The Correlation of PLATO® instructional curricula to California Academic Content Standards (CACS)

Mathematics

Grade 8–12

Algebra II

April 13, 2005

PLATO Learning Correlation to the California Academic Content Standards

INTRODUCTION

PLATO Learning, Inc. combines PLATO® computer-assisted instruction into a flexible, integrated learning system to enhance instructional effectiveness in education programs. This document identifies PLATO® instructional activities that correlate to the California Academic Content Standards, Mathematics, Grade 8–12, Algebra II.

It is recommended that instructors review the correlation in order to fine-tune the activity to fit their educational environment. Modules may be added or removed; web sites and offline activities may also be incorporated to enhance the learning path.

The following PLATO® courseware was used in this alignment:

- **PLATO® Algebra 1, Part 1**
- **PLATO® Algebra 2, Part 1**
- **PLATO® Geometry and Measurement 1**
- **PLATO® Quality Fundamentals**
- **PLATO® Algebra 1, Part 2**
- **PLATO® Algebra 2, Part 2**
- **PLATO® Geometry and Measurement 2**

PLATO Learning, Inc. looks forward to supporting your initiatives in providing successful educational programs using PLATO® computer-based lessons.

1.0 Students solve equations and inequalities involving absolute value.

PLATO Algebra 1, Part 2
- ·Equations and Inequalities
  - ·Equations with Absolute Values
  - ·Solving and Graphing Equations in 1 Variable
  - ·Review: Equations and Inequalities

PLATO Algebra 2, Part 2
- ·Special Equations and Inequalities
  - ·Graphing with Restrictions on the Variable

2.0 Students solve systems of linear equations and inequalities (in two or three variables) by substitution, with graphs, or with matrices.

PLATO Algebra 1, Part 1
- ·Graphing Basics
  - ·Solving and Graphing Systems of Equations

PLATO Algebra 2, Part 1
- ·Linear Systems of Equations and Inequalities
  - ·Solving Linear Systems of Equations: Graphs
  - ·Solving Linear Systems of Inequalities: Graphs
  - ·Solving Linear Systems of Equations: Substitution
  - ·Solving Linear Systems of Equations: Addition
  - ·Solving Linear Systems of Equations: Matrices 1
  - ·Solving Linear Systems of Equations: Matrices 2
  - ·Solving Problems with Linear
  - ·Review: Linear Systems

3.0 Students are adept at operations on polynomials, including long division.

PLATO Algebra 1, Part 1
- ·Math Sentences
  - ·Adding Monomials
  - ·Subtracting Monomials
  - ·Adding Binomials and Monomials
  - ·Subtracting Binomials and Monomials

PLATO Algebra 1, Part 2
- ·Polynomials and Factoring
  - ·Monomial Sum
  - ·Monomial Difference
  - ·Binomial Sum
  - ·Additive Inverse of a Binomial
  - ·Binomial Difference
  - ·Polynomial Sum
  - ·Polynomial Difference
  - ·Simplifying Polynomial Expressions
  - ·Product of Polynomials
  - ·Quotient of a Binomial and Polynomial
  - ·Review: Polynomials and Factoring

PLATO Algebra 2, Part 2
- ·Numbers and their Properties
  - ·Multiplying Algebraic

4.0 Students factor polynomials representing the difference of squares, perfect square trinomials, and the sum and difference of two cubes.

PLATO Algebra 1, Part 2
- ·Polynomials and Factoring
  - ·Factoring the Difference of 2 Squares
  - ·Factoring Perfect Square Trinomials
  - ·Review: Polynomials and Factoring

PLATO Algebra 2, Part 2
- ·Numbers and their Properties
  - ·Factoring Sums and Differences of Perfect Cubes

7.0 Students add, subtract, multiply, divide, reduce, and evaluate rational expressions with monomial and polynomial denominators and simplify complicated rational expressions, including those with negative exponents in the denominator.

PLATO Algebra 2, Part 1
- ·Rational Expressions
  - ·Equivalent Forms of Rational Expressions
  - ·Simplifying Rational Expressions
  - ·Sum of Rational Expressions, Part 1
  - ·Difference of Rational Expressions, Part 1
  - ·Product of Rational
  - ·Quotient of Rational
  - ·Common Denominators of Rational Expressions
  - ·Sum of Rational Expressions, Part 2
  - ·Difference of Rational Expressions, Part 2
  - ·Review: Rational Expressions

PLATO Algebra 2, Part 2
- ·Numbers and their Properties
  - ·Rationalizing the Denominator in Rational Expressions
  - ·Applying Rules for Exponents and Radicals
  - ·Rational Expressions: Add and Subtract
  - ·Rational Expressions: Multiply and Divide

8.0 Students solve and graph quadratic equations by factoring, completing the square, or using the quadratic formula. Students apply these techniques in solving word problems. They also solve quadratic equations in the complex number system.

