

# SAE Mathematics Practice Exam (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. If a student evaluated the expression  $(3 + 7) - 6/2$  to equal 2 on an exam, what error did she most likely make?**
  - A. She forgot to add the numbers first**
  - B. She performed the operations from left to right**
  - C. She multiplied instead of dividing**
  - D. She failed to include parentheses**
- 2. If a group of students completes 30% of a project in 12 hours, how many total hours will it take them to finish the project?**
  - A. 30 hours**
  - B. 40 hours**
  - C. 60 hours**
  - D. 20 hours**
- 3. What must students do regarding decimal places before performing which of the following operations?**
  - A. Addition**
  - B. Subtraction**
  - C. Multiplication**
  - D. Division**
- 4. Which of the following formulas would correctly calculate the perimeter of a legal-sized piece of paper that is 14 inches long and  $8 \frac{1}{2}$  inches wide?**
  - A.  $P = 2(14 + 8 \frac{1}{2})$**
  - B.  $P = 14 + 8 \frac{1}{2} + 14 + 8 \frac{1}{2}$**
  - C.  $P = 14 \times 8 \frac{1}{2}$**
  - D.  $P = 14 + 14 + 8 \frac{1}{2} + 8 \frac{1}{2}$**
- 5. What type of graph is most appropriate for representing the trend of a stock value over monthly intervals?**
  - A. Bar graph**
  - B. Pie chart**
  - C. Line graph**
  - D. Scatter plot**

**6. What shape corresponds to the missing side indicated in the question?**

- A. Circle**
- B. Square**
- C. Triangle**
- D. Rectangle**

**7. Solve for  $x$ :  $x^2 - 16 = 0$ .**

- A.  $x = 2, -2$**
- B.  $x = 4, -4$**
- C.  $x = 4, 2$**
- D.  $x = 0, 16$**

**8. What is the value of  $9 - (3 + 2)$ ?**

- A. 4**
- B. 5**
- C. 6**
- D. 3**

**9. Which of the following is the area of a circle with a radius of 3 cm? (Use  $\pi \approx 3.14$ )**

- A.  $12.56 \text{ cm}^2$**
- B.  $28.26 \text{ cm}^2$**
- C.  $18.84 \text{ cm}^2$**
- D.  $15.5 \text{ cm}^2$**

**10. A rectangle formed from pipe cleaner has a length of  $1/2$  feet and width of 1.5 inches. What is its area in square inches?**

- A.  $30 \text{ inch}^2$**
- B.  $33 \text{ inch}^2$**
- C.  $27 \text{ inch}^2$**
- D.  $36 \text{ inch}^2$**

## **Answers**

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

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## **Explanations**

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**1. If a student evaluated the expression  $(3 + 7) - 6/2$  to equal 2 on an exam, what error did she most likely make?**

- A. She forgot to add the numbers first**
- B. She performed the operations from left to right**
- C. She multiplied instead of dividing**
- D. She failed to include parentheses**

When evaluating the expression  $(3 + 7) - 6/2$ , it is important to follow the order of operations, commonly remembered by the acronym PEMDAS (Parentheses, Exponents, Multiplication and Division (from left to right), Addition and Subtraction (from left to right)). In this case, the correct steps to evaluate the expression are as follows: 1.

\*\*Perform the operation inside the parentheses first\*\*:  $3 + 7$  equals 10. 2. \*\*Then evaluate the division\*\*: 6 divided by 2 equals 3. 3. \*\*Finally, perform the subtraction\*\*:  $10 - 3$  equals 7. If the student disregarded the order and simply performed operations from left to right without considering the established hierarchy of operations, she may have first subtracted 6 from 3, yielding a negative result, and then continued performing operations without correctly applying the division step. This would lead to an incorrect final answer such as 2, demonstrating a misunderstanding of how to correctly apply order of operations. Thus, the most likely error the student made aligns with performing operations from left to right without adhering to the appropriate sequence dictated by the order of operations.

