Syllabus

Algebra 1A

Course Overview

Algebra is a branch of mathematics that uses symbols in place of numbers to describe and generalize relationships. In Algebra 1A, you will explore relationships between mathematical quantities, how to reason with equations and inequalities, graphing, functions, and mathematical modeling. You will build on your knowledge of variables, exponents, expressions, and algebraic terminology by applying algebra to real-world situations.

Course Goals

By the end of this course, you will:

- Perform addition, subtraction, multiplication, and division with monomial, binomial, and other polynomial expressions.
- Graph linear equations and inequalities on a coordinate plane.
- Find the slope and intercepts of a linear equation.
- Apply the slope-intercept and point-slope forms of an equation of a line.
- Graph a system of linear equations and inequalities.
- Solve linear systems using substitution, linear combinations, and addition.
- Use sequences and patterns to predict future events.
- Interpret statements and represent real-world situations using function notation.
- Find the domain and range of a function.
- Relate functions with equations, tables, and graphs.
- Write exponential functions and solve problems using exponential functions.
- Write normal and recursive functions and combine different functions.
- Write rules for arithmetic and geometric series and find sums of series.
- Transform and translate graphs of functions and find computed functions for transformed graphs.
- Find the domain and range of a composite function.
- Find the inverse of a function.
- Simplify rational exponents.

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 and Google Docs.
- Perform online research using various search engines and library databases.
- Communicate through email and discussion boards.

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.

Credit Value

Algebra 1A is a 0.5-credit course.

Course Materials

- Notebook
- Computer with Internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft Excel or equivalent

Course Pacing Guide

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

Unit 1: Single-Variable Expressions, Equations, and Inequalities

Summary

In this unit, you will focus on expressions, equations, and inequalities with a single variable. In the first half of the unit, you will perform simple operations with monomial and binomial expressions. In the latter part of the unit, you will write equations and inequalities to represent and solve word problems.

Day	Activity / *Plato Objective*	Type
1 day: 1	**Syllabus and Plato Student Orientation** *Review the Plato Student Orientation and Course Syllabus at the beginning of this course.*	Course Orientation
1 day: 2	**Adding Monomials** *Add monomials.*	Lesson

Day	Activity / *Plato Objective*	Type
1 day: 3	**Subtracting Monomials** *Subtract monomials.*	Lesson
1 day: 4	**Multiplying Monomials** *Multiply monomials.*	Lesson
1 day: 5	**Dividing Monomials** *Divide monomials.*	Lesson
1 day: 6	**Adding Binomials and Monomials** *Add binomials.*	Lesson
1 day: 7	**Subtracting Binomials and Monomials** *Subtract binomials.*	Lesson
1 day: 8	**Multiplying Monomials and Binomials** *Multiply binomials.*	Lesson
1 day: 9	**Dividing Binomials by Monomials** *Divide binomials.*	Lesson
1 day: 10	**Linear Equations in 1 Variable: Isolating the Variable** *Solve more-difficult linear equations by isolating the variable.*	Lesson
1 day: 11	**Literal Equations** *Write literal equations to solve math problems.*	Lesson
2 days: 12–13	**Using Linear Equations to Solve Problems** *Use linear math sentences in one variable to solve practical problems.*	Lesson
1 day: 14	**Linear Inequalities in 1 Variable, Part 1** *Solve linear inequalities using addition and subtraction.*	Lesson
1 day: 15	**Linear Inequalities in 1 Variable, Part 2** *Solve linear inequalities for which multiplication and division are required.*	Lesson
1 day: 16	**More-Difficult Linear Inequalities in 1 Variable** *Solve more-difficult linear inequalities by isolating the variable.*	Lesson
3 days: 17–19	**Unit Activity/Threaded Discussion—Unit 1**	Unit Activity
1 day: 20	**Posttest—Unit 1**	Assessment

Unit 2: Two-Variable Equations and Graphs

Summary

In this unit, you will graph equations in two variables and interpret the graphs. You will create two-variable equations to represent linear relationships and graph the equations on a coordinate plane. You will find the slope and intercepts of a linear equation by looking at its graph. Finally, you will use the point-slope form and the slope-intercept form to determine the equation of a given line.

Day	Activity / *Plato Objective*	Type
2 days: 21–22	**Ordered Pairs as Solutions of Linear Equations** *Determine whether an ordered pair is a solution of a linear equation.*	Lesson
1 day: 23	**Graphing Linear Equations in 2 Variables** *Determine if a point is on the graph of a linear equation.*	Lesson
2 days: 24–25	**Graphs, Slopes, and *y*-Intercepts** *Determine the slope and intercept of a linear relationship from its graph.*	Lesson
1 day: 26	**Finding *x*- and *y*-Intercepts of a Linear Equation** *Find the intercepts of a linear equation.*	Lesson
2 days: 27–28	**Equations, Graphs, Slopes, and *y*-Intercepts** *Use the slope and intercept of linear functions to write an equation from a graph and draw a graph from an equation.*	Lesson
1 day: 29	**Slope-Intercept Form** *Apply the slope-intercept form of the equation of a line.*	Lesson
1 day: 30	**Point-Slope Form** *Apply the point-slope form of the equation of a line.*	Lesson
1 day: 31	**Interpreting Graphs to Solve Problems** *Solve problems or answer questions based on linear graphs that represent real-world situations.*	Lesson
3 days: 32–34	**Unit Activity/Threaded Discussion—Unit 2**	Unit Activity
1 day: 35	**Posttest—Unit 2**	Assessment

Unit 3: Systems of Equations

Summary

In this unit, you will use systems of linear equations and systems of linear inequalities to represent word problems and find the solution of a system by graphing. You will also use substitution, linear combinations, and addition to solve systems of equations.

