

# BMS Mathematics Academic Team Practice Test (Sample)

## Study Guide



**Everything you need from our exam experts!**

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# Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

# How to Use This Guide

**This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:**

## 1. Start with a Diagnostic Review

**Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.**

## 2. Study in Short, Focused Sessions

**Break your study time into manageable blocks (e.g. 30 - 45 minutes). Review a handful of questions, reflect on the explanations.**

## 3. Learn from the Explanations

**After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.**

## 4. Track Your Progress

**Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.**

## 5. Simulate the Real Exam

**Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.**

## 6. Repeat and Review

**Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.**

**There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!**

## **Questions**

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- 1. Calculate the circumference of a circle with radius 4 cm.**
  - A. 12.56 cm
  - B. 25.12 cm
  - C. 31.42 cm
  - D. 50.24 cm
- 2. If the length of one side of a square is doubled, what happens to the area?**
  - A. The area remains the same
  - B. The area doubles
  - C. The area quadruples
  - D. The area triples
- 3. What is the median of the set {3, 5, 7, 9, 11}?**
  - A. 5
  - B. 6
  - C. 7
  - D. 8
- 4. When working with the sequence: 2, 3, 5, 8, 12, 17, what is the difference between consecutive terms?**
  - A. Increasing by 1
  - B. Varied increases
  - C. Constant increases
  - D. No discernible pattern
- 5. Which of the following contains both positive and negative fractions?**
  - A. Rational numbers
  - B. Whole numbers
  - C. Natural numbers
  - D. Integers

**6. What is the least common multiple (LCM) of 6, 8, and 12?**

- A. 12
- B. 18
- C. 24
- D. 36

**7. What will the value be for Y when X equals 0 in the equation  $Y = -2(X + 3) + 5$ ?**

- A. 1
- B. -1
- C. 0
- D. 2

**8. What is the process of rewriting an expression as a product of its factors called?**

- A. Factoring
- B. Expanding
- C. Simplifying
- D. Evaluating

**9. What technique confirms the correctness of factored expressions?**

- A. Substitution
- B. Mental calculation
- C. Re-expansion
- D. Estimation

**10. Find  $166 \frac{2}{3}$  percent of \$90.**

- A. \$90
- B. \$120
- C. \$150
- D. \$180

## **Answers**

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1. B
2. C
3. C
4. B
5. A
6. C
7. B
8. A
9. C
10. C

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## **Explanations**

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**1. Calculate the circumference of a circle with radius 4 cm.**

- A. 12.56 cm
- B. 25.12 cm**
- C. 31.42 cm
- D. 50.24 cm

To find the circumference of a circle, you can use the formula:  $C = 2\pi r$  where  $C$  is the circumference,  $\pi$  is approximately 3.14, and  $r$  is the radius of the circle. In this case, the radius is given as 4 cm. Applying the formula:  $C = 2 \times \pi \times 4$   $C = 8\pi$  Now, using the approximate value of  $\pi$  as 3.14:  $C \approx 8 \times 3.14$   $C \approx 25.12$  This calculation leads to a circumference of approximately 25.12 cm, confirming that this option is indeed accurate. Thus, the answer is correct based on the application of the formula for the circumference of a circle using the provided radius.

**2. If the length of one side of a square is doubled, what happens to the area?**

- A. The area remains the same
- B. The area doubles
- C. The area quadruples**
- D. The area triples

When the length of one side of a square is doubled, the effect on the area can be understood through the formula for the area of a square. The area  $A$  of a square is calculated as  $A = s^2$ , where  $s$  is the length of one side. If the original side length is  $s$ , the original area is  $s^2$ . When the side length is doubled, it becomes  $2s$ . The new area is calculated as follows:  $A' = (2s)^2 = 4s^2$  This means that the new area,  $A'$ , is four times the original area  $A$ :  $A' = 4s^2 = 4A$  Thus, doubling the length of one side of the square causes the area to increase by a factor of four, which means it quadruples. This is why the correct answer highlights that the area quadruples when the side length is doubled.

