUNDED 1965



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ALGEBRA II

Grade Level: 3rd Form (9th Grade)

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Academic Year: 2011-2012

INTRODUCTION AND DESCRIPTION OF COURSE

Algebra is a rigorous course of math that focuses on the practical aspect of the subject, with emphasis on acquiring an intuitive understanding of mathematical topics. This objective is carried out through comparing and contrasting the language of Math with our daily language, so as to find the advantages and disadvantages of using one over the other, allowing students to develop an appreciation for what math is able to do.

SKILLS

- Build a foundation for real life problem solving through the use of algebraic patterns; and to provide a solid understanding of graphical techniques as preparation for more advance courses in mathematics.
- To familiarize the students with the concepts of slope, y-intercept and other important graphing schemes utilized as shortcuts for obtaining the graph of linear functions and inequalities.
- Extend the techniques for graphing single equations to two simultaneous linear equations, and to learn how to find exact solutions for systems of linear equations using substitution and linear combination, and also be able to solve linear inequalities graphically.
- Quadratic functions, students are to learn the basic concepts of Parabolas, including: Axis of Symmetry, Vertex, Reflection, Symmetry, and X-intercepts. They are to learn how solve quadratic functions both graphically and numerically.
- Pascal's Triangle and the Binomial Theorem, these important topics of statistical analysis are presented as preparation for future college level statistics and probability courses.
- Identify who the main characters are in the history of Algebra, people like: Descartes, Pascal, Euler, Newton, Leibniz, Riemann
- Develop independent thinking and realize how they can use Algebra to conduct formal research
- To be aware of career choices in math: Actuarial Science, Statistics, Research, Engineering, etc.

CONTENT

Equations & Inequalities

- Real Numbers and Operations
- Algebraic Expressions and Models
- Solving Linear Equations
- Rewriting Equations and Formulas
- Problems Solving Using Algebraic Models
- Solving Linear Inequalities
- Solving Absolute Value Equations and Inequalities

Linear Equations & Functions

- Functions and their Graphs
- Slope and Rate of Change
- Quick Graphs of Linear Equations
- Writing Equations of Lines
- Correlation and Best-Fitting Lines
- Linear Inequalities in two Variables
- Absolute Value Functions

Linear Systems

- Solving Linear Systems by Graphing
- Solving Linear Systems Algebraically
- Graphing and Solving Systems of Linear Inequalities

Quadratic Functions and Factoring

- Graphing Quadratic Functions
- Solving Quadratic Equations by Factoring
- Completing the Square
- Quadratic Formula and the Discriminant
- Graphing Quadratic Inequalities
- Modeling with Quadratic Functions

Parabolas

- Graphing and Writing Equations of Parabolas, Focus and Directrix
- Using Parabolas in Real Life
- Chapter-12: Pascal's Triangle & the Binomial Theorem
- Factorials of Natural numbers

Pascal's Triangle

- Expanding a Binomial using Pascal's Triangle
- Expanding a Binomial using the Binomial Formula
- Expanding a Binomial using Newton's Method

Rules of Exponents

- Exponential operations
- Intro to Exponential Functions

TEXTBOOK AND OTHER RESOURCES

- Text Book: Algebra II, by: Holt McDougal; Larson, 2011
- http://www.classzone.com/cz/books/algebra_2_2011_na/book_home.htm?state=INTER
- How to solve word problems in Algebra, by: Mildred Johnson and Tim Johnson
- Standard Deviants DVD: Algebra 1 & 2
- Quick-Study Outline: Algebra 1 & 2
- Quick-Study Outlines: Algebraic Equations
- Smart Board Taught Lessons
- Teacher prepared Summaries and Posters
- Expanding a Binomial using Newton's Method

TEACHING STRATEGIES

Students will benefit from a wide range of teaching strategies and evaluation criteria.

1. Students will be exposed to the style of the book, which includes formal definitions, problem solving techniques, activities and exercises.
2. In addition to the above, in layman's terms, prepared by the teacher, they get an intuitive interpretation of the topic, including a summary of the lesson and some selected exercises to be discussed during class.
3. Occasionally, a math video may be brought in to further reinforce what is being taught.
4. Students will also be encourage to explain, in their or words, their interpretation of the given topic of discussion and to think of situations from everyday life where the particular mathematical techniques could be useful.
5. The student will be administered two (2) different tests (worth 15 and 25% percent of the total grade) per Corte to evaluate their progress and understanding of mathematical techniques.

6. If students need further help, they could come see the teacher, one-on-one, during hours of enrichment, every Thursday, from 2:45 to 3:30, at Octavio Paz.

Furthermore, students will be required to keep a one-word-a-day English vocabulary enrichment list – preferably in the back of their notebooks. There are several strategic reasons why they should keep this collection of words. First, they will be able to better understand textbooks and teachers as a result of knowing the exact meaning of the words being used. Second, this activity does improve their written and spoken English. Third, as a result of studying the most sophisticated vocabulary of the English language, they will be preparing for their SAT. And, finally, it's my observation that this gives them an opportunity to learn something other than math, and, for the most part, it makes the class a lot more interesting and refreshes the minds of the students.

List of class activities:

- Present the Text Book perspective of the topic
- http://www.classzone.com/cz/books/algebra_2_2011_na/book_home.htm?state=INTER
- Prepare lesson summaries to maximize in-class time
- Complete class assignments and homework for the given chapters
- Triangle & the Binomial Theorem
- Explore the essential questions of the class period as a group
- Mathematical debates
- Video aided instructions
- History of math
- Biographies of mathematicians
- Famous mathematical quotes
- Major breakthroughs in Math
- Modern issues in Math
- The new frontiers of present day Math
- Further Readings and authors of mathematical literature
- Present final-exam review
- Present mid-term review

EVALUATIONS

- In-class Assignments: 30%
- Homework and Projects: 15%
- Test #1: 20%
- Test #2: 25%
- Cooperation: 10%

OTHER REMARKS REGARDING OUR CLASS

Students achieving grade levels of 96% or above, whose conduct are over 90, in all Grading Periods “Cortes”, will be exonerated from taking the final exam.