Day	Activity / *Plato Objective*	Type
2 days: 36–37	**Graphing Linear Inequalities in Two Variables** *Graph linear inequalities in two variables.*	Lesson
1 day: 38	**Solving and Graphing Systems of Equations** *Solve a system of linear equations.*	Lesson
2 days: 39–40	**Solving Systems of Linear Inequalities by Graphing** *Solve a system of inequalities by graphing.*	Lesson
1 day: 41	**Solving Problems with Systems of Linear Equations** *Solve practical problems with two variables.*	Lesson
1 day: 42	**Solving Linear Systems Using Substitution** *Solve linear equations using the substitution method.*	Lesson
1 day: 43	**Solving Linear Systems Using Linear Combinations** *Solve systems of linear equations using the linear combinations method.*	Lesson
1 day: 44	**Solving Linear Systems of Equations: Addition** *Solve a system of equations by adding or subtracting.*	Lesson
1 day: 45	**Solving Problems with Linear Systems** *Solve word problems using a system of two linear equations or inequalities.*	Lesson
3 days: 46–48	**Unit Activity/Threaded Discussion—Unit 3**	Unit Activity
1 day: 49	**Posttest—Unit 3**	Assessment

Unit 4: Functions

Summary

In this unit, you will use functions to represent and solve word problems. First, you will explore patterns and sequences and see how to predict future events in a series. Next, you will study function notation and find the domain and range of a function. Finally, you will use linear functions and exponential functions to represent and solve word problems.

Day	Activity / *Plato Objective*	Type
1 day: 50	**Patterns and Sequences** *Study different types of patterns and predict future items in these patterns.*	Lesson
2 days: 51–52	**Function Notation** *Study and use function notation.*	Lesson

Day	Activity / *Plato Objective*	Type
1 day: 53	**Finding the Domain and Range of a Function** *Find the domain and range of a function.*	Lesson
2 days: 54–55	**Describing Functions with Equations, Tables, and Graphs** *Study how equations, tables, and graphs can represent the same function.*	Lesson
1 day: 56	**Exponential Growth** *Solve problems that involve exponential growth.*	Lesson
1 day: 57	**Exponential Decay** *Solve problems that involve exponential decay.*	Lesson
3 days: 58–60	**Unit Activity/Threaded Discussion—Unit 4**	Unit Activity
1 day: 61	**Posttest—Unit 4**	Assessment

Unit 5: Advanced Functions

Summary
In this unit, you will focus on writing more-advanced functions. You will combine functions and use the combinations to represent translations and transformations of functions. You will also explore arithmetic and geometric sequences and write and analyze composite and inverse functions.

Day	Activity / *Plato Objective*	Type
2 days: 62–63	**Writing and Combining Functions** *Write normal functions and recursive functions, and also combine functions, to represent situations.*	Lesson
1 day: 64	**Arithmetic Sequences and Series** *Write rules for arithmetic sequences and find sums of arithmetic series.*	Lesson
1 day: 65	**Geometric Sequences and Series** *Write rules for geometric sequences and find sums of geometric series.*	Lesson
1 day: 66	**Translations and Transformations** *Alter a function by translating and transforming the graph.*	Lesson
1 day: 67	**Functional Values** *Compute functional values by translating and transforming a function.*	Lesson

Day	Activity / *Plato Objective*	Type
1 day: 68	**Composite Functions** *Find composite functions, their values, and the simpler functions that make up composite functions.*	Lesson
1 day: 69	**Domain Values of Composite Functions** *Define the restrictions on the domain of a composite function and determine whether a value is in the domain of a composite function.*	Lesson
1 day: 70	**Inverse of a Function** *Find the inverse of a function.*	Lesson
1 day: 71	**Determining if a Function Has an Inverse** *Determine whether a function has an inverse by looking at a mapping diagram or by inspecting a graph.*	Lesson
3 days: 72–74	**Unit Activity/Threaded Discussion—Unit 5**	Unit Activity
1 day: 75	**Posttest—Unit 5**	Assessment

Unit 6: Rules of Exponents and Polynomials

Summary
In this unit, you will study expressions with radicals and rational exponents. You will simplify expressions with integer exponents using the product, quotient, and power rules. You will explore the rule for exponents and use it to rationalize the denominator in rational expressions. You will apply the rules for exponents and radicals to simplify rational expressions.

Day	Activity / *Plato Objective*	Type
1 day: 76	**Integer Exponents and the Product Rule** *Simplify a product using the product rule for exponents.*	Lesson
1 day: 77	**Integer Exponents and the Quotient Rule** *Divide exponential forms with the same base using the quotient rule for exponents.*	Lesson
1 day: 78	**Integer Exponents and the Power Rule, Part 1** *Use the power rule for exponents to simplify an expression with exponents raised to a power.*	Lesson
1 day: 79	**Integer Exponents and the Power Rule, Part 2** *Use the power rule for exponents to simplify an expression with exponents raised to a power.*	Lesson
2 days: 80–81	**Rational Exponents** *Study and apply properties of exponents to rational exponents.*	Lesson

Day	Activity / *Plato Objective*	Type
1 day: 82	**Rationalizing the Denominator in Rational Expressions** *Rationalize the denominator in rational expressions using the rules for exponents.*	Lesson
1 day: 83	**Rules for Exponents and Radicals** *Apply the rules for exponents when the exponents are rational numbers.*	Lesson
1 day: 84	**Applying Rules for Exponents and Radicals** *Simplify rational expressions with exponents and radicals.*	Lesson
3 days: 85–87	**Unit Activity/Threaded Discussion—Unit 6**	Unit Activity
1 day: 88	**Posttest—Unit 6**	Assessment
1 day: 89	**Semester Review**	
1 day: 90	**End-of-Semester Test**	Assessment