



Pre-Algebra Course Description

Chapter 1: Introduction to Algebra Terms and Concepts

This chapter introduces students to basic terms and concepts used in algebra. Time is taken to ensure the student understands basic number operations, variables and their applications. Additionally, the student gains a fundamental sense of equations, inequalities and their solutions.

Sections:

- Number Operations
- Variables
- Order of Operations
- Translating Verbal and Algebraic Phrases
- Equations/Inequalities/Solutions

Chapter 2: Real Numbers and Simplifying Variable Expressions

This chapter focuses on getting the student to master working with the Real Numbers. Students learn the rules of integers and practice through many examples. Also, students will learn to apply the Distributive property and simplify variable expressions by combining like terms.

Sections:

- Real Numbers/Simplifying Variable Expressions
- Real Number System
- Adding Real Numbers
- Subtracting Real Numbers
- Multiplying and Dividing Real Numbers
- Distributive Property
- Simplifying by Combining Like Terms

Chapter 3: Fractions and Decimals

This chapter reviews how to work with fractions. Although it is assumed students possess these skills, time is taken to ensure the student has mastered the procedures to perform operations involving fractions.

Sections:

- Introduction to Fractions and Decimals
- Least Common Multiple/Denominator
- Multiplying and Dividing Fractions
- Adding and Subtracting Fractions

Chapter 4: Solving Equations

The chapter breaks down the steps to solve multi-step linear equations. Students will build up their skills as they progress from one and two-step equations to more advanced equations. Core concepts involved will be reviewed to include the distributive property and combining like terms.

Sections:

- One Step Equations
- Solving Two Step Equations
- Solving Multi-Step Equations
- Formulas and Literal Equations



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Chapter 5: Inequalities

In this chapter students will apply their equation solving skills to solve linear inequalities. Basic concepts and terms are introduced first, along with how to graph inequalities. Also, a section is dedicated to explain and teach how to solve absolute value equations.

Sections:

- Linear Inequalities
- Compound Inequalities
- Graphing Linear Inequalities in Two Variables
- Absolute Value Inequalities

Chapter 6: Graphing Linear Equations

This very important chapter walks the student step-by-step to master how to graph linear equations. Concepts involving the coordinate plane, slope and methods to graph lines are thoroughly reviewed and introduced. Upon completion of the chapter students will gain the necessary knowledge and skills needed to learn more advance topics involving linear equations.

Sections:

- Graphing Lines with One Variable
- Graphing Lines with Two Variables
- The Slope of a Line
- Slope Intercept Method
- XY Intercept Method

Chapter 7: Writing the Equations of Lines

The chapter builds on the student's prior knowledge and skill of linear equations. Various methods to find and write the equation of a line are introduced and practiced. The chapter focuses on the proper way to set-up and use formulas to write linear equations. Additional related topics are explored to include linear models, linear regression and word problems.

Sections:

- Using Slope-Intercept Form
- Using Point-Slope intercept
- Given the Slope and a Point
- Given Two Points
- Standard Form of Linear Equations
- Best Fitting Line
- Linear Models/Word Problems

Chapter 8: Introduction to Systems

Understanding systems and the methods to solve them are vital in algebra. This chapter introduces the student to systems and what their solutions represent. Techniques to solve systems will build from the student's prior knowledge of solving linear equations. Upon completion of the chapter a student will have a solid skill set in systems that prepares them for Algebra 1 and 2.

Sections:

- Solving Systems by Graphing
- Solving Systems Substitution Method
- Solving Systems by Elimination/Linear Combination



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Chapter 9: Absolute Value

Absolute value problems can be challenging for some students to grasp. Time is taken to teach students core concepts and build understanding. Students will learn how to graph absolute value functions and apply the steps to solve absolute value equations/inequalities.

Sections:

- Introduction to Absolute Value
- Graphing Absolute Value Equations
- Solving Absolute Value Equations
- Absolute Value Inequalities

Chapter 10: Powers and Exponents

This chapter covers the rules of powers and exponents a student needs to learn in algebra. Also, important applications of these rules are covered to include scientific notation, compound interest and exponential growth and decay.

Sections:

- Product and Power Rules of Exponents
- Negative and Zero Exponents Rules
- Division Rules of Exponents
- Scientific Notation
- Compound Interest
- Exponential Growth and Decay

Chapter 11: Polynomials

Polynomials are the key building blocks of algebra. The chapter starts by covering the parts of a polynomial and related terminology. Students then learn how to perform various polynomial operations, and a special focus is placed on avoiding common mistakes. Lastly, there is a section dedicated to introduce quadratic equations which are extremely important in more advance topics in algebra.

Sections:

- Introduction to Polynomials
- Adding and Subtracting Polynomials
- Multiplying Polynomials
- Introduction to Quadratic Equations

Chapter 12: Rational Expressions

This chapter takes the student through fundamental rational expressions to include ratios, proportions, percent and variation. Students will learn different methods to solve rational expression problems. The section on simplifying rational algebraic expressions starts by reviewing basic examples using numbers before introducing variable examples.

Sections:

- Ratios and Proportions
- Percent
- Direct and Inverse Variation
- Simplifying Rational Expressions



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Chapter 13: Introduction to Functions and Relations

Functions and relations transcend all through mathematics. This chapter explains core concepts at the Pre-Algebra level and prepares the student for more advance study of the topic. Time is taken to explain the difference between a function and relation; and introduce the student to the language of functions to include the domain, range and linear/nonlinear functions.

Sections:

- Introduction to Functions and Relations
- Graphing Functions
- Linear and Nonlinear Functions

Chapter 14: Area and Volume

This chapter explores the link between algebra and geometry. Basic formulas for area and volume are covered. Also, a section is dedicated to explain concepts related to circles to include area, volume, diameter, radius, and pi.

Sections:

- Area of Basic Figures
- Circles: Area and Circumference
- Surface Area of Basic Figures
- Volume of Basic Figures

Chapter 15: Right Triangle Theorems and Formulas

Properties of right triangles form the basis of many more advance topics in algebra, geometry and trigonometry. Sections in the chapter introduce fundamental theorems and formulas to include the distance and mid-point formula and the Pythagorean Theorem.

Sections:

- The Distance and Mid-Point Formula
- The Pythagorean Theorem