Precalculus A

Course Overview

Studying higher algebra and trigonometry leads to a better understanding of calculus. In Precalculus A, you will explore and build your knowledge of inverse, trigonometric, and logarithmic functions; trigonometric identities; complex numbers; and vectors. You will also apply this knowledge to real-world situations.

Course Goals

This course will help you meet these goals:

- Write a function that describes a relationship between two quantities.
- Define and solve inverse functions, exponential functions, logarithmic functions, and trigonometric functions.
- Investigate exponential models and logarithmic models.
- Use the unit circle to manipulate, solve, and explain symmetry and periodicity of trigonometric functions.
- Find unknown measurements in right triangles.
- Examine and apply trigonometric identities.
- Measure the magnitude of vectors and use vectors to represent velocity in models.
- Apply vector operations of addition and multiplication to negative vectors.
- Examine polar coordinates in graphs.
- Perform advanced operations with complex numbers, including De Moivre's Theorem.
- Represent basic operations of complex numbers geometrically on the complex plane.

General Skills

To participate in this course, you should be able to:

- Complete basic operations with word-processing software, such as Microsoft Word or 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

Precalculus A 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: Functions

Summary
In this unit, you will explore inverse, exponential, and logarithmic functions. You will also study exponential and logarithmic modeling. In the last lesson of the unit, you will solve exponential and logarithmic functions.

Day	Activity/*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
4 days: 2–5	**Modeling with Functions** *Write a function that describes a relationship between two quantities.*	Lesson
3 days: 6–8	**Inverse Functions** *Define and use inverse functions.*	Lesson
3 days: 9–11	**Exponential Models** *Investigate exponential models.*	Lesson
3 days: 12–14	**Logarithmic Functions** *Examine logarithmic functions.*	Lesson
3 days: 15–17	**Logarithmic Models** *Investigate logarithmic models.*	Lesson
4 days: 18–21	**Solving Exponential and Logarithmic Functions** *Solve exponential and logarithmic functions.*	Lesson

Day	Activity/*Objective*	Type
5 days: 22–26	**Unit Activity/Threaded Discussion—Unit 1**	Unit Activity
1 day: 27	**Posttest—Unit 1**	Assessment

Unit 2: Trigonometric Functions

Summary
In this unit, you will focus on trigonometry and its identities. You will study trigonometric symmetry and inverse trigonometric functions. You will explore various identities, including the sum, difference, cofunction, double-angle, half-angle, product-sum, and sum-product identities. You will also solve problems involving right triangles and trigonometric equations.

Day	Activity/*Objective*	Type
4 days: 28–31	**The Unit Circle** *Use the unit circle to manipulate and solve trigonometric functions.*	Lesson
3 days: 32–34	**Problems Involving Right Triangles** *Find unknown measurements in right triangles.*	Lesson
3 days: 35–37	**Trigonometric Symmetry** *Use the unit circle to explain symmetry and periodicity of trigonometric functions.*	Lesson
3 days: 38–40	**Inverse Trigonometric Functions** *Examine inverse trigonometric functions.*	Lesson
3 days: 41–43	**Sum, Difference, and Cofunction Identities** *Examine and apply the sum, difference, and cofunction identities.*	Lesson
4 days: 44–47	**Double-Angle and Half-Angle Identities** *Use the double-angle and half-angle identities.*	Lesson
3 days: 48–50	**Product-Sum and Sum-Product Identities** *Examine and apply the product-sum and sum-product identities.*	Lesson
3 days: 51–53	**Solving Trigonometric Equations** *Solve trigonometric equations.*	Lesson
5 days: 54–58	**Unit Activity/Threaded Discussion—Unit 2**	Unit Activity

Day	Activity/*Objective*	Type
1 day: 59	**Posttest—Unit 2**	Assessment

Unit 3: Vectors and Complex Numbers

Summary
In this unit, you will explore vectors and complex numbers. You will start with representing vectors in a plane. You will then perform addition, subtraction, and scalar multiplication on vectors and represent velocity by vectors in a plane. After learning the definition of a complex number, you will perform advanced operations with complex numbers and represent complex numbers in a plane.

Day	Activity/*Objective*	Type
3 days: 60–62	**Vectors in a Plane** *Identify, add, and measure the magnitude of vectors.*	Lesson
3 days: 63–65	**Velocity Vectors** *Use vectors to represent velocity in models.*	Lesson
4 days: 66–69	**Negative Vectors** *Apply vector operations of addition and multiplication to negative vectors.*	Lesson
3 days: 70–72	**Complex Numbers** *Define and work with complex numbers.*	Lesson
3 days: 73–75	**Polar Coordinates in Graphs** *Examine polar coordinates in graphs.*	Lesson
3 days: 76–78	**Complex Numbers and De Moivre's Theorem** *Perform advanced operations with complex numbers, including De Moivre's Theorem.*	Lesson
4 days: 79–82	**Complex Numbers in the Plane** *Represent basic operations of complex numbers geometrically on the complex plane*	Lesson
5 days: 83–87	**Unit Activity/Threaded Discussion—Unit 3**	Unit Activity
1 day: 88	**Posttest—Unit 3**	Assessment

Day	Activity/*Objective*	Type
1 day: 89	**Semester Review**	
1 day: 90	**End-of-Semester Test**	Assessment