

# Algebra 1 Objectives

## Overall Objectives for Algebra 1:

- Recognize and apply the unique vocabulary, properties, and symbolism of algebra.
- Simplify and evaluate numerical and variable expressions (including linear, quadratic, exponential, polynomial, square root, or rational expressions) using order of operations, combining like terms, and exponent rules.
- Apply problem solving techniques to worded problems and translate verbal phrases into mathematical expressions, equations, or inequalities.
- Solve linear, quadratic, polynomial, square root, and rational equations and inequalities algebraically and graphically using various methods, including systems of linear equations.
- Recognize if an equation, table, or graph represents a function or specific type of function such as linear, quadratic, exponential, square root, or rational function, and to create a table or graph given an equation or write an equation given a table or graph.
- Determine when a problem is complete and determine the reasonableness of solutions, including sign, size, relative accuracy, and units of measurement.
- Communicate mathematics and explain solutions to problems both orally and in well written sentences.
- Use the graphing calculator to evaluate expressions, set up tables, and graph equations.

# Algebra 1 Objectives

## Detailed Objectives for Algebra 1:

### Expressions, Equations, & Functions (Chapter 1)

#### Main Objective:

- To evaluate expressions by hand and using a graphing calculator, translate verbal phrases into expressions, equations, and inequalities, and identify and represent functions with verbal rules, equations, tables, and graphs.

#### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with expressions, equations, and functions.
- To simplify and evaluate expressions using order of operations by hand and using a graphing calculator.
- To translate verbal phrases and sentences into expressions, equations, and inequalities.
- To find a unit rate.
- To determine if a given number is a solution to an equation or inequality.
- To identify if a table or mapping diagram is a function and to find the domain and range of a function given a table or graph.
- To create a table or graph for a function given an equation by hand and on the graphing calculator and to find an equation given the table or graph of a function.

### Properties of Real Numbers (Chapter 2)

#### Main Objective:

- To perform operations with real numbers, apply properties of real numbers, and classify and compare real numbers.

#### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with properties of real numbers.
- To identify number sets (real, irrational, rational, integers, and whole numbers) and to give examples of numbers in each set.
- To compare and graph real, irrational, rational, integer, and whole numbers on a number line.
- To find opposites and absolute values of numbers.
- To add, subtract, multiply, and divide real, rational, integers, and whole numbers.
- To identify algebraic properties in a given an equation.
- To perform matrix addition, subtraction, and scalar multiplication.
- To simplify expressions by combining like terms and using the distributive property.
- To find square roots of perfect squares and approximate square roots of non-perfect squares.

# Algebra 1 Objectives

## Solving Linear Equations (Chapter 3)

### Main Objective:

- To solve equations in one variable and proportion and percent problems.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with solving linear functions.
- To solve single and multistep equations in one variable using the distributive property, variable on one side, and variable on both sides.
- To understand what a solution to an equation is and know how to check to see if an answer is correct by hand and on a graphing calculator.
- To create and solve an equation from a word problem.
- To write and simplify ratios.
- To solve proportions.
- To create and solve a proportion from a word problem.
- To solve percent problems using proportions and the percent equation.
- To rewrite equations and formulas for a given variable.

## Graphing Linear Equations and Functions (Chapter 4)

### Main Objective:

- To recognize and graph linear equations and functions.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with graphing linear equations and functions.
- To plot and name points in a coordinate plane.
- To graph linear equations by hand using a table of points and on the graphing calculator.
- To identify discrete and continuous functions.
- To find x and y intercepts given an equation or graph, and to create a graph using the x and y intercepts.
- To find the slope and rate of change given two points, a table or graph.
- To graph linear equations and functions written in various forms including slope-intercept form and standard form.
- To recognize and graph direct variations.
- To write an equation in function notation and evaluate the function.
- To compare the graphs of linear functions and equations.

# Algebra 1 Objectives

## Writing Linear Equations (Chapter 5)

### Main Objective:

- To write linear equations and functions in standard and slope-intercept form, use linear models to solve problems, and model data with a line of best fit.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with writing linear functions.
- To write linear equations and functions in standard and slope-intercept form given two points, the slope and a point, graph, or table.
- To determine if two equations represent perpendicular or parallel lines and write equations of perpendicular and parallel lines.
- To describe the correlation of data.
- To find the line of best fit by hand and using linear regression on the graphing calculator and then use the line of best fit to make predictions.

