

Pre-Algebra B



Course Overview

In the second half of the K¹² Pre-Algebra sequence, students continue to build their Algebra skills. Students will:

- Compute basic trigonometric ratios
- Change word phrases and sentences into mathematical expressions and equations
- Add, subtract, multiply, and divide positive and negative rational numbers in decimal and fraction form
- Use several transformations to solve equations and inequalities
- Study points, lines, planes, polygons, and circles
- Solve problems involving percents, ratios, and proportions
- Graph equations, inequalities, and systems of equations
- Calculate areas of plane figures
- Calculate volumes and surface areas of space figures
- Apply the Pythagorean Theorem to solve triangles and compute basic trigonometric ratios
- Calculate statistical measures and expected value
- Compute the probability of overlapping, independent, and dependent events
- Add, subtract, multiply, and divide polynomials and monomials
- Communicate strategies for solving word problems

Course Outline

Introduction to Algebra

- Mathematical Expressions
- Order of Operations
- Equations
- Inequalities
- Inverse Operations, Part 1
- Inverse Operations, Part 2
- Writing Expressions for Word Phrases
- Equations and Inequalities for Word Sentences
- Problem-Solving Strategies

The Decimal System

- Exponents
- The Decimal System
- Rounding
- Basic Properties
- Simplifying Expressions, Part 1
- Simplifying Expressions, Part 2
- Problem-Solving Model

Positive and Negative Numbers

- The Integers
- Decimals on the Number Line
- Adding Positive and Negative Numbers, Part 1
- Adding Positive and Negative Numbers, Part 2
- Subtracting Positive and Negative Numbers, Part 1
- Subtracting Positive and Negative Numbers, Part 2
- Multiplying Positive and Negative Numbers
- Dividing Positive and Negative Numbers, Part 1
- Dividing Positive and Negative Numbers, Part 2
- Negative Integers as Exponents
- Scientific Notation

Rational Numbers

- Positive and Negative Fractions
- Equivalent Fractions, Part 1
- Equivalent Fractions, Part 2
- Least Common Denominators
- Adding and Subtracting Fractions
- Multiplying Fractions
- Dividing Fractions, Part 1
- Dividing Fractions, Part 2
- Fractions and Decimals

Equations and Inequalities

- Properties of Equality
- Equivalent Equations
- Solving Equations with Addition and Subtraction
- Solving Equations with Multiplication and Division
- Using Several Transformations, Part 1
- Using Several Transformations, Part 2
- Equivalent Inequalities
- Solving Inequalities by Several Transformations, Part 1
- Solving Inequalities by Several Transformations, Part 2
- Translating Equations into Problems
- Translating Problems into Equations
- Error Analysis, Part 1
- Error Analysis, Part 2

Geometry

- Points, Lines, and Planes
- Circles
- Angles
- Special Angles
- Parallel Lines
- Triangles
- Special Quadrilaterals



- Polygons and Their Perimeters
- Congruent Polygons

Ratio, Proportion, and Percent

- Ratio and Proportion
- Problem Solving: Using Rates
- Scale Drawings
- Percents, Fractions, and Decimals
- Working with Percents
- Percent of Increase and Decrease
- Commissions, Discounts, Royalties
- Percents and Proportions
- Interest, Part 1
- Interest, Part 2

The Coordinate Plane

- The Coordinate Plane, Part 1
- The Coordinate Plane, Part 2
- Equations in Two Variables, Part 1
- Equations in Two Variables, Part 2
- Graphing Equations in the Coordinate Plane, Part 1
- Graphing Equations in the Coordinate Plane, Part 2
- Graphing a System of Equations, Part 1
- Graphing a System of Equations, Part 2
- Problem Solving, Part 1
- Problem Solving, Part 2
- Graphing Inequalities, Part 1
- Graphing Inequalities, Part 2
- Introduction to Functions
- Function Graphs

Areas and Volumes

- Areas of Rectangles and Triangles, Part 1
- Areas of Rectangles and Triangles, Part 2
- Areas of Quadrilaterals
- Areas of Circles
- Areas of Symmetric Figures
- Volumes of Prisms and Cylinders, Part 1
- Volumes of Prisms and Cylinders, Part 2
- Volumes of Pyramids and Cones, Part 1
- Volumes of Pyramids and Cones, Part 2
- Surface Areas of Prisms and Cylinders
- Volumes and Surface Areas of Spheres
- Mass and Density, Part 1
- Mass and Density, Part 2

Square Roots and Right Triangles

- Square Roots
- Calculating Square Roots
- The Pythagorean Theorem, Part 1
- The Pythagorean Theorem, Part 2

- Similar Triangles
- Special Right Triangles, Part 1
- Special Right Triangles, Part 2
- Trigonometric Ratios, Part 1
- Trigonometric Ratios, Part 2
- Solving Right Triangles, Part 1
- Solving Right Triangles, Part 2

Probability

- Permutations
- Combinations
- The Probability of an Event
- Odds in Favor and Odds Against
- Mutually Exclusive Events
- Overlapping Events
- Independent Events
- Dependent Events
- Estimating Probabilities

Statistics

- Bar Graphs
- Line Graphs
- Statistical Measures
- Frequency Distributions
- Stem-and-Leaf Plots
- Box-and-Whisker Plots
- Histograms and Frequency Polygons
- Expected Value of a Random Variable

Polynomials

- Polynomial Expressions
- Adding and Subtracting Polynomials
- Multiplying and Dividing Monomials
- Multiplying and Dividing a Polynomial by a Monomial
- Multiplying Polynomials, Part 1
- Multiplying Polynomials, Part 2
- Dividing Polynomials