

2017 ap calc bc

Ebook Description: 2017 AP Calculus BC

This ebook provides a comprehensive review of the 2017 AP Calculus BC curriculum. It's designed to help students prepare for the exam by providing a clear understanding of key concepts, practice problems, and effective test-taking strategies. The significance of mastering AP Calculus BC lies in its importance for college admissions and future success in STEM fields. A strong performance on this exam can demonstrate a student's readiness for rigorous college-level mathematics courses, opening doors to a wider range of academic and career opportunities. This ebook serves as an invaluable resource for students aiming to achieve a high score on the exam, providing detailed explanations, worked examples, and ample practice to solidify their understanding. The relevance extends beyond the immediate exam; the concepts learned are fundamental to numerous fields, including engineering, physics, economics, and computer science.

Ebook Title: Conquering the 2017 AP Calculus BC Exam

Contents:

Introduction: Overview of the AP Calculus BC exam, scoring, and effective study strategies.

Chapter 1: Limits and Continuity: A thorough review of limit properties, techniques for evaluating limits, continuity definitions, and applications.

Chapter 2: Derivatives: Rules of differentiation, implicit differentiation, related rates, and applications of derivatives (optimization, curve sketching).

Chapter 3: Integrals: Techniques of integration (u-substitution, integration by parts), definite and indefinite integrals, applications of integrals (area, volume).

Chapter 4: Differential Equations: Introduction to differential equations, separable equations, slope fields, Euler's method.

Chapter 5: Infinite Sequences and Series: Convergence and divergence tests, Taylor and Maclaurin series.

Chapter 6: Parametric Equations and Polar Coordinates: Graphing and calculus with parametric and polar equations.

Chapter 7: Vectors and 3D Space: Vector operations, lines and planes in 3D space.

Chapter 8: Practice Exams and Solutions: Multiple full-length practice exams mirroring the actual AP exam, with detailed solutions.

Conclusion: Final tips for exam day, resources for further study, and a recap of key concepts.

Article: Conquering the 2017 AP Calculus BC Exam

Introduction: Mastering the Calculus BC Exam

The AP Calculus BC exam is a challenging but rewarding experience for high school students. Success on this exam can significantly impact college applications and future academic prospects. This comprehensive guide breaks down the key concepts covered in the 2017 AP Calculus BC curriculum, providing a pathway to mastering the material and achieving a high score. The exam assesses students' understanding of both differential and integral calculus, including topics not covered in the AB curriculum, such as sequences, series, parametric equations, polar coordinates, and vectors. Effective preparation requires a strategic approach combining focused study, consistent practice, and a thorough understanding of the exam format.

Chapter 1: Limits and Continuity: The Foundation of Calculus

Limits form the bedrock of calculus. Understanding limits is crucial for grasping derivatives and integrals. This chapter covers various techniques for evaluating limits, including direct substitution, factoring, rationalizing, L'Hopital's rule (though its rigorous proof might be beyond the scope of the AP exam), and dealing with limits at infinity. Continuity is explored, defining continuous functions and identifying discontinuities. The Intermediate Value Theorem (IVT) and the Extreme Value Theorem (EVT) are explained with examples, showing their applications in proving existence of solutions or extrema. The Epsilon-Delta definition of a limit might be touched upon, although a complete formal treatment is not typically required for the AP exam.

Chapter 2: Derivatives: The Rate of Change

This chapter delves into the core concept of derivatives as instantaneous rates of change. Various differentiation rules, including the power rule, product rule, quotient rule, and chain rule, are meticulously explained and illustrated with examples. Implicit differentiation is introduced, enabling the differentiation of equations where one variable isn't explicitly defined in terms of another. Related rates problems, which involve finding the rate of change of one quantity with respect to another, are analyzed through systematic problem-solving strategies. Applications of derivatives, such as optimization problems (finding maximum or minimum values) and curve sketching (analyzing concavity, inflection points, and critical points), are covered in detail.