**2. If a group of students completes 30% of a project in 12 hours, how many total hours will it take them to finish the project?**

- A. 30 hours**
- B. 40 hours**
- C. 60 hours**
- D. 20 hours**

To find out how many total hours it will take for the students to finish the project, we can first determine their rate of work based on the information given. If the group of students completed 30% of the project in 12 hours, we can use this to figure out the total time for 100% completion. First, we calculate how much of the project they complete in an hour. Since they completed 30% of the project in 12 hours, we can find their completion rate per hour: 30% of the project takes 12 hours, so they complete:  $\text{Rate} = \frac{30\%}{12 \text{ hours}} = \frac{0.30}{12} = 0.025 \text{ (or 2.5\% of the project per hour)}$ . Next, we want to find out how many total hours it takes to complete 100% of the project. Since they are working at a rate of 2.5% per hour, we can set up the equation to find the total hours (let's represent it as  $x$ ). To complete the full project (100%), we write:  $100\% = \text{Rate} \times x$

**3. What must students do regarding decimal places before performing which of the following operations?**

- A. Addition**
- B. Subtraction**
- C. Multiplication**
- D. Division**

Before performing addition, it is essential for students to ensure that the numbers being added have the same number of decimal places. This standardization allows for accurate alignment of the numbers, which is crucial for correctly determining the sum. When numbers have different decimal places, aligning them based on their decimal points maintains the integrity of the addition process. For instance, adding 2.5 and 3.45 directly without converting 2.5 to 2.50 would lead to an incorrect result. Thus, ensuring the same number of decimal places by padding with zeros where necessary is a necessary step in addition. Other operations such as multiplication and division do not require decimal places to be standardized in the same way before the calculation is performed. In subtraction, while alignment might be important, the primary focus is on ensuring correct placement rather than uniformly adjusting decimal places. Therefore, the emphasis on decimal places is particularly significant in the context of addition.

**4. Which of the following formulas would correctly calculate the perimeter of a legal-sized piece of paper that is 14 inches long and 8 1/2 inches wide?**

- A.  $P = 2(14 + 8 \frac{1}{2})$**
- B.  $P = 14 + 8 \frac{1}{2} + 14 + 8 \frac{1}{2}$**
- C.  $P = 14 \times 8 \frac{1}{2}$**
- D.  $P = 14 + 14 + 8 \frac{1}{2} + 8 \frac{1}{2}$**

To determine the perimeter of a rectangle, you can use the formula that involves adding together all the sides of the rectangle. In this case, the legal-sized piece of paper has a length of 14 inches and a width of 8.5 inches. The formula for the perimeter  $(P)$  of a rectangle is typically given as:  $P = 2(\text{length} + \text{width})$ . However, just adding all the sides directly will also yield the same result. The correct approach is to sum the lengths of all sides: two lengths and two widths. In this case, adding the lengths gives you: - Two lengths:  $(14 + 14)$  - Two widths:  $(8.5 + 8.5)$ . When you add these together, you effectively calculate the perimeter:  $P = 14 + 14 + 8.5 + 8.5$ . This corresponds to the choice presented. The perimeter can also be simplified using the addition formula, but the method of directly adding each side is valid and results in the same perimeter value of 45 inches. This demonstrates the calculation correctly leads to the answer, affirming why this formula works perfectly for determining

**5. What type of graph is most appropriate for representing the trend of a stock value over monthly intervals?**

- A. Bar graph**
- B. Pie chart**
- C. Line graph**
- D. Scatter plot**

A line graph is the most appropriate choice for representing the trend of a stock value over monthly intervals because it effectively displays continuous data points over a period of time, allowing for easy visualization of trends and changes. In a line graph, each point represents the stock value at a specific month, and connecting these points with a line provides a clear view of how the stock value has risen or fallen over the specified intervals. This format emphasizes the direction and rate of change, making it easier to observe patterns such as increases, decreases, or stability in the stock's value. Using a line graph also allows for the identification of long-term trends which can be essential for analysis in financial contexts. Other types of graphs, such as bar graphs, pie charts, or scatter plots, are better suited for different types of data representation, where relationships or proportions are being emphasized instead of trends over time.