**3. What is the median of the set {3, 5, 7, 9, 11}?**

- A. 5
- B. 6
- C. 7**
- D. 8

To find the median of a set of numbers, the data must be organized in ascending order, which, in this case, is already presented as {3, 5, 7, 9, 11}. The median is defined as the middle number in a sorted list of values. Since there are five numbers in this set, which is an odd count, the median will be the number located at the center position. To determine the position of the median, you can use the formula:  $\text{Median position} = \frac{n+1}{2}$  where  $n$  is the number of values in the set. Substituting in the value for  $n$ :  $\text{Median position} = \frac{5+1}{2} = 3$  This indicates that the median is the third number in the ordered list. Looking at the set, the first number is 3, the second is 5, and the third is 7. Therefore, the median of the set {3, 5, 7, 9, 11} is clearly 7. This is the value that divides the set into two equal halves.

**4. When working with the sequence: 2, 3, 5, 8, 12, 17, what is the difference between consecutive terms?**

- A. Increasing by 1**
- B. Varied increases**
- C. Constant increases**
- D. No discernible pattern**

To analyze the differences between the consecutive terms in the given sequence: 2, 3, 5, 8, 12, 17, we can start by calculating the differences: - The difference between the first term (2) and the second term (3) is 1. - The difference between the second term (3) and the third term (5) is 2. - The difference between the third term (5) and the fourth term (8) is 3. - The difference between the fourth term (8) and the fifth term (12) is 4. - The difference between the fifth term (12) and the sixth term (17) is 5. Thus, the differences are: 1, 2, 3, 4, and 5. This shows that the increases between consecutive terms are not constant; instead, they vary as they increment by 1, which indicates that each term's difference from its predecessor is consistently increasing, but the increases themselves are not the same value. The answer is indicative of the nature of the sequence where the increments are varied and not constant, which is why the choice representing varied increases is correct. The differences clearly demonstrate a

**5. Which of the following contains both positive and negative fractions?**

- A. Rational numbers**
- B. Whole numbers**
- C. Natural numbers**
- D. Integers**

The option that includes both positive and negative fractions is rational numbers. Rational numbers are defined as any number that can be expressed as the quotient of two integers, where the denominator is not zero. This definition encompasses a wide array of numbers, including positive and negative fractions (such as  $1/2$  or  $-3/4$ ), as well as whole numbers and integers. Whole numbers, on the other hand, only include the non-negative integers (0, 1, 2, 3, ...), and do not account for negative numbers or fractions. Natural numbers are even more restricted, typically including only the positive integers (1, 2, 3, ...). Integers include all whole numbers as well as their negative counterparts (-1, -2, ...), but they do not include fractions. Thus, rational numbers is the only option that fully encompasses both positive and negative fractions, providing a complete representation of the set in question.

**6. What is the least common multiple (LCM) of 6, 8, and 12?**

- A. 12
- B. 18
- C. 24**
- D. 36

To determine the least common multiple (LCM) of the numbers 6, 8, and 12, we first need to find their prime factorizations: - The prime factorization of 6 is  $(2^1 \times 3^1)$ . - The prime factorization of 8 is  $(2^3)$ . - The prime factorization of 12 is  $(2^2 \times 3^1)$ . The LCM is found by taking the highest power of each prime that appears in the factorizations: - For the prime number 2, the highest power is  $(2^3)$  (from 8). - For the prime number 3, the highest power is  $(3^1)$  (from both 6 and 12). Now, we combine these:  $[ \text{LCM} = 2^3 \times 3^1 = 8 \times 3 = 24 ]$  Thus, the least common multiple of 6, 8, and 12 is 24. This answer makes sense because 24 is a multiple of each of the original numbers. It is the smallest number that can be evenly divided by 6, 8,

