Algebra 1, Part 1
Course Outline & Objectives

Course Description:

In Algebra 1 Part 1, students will study the foundations of algebra, including the understanding of variables, expressions, and working with real numbers to simplify expressions. They will also learn to solve equations, from one-step to complex equations, including proportions and absolute value equations. Students will learn to solve and graph inequalities, will be introduced to linear functions, and will solve systems of equations and inequalities.

Credits - One Semester (0.5 Carnegie unit / CA: 5 credits) | Prerequisites: None

Course Outline

Unit 1: Expressions and Operations

1.1 Properties of Real Numbers
1.2 Order of Operations
1.3 Simplifying Expressions
1.4 Evaluating Algebraic Expressions
1.5 Distributive Property
1.6 Descriptive Modeling and Accuracy

Unit 2: Equations and Inequalities

2.1 Solving One- and Two-Step Equations
2.2 Solving Multi-Step Equations
2.3 Solving Equations with Variables on Each Side
2.4 Solving Proportions
2.5 Literal Equations
2.6 Solving Absolute Value Equations
2.7 Graphing and Writing Inequalities
2.8 Solving Inequalities
2.9 Solving Absolute Value Inequalities

Common Core Standards

In Unit 1 students will:
Classify real numbers and apply properties such as commutative, associative, and distributive properties.
Simplify algebraic expressions using order of operations, like terms, and the distributive property.
Evaluate expressions by substituting values and applying inverse and identity properties.
Use significant figures, precision, and accuracy when performing measurements and calculations.
Choose appropriate units and types of measurement for different real-world situations.
[A-SSE, N-Q]

In Unit 2 students will:
Solve one-step, two-step, and multi-step equations, including those with variables on both sides.
Work with proportions, literal equations, and equations involving absolute value.
Graph and write inequalities on a number line using symbolic and verbal descriptions.
Solve and graph linear, compound, and absolute value inequalities, and express solutions in interval notation.
Apply equations and inequalities to real-world problems and interpret solutions within context.
[A-CED, A-REI]

Course Outline

Unit 3: Relations and Functions

3.1 Identifying Functions
3.2 Evaluating Functions
3.3 Writing Function Rules
3.4 Graphing Functions
3.5 Step Functions
3.6 Features of Functions
3.7 Transformations of Functions

Unit 4: Linear Equations and Inequalities

4.1 Rate of Change and Slope
4.2 Slope-Intercept Form
4.3 Point-Slope Form and Standard Form
4.4 Direct and Inverse Variation
4.5 Linear Word Problems
4.6 Graphing Linear Inequalities
4.7 Piecewise Functions
4.8 Absolute Value Functions
4.9 Inverse of a Linear Function

Unit 5: Systems of Equations and Inequalities

5.1 Solving Systems by Graphing
5.2 Solving Systems Using Substitution
5.3 Solving Systems Using Elimination
5.4 Solving Special Systems
5.5 Applying Systems
5.6 Solving Systems of Linear Inequalities

Common Core Standards

In Unit 3 students will:
Identify functions using various representations, such as ordered pairs, tables, graphs, and mappings.
Evaluate functions and use function notation to solve problems.
Write function rules from tables, scenarios, and verbal descriptions.
Graph linear and step functions, and describe features such as intercepts, domain, range, and intervals of increase or decrease.
Apply transformations—including shifts, reflections, and dilations—to parent functions.
[F-IF, F-BF]

In Unit 4 students will:
Analyze and graph linear equations in slope-intercept, standard, and point-slope form.
Solve real-world problems using direct and inverse variation and interpret slope and intercepts in context.
Graph and solve linear inequalities and systems, including compound and absolute value inequalities.
Work with piecewise and absolute value functions, including graphing and interpreting their behavior.
Explore inverse functions by finding and verifying the inverse of linear functions.
[A-CED, A-REI, F-IF, F-BF, F-LE]

In Unit 5 students will:
Solve systems of linear equations using graphing, substitution, and elimination methods.
Identify systems that have one solution, no solution, or infinitely many solutions.
Apply systems of equations to solve real-world word problems involving two variables.
Graph and interpret solutions to systems of linear inequalities.
Analyze overlapping solution regions for systems of inequalities and determine feasible solutions.
[A-CED, A-REI]