

Syllabus

Developmental Math 1—Pre-Algebra

Course Overview

Pre-Algebra is a course that will set you up for difficult concepts in algebra. It is a comprehensive collection of mathematical concepts designed to give you a deeper understanding of the world around you, and includes topics such as whole numbers, ratio and proportion, solving equations, and inequalities.

In this course, you will be introduced to graphing, along with learning about exponents and radicals. The course includes offline learning activities that focus on improving your understanding of the concepts taught in the course.

Course Goals

By the end of this course, you will be able to do the following:

- Find missing numbers in addition and subtraction sentences.
- Learn how to subtract in different ways.
- Solve real-life problems using addition and subtraction.
- Multiply and divide two-digit numbers.
- Solve linear equations that have one variable by isolating the variable and using inspection.
- Solve real-life problems using addition, subtraction, multiplication, and division.
- Write an expanded product when the exponential form is given.
- Study the associative and communicative properties of addition and multiplication.
- Use the distributive property of multiplication over addition.
- Explore division of fractions.
- Identify proper and improper fractions.
- Represent mixed numbers and fractions through hundredths as decimal numbers.
- Rename a fraction as a decimal.
- Add, subtract, multiply, and divide decimal numbers.
- Explore equivalent ratios.
- Apply inequality theorems to solve problems involving the relative sizes of the sides and angles of triangles.
- Learn about ratios, percents, proportions, and how to solve proportions.
- Learn to change percents into decimals and fractions into percents.
- Convert a decimal to a percent when the value is less than 1%.
- Convert decimals greater than 1 to percents.
- Calculate the fractional percent of a whole number.

- Use mental math to add, subtract, multiply, and divide two fractions, and find the percentage of a whole number when the percent ends in 0 or 5.
- Solve real-life problems using addition and subtraction, multiplication and division, fractions and decimals, ratio, proportion and percent.
- Add, subtract, multiply, and divide positive and negative integers.
- Define the additive inverse, or opposite of a number.
- Create and interpret bar, line, and circle graphs, and scatter plots.
- Determine whether certain elements belong to a set.
- Identify the subsets of a set.
- Classify a set as finite or infinite.
- Identify the intersection and union of two sets.
- Graph sets of numbers on a number line.
- Study the simplest form of fractions; find the common multiples, and the least common multiple (LCM) of two whole numbers.
- Explore how to add and subtract monomials and binomials.
- Find the value of an expression with one variable.
- Use linear math sentences in one variable to solve practical problems.
- Solve linear inequalities using addition and subtraction.
- Graph the solution sets to inequalities in one variable.
- Find the coordinates of a given point on a coordinate plane.
- Determine the slope and intercept of a linear relationship from its graph.
- Graph an ordered pair of real numbers on a coordinate plane.
- Find the lengths of the sides of a right triangle using the Pythagorean Theorem.
- Find the distance between two points using the distance formula.
- Study the power rule for exponents to simplify an expression with exponents raised to a power.
- Simplify a product using the product rule for exponents.
- Divide exponential forms with the same base using the quotient rule for exponents.
- Find the sum and difference of two polynomials.
- Find the product of a polynomial and monomial.
- Learn how to divide a polynomial by a monomial.

General Skills

To participate in this course, you should be able to do the following:

- Complete basic operations with word processing software, such as Microsoft Word or Google Docs.
- Complete basic operations with presentation software, such as Microsoft PowerPoint or Google Docs presentation.
- Perform online research using various search engines and library databases.
- Communicate through email and participate in discussion boards.

Credit Value

Pre- Algebra is a 0.5-credit course.

Course Materials

- notebook
- computer with Internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft PowerPoint or equivalent

Course Pacing Guide

This course description and pacing guide is intended to help you keep on schedule with your work. Note that your course instructor may modify the schedule to meet the specific needs of your class.

