

Praxis Core Academic Skills for Educators: Mathematics Part 1

Course Overview

The development of the Praxis Core Academic Skills for Educators (Praxis CASE) Courses aligns Plato Courseware with the strands and topics assessed in the 2014 Praxis CASE Test. Each unit aligns with one or more objectives within the 2014 Praxis CASE Test and the modules within each unit target the essential concepts of the Common Core State Standards as assessed in the Praxis CASE test. The 2014 Praxis CASE Test for Mathematics is the study of both numerical and algebraic problem-solving skills. In this course, you will find a variety of lessons and activities to improve your knowledge and skills in these areas.

Course Goals

By the end of this course, you will:

- Understand the concept of ratio, proportion, and percent, and solve real-world problems.
- Solve problems using mean, median, and mode.
- Explore addition and subtraction on multi-digit numbers.
- Explore common multiples, least common multiples, and greatest common factors of whole numbers.
- Explore addition, subtraction, multiplication, and division on fractions and rational expressions.
- Understand rational and irrational numbers.
- Learn how to use the product rule, quotient rule, and power rule for integer exponents.
- Explore the use of counting techniques to determine the number of outcomes.
- Learn how to use bar graphs, pie charts, and histograms to graph and chart data.
- Learn how to find information from line graphs and complex tables.
- Explore addition and subtraction on monomials, polynomials, and between binomials and monomials.
- Explore products and quotients of a monomial and polynomial.
- Explore simplification, multiplication, and factorization of algebraic expressions.
- Understand rational expressions and their equivalent forms.
- Explore slope of a line and equations of parallel or perpendicular lines.
- Solve linear equations in one and two variables and linear inequalities in one variable.
- Solve systems linear equations, algebraically and graphically.
- Solve systems of linear inequalities by graphing.

- Understand the concepts of point, slope, and intercept, and explore the slope and intercept of a linear relationship, slope-intercept form, and point-slope form.
- Understand what are functions and the inverse of functions.
- Explore composite function.
- Perform operations on functions.

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.

For a complete list of general skills that are required for participation in online courses, refer to the Prerequisites section of the Plato Student Orientation document, found at the beginning of this course.

Course Materials

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

Course Structure

Unit 1–5: Number and Quantity

Summary

Unit 1 explores the concept of ratios and equivalent ratios and then moves on to explaining the concept of proportions. In this unit, you will learn to solve real-world problems involving ratios, proportions, and percent stories. Additionally, you will solve problems with mean, median, and mode.

Unit 2 includes lessons that demonstrate how to multiply common fractions and divide a fraction by a fraction. In addition, you will learn to perform addition and subtraction on multi-digit numbers, find the common multiples, least common multiples, and greatest common factors of whole numbers.

In Unit 3, you will determine the order of fractions and learn to perform addition and subtraction on fractions with like and unlike denominators. You will also learn to multiply and divide fractions. This unit also explains the simplification, addition, subtraction, multiplication, and division of rational expressions. It concludes with an activity based on rational and irrational numbers.

Unit 4 focuses on teaching the application of the rules of exponents and radicals like the power rules, product rule, and quotient rule, when the exponents are integers.

Unit 5 begins by explaining the use of counting techniques to determine the number of outcomes. The unit focuses on graphing and charting data by using bar graphs, pie charts, and histograms. You will also learn to read line graphs and complex tables to find information.

Unit 6 - 10: Algebra and Functions

Summary

Unit 6 shows you how to perform addition and subtraction on monomials and addition and subtraction between binomials and monomials. You will learn to find the sum and difference of polynomials. In addition, you will also figure out how to determine the product or quotient of a monomial and polynomial.

In Unit 7, explores how to simplify, multiply, and factor algebraic expressions. You will learn to use basic number ideas, identify expressions involved in the real world, and determine equivalent forms of rational expressions.

In Unit 8, you will learn to calculate the slope of a line and use it to identify or find the equations of parallel or perpendicular lines. Additionally, you will solve linear equations in one variable by isolating the variable and linear equations in two variables by the process of graphing. In the latter part of this unit, you will learn how to solve linear inequalities in one variable. The unit concludes with a lesson that reviews the methods of solving equations and inequalities.

Unit 9 shows you how to interpret graphs to solve problems and the procedure followed when solving and graphing systems of equations. You will find the solution of systems of linear inequalities by graphing. Further, in this unit, you will identify graphs, slopes, and y -intercepts of various linear equations. The unit concludes with lessons on the slope-intercept and point-slope forms of linear equations.

Unit 10 begins by introducing the definition of a function with its rule. Using its rule, you will learn to find the values of a function at different points. This unit also introduces the concept of the inverse of a function and the ways of determining if a function has an inverse. The unit ends with lessons on composite functions and operations on functions.