**Course Description:**

AP Calculus AB is roughly equivalent to a first semester college calculus course devoted to topics in differential and integral calculus. The AP course covers topics in these areas, including concepts and skills of limits, derivatives, definite integrals, and the Fundamental Theorem of Calculus. The course teaches students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations. Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions.

[**AP Calculus Syllabus**](https://www.rcsdk12.org/cms/lib/NY01001156/Centricity/Domain/11352/AP%20Course%20Criteria%202017.pdf)

The course is organized around the foundational concepts of calculus:

**I. Limits:**

Students must have a solid, intuitive understanding of limits and be able to compute one-sided limits, limits at infinity, the limit of a sequence, and infinite limits. They should be able to apply limits to understand the behavior of a function near a point and understand how limits are used to determine continuity.

**II. Derivatives:**

Students should be able to use different definitions of the derivative, estimate derivatives from tables and graphs, and apply various derivative rules and properties. Students should also be able to solve separable differential equations, understand and be able to apply the Mean Value Theorem, and be familiar with a variety of real-world applications, including related rates, optimization, and growth and decay models.

**III. Integrals and the Fundamental Theorem of Calculus:**

Students should be familiar with basic techniques of integration, including basic antiderivatives and substitution, and properties of integrals. Students should also understand area, volume, and motion applications of integrals, as well as the use of the definite integral as an accumulation function. It is critical that students understand the relationship between integration and differentiation as expressed in the Fundamental Theorem of Calculus.

**Assessment Overview**

The AP Calculus AB Exam questions measure students’ understanding of the concepts of calculus, their ability to apply these concepts, and their ability to make connections among graphical, numerical, analytical, and verbal representations of mathematics. Adequate preparation for the exam also includes a strong foundation in algebra, geometry, trigonometry, and elementary functions, though the course necessarily focuses on differential and integral calculus. Students may not take both the Calculus AB and Calculus BC Exams within the same year.

The free-response section tests students’ ability to solve problems using an extended chain of reasoning. During the second timed portion of the free-response section (Part B), students are permitted to continue work on problems in Part A, but they are not permitted to use a calculator during this time.

**Format of Assessment**

**Section I:** Multiple Choice | 45 Questions | 1 Hour, 45 Minutes | 50% of Exam Score

• **Part A:** 30 questions; 60 minutes (calculator not permitted)

• **Part B**: 15 questions; 45 minutes (graphing calculator required)

**Section II:** Free Response | 6 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

• **Part A:** 2 questions; 30 minutes (graphing calculator required)

• **Part B:** 4 questions; 60 minutes (calculator not permitted)