## Solving and Graphing Linear Inequalities (Chapter 6)

### Main Objective:

- To solve and graph linear, compound, and absolute inequalities.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with solving and graphing linear inequalities.
- To solve linear inequalities applying properties of inequalities and graph solutions on a number line.
- To solve compound inequalities and equations and graph solutions on a number line.
- To solve absolute value inequalities and equations and graph solutions on a number line.
- To graph linear inequalities in two variables on a coordinate plane.

## Systems of Equations and Inequalities (Chapter 7)

### Main Objective:

- To solve linear systems by graphing and using algebra and to solve systems of linear inequalities by graphing.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with systems of equations and inequalities.
- To solve systems of equations by graphing, substitution, and the elimination method.
- To determine if a system is consistent, inconsistent, dependent, or independent.
- To solve linear systems of inequalities by graphing.
- To determine if an ordered pair is a solution to a linear system of equations or inequalities.

# Algebra 1 Objectives

## Exponents and Exponential Functions (Chapter 8)

### Main Objective:

- To apply properties of exponents to simplify expressions, convert numbers to and from standard form and scientific notation, and write and graph exponential functions.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with exponents and exponential functions.
- To apply properties of exponents to simplify expressions involving exponent products and quotients, and zero and negative exponents.
- To convert numbers to and from standard form and scientific notation.
- To evaluate expressions in scientific notation.
- To recognize if an equation, graph, or table represents an exponential function and determine the domain and range of the function.
- To write an exponential function given a table or graph.

## Polynomials and Factoring (Chapter 9)

### Main Objective:

- To add, subtract, multiply, and factor polynomials and to write and solve polynomial equations.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with polynomials and factoring.
- To add and subtract polynomial expressions.
- To multiply polynomial expressions.
- To factor the greatest common factor from a polynomial expression.
- To factor polynomials using greatest common factor, recognizing factoring rules, grouping, and the guess and check method.
- To solve polynomial equations in factored form.

# Algebra 1 Objectives

## Quadratic Equations and Functions (Chapter 10)

### Main Objective:

- To graph and solve quadratic equations and functions.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with quadratic equations and functions.
- To compare graphs of quadratic functions.
- To find the vertex, axis of symmetry, direction, maximum or minimum value and intercepts given a graph or equation of a quadratic function.
- To create a table of points given a quadratic equation or function and to use it to create a graph.
- To determine the number of real solutions by graphing a quadratic function.
- To solve quadratic equations and functions using square roots, complete the square, quadratic formula and by graphing by hand and on the graphing calculator.
- To find the value of the discriminant and use it to determine the number and type of solutions for a quadratic equation or function.

## Radicals and Geometry Connections (Chapter 11)

### Main Objective:

- To graph square root functions, use properties of radicals to simplify expressions and solve equations.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with radicals.
- To graph and compare square root functions.
- To simplify radical expressions involving rational and irrational numbers.
- To add, subtract, multiply, and divide radical expressions.
- To solve radical equations and check for extraneous roots.
- To apply the distance and midpoint formulas.

# Algebra 1 Objectives

## Rational Equations and Functions (Chapter 12)

### Main Objective:

- To graph rational functions, perform operations on rational expressions, and solve rational equations.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with rational equations and functions.
- To determine if an equation or graph is a direct variation, inverse variation or neither.
- To graph inverse variations given an equation by hand and using the graphing calculator.
- To divide polynomials.
- To graph rational functions and determine the equations of asymptotes by hand and using the graphing calculator.
- To simplify rational expressions and state the excluded values.
- To add, subtract, multiply, and divide rational expressions.
- To solve rational equations.

## Probability and Data Analysis (Chapter 13)

### Main Objective:

- To find probability of simple and compound events, analyze sets of data, and make and interpret data displays.

### Detailed Objectives:

- To understand, interpret, and apply the vocabulary associated with simple probability and data analysis.
- To find probability and odds of simple events.
- To find probabilities using permutations and combinations.
- To find probabilities of compound events. (if time allows)
- To analyze samples and surveys.
- To find and analyze the measures of central tendency (mean, median, and mode).
- To recognize, interpret, analyze and create stem-leaf plots, histograms, and box and whisker plots.