



PINEWOOD – THE AMERICAN INTERNATIONAL SCHOOL OF THESSALONIKI, GREECE

NAME OF COURSE: ALGEBRA I

GRADE LEVEL: 7-9

SCHOOL YEAR: 2011-2012

GENERAL DESCRIPTION

Algebra I is a traditional one-year course in modern Algebra and it is the first course in the college preparatory sequence. It is intended to stress the modern concepts and structure of first year Algebra and encourage the student to use precise language and deductive reasoning. The goal of this course is to teach the basic concepts and skills in Algebra, which are fundamental to future understanding in Math and Science. Areas of study include: properties, problem solving, polynomials, factoring polynomials, algebraic fractions, linear equations and systems and inequalities.

This course provides the necessary tools for success in Geometry and Algebra II.

LEARNING OBJECTIVES

It is expected that students will:

- Use a variety of methods to solve real-life, practical, technical, and theoretical problems.
- Explain and illustrate the structure and the interrelationships of the set of numbers within the rational number system.
- Develop a 'number sense' for powers with integral exponents and rational bases.
- Recognize and use mathematical properties to simplify computations with rational numbers.
- Solve problems using rational numbers and exponents.
- Perform calculations involving very large and very small numbers involving integer exponents.
- Solve problems using appropriate patterns, models, or technology.
- Perform operations on polynomials
- Solve and verify linear equations and inequalities in one variable.
- Solve problems involving perimeter, area, surface area, and volume in 2-D shapes and 3-D objects.

SCOPE AND SEQUENCE

QUARTER I

Introduction to Algebra

- Perform all operations with integers
- Simplify numerical expressions
- Evaluate algebraic expressions
- Use the order of operations to simplify expressions
- Perform basic operations using real numbers
- Find solution sets of equations over a given domain
- Translate words into mathematical expressions and mathematical equations
- Use opposites and absolute values

Properties and Operations

- Use number properties to simplify expressions
- Use algebraic properties to prove statements and algebraic equations
- Transform equations and formulas

Equations

- Solve equations using more than one transformation
- Solve absolute value equations
- Solve and graph inequalities

QUARTER II

Powers and Polynomials

- Identify and illustrate power, base, coefficient, and exponent in numerical and algebraic expressions
- Apply the exponent laws to simplify monomial and polynomial expressions
- Calculate the product of two monomials, a monomial and a polynomial, two binomials and two or more polynomials.
- Simplify polynomial expressions
- Solve polynomial equations

2-D Shapes and 3-D Objects

- Calculate the perimeter, area, surface area and volume of shapes and objects using appropriate formulas while applying the exponent laws and the rules for simplifying monomial and binomial terms

Word Problems

- Translate word phrases describing numerical operations into variable expressions and into equations
- Organize the facts of a problem in a chart
- Solve problems involving area, cost/income/value, distance/rate/time, consecutive integers.

QUARTER III

Factoring Polynomials

- Simplify quotients of monomials and find the greatest common factor of several monomials
- Divide polynomials by monomials and find monomial factors of polynomials
- Study and apply factoring patterns for binomials and trinomials
- Factor polynomial terms by grouping
- Factor to solve polynomial equations and word problems

Fractions

- Simplify algebraic fractions
- Use factoring to simplify the multiplication and division of rational expressions
- Add and subtract rational expressions
- Solve word problems involving rational expressions
- Perform polynomial long division

QUARTER IV

Ratios, Proportion and Percent

- Solve equations with fractional coefficients
- Solve fractional equations
- Compute with percent
- Work with negative exponents and scientific notation
- Solve scientific notation problems

Rational Numbers

- Find square roots of numbers that have rational square roots
- Solve simple radical equations

Quadratic Equations

Use the quadratic formula to solve quadratic equations

Linear Equations and Functions

- Graph equation of the line on the coordinate plane
- Find the x and y intercepts of a given equation
- Find the slope of a line
- Use the slope-intercept form of a linear equation
- Determine the equation of a line
- Define a functions defined by using tables and graphs
- Graph linear and quadratic functions

Linear Equations and Inequalities

- Solve systems of linear equations using the graphing method, the substitution method, the addition and subtraction method
- Solve problems using all methods
- Solve linear inequalities and graph
- Solve problems that involve inequalities
- Combined inequalities

HOMEWORK POLICY

Frequent homework assignments are given, based on the day's lecture and assigned out of the main textbook or given in the format of a worksheet. All homework is to be collected and graded. Homework submitted late will lose 10% of the overall score for each day late, and will only be accepted up to two days after the due date.

ASSESSMENT

The students are assessed on the following:

- Frequent homework assignments, based on the days lecture and assigned out of the main textbook or given in the format of a worksheet.
- Class participation including board work, attentiveness of the student during the lecture, interest and effectiveness of the student in answering and asking questions about the lecture, and general classroom behavior of the student.
- Three to four tests per quarter, testing the student's overall knowledge and comprehension of a specific chapter or a number of sections.
- Periodically, students will write unannounced quizzes, testing the students' understanding of the previous lessons.
- The department will not be giving any retake tests, therefore thorough preparation is expected.

GRADING POLICY

- TESTS, QUIZZES 60% of the Quarter grade
- HOMEWORK 30% of the Quarter grade
- CLASS PARTICIPATION 10% of the Quarter grade
 - 4% PARTICIPATION
 - 3% EFFORT
 - 3% BEHAVIOR / ATTITUDE

Semester I grade: 40% Quarter I grade + 40% Quarter II grade + 20% Exam I

Semester II grade: 40% Quarter III grade + 40% Quarter IV grade + 20% Exam II

FINAL GRADE: 50% SEMESTER I GRADE + 50% SEMESTER II GRADE

RESOURCES

- Main textbook: Algebra: Structure and Method. Book 1
Published by Houghton-Mifflin, 1991.
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ACADEMIC HONESTY

- Academic honesty is fundamental to the integrity and operation of our school. Acts of academic dishonesty, including plagiarism (the act of presenting others' words and ideas as one's own without crediting the source), stealing in quizzes and tests, copying work from other students or allowing their own work to be copied, or using notes during a test, are considered serious offences. The consequences of academic dishonesty will be a zero grade on the specific test/assignment, and additional disciplinary action. The said student will be ineligible or removed from the National Honor Society.