PLATO Algebra 1, Part 1
- ·Math Sentences
  - ·Special Quadratic Equations, Part 1
  - ·Using Quadratic Equations to Solve Problems

PLATO Algebra 1, Part 2
- ·Equations and Inequalities
  - ·Solving Simple Quadratic Equations
  - ·Solving Quadratic Equations by Factoring, Part 1
  - ·Solving Quadratic Equations by Factoring, Part 2
  - ·Solving Quadratic Equations by Factoring, Part 3
  - ·Quadratic Formula
  - ·Solving Problems with the Quadratic Equations
  - ·Review: Equations and Inequalities

PLATO Algebra 2, Part 2
- ·Numbers and their Properties
  - ·Factoring or Using the Quadratic Formula
- ·Coordinates and Curves
  - ·Distance and Circles
  - ·Parabola and Its Intercepts
  - ·Parabola and Its Vertex
- ·Functions and their Graphs
  - ·Solving Problems with Quadratic Functions

9.0 Students demonstrate and explain the effect that changing a coefficient has on the graph of quadratic functions; that is, students can determine how the graph of a parabola changes as a, b, and c vary in the equation y = a(x-b)2+ c.

PLATO Algebra 2, Part 2
- ·Functions and their Graphs
  - ·Translations and Transformations
  - ·Functional Values
  - ·Composite Functions

10.0 Students graph quadratic functions and determine the maxima, minima, and zeros of the function.

PLATO Algebra 1, Part 2
- ·Equations and Inequalities
  - ·Solving Quadratic Equations by Factoring, Part 2
  - ·Solving Quadratic Equations by Factoring, Part 3
  - ·Quadratic Formula

PLATO Algebra 2, Part 2
- ·Numbers and their Properties
  - ·Factoring or Using the Quadratic Formula
- ·Coordinates and Curves
  - ·Parabola and Its Intercepts
  - ·Parabola and Its Vertex
- ·Functions and their Graphs
  - ·Solving Problems with Quadratic Functions

11.0 Students prove simple laws of logarithms.

11.1 Students understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.

PLATO Algebra 2, Part 2
- ·Exponential and Logarithmic Functions
  - ·Properties of Logarithmic Functions
  - ·Solving Problems: Exponential and Logarithmic

11.2 Students judge the validity of an argument according to whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step.

PLATO Algebra 2, Part 2
- ·Numbers and their Properties
  - ·Simplifying Algebraic Expressions
- ·Exponential and Logarithmic Functions
  - ·Properties of Logarithmic Functions

12.0 Students know the laws of fractional exponents, understand exponential functions, and use these functions in problems involving exponential growth and decay.

PLATO Algebra 2, Part 2
- ·Numbers and their Properties
  - ·Rules for Exponents and Radicals
  - ·Rationalizing the Denominator in Rational Expressions
  - ·Applying Rules for Exponents and Radicals
- ·Exponential and Logarithmic Functions
  - ·Properties of Exponential Functions
  - ·Recognizing Graphs of Types of Functions
  - ·Solving Problems: Exponential and Logarithmic
  - ·Exponential Growth
  - ·Exponential Decay

13.0 Students use the definition of logarithms to translate between logarithms in any base.

PLATO Algebra 2, Part 2
- ·Exponential and Logarithmic Functions
  - ·Properties of Logarithmic Functions

14.0 Students understand and use the properties of logarithms to simplify logarithmic numeric expressions and to identify their approximate values.

PLATO Algebra 2, Part 2
- ·Exponential and Logarithmic Functions
  - ·Properties of Logarithmic Functions

16.0 Students demonstrate and explain how the geometry of the graph of a conic section (e.g., asymptotes, foci, eccentricity) depends on the coefficients of the quadratic equation representing it.

PLATO Algebra 2, Part 2
- ·Coordinates and Curves
  - ·Distance and Circles
  - ·Parabola and Its Intercepts
  - ·Parabola and Its Vertex
  - ·Ellipse
  - ·Hyperbola
  - ·Equations of Ellipses and Hyperbolas

17.0 Given a quadratic equation of the form ax2 + by2 + cx + dy + e = 0, students can use the method for completing the square to put the equation into standard form and can recognize whether the graph of the equation is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.

PLATO Algebra 2, Part 2
- ·Coordinates and Curves
  - ·Distance and Circles
  - ·Parabola and Its Intercepts
  - ·Parabola and Its Vertex
  - ·Ellipse
  - ·Hyperbola
  - ·Equations of Ellipses and Hyperbolas

18.0 Students use fundamental counting principles to compute combinations and permutations.

PLATO Algebra 2, Part 1
- ·Probability
  - ·Multiplication Principle of Counting
  - ·Review: Probability

19.0 Students use combinations and permutations to compute probabilities.

PLATO Algebra 2, Part 1
- ·Probability
  - ·Multiplication Principle of Counting
  - ·Review: Probability

22.0 Students find the general term and the sums of arithmetic series and of both finite and infinite geometric series.

PLATO Algebra 1, Part 1
- ·Introduction to Functions
  - ·Patterns and Sequences

23.0 Students derive the summation formulas for arithmetic series and both finite and infinite geometric series.

PLATO Algebra 1, Part 1
- ·Introduction to Functions
- ·Patterns and Sequences

24.0 Students solve problems involving functional concepts, such as composition, defining the inverse function and performing arithmetic operations on functions.

PLATO Algebra 2, Part 2
- ·Functions and their Graphs
- ·Translations and Transformations
- ·Functional Values
- ·Composite Functions
- ·Domain Values of Composite Functions
- ·Inverse of a Function
- ·Determining if a Function Has an Inverse

25.0 Students use properties from number systems to justify steps in combining and simplifying functions.

PLATO Algebra 2, Part 2
- ·Numbers and their Properties
- ·Simplifying Algebraic Expressions
- ·Functions and their Graphs
- ·Translations and Transformations
- ·Functional Values
- ·Composite Functions