

Algebra I Teacher: Claraines Deeb

Course Description:

This course develops students' abstract thinking, comprehension, analysis, reasoning, and problem solving skills. Students learn to write algebraic sentences, simplify polynomials, solve equations, apply properties, relate arithmetic, algebra and geometry, identify quadratic functions, and factor polynomials. Students work with linear functions as models to relate data, and learn to simplify algebraic expressions and to solve equations. Algebra 1 develops in students deductive reasoning relating concepts, real numbers, one to one functions, graphs, mathematical models, and problem solving techniques.

Text:

Algebra 1
Common Core
Pearson 2015

Other Materials:

- The National Council of Teachers of Mathematics Standards and guide.
- Algebra I Concepts and Skills by Larson, Boswell, Kanold, and Stiff.
- Resource book, Algebra, Structure and Method, New Edition, book 1 by Dolciani, Brown, Ebos, and Cole.
- Algebra I exams from previous years.
- Word Problem Workbook by Kelli Jade Hammer.
- Structure and Method Book 1, Dolciani

Learning objectives:

- To develop an understanding of algebra by using a variety of learning strategies, examples, and activities.
- To continue learning how to analyze word phrases and sentences, translate them into mathematical language, and solve problems using algebraic equations and inequalities.
- To continue exercising students' spatial and interpersonal skills by studying graphs, diagrams, charts, and by using a variety of group activities for solving systems of equations, working on operations with polynomials and radicals, factoring polynomials, solving rational equations.
- To make connections with earlier math courses, data analysis, real-world applications as well as interdisciplinary connections between different sciences and mathematics.

Higher order thinking skills:

Recall and transfer, applying concepts, analysis, interpreting, reasoning and inferencing, spatial perception, and synthesis.

Learning activities:

Using manipulatives (such as colored tiles or chips, a balance scale, etc.), cooperative learning, exploration activities, using technology, “Making Practice fun” and other worksheets , homework exercises, projects and challenging problems.

Technology

Calculators, computer lab, student CD-ROM, Internet.

Curriculum outline:

SEMESTER I

I. Expressions, equations and functions

- Order of operations
- Equations and inequalities
- Functions as rules and tables
- Functions as graphs
- Application and connection to the analysis and solution of real-life problems

II. Working with Real Numbers

- Addition and subtraction
- Multiplication
- Division
- Distributive property
- Square roots, comparison
- Application and connection to the analysis and solution of real-life problems

III. Solving Equations and Problems

- Solving equations:
 - One step
 - Two steps
 - Multiple steps
 - Variables on both sides
 - Ratios and proportions
 - Percents
 - Formulas
- Application and connection to the analysis and solution of real-life problems

IV. Graphing linear equations and functions

- Intercepts

- Slope
- Rate of change
- Direct variation
- Application and connection to the analysis and solution of real-life problems

V. Linear equations

- Writing linear equations from:
 - graphs
 - points
 - data
- Parallel and perpendicular lines
- Solution of linear equations
- Regressions
- Application and connection to the analysis and solution of real-life problems
- Predictions with linear models

SEMESTER II

VI. Solving and graphing linear inequalities

- Solving simple inequalities
- Solving multi-steps inequalities
- Solving and analyzing compound inequalities
- Equations and inequalities with absolute value
- Graphs of inequalities in two variables
- Application and connection to the analysis and solution of real-life problems

VII. Systems of equations and inequalities

- Solving linear systems by:
 - graphing method
 - Addition or subtraction
 - Linear combination
- Application and connection to the analysis and solution of real-life problems.

VIII. Exponents and exponential functions

- Properties of exponents
- Negative exponents
- Scientific notation
- Exponential growth and decay functions
- Graphical analysis and application of exponential functions
- Application and connection to the analysis and solution of real-life problems

IX. Polynomials and factoring

- Operations with polynomials
- Factorization of polynomials
 - common factor
 - trinomials
 - grouping
 - special products
- Application and connection to the analysis and solution of real-life problems

X. Quadratic equations and functions

- Graphs of quadratic functions
- Intercepts, roots
- Solving quadratic functions:
 - graphically
 - completing the square
 - quadratic formula
 - factoring
- Analysis of discriminant
- Quadratic regressions
- Application and connection to the analysis and solution of real-life problems

XI. Radicals and geometry of connections

- Properties and operations with radicals
- Solving radical equations
- Pythagorean Theorem and its applications
- Application and connection to the analysis and solution of real-life problems

XII. Rational equations and functions

- Variations: direct, indirect, joint
- Simplification and operations of rational expressions
- Rational equations: analysis, graphs and solution.
- Application and connection to the analysis and solution of real-life problems
- Vectors in geometry (advanced)
- Rotations in the coordinate plane

XIII. Proof and Logic

- If-then statements
- Indirect proof

Evaluative criteria & instruments:

- Class preparation
- Class work
- Group work
- Research
- Homework
- Projects
- Quizzes
- Tests
- Self evaluation
- Alternative Assessment Project
- Cumulative Tests
- Practice Tests.