

Pre-Algebra – High School

COURSE DESCRIPTION: In this course, students learn computational and problem-solving skills and the language of algebra. Students translate word phrases and sentences into mathematical expressions; analyze geometric figures; solve problems involving percentages, ratios, and proportions; graph different kinds of equations and inequalities; calculate statistical measures and probabilities; apply the Pythagorean theorem; and explain strategies for solving real-world problems. A textbook provides students with a ready reference and explanations that supplement the online material. Online lessons provide demonstrations of concepts, as well as interactive problems with contextual feedback.

PREREQUISITES: Math Foundations

COURSE LENGTH: Two Semesters

REQUIRED TEXT:

Pre-Algebra: A Reference Guide and Problem Sets

COURSE OUTLINE:

Semester 1

Unit 1: The Basics

- Semester Introduction
- Order of Operations
- Variable Expressions
- Writing Expressions for Word Phrases
- Comparing Expressions
- Replacement Sets
- Related Equations
- Solving Problems

Unit 2: Addition and Subtraction

- Integers on a Number Line
- Adding Integers
- Subtracting Integers
- Decimals on a Number Line
- Adding Decimals
- Subtracting Decimals

- Addition and Subtraction Properties
- Equations Involving Addition and Subtraction
- Addition and Subtraction Applications

Unit 3: Multiplication and Division

- Multiplying Integers and Decimals
- Dividing Integers and Decimals
- Multiplication and Division Properties
- Rounding and Estimation
- Equations Involving Multiplication and Division
- Multiplication and Division Applications

Unit 4: Fractions

- Equivalent Fractions
- Multiplying Fractions
- Dividing Fractions
- Common Denominators
- Adding and Subtracting Fractions
- Working with Mixed Numbers
- Multiplying and Dividing Mixed Numbers
- Equations with Fractions

Unit 5: Combined Operations

- The Distributive Property
- Like Terms
- Expressions with Mixed Operations
- Equations with Mixed Operations
- Error Analysis
- Inequalities

Unit 6: Number Properties

- Positive Exponents
- Factors and Primes
- GCF and Relative Primes
- Negative Exponents
- Powers of Ten

Unit 7: Geometry Basics

- Points, Lines, and Planes
- Rays and Angles
- Parallel Lines and Transversals
- Triangles
- Polygons
- Circles
- Transformations

Unit 8: Semester Review and Test

- Semester Review
- Semester Test

Semester 2

Unit 1: Ratio, Proportion, and Percent

- Semester Introduction
- Ratio
- Proportion
- Similarity and Scale
- Working with Percent
- Percent of Increase or Decrease
- Simple Interest

Unit 2: Analytic Geometry

- Points on the Plane
- Two-Variable Equations
- Linear Equations and Intercepts
- Slope
- Problem Solving
- Functions

Unit 3: Perimeter and Area

- Types of Polygons
- Perimeter
- Areas of Rectangles and Triangles
- Special Quadrilaterals
- Areas of Special Quadrilaterals
- Circumference

- Areas of Circles

Unit 4: Square Roots and Right Triangles

- Rational Square Roots
- Irrational Square Roots
- The Pythagorean Theorem
- The Distance Formula
- Special Types of Triangles

Unit 5: Solid Figures

- Volume and Capacity
- Volumes of Prisms and Cylinders
- Volumes of Pyramids and Cones
- Surface Area
- Surface Areas of Prisms and Cylinders

Unit 6: Counting and Probability

- Counting Principles
- Permutations
- Combinations
- Probability
- Mutually Exclusive Events
- Samples and Prediction

Unit 7: Statistics

- Graphs
- Measures of Center
- Stem-and-Leaf Plots
- Box-and-Whisker Plots
- Frequency Tables and Histograms

Unit 8: Semester Review and Test

- Semester Review
- Semester Test