

## Algebra I

### **COURSE DESCRIPTION:**

The purpose of this course is to allow the student to gain mastery in working with and evaluating mathematical expressions, equations, graphs, and other topics in a year long algebra course. Topics included are real numbers, simplifying real number expressions with and without variables, solving linear equations and inequalities, solving quadratic equations, graphing linear and quadratic equations, polynomials, factoring, linear patterns, linear systems of equality and inequality, simple matrices, sequences, and radicals. Assessments within the course include multiple-choice, short-answer, or extended response questions. Also included in this course are self-check quizzes, audio tutorials, and interactive games.

### **COURSE OBJECTIVES:**

Students will:

- Read, write, evaluate, and understand the properties of mathematical expressions including real numbers, radicals, and polynomials
- Add, subtract, multiply, and divide radical expressions, polynomials, and polynomial expressions
- Read, write, solve, and graph linear and quadratic equations and inequalities
- Students will solve absolute value equations and inequalities
- Work effectively with ratios and direct and inverse variation
- Solve systems of linear equations and inequalities
- Work with arithmetic sequences and linear patterns
- Understand basic statistics including measures of central tendencies and box plots
- Understand different types of graphs, including histograms, line graphs, circle graphs, and stem-and-leaf plots

**PREREQUISITES:** None

**COURSE LENGTH:** Two semesters

**REQUIRED TEXT:** None

### **COURSE OUTLINE:**

#### **Semester 1**

Numbers and Expressions

- Evaluating Expressions
- Some Useful Properties
- Integers
- Exponents and Roots
- Logic and Graphs

Real Numbers

- Rational Numbers
- Addition and Subtraction of Rational Numbers
- Multiplication and Division of Rational Numbers
- Estimation and Problem Solving
- Closure and Properties of Equality

## Algebra I (continued)

### **COURSE OUTLINE (continued):**

#### Equations

- Equations
- Multi-Step Problems
- Ratios, Proportions and Percent
- Problem Solving

#### Functions and Linear Equations

- The Coordinate Plane and Relations
- Graphing Linear Equations
- Patterns and Sequences
- Linear Equations
- Data

### **Semester 2**

#### Solving Systems of Linear Equations and Inequalities

- Graphing Systems of Equations
- Substitution
- Elimination and Matrices
- Graphing Inequalities
- Statistics and Box and Whiskers

#### Polynomials and Factoring

- Scientific Notation
- Polynomials and Addition and Subtraction
- Multiplying Polynomials
- Factors and GCF
- Factoring Trinomials
- Special Factors

#### Quadratic Functions and Radicals

- Quadratic Functions
- Solving Quadratic Equations
- Radicals and Radical Operations
- Radical Equations

#### Rational Expressions

- Inverse Variation
- Multiplying and Dividing Rational Expressions
- Adding and Subtracting Rational Expressions
- Solving Rational Equations