**7. What will the value be for Y when X equals 0 in the equation  $Y = -2(X + 3) + 5$ ?**

- A. 1
- B. -1**
- C. 0
- D. 2

To determine the value of Y when X equals 0 in the equation  $Y = -2(X + 3) + 5$ , we start by substituting 0 for X. The equation becomes:  $Y = -2(0 + 3) + 5$ . Calculate the value inside the parentheses first:  $0 + 3$  equals 3. Now substitute that back into the equation:  $Y = -2(3) + 5$ . Multiply -2 by 3:  $Y = -6 + 5$ . Now, perform the addition:  $-6 + 5$  equals -1. Thus, when X equals 0, Y equals -1. This shows that the calculation of Y at the specified value of X leads straightforwardly to the answer, confirming the relationship outlined in the equation.

**8. What is the process of rewriting an expression as a product of its factors called?**

- A. Factoring**
- B. Expanding**
- C. Simplifying**
- D. Evaluating**

The process of rewriting an expression as a product of its factors is called factoring. When you factor an expression, you identify common elements or patterns within the expression that allow you to break it down into simpler components that, when multiplied together, yield the original expression. For instance, consider the quadratic expression  $x^2 - 5x + 6$ . By factoring, you can rewrite it as  $(x - 2)(x - 3)$ . This process is vital in algebra as it simplifies expressions and makes it easier to solve equations, particularly when finding roots or solving polynomial equations. The other options represent different processes related to manipulating algebraic expressions. Expanding involves converting a product into a sum, simplifying refers to reducing an expression to its simplest form, and evaluating means substituting values for variables and calculating the resulting numerical value. However, none of these describe the act of rewriting an expression specifically as a product of its factors. Thus, factoring is the precise term that defines this process.

**9. What technique confirms the correctness of factored expressions?**

- A. Substitution**
- B. Mental calculation**
- C. Re-expansion**
- D. Estimation**

Re-expansion is the technique that confirms the correctness of factored expressions by taking the factored form and expanding it back into its polynomial form. When you re-expand, you multiply the factors together, which allows you to check if you obtain the original expression you started with. This technique is particularly useful when verifying whether the factored expression has been factored correctly. For example, if you have factored a polynomial into the product of two binomials, re-expansion involves applying the distributive property to ensure that you arrive back at the original polynomial. If the two forms match, it confirms that the factoring was done correctly. This method is straightforward and provides a clear verification step in the process of working with polynomials. Other techniques mentioned, such as substitution, mental calculation, and estimation, serve different purposes. Substitution typically is used to test specific values within an equation, mental calculation is more about performing arithmetic operations without written work, and estimation helps in finding approximate values rather than verifying the exactness of expressions. These methods do not specifically focus on the process of confirming the accuracy of factored expressions like re-expansion does.

**10. Find  $166 \frac{2}{3}$  percent of \$90.**

- A. \$90
- B. \$120
- C. \$150**
- D. \$180

To find  $166 \frac{2}{3}$  percent of \$90, first, it's helpful to convert the percentage into a decimal. The fraction  $\frac{2}{3}$  can be expressed as a decimal, which is approximately 0.6667. Therefore,  $166 \frac{2}{3}$  percent can be converted to an improper fraction or decimal as follows:  $166 \frac{2}{3}$  percent =  $166.67\%$  =  $166.67/100$  = 1.6667 (approximately). To calculate  $166 \frac{2}{3}$  percent of \$90, multiply the decimal equivalent by 90:  $1.6667 * \$90 = \$150$  (approximately). Now, looking at the multiple-choice options, we can see that the correct answer aligns with the calculated result. This makes \$150 the correct interpretation of  $166 \frac{2}{3}$  percent of \$90. Knowing how to convert percentages into decimal form and then applying that to a monetary amount is a fundamental skill in percentages and money-related calculations.

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# Next Steps

**Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.**

**As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.**

**If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at [hello@examzify.com](mailto:hello@examzify.com).**

**Or visit your dedicated course page for more study tools and resources:**

**<https://bmsmathacadteam.examzify.com>**

**We wish you the very best on your exam journey. You've got this!**

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