

2017 calculus bc free response

2017 calculus bc free response questions represent a significant portion of the AP Calculus BC exam, challenging students to apply their knowledge and problem-solving skills in various contexts. Understanding the structure and content of these free response questions is essential for effective exam preparation. This article delves into the specific questions from the 2017 exam, providing detailed solutions and explanations. We will explore the types of problems presented, the scoring guidelines, and strategies for success. By breaking down the exam into manageable sections, students can better grasp the material and improve their performance on similar future assessments.

- Introduction to the 2017 Calculus BC Free Response
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Overview of the 2017 Calculus BC Free Response Format

The 2017 Calculus BC free response section consisted of six questions, each designed to assess a range of skills including conceptual understanding, analytical reasoning, and application of calculus principles. The questions were divided into two parts: those that required students to show their work and those that included multiple steps. This format encourages students to demonstrate their reasoning process, which is critical for scoring well.

Typically, the free response section is weighted heavily in the overall scoring of the AP exam. Each question is graded based on specific criteria outlined by the College Board, which includes the accuracy of the answer, the completeness of the solution, and the clarity of the reasoning. Understanding these criteria can help students focus their preparation efforts effectively.

Detailed Analysis of Individual Questions

Each question on the 2017 AP Calculus BC free response section aimed to challenge students on different aspects of calculus. Here, we will analyze some of the key questions, providing a breakdown of the tasks required and the mathematical concepts involved.

Question 1: Polynomial Functions

The first question involved polynomial functions and required students to analyze the behavior of a given function based on its derivatives. Students needed to determine the intervals of increase and decrease, as well as identify local maxima and minima.

- **Identifying Critical Points:** Students were required to set the first derivative equal to zero and solve for x .
- **Second Derivative Test:** The second derivative was used to determine the concavity of the function at the critical points.
- **Behavior at Infinity:** Students also analyzed the end behavior of the polynomial function.

Question 2: Series and Sequences

This question focused on convergence and divergence of series, challenging students to apply the ratio test and comparison test. Students had to demonstrate their understanding of infinite series, specifically in the context of power series.

- **Applying the Ratio Test:** Students calculated the limit of the ratio of consecutive terms to determine convergence.
- **Comparison Test:** Students compared the series to a known convergent or divergent series.

Question 3: Differential Equations

The third question involved solving a differential equation using initial conditions. Students were required to integrate the function and apply the initial condition to find specific constants.

- **Integration Techniques:** Students demonstrated their ability to integrate various functions, including exponential and logarithmic functions.
- **Applying Initial Conditions:** The initial condition was crucial for finding the particular solution.

Scoring Guidelines and Tips for Success

Understanding the scoring guidelines for the AP Calculus BC exam is essential for students aiming for a high score. Each question is scored on a scale, typically out of 9 points, with points awarded for both the correctness of the final answer and the method used to arrive at that answer.

Here are some effective strategies for succeeding in the free response section:

- **Show All Work:** Always show your calculations and reasoning, as partial credit is often awarded for correct methods even if the final answer is incorrect.
- **Practice with Past Exams:** Familiarize yourself with previous free response questions to understand the format and types of problems that may appear.
- **Time Management:** Allocate time wisely during the exam, ensuring you have enough time to address each question thoroughly.
- **Review Basic Concepts:** A strong grasp of fundamental calculus concepts is crucial for tackling the more complex problems presented in the exam.

Practice Resources and Further Study

To prepare effectively for the AP Calculus BC exam, students should utilize a variety of resources. The following materials can be beneficial:

- **AP Calculus BC Prep Books:** Comprehensive review books often include practice questions and detailed solutions.
- **Online Practice Exams:** Websites that offer practice exams can simulate the test environment and help students gauge their preparedness.
- **Study Groups:** Collaborating with peers can provide different perspectives on

problem-solving and enhance understanding.

Conclusion

The 2017 calculus BC free response section presents a valuable opportunity for students to demonstrate their understanding of advanced calculus concepts. By analyzing specific questions, understanding the scoring guidelines, and employing effective study strategies, students can enhance their performance on this challenging exam. Mastery of the material covered in the free response section not only prepares students for the AP exam but also lays a strong foundation for future studies in mathematics and related fields.

Q: What topics are covered in the 2017 Calculus BC free response section?

A: The topics include polynomial functions, series and sequences, differential equations, and applications of calculus concepts.

Q: How are free response questions scored on the AP Calculus BC exam?

A: Each question is scored out of 9 points, based on the correctness of the final answer and the clarity of the reasoning and methods used.

Q: What strategies can help improve performance on free response questions?

A: Showing all work, practicing with past exams, managing time effectively, and reviewing fundamental concepts are key strategies.

Q: Are there specific resources recommended for studying for the AP Calculus BC exam?

A: AP Calculus BC prep books, online practice exams, and study groups are recommended resources for effective preparation.

Q: How can I demonstrate my understanding in free response questions?

A: Clearly showing all calculations, explaining reasoning, and utilizing proper calculus terminology will demonstrate understanding.

Q: What is the importance of showing work in free response questions?

A: Demonstrating all steps allows for partial credit to be awarded, even if the final answer is incorrect, thus improving overall scores.

Q: How much time should I allocate for the free response section during the exam?

A: It's advisable to allocate approximately 1.5 minutes per point available on each question, ensuring enough time for all questions.

Q: Can I receive credit for a correct method even if my final answer is wrong?

A: Yes, partial credit is often awarded for correct methods, calculations, and reasoning, even if the final answer is incorrect.

Q: What are common mistakes to avoid in free response questions?

A: Common mistakes include failing to show work, making calculation errors, or misinterpreting the question's requirements.

Q: How can I build my confidence for the AP Calculus BC exam?

A: Regular practice, reviewing mistakes, and understanding concepts thoroughly can significantly build confidence for the exam.

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