

## PLATO Course TABE Mathematics Level A, Part 1

### Course Overview

The PLATO Course TABE Mathematics Level A, Part 1 is outlined according to the Test for Adult Basic Education (TABE). The TABE is an analytical and reliable test, created to assess the proficiency levels and aptitude of adult learners. The PLATO Course TABE Mathematics Level A, Part 1 consists of three units that will improve your math skills. Each unit will build your knowledge in subjects such as algebra, geometry, and computation. There are sections in each lesson that explain concepts in an easy manner, and will help you practice what you have learned, through activities and tests.

### Course Goals

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

- Determine whether elements belong to a set, and identify subsets, unions, and intersections of two sets.
- Understand positive and negative exponents, and find the positive and negative square roots of integers.
- Multiply and divide radicals.
- Add and subtract square root expressions using the distributive property.
- Understand basic geometric concepts.
- Solve problems that involve scale drawings of geometric figures.
- Use facts about angles to write and solve simple equations for a figure's unknown angle.
- Apply facts about angle relationships in triangles.
- Examine the properties of the angles created when parallel lines are cut by a transversal.
- Understand the Pythagorean Theorem and its converse and solve problems by applying the relationship between the lengths of the legs and the hypotenuse in right triangles.
- Find the areas of triangles, special quadrilaterals, and polygons.
- Apply volume formulas to find the volumes of right rectangular prisms.
- Use coordinates to find the length of a side of a polygon.
- Use the formulas for the area and circumference of a circle to solve problems.
- Identify and describe relationships among inscribed angles, radii, and chords.

- Use similarity to understand the relationship of length of an arc intercepted by an angle and the radius of the circle.
- Derive the formula for the area of a sector.
- Find the surface area of three-dimensional figures.
- Examine relationships called functions and understand how equations, tables, and graphs can represent the same function.
- Use the slope and intercept of linear functions to write an equation from a graph, and draw a graph from an equation.
- Find the additive inverse of a monomial and binomial.
- Find the sum, difference, product of two polynomials, and product of monomials and polynomials.
- Simplify polynomial expressions, divide a polynomial by a monomial, and divide a polynomial by a binomial.
- Find the greatest common factor of two or more monomials and factor a polynomial that has monomial factors.
- Group terms to write an expression as the product of two sums or differences.
- Factor a difference of squares.
- Solve linear equations that have one variable, using inspection and by isolating the variable, and solve equations that have absolute values.
- Solve equations and graph the solution sets of numbers on a number line.
- Solve word problems that can be represented by a linear equation by solving for one variable.
- Find the solutions for the quadratic equations of the form  $x^2 + bx = 0$ .
- Use the quadratic formula to find the solution set for a quadratic equation.
- Solve word problems that can be represented by quadratic equations.

## 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.
- Understand the basics of spreadsheet software, such as Microsoft Excel or Google Spreadsheets, but having prior computing experience is not necessary.
- Perform online research using various search engines and library databases.
- Communicate through email, and participate in discussion boards.

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

## Course Materials

- Notebook
- Graphing calculator, recommend TI-83 or equivalent
- Computer with internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft Excel or equivalent

## Unit 1: Intermediate Computation with Decimals, Fractions, and Percents

### Summary

Unit 1 is about determining whether elements belong to a set, and identifying subsets, unions, and intersections of two sets. You will study positive and negative exponents, and use the power rule for exponents to simplify an expression with exponents raised to a power. Later, you will find the positive and negative square roots of integers, and multiply and divide radicals. Finally, you will add and subtract square root expressions using the distributive property, and review fractions, sets, exponents, and radicals.

## Unit 2: Geometry and Measurements

### Summary

Unit 2 will focus on geometry and measurement. After completing this unit, you will understand basic geometric concepts and be able to solve problems that involve scale drawings of geometric figures. You will also be able to use facts about angles to write and solve simple equations for a figure's unknown angle, apply facts about angle relationships in triangles, and examine the properties of the angles created when parallel lines are cut by a transversal. Additionally, you will understand the Pythagorean Theorem and its converse and solve problems by applying the relationship between the lengths of the legs and the hypotenuse in right triangles. Later in the unit, you will find the areas of triangles, special quadrilaterals, and polygons. You will also apply volume formulas to find the volumes of right rectangular prisms and use coordinates to find the length of a side of a polygon. In this unit you will also learn about circles. This includes learning to use the formulas for the area and circumference of a circle to solve problems and learning to identify and describe relationships among inscribed angles, radii, and chords. You will also use similarity to understand the relationship of the length of an arc intercepted by an angle and the radius of the circle. Then you will derive the formula for the area of a sector. Last, you will learn to find the surface area of three-dimensional figures.

## Unit 3: Algebraic Concepts

### Summary

Unit 3 consists of algebraic concepts where you will study relationships called functions, and understand how equations, tables, and graphs can represent the same function. You will use the slope and intercept of linear functions to write an equation from a graph, and draw a graph from an equation. You will also find the additive inverse of a monomial and binomial. Then, you will find the sum, difference, product of two polynomials, and the product of monomials and polynomials. You will also learn to simplify polynomial expressions, divide a polynomial by a monomial, and divide a polynomial by a binomial. Additionally, you will find the greatest common factor of two or more monomials, and factor a polynomial that has monomial factors. Later, you will learn to group terms to write an expression as the product of two sums or differences. In this unit, you will factor a difference of squares and solve linear equations that have one variable by using the inspection method and by isolating the variable. You will also solve equations that have absolute values. After this, you will solve equations and graph the solution sets of numbers on a number line. You will then solve word problems that can be represented by linear equations by solving for one variable. You will also find the solutions for quadratic equations of the form  $x^2 + bx = 0$  and use the quadratic formula to find the solution set for a quadratic equation. Finally, you will solve word problems that can be represented by quadratic equations.