Chapter 3: Integrals: Accumulation and Area

The chapter introduces the concept of integration as the inverse operation of differentiation, and as the process of finding the area under a curve. Both indefinite and definite integrals are explored. Techniques of integration, such as u-substitution and integration by parts, are thoroughly explained. The Fundamental Theorem of Calculus (FTC), which connects differentiation and integration, is a critical component of this section. Applications of integration are presented, focusing on calculating areas between curves and volumes of solids of revolution using methods like disk and washer methods, or shell method.

Chapter 4: Differential Equations: Modeling Change

This chapter introduces differential equations, equations that involve derivatives. Separable differential equations, a type that can be solved using integration, are explained and solved through numerous examples. Slope fields, graphical representations of the solutions to differential equations, are presented as a visual tool for understanding the behavior of solutions. Euler's method, a numerical technique for approximating solutions to differential equations, is also discussed.

Chapter 5: Infinite Sequences and Series: Convergence and Divergence

This chapter introduces the concepts of infinite sequences and series, exploring their convergence and divergence. Various convergence tests, such as the n th term test, integral test, comparison test, limit comparison test, ratio test, and alternating series test, are explained with clear examples. Taylor and Maclaurin series, which represent functions as infinite sums of terms, are covered in detail, including finding the radius and interval of convergence. Applications of Taylor series, such as approximating function values, are explored.

Chapter 6: Parametric Equations and Polar Coordinates: Beyond Cartesian Coordinates

This section introduces parametric equations, where both x and y coordinates are defined as functions of a parameter. Graphing and calculus with parametric equations, including finding derivatives and areas, are discussed. Polar coordinates, an alternative system for representing points in the plane, are also covered. Converting between Cartesian and polar coordinates, and calculating areas and arc lengths in polar coordinates, are demonstrated.

Chapter 7: Vectors and 3D Space: Extending Calculus to Three Dimensions

This chapter extends calculus concepts to three dimensions using vectors. Vector operations (addition, subtraction, dot product, cross product) are explained and their geometric interpretations are explored. Lines and planes in 3D space are discussed, including their equations and relationships.

Chapter 8: Practice Exams and Solutions: Honing Your Skills

This chapter includes several full-length practice exams designed to mimic the actual AP Calculus BC exam in terms of difficulty and format. Each practice exam is followed by detailed solutions, providing students with opportunities to identify their strengths and weaknesses.

Conclusion: Preparing for Success on Exam Day

This concluding section offers final advice for exam day preparation, emphasizing time management, strategic problem-solving, and stress reduction techniques. It also lists resources for continued study and review, reiterating crucial concepts and formulas.

FAQs

1. What topics are covered in the AP Calculus BC exam that are not in the AB exam? Sequences and series, parametric and polar equations, and vectors.
2. How is the AP Calculus BC exam scored? It's scored out of 108 points, with a composite score determining the final grade (5, 4, 3, 2, 1).
3. What resources are recommended for further study? Textbooks, online resources, and practice problems from various sources.
4. What is the best way to prepare for the free-response section? Practice writing out solutions to problems and reviewing examples.
5. How much emphasis should be placed on memorizing formulas? A good understanding of the concepts is more important than rote memorization.
6. What are some common mistakes to avoid? Careless errors in calculations and not showing your work.
7. What calculator is allowed on the exam? Graphing calculators are permitted, but their use should be strategic.
8. What is the best way to manage time during the exam? Allocate time efficiently across sections, and don't spend too long on any one problem.
9. What is the passing score for the AP Calculus BC exam? There isn't a fixed passing score; the score needed for a 3, 4, or 5 depends on the difficulty of the exam.

Related Articles:

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3. Understanding Integrals in AP Calculus BC: A comprehensive explanation of integration techniques and applications.

4. Differential Equations Made Easy: An AP Calculus BC Guide: A simplified approach to differential equations.
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6. Navigating Parametric and Polar Equations in AP Calculus BC: A focused study on parametric and polar coordinates.
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8. Effective Strategies for AP Calculus BC Exam Preparation: Tips and strategies for maximizing success.
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Additional Resources

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