

## 2023 Advanced Placement® Precalculus

### About the AP® Precalculus Summer Institute

This course is for teachers preparing to teach AP Precalculus. A discussion regarding course purpose and philosophy will help guide our week's work. We will fully explore the current Course and Exam Description (CED) to gain an in-depth understanding of the vision of the course. A detailed analysis of the Essential Knowledge statements will provide a cohesive view of function analysis, rate of change work, and modeling implementation. A variety of effective activities to support student learning will help increase student access to content. We will discuss common student misconceptions, AP exam question approaches and scoring, and classroom strategies to maximize learning. Discussions will focus on enhancing teacher understanding and development of topics as well as sharing ideas and activities. Participants will find access to Google Drive beneficial since sharing can occur efficiently within the Google platform.

### Goals of the Institute:

The topics listed below will be incorporated throughout the week. The emphasis, order, and inclusion of these and other topics will be driven by participant needs and goals.

- Introductions and Goals for the Week
- Curricular Requirements Discussion
- Diversity & Inclusion and Equity & Access Discussions
- AP Precalculus Course and Exam Description Deep-Dive
- AP Classroom Resources and Implementation
- Course Pacing Plan Development
- Strategies for Using Data to Assess, Reflect, and Adjust
- Unpacking and Implementing the Three Mathematical Practices
- Limit Notation as a Descriptive Thread in the Course
- Modeling Analysis Along with Interpretation of Residuals and Assumptions/Limitations
- Development and Planning of Unit 1: Polynomial and Rational Functions
- Incorporating Multiple Representations
- How Topics Appearing in Prerequisite Courses Manifest Differently
- Key Components of Unit 2: Exponential and Logarithmic Functions
- Key Components of Unit 3: Trigonometric and Polar Functions
- Key Components of Unit 4: Functions Involving Parameters, Vectors, and Matrices
- Analysis of CED Topic Notes and Learning Notes
- Creating a Classroom Community and Culture of Success
- Instructional Strategies and Effective Activity Design
- Exam Style Questions and Task Verbs
- A Deep-Dive with Practice Questions in the CED
- AP Exam Structure Discussion
- Expectations for Student Use of Justifications
- Graphing Calculator Discussions

**Tentative Daily Schedule:**

8 am – 12 pm Morning Session

12 pm – 1 pm Lunch

1 pm – 5 pm Afternoon Session

**What to bring:**

Items you should have access to during the week include:

- A laptop computer/ tablet
- A favorite lesson or practice to share
- A copy of your school's academic calendar
- A copy of the textbook you will be using next year (if you have access to one)
- A graphing calculator

**Instructor:**

**Dr. Martha Cantrell** taught high school mathematics for 39 years with more than 30 years of experience teaching AP Calculus and more than 25 years of experience teaching Advanced Algebra/Trigonometry and Precalculus. Dr. Cantrell has led regional AP Calculus workshops for the Georgia Department of Education and served as an AP Reader for AP Calculus from 2007 to 2020. She has also served as a consultant for the National Math and Science Institute (NMSI), leading Saturday study sessions for AP Calculus for students in Georgia, South Carolina, and Florida. While continuing to teach AP Calculus courses, Dr. Cantrell began serving as District Gifted Program Coordinator for Habersham County Schools in 2008 where she oversees K-12 gifted services, leads professional learning targeting the identification of underserved populations, and works to serve all students ready for advanced academic offerings. Under her leadership, the school system has expanded Advanced Placement offerings, added the AP Capstone Program, and increased advanced course offerings for academically prepared students in all core content areas and fine arts.