Unit 1: Whole Numbers

Summary

In this unit, you will find missing numbers in addition and subtraction sentences. You will learn several ways to think about subtraction. By using addition, subtraction, multiplication, and division, you will solve real-world problems. You will multiply and divide 2-digit numbers and study the place value for numbers to thousands. You will also learn how to find factors and prime factors. Then, by isolating the variable and using the method of inspection, you will solve simple equations. Through the lessons in this unit, you will study how to write an expanded product when the exponential product is given, and write products in their exponential form. In the latter part of the unit, you will learn the associative and commutative properties of addition and multiplication. You will study the distributive property of multiplication over addition. Finally, you will solve difficult linear equations by the isolating-the-variable method and by the inspection method.

Unit 2: Proportional Reasoning I

Summary

Unit 2 begins with teaching you how to find factors and prime factors, and divide fractions. You will then go on to study fraction notation, proper fractions, and improper fractions. You will represent mixed numbers and fractions through hundredths as decimal numbers. Additionally, you will study how to estimate by rounding. You will also learn about rounding decimals. You will learn to rename a fraction as a decimal. The unit also teaches to you add, subtract, multiply, and divide decimal numbers. Finally, you will solve real-life problems using addition and subtraction, multiplication and division, and fractions and decimals.

Unit 3: Proportional Reasoning II

Summary

This unit focuses on ratio and proportions. To start with you will study about equivalent ratios, proportionality, ratios, and percent. You will learn to solve proportions and problems that involve percents. You will learn to relate fractions, decimals, and percents. Further in this unit, you will learn to convert a decimal to a fraction of a percent. You will then learn to convert percents greater than 100% to decimals and less than 1% to decimals. The next lesson in the unit will help you find the percent of a decimal number using mental math to add, subtract, multiply, and divide, as well as find the percentage of a whole number when the percent ends in 0 or 5. Finally, you will solve real-life problems using addition and subtraction, multiplication, and division. You will also solve problems related to fractions and decimals, and ratio, proportion and percents.

Unit 4: Signed Numbers and Interpreting Data

Summary

This unit starts with teaching you the basic ideas about absolute value. You will also add, subtract, multiply, and divide positive and negative integers. In the latter part of the unit, you will study positive and negative integers, as well as define the additive inverse, or opposite of a number. Finally, you will create and interpret bar, line, and circle graphs, and scatter plots.

Unit 5: Real Numbers

Summary

This unit will start with teaching you how to determine whether certain elements belong to a set. You will study how to identify the subsets of a set and classify a set as finite or infinite. You will also learn to identify the intersection and union of two sets. Additionally, you will graph sets of numbers on a number line. The unit describes rational and irrational numbers and teaches how to simplify fractions. You will also learn to find the common multiples and the least common multiple (LCM) of two whole numbers, the factors, and prime factors. The unit then teaches you to find the greatest common factors. Finally, you will study the simplest form of fractions, and how to multiply them.

Unit 6: Solving Linear Equations and Inequalities

Summary

In unit 6, you will study how to add and subtract monomials and binomials. You will study variables and how to find the value of an expression with one variable. You will also learn to classify polynomials. Further, you will use linear math sentences in one variable in order to solve practical problems. You will solve word problems that can be represented by linear equations by solving for one variable. Through the activities in this unit, you will solve linear inequalities with the help of addition and subtraction, as well as by isolating the variable. Finally, you will graph the solution sets to inequalities in one variable.

Unit 7: Introduction to Graphing

Summary

At the start of this unit, you will study how to find the coordinates of a given point on a coordinate plane. You will study how to use the slope and intercept of a linear function to write an equation from a graph. You will also learn to draw a graph from an equation. You will determine the slope and intercept of a linear relationship from its graph and then graph an ordered pair of real numbers on a coordinate plane. Toward the end of the unit, you will find the lengths of the sides of a right triangle using the Pythagorean Theorem, and find the distance between two points using the distance formula.

Unit 8: Exponents and Polynomials

Summary

This unit starts with teaching you the method of using the power rule of exponents to simplify expression with exponents raised to a power. You will learn to simplify a product using the product rule for exponents. You will divide exponential forms with the same base using the quotient rule for exponents. You will also study about negative and positive integers. Through the activities in the unit, you will find the sum and difference of two polynomials. You will also find the product of a polynomial and monomial, as well as divide a polynomial by a monomial. Finally, you will study how to evaluate polynomials