

Mathematics

Algebra

Core Texts:

Algebra Unplugged, Jim Loats

Algebra Concepts and Applications, Glencoe McGraw-Hill

Algebra Concepts and Skills, McDougal Littell

Geometry Concepts and Applications, Glencoe McGraw-Hill

Chicago School Mathematics Project, Scott Foresman

Core Concepts

Trimester One

Introductory Concepts and Components

- Simplify and evaluate numerical expressions, and variable expressions.
- Simplify expressions with and without grouping symbols.
- Find solution sets of equations.
- Represent numerical relationships stated in words by mathematical expressions.
- Translate word sentences describing the equality of numbers into equations.
- Identify five steps in solving word problems.
- Graph real numbers on a number line.
- Use opposites and absolute values.
- Show the order of real numbers.

Working with Real Numbers

- Use number properties to simplify expressions.
- Use a number line to add real **numbers**. Add real numbers and subtract real numbers.
- Use the distributive axiom to simplify expressions.
- Multiply and divide real numbers.
- Write equations to represent relationships among integers.
- Use reciprocals.

Equations and Problems

- Solve equations using addition or subtraction,
- Solve equations using multiplication or division. Use several transformations to solve an equation. Use the five-step plan to solve word problems.
- Solve equations having the variable in both sides.
- Arrange the facts of a problem in a chart.
- Solve problems involving cost and value.
- Prove statements in algebra.

Polynomials

- Write and simplify exponential expressions.
- Add, subtract, and multiply monomials.
- Find powers of a monomial.
- Multiply a polynomial by a monomial.
- Multiply polynomials.
- Transform formulas.
- Solve problems involving uniform motion.
- Solve problems involving area.
- Recognize problems that do not have solutions.

Trimester Two:

Factoring Polynomials

- Factor integers.
- Divide and factor monomials.
- Divide a polynomial by a monomial and to find a monomial factor of a polynomial.
- Find the product of two binomials mentally.
- Simplify products of the form $(a+b)(a-b)$ and to factor differences of squares.
- Find squares of binomials and to factor trinomial squares.
- Factor quadratic trinomials whose quadratic coefficient is 1 and whose constant term is positive.
- Factor quadratic trinomials: $x^2 + bx + c$, c negative.
- Factor quadratic trinomials: $ax^2 + bx + c$.
- Factor a polynomial by grouping terms.
- Factor polynomials completely.
- Solve polynomial equations by factoring.

Fractions

- Simplify algebraic fractions.
- Multiply algebraic fractions.
- Divide algebraic fractions.
- Express two or more fractions with their least common denominator.
- Add and subtract algebraic fractions.
- Write mixed expressions as fractions in simplest form.
- Divide polynomials.
- Solve problems involving ratios.
- Solve problems involving proportions.
- Solve equations with fractional coefficients.
- Solve fractional equations.
- Work with percents.
- Solve problems involving percents.
- Solve mixture, and work problems.
- Use scientific notation.
- Use negative exponents.

Linear Equations and Systems

- Solve equations in two variables over given domains of the variables.
- Graph ordered pairs and linear equations in two
- Use graphs to solve systems of linear equations.
- Use the substitution method to solve systems of linear equations in two variables.
- Use systems of linear equations in two variables to solve problems.
- Use addition or subtraction to solve systems of linear equations in two variables.
- Use multiplication with the addition/subtraction method to solve systems of linear equations.
- Use systems of equations to solve wind and water current problems.
- Use systems of equations to solve digit, age, and fraction problems.

Trimester Three

Functions

- Find the slope of a line.
- Use the slope-intercept form of a linear equation.
- Find an equation of a line given the slope and one point on the line, or given

two points on the line.

- Understand what a function is and how to find its values.
- Define functions without using equations.

Graph linear and quadratic functions.

- Use the concept of direct variation to solve problems.
- Use the concept of inverse variation to solve problems.
- Use quadratic direct variation and variation inversely as a square in problem solving.
- Solve problems involving joint variation and *combined* variation,
- Inequalities
- Review the concept of order and graph certain inequalities.
- Transform inequalities in order to solve them.
- Solve problems that involve inequalities.
- Find the solution set of combined inequalities.
- Solve equations and inequalities involving absolute value,
- Extension of open sentences involving absolute value.

Graph linear inequalities in two variables,

- Graph the solution set of a system of two linear inequalities in two variables.
- Rational and Irrational Numbers
- Apply properties of real numbers.
- Express rational numbers as decimals or fractions.
- Find the square root of numbers that have rational square roots.
- Simplify radicals and *find decimal* approximations to irrational square roots.
- Find square roots of variable expressions and use them to solve equations.
- Use the Pythagorean theorem and its converse,
- Simplify products and quotients of radicals.
- Simplify sums and differences of radicals.
- Multiply binomials containing square -root radicals.
- Solve simple radical equations.

Quadratic Functions

- Solve quadratic equations involving perfect squares.
- "Complete the square" and use the result to solve quadratic equations.
- Use the quadratic formula.