

AP CALCULUS AB SYLLABUS 2026-2027

Room: Computer Lab **Tuesday & Thursday** 1:25 PM to 2:50 PM **Owen Davis** - okdavis59@gmail.com

Course Description and Content:

AP Calculus AB is an invitation into a new and fundamentally deeper level of mathematical understanding of how much of the mathematics you have already learned is connected. You will use powerful new tools like derivatives and integrals to analyze interesting real-world problems, like tracking the changing speed of a launching rocket or predicting how quickly a rumor spreads through a crowd. It is a transformative journey where the changing steepness of the curve on the graph of a function and the area beneath the curve reveal themselves as two sides of the same coin. **AP Calculus AB is equivalent to a rigorous first-semester college calculus course exploring concepts of limits, derivatives, definite integrals, and the Fundamental Theorem of Calculus.**

Limits & Continuity of Functions – Instantaneous Change? - Limit Values from Graphs, Tables, and Using Algebra - Discontinuity versus Continuity of Functions - Limits Involving Infinity

Differentiation: Definition and Rules – Average and Instantaneous Rates of Change - Derivative of a Function - Derivative Rules for All Basic Functions and for Mathematical Combinations of Functions

Differentiation: Advanced Functions and Procedures – The Chain Rule - Implicit Differentiation - Differentiating Inverse Functions - Calculating Higher Order Derivatives of Functions

Contextual Applications of Derivatives – Rates of Change for Straight-Line Motion and Other Contexts - Related Rates Real World Problems - Local Linearity - L'Hospital's Rule for Indeterminate Forms

Analytical Applications of Derivatives – Mean & Extreme Values - Functions Increasing or Decreasing - Relative and Absolute Extrema - Concavity of Functions - Sketching Graphs of Functions and Their Derivatives - Real World Optimization Problems

Integration and Accumulation of Change – Approximating Areas Using Riemann Sums - Definite Integrals - Fundamental Theorem of Calculus - Methods for Finding Antiderivatives and Indefinite Integrals

Differential Equations – Modeling Situations - Slope Fields - Finding General and Particular Solutions

Applications of Integration – Average Value of a Function - Connecting Position, Velocity, and Acceleration Functions - Other Real World Applications - Finding the Area Between Curves - Volumes of Solids Using either Related Cross Sections or Revolving a Region About the x-axis or y-axis.

Course Resources:

AP Classroom: <https://myap.collegeboard.org/login> Create a Student Account then use Join Code: PPVD7X

Online Textbook: <https://openstax.org/books/calculus-volume-1>

Graphing Calculator: TI-84 Plus CE, check AP Classroom for other equivalent options.

Grading Policy:

Grades will be based on the following assignments:

Homework 10% -- The most important work for your success!

Classroom Activities 10%

Quizzes 40% (Homework Quizzes, Regular Quizzes, and Unit Quizzes)

Exams 40% (20% Midterm Exam & 20% Final Exam)

Note: Points and assignments above may be subject to change.

Additional Help:

The most important help will come from collaborating with each other whenever possible. I will be available through the Jupiter Student Information System, and on campus during the school days if and when possible.

General Policies:

Cell Phones, Missed Assignments or Exams, Academic Integrity, and other policies will closely adhere to the Torah High School policies outlined in the Student-Parent Handbook.