

# Cracking the AP Calculus AB Exam – Book Summary

**Author:** The Princeton Review

**Publisher:** Penguin Random House

**Edition Reviewed:** 2017 (Applicable for foundational AP prep, still relevant for structure and strategy)

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## Introduction

The **Advanced Placement (AP) Calculus AB exam** remains one of the most rigorous mathematics assessments in the U.S. high school curriculum. Preparing for it requires not only a strong foundation in differential and integral calculus but also a clear understanding of how the College Board structures its exam, scores student responses, and assesses mathematical reasoning.

To support students in this endeavor, The Princeton Review's *Cracking the AP Calculus AB Exam* has been a longstanding companion, widely regarded for its comprehensive coverage and student-friendly approach. This review aims to unpack the structure, content, pedagogical value, and ideal use cases of the 2017 edition of this guide.

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## Purpose and Pedagogical Approach

The Princeton Review is known for its **test-centric pedagogy**. Unlike traditional textbooks, which often emphasize theoretical development, this book adopts an outcome-based approach focused on **exam readiness**. It is designed to:

- Simulate actual AP exam conditions
- Build familiarity with the types of questions students will encounter
- Teach efficient strategies for multiple-choice and free-response sections
- Provide targeted content review informed by past exam trends

The authors adopt a **diagnostic-and-targeting methodology**—students are encouraged to evaluate themselves early in the process and then follow personalized study plans using the material provided.

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## Structural Overview

The book is divided into **six major parts**, each with a specific pedagogical function. The structure allows for both linear study and modular, needs-based use.

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### Part I: Using This Book to Improve Your AP Score

This introductory section is diagnostic in nature. It includes:

- **Pre-study self-assessment tools:** Students are asked to rate their content knowledge and test readiness.
- **Goal-setting activities:** Learners set target scores (e.g., 3, 4, or 5), with strategic advice tailored to each level.
- **Study planning:** Students are guided in building a study calendar based on the number of weeks before the exam.

This section models **metacognitive learning** by prompting reflection and planning before engaging with content.

## Part II: Practice Test 1 (Diagnostic)

Includes:

- A full-length practice test mirroring the **official AP Calculus AB exam** structure.
- **Section I:** 45 multiple-choice questions, half of which allow calculator use.
- **Section II:** 6 free-response questions assessing deeper conceptual understanding and justifications.

**Answer keys and detailed explanations** accompany each question. Students are encouraged to assess performance, identify patterns in errors, and refine their study strategies accordingly.

## Part III: About the AP Calculus AB Exam

This informational section situates the exam in the broader context of:

- **College Board assessment goals**
- **Scoring breakdown** (50% multiple-choice, 50% free-response)
- **Calculator usage rules**
- **Differences between Calculus AB and BC**
- **How colleges use AP scores** for credit and placement

It also provides advice on **using online tools**, such as practice grids and formula sheets available through the Princeton Review's web portal.

## Part IV: Test-Taking Strategies

This section focuses on **cognitive and behavioral strategy instruction**, including:

- How to interpret question structures
- When to guess (based on the lack of penalty for incorrect answers)
- Time management techniques for Section I and II
- Guidelines for writing free-response justifications that earn full credit
- **Graphing calculator strategies**: Maximizing output from tools allowed on Section I-B and II-A

The strategies here are rooted in research on **test-wiseness** and **heuristic reasoning** under pressure.

## Part V: Content Review and Conceptual Mastery

This is the core of the book, containing detailed instructional units that map directly onto the AP Calculus AB curriculum framework. Each unit includes:

- **Clear conceptual explanations**
- **Worked examples**
- **Practice problem sets**
- **Reflection questions**

## Unit 1: Differential Calculus Essentials

Topics:

- Limits (including one-sided and infinite limits)
- Continuity and types of discontinuities
- Definition of the derivative
- Basic derivative rules: power, product, quotient, and chain
- Graphical interpretation of derivatives

**Pedagogical focus:** Building comfort with the concept of instantaneous rate of change and symbolic manipulation of functions.

## Unit 2: Applications of Derivatives

Topics:

- Tangents and normals
- Critical points, relative extrema, and inflection points
- The Mean Value Theorem and Rolle's Theorem
- Curve sketching using  $f'$  and  $f''$
- Motion along a line: position, velocity, and acceleration
- Related rates problems
- Derivatives of exponential/logarithmic functions
- L'Hôpital's Rule and differentials

**Pedagogical focus:** Connecting calculus to real-world change, optimization, and geometric interpretation.

### Unit 3: Integral Calculus Essentials

Topics:

- Antiderivatives and indefinite integrals
- The Fundamental Theorem of Calculus (Parts I and II)
- Riemann sums and trapezoidal approximation
- u-substitution
- Integration of trigonometric, exponential, and logarithmic functions

**Pedagogical focus:** Understanding accumulation as the inverse of differentiation and modeling total change.

### Unit 4: Applications of Integration

Topics:

- Area between curves
- Volumes of solids of revolution (disk, washer, shell methods)
- Volumes by known cross-sections
- Slope fields and differential equations
- Separation of variables and initial value problems

**Pedagogical focus:** Applying integrals to geometry and modeling differential behavior over time.

Each unit ends with **skill drills** that include test-style questions and reflection prompts, encouraging students to assess their readiness before progressing.

## Part VI: Additional Full-Length Practice Tests

This section includes two additional AP-style exams with:

- Section I (multiple-choice) and Section II (free-response)
- Scoring rubrics and answer explanations
- Calculator and non-calculator sections

These tests are intended for benchmarking and final review. Students are encouraged to simulate exam conditions to build stamina and accuracy.

## Strengths of the Book

- **Comprehensive coverage** of all AP Calculus AB topics
- Emphasis on **exam-specific strategies**, not just content review
- Multiple **full-length tests with detailed solutions**
- Intuitive formatting and structure designed for self-study
- Includes **graphical, numerical, analytical, and verbal representations** of calculus concepts, in line with AP exam standards
- Access to **online student tools**, including formula sheets and college planning resources

## Potential Limitations

- The 2017 edition may not fully reflect **minor structural updates** in the latest AP curriculum frameworks (e.g., scoring rubrics or question types), though the core content remains relevant.
- As a test prep book, it may not be ideal as a **primary instructional text** in classrooms focused on in-depth theoretical development.

## Ideal Users

This book is best suited for:

- Students enrolled in AP Calculus AB who need structured exam preparation
- Independent learners and homeschoolers
- Students aiming to score a **4 or 5**
- Educators seeking supplementary practice material for exam review

## Recommended Study Plan (10–12 Weeks)

1. **Week 1:** Take Practice Test 1 and identify weak areas
2. **Weeks 2–5:** Complete Units 1 and 2 with daily practice
3. **Weeks 6–8:** Complete Units 3 and 4 with applied drills
4. **Weeks 9–10:** Take Practice Test 2, review free-response writing
5. **Week 11:** Target remaining weak areas
6. **Week 12:** Take Practice Test 3 under timed conditions

## Conclusion

The Princeton Review's *Cracking the AP Calculus AB Exam* offers a well-balanced approach to mastering both **conceptual understanding** and **test performance**. With structured content review, robust practice tests, and strategic instruction, the book remains an effective resource for any student aiming for excellence on the AP Calculus AB exam.

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