

Algebra I Topics

5 credits - Level II (meets the requirements for Algebra)

Grades: 9

Prerequisites: Successful completion of 8th grade mathematics.

This course is designed for students who are at or near grade level in their mathematical ability. The course focuses on the key topics that provide a strong foundation in the essentials of algebra: properties of real numbers, linear and quadratic equations and functions, linear and quadratic inequalities, polynomials and factoring, rational expressions and equations, and radical expressions and equations.

PROFICIENCIES

PRE-ALGEBRA

- apply the order of operations including expressions with variables and exponents.
- translate words into mathematical symbols and develop a problem-solving plan to model and solve real life problems
- study and make use of tables, graphs and simple functions

REAL NUMBERS

- graph, compare and order real numbers
- investigate the opposite and the absolute value of real numbers
- add, subtract, multiply, and divide real numbers
- understand and use the distributive property and simplify algebraic expressions
- identify and use inductive/deductive reasoning – patterns

SOLVING LINEAR EQUATIONS

- solve one step linear equations using one of the four operations for real numbers
- solve multi-step linear equations for real numbers
- solve equations which have variables on both sides of equal sign
- solve literal equations
- use ratios, rate, and percentages to solve real life problems

GRAPHING LINEAR EQUATION FUNCTIONS

- graph lines using a table of values, X and Y intercepts, and slope-intercept form
- show an understanding of positive and negative slope, horizontal and vertical lines, and parallel lines
- write and graph equations which represent direct variation in order to model real life problems
- understand the concept of relations, functions

SLOPE-INTERCEPT FORM

- apply slope-intercept form, point-slope form, or standard form to formulate linear equations
- write and utilize linear equation to solve real life problems
- identify, graph and write equations of perpendicular lines

SOLVING GRAPHIC INEQUALITIES

- solve and graph one-step inequalities in one variable using addition and subtraction
- solve and graph one-step inequalities in one variable using multiplication and division
- solve and graph multi-step inequalities in one variable, and will apply these principles to real life problems

SYSTEM OF LINEAR EQUATIONS

- estimate the solution of a system of linear equations by graphing
- solve a linear system by substitution
- use linear systems to solve real-life problems
- identify how many solutions a linear system has

EXPONENTS AND EXPONENT FUNCTIONS

- use multiplication properties of exponents and evaluate powers that have zero or negative exponents
- use division properties of exponents and read and write numbers in scientific notation

QUADRATIC EQUATION FUNCTIONS

- evaluate and approximate square roots and solve quadratic equations by finding square roots
- simplify radical expressions
- use the quadratic formula to solve a quadratic equation

POLYNOMIALS AND FACTORING

- add and subtract polynomials
- multiply polynomials
- use special product patterns to multiply polynomials
- solve quadratic equation in factored form
- factor trinomials of the form $X^2 + BX + C$