Algebra 2B

Course Overview

Algebra is a branch of mathematics that uses symbols in place of numbers to describe and generalize relationships. In Algebra 2B, you will begin with trigonometry, which is the study of how the sides and angles of a triangle are related. You will examine trigonometric functions and graphs in the context of the unit circle. You will extend your understanding of lines by classifying systems of linear equations. In prior courses, you solved inequalities by graphing. Here, you will solve systems of inequalities, including quadratic and absolute value inequalities that contain restrictions on the variable. You will finish Algebra 2B by applying statistics and probability to make complex decisions. You'll reach decisions based on representative sampling from a population and by creating and evaluating statistical models.

Course Goals

By the end of this course, you will:

- Examine trigonometric functions and their graphs.
- Examine and apply basic trigonometric identities.
- Rewrite and solve single-variable equations.
- Classify linear systems.
- Solve linear systems by graphing or substitution.
- Graph the solution to inequalities, including absolute value inequalities.
- Perform operations on functions.
- Graph exponential and logarithmic functions and solve problems involving such functions.
- Investigate transformations of functions.
- Find the inverse of a function.
- Fit a data set to a normal distribution curve.
- Make predictions and inferences from a data set.
- Estimate a population mean and develop a margin of error.
- Solve complex probabilities to make fair decisions.
- Use data to compare two treatments or experiments.

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 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 Plato Student Orientation document, found at the beginning of this course.

Credit Value
Algebra 2B 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: Trigonometric Functions

Summary
In this unit, you will explore trigonometric functions. You will learn about radians and will use the unit circle to understand trigonometric functions. You will also examine trigonometric graphs and use different trigonometric identities.

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
2 days: 2–3	**Angles and Their Measures** *Examine angles and their measures.*	Lesson
3 days: 4–6	**Trigonometric Functions and the Unit Circle** *Examine trigonometric functions using a unit circle.*	Lesson
3 days: 7–9	**Trigonometric Functions** *Examine trigonometric functions.*	Lesson
3 days: 10–12	**Trigonometric Graphs** *Examine trigonometric graphs.*	Lesson

3 days: 13–15	**Basic Trigonometric Identities** *Examine and apply the basic trigonometric identities.*	Lesson
4 days: 16–19	**Unit Activity/Threaded Discussion—Unit 1**	Unit Activity
1 day: 20	**Posttest—Unit 1**	Assessment

Unit 2: Modeling with Functions

Summary

In this unit, you will solve equations, inequalities, and systems of equations. You will learn how to write and solve equations that represent a situation or a word problem. You will also learn how to classify and solve linear systems of equations.

Day	Activity / *Plato Objective*	Type
3 days: 21–23	**Creating and Solving Equations** *Create equations to represent situations and solve them to work out problems in context.*	Lesson
2 days: 24–25	**Rewriting Formulas** *Rewrite equations to solve for a single variable.*	Lesson
2 days: 26–27	**Solving Linear Systems of Equations: Graphs** *Use the graphing method to solve systems of two linear equations.*	Lesson
2 days: 28–29	**Classifying Linear Systems** *Classify a system of linear equations as parallel, intersecting, or coincident.*	Lesson
2 days: 30–31	**Solving Linear Systems of Inequalities: Graphs** *Solve a system of inequalities by graphing.*	Lesson
2 days: 32–33	**Solving Linear Systems of Equations: Substitution** *Solve a system of equations by substitution.*	Lesson
2 days: 34–35	**Estimating Solutions for a System of Equations** *Study how the graphs of equations relate to the solution of a system of equations and explore multiple methods of approximation for a system of equations.*	Lesson
3 days: 36–38	**Unit Activity/Threaded Discussion—Unit 2**	Unit Activity
1 day: 39	**Posttest—Unit 2**	Assessment

Unit 3: Graphing with Functions

Summary

In this unit, you will graph the solution set for single inequalities, including absolute value inequalities and associated inequalities. You will add, subtract, multiply, and divide pairs of functions. You will solve word problems using exponential and logarithmic functions and graph and identify the key features of these function types. Finally, you will examine different transformation of functions and how to find the inverse of a function.

Day	Activity / *Plato Objective*	Type
2 days: 40–41	**Graphing Linear Inequalities in 1 Variable** *Graph the solution sets to inequalities in one variable.*	Lesson
2 days: 42–43	**Graphing with Restrictions on the Variable** *Graph the solution sets to absolute value inequalities in one variable.*	Lesson
2 days: 44–45	**Graphing Solution Sets of Associated Inequalities** *Graph the solution sets of quadratic inequalities in one variable and other unions of solution sets.*	Lesson
3 days: 46–48	**Operations on Functions** *Add, subtract, multiply, and divide pairs of functions.*	Lesson
3 days: 49–51	**Solving Problems: Exponential and Logarithmic** *Solve problems that involve exponential or logarithmic functions.*	Lesson
2 days: 52–53	**Graphing Exponential and Logarithmic Functions** *Graph exponential and logarithmic functions and identify key features of those functions.*	Lesson
3 days: 54–56	**Transformation of Functions** *Investigate transformations of functions.*	Lesson
2 days: 57–58	**Inverse Functions** *Study and apply the method for finding the inverse of a function.*	Lesson
3 days: 59–61	**Unit Activity/Threaded Discussion—Unit 3**	Unit Activity
1 day: 62	**Posttest—Unit 3**	Assessment

Unit 4: Inferences and Conclusions from Data

Summary

In this unit, you will analyze statistical data and models. You will analyze data sets and fit them to normal distribution curves using their mean and standard deviation. You will make inferences from statistical data and evaluate the validity of statistical models. You will examine the purposes of and differences among various data collection methods. Finally, you will use probability concepts for making decisions in complex situations.

Day	Activity / *Plato Objective*	Type
3 days: 63–65	**Normal Distributions** *Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages.*	Lesson
2 days: 66–67	**Making Inferences Based on Statistics** *Understand statistics as a process for making inferences about population parameters based on a random sample from that population.*	Lesson
2 days: 68–69	**Evaluating the Validity of a Statistical Model** *Decide if a specified model (such as a simulation) is consistent with results from a given data-generating process.*	Lesson
3 days: 70–72	**Using Statistics in Surveys, Experiments, and Studies** *Recognize the purposes of and differences among sample surveys, experiments, and observational studies.*	Lesson
2 days: 73–74	**Analyzing a Survey** *Use data from a sample survey to estimate a population mean or proportion and develop a margin of error through the use of simulation models for random sampling.*	Lesson
3 days: 75–77	**Fair Decisions with Random Variables** *Solve for probabilities in complex situations that go beyond counting rules and use these probabilities to make fair decisions.*	Lesson
2 days: 78–79	**Evaluating Reports Based on Data** *Evaluate reports based on data.*	Lesson
2 days: 80–81	**Statistically Comparing Two Treatments** *Use data from a randomized experiment to compare two treatments and use simulations to decide if differences between parameters are significant.*	Lesson
3 days: 82–84	**Complex Decisions Using Probability** *Analyze decisions and strategies in complex situations, using probability concepts that go beyond counting rules.*	Lesson

3 days: 85–87	**Unit Activity/Threaded Discussion—Unit 4**	Unit Activity
1 day: 88	**Posttest—Unit 4**	Assessment
1 day: 89	**Semester Review**	
1 day: 90	**End-of-Semester Test**	Assessment