**6. What shape corresponds to the missing side indicated in the question?**

- A. Circle**
- B. Square**
- C. Triangle**
- D. Rectangle**

The correct answer, which is a triangle, makes sense in this context depending on the characteristics of the missing side in question. In geometry, a triangle is defined as a three-sided polygon with three corners or vertices. If the question is pertaining to a situation where you have two sides clearly defined and are looking to find a third side that will allow you to complete a geometric figure, it is quite common for that figure to be a triangle. This could apply to various scenarios such as completing a right triangle, where you might use the Pythagorean theorem to find the missing side, or simply when identifying configurations that involve three connected points. In terms of geometric properties, triangles can take on various forms—scalene, isosceles, or equilateral—but they all adhere to the fundamental characteristic of having three sides. The other shapes presented, such as circles, squares, and rectangles, do not fit the criteria of having three sides, as circles are defined by a continuous curve with no sides, while squares and rectangles both have four sides. Therefore, when identifying a missing side in a scenario that leads to the conclusion of a triangle, it is clear why the triangle is the appropriate and correct choice.

**7. Solve for x:  $x^2 - 16 = 0$ .**

- A.  $x = 2, -2$
- B.  $x = 4, -4$**
- C.  $x = 4, 2$
- D.  $x = 0, 16$

To solve the equation  $(x^2 - 16 = 0)$ , the first step is to recognize that this is a difference of squares. The expression can be factored using the formula  $(a^2 - b^2 = (a - b)(a + b))$ . Here,  $(a)$  is  $(x)$  and  $(b)$  is  $(4)$ , since  $(16)$  is  $(4^2)$ . Factoring the equation yields:  $(x - 4)(x + 4) = 0$ . This product will equal zero if either factor is zero. Therefore, we set each factor equal to zero: 1.  $(x - 4 = 0)$  leads to  $(x = 4)$  2.  $(x + 4 = 0)$  leads to  $(x = -4)$ . Thus, the solutions to the equation  $(x^2 - 16 = 0)$  are  $(x = 4)$  and  $(x = -4)$ . This confirms that the correct answer reflects the values of  $(x)$  derived from solving the equation, which are both  $(4)$  and  $(-4)$ .

**8. What is the value of  $9 - (3 + 2)$ ?**

- A. 4
- B. 5**
- C. 6
- D. 3

To find the value of the expression  $9 - (3 + 2)$ , you first need to evaluate the sum within the parentheses. Start by calculating  $3 + 2$ , which equals 5. Now you can substitute that back into the original expression, giving you  $9 - 5$ . Next, perform the subtraction:  $9 - 5$  equals 4. This result indicates a thorough understanding of the order of operations, confirming that addition within parentheses is completed before performing the subtraction. Thus, the correct answer is 4, which is not the chosen option.

**9. Which of the following is the area of a circle with a radius of 3 cm? (Use  $\pi \approx 3.14$ )**

- A.  $12.56 \text{ cm}^2$
- B.  $28.26 \text{ cm}^2$**
- C.  $18.84 \text{ cm}^2$
- D.  $15.5 \text{ cm}^2$

To find the area of a circle, you can use the formula:  $\text{Area} = \pi * r^2$  where  $\pi$  (pi) is approximately 3.14, and  $r$  is the radius of the circle. In this case, the radius is given as 3 cm. First, calculate the radius squared:  $r^2 = 3 \text{ cm} * 3 \text{ cm} = 9 \text{ cm}^2$ . Next, multiply that result by  $\pi$ :  $\text{Area} = \pi * 9 \text{ cm}^2 = 3.14 * 9 \text{ cm}^2 = 28.26 \text{ cm}^2$ . Therefore, the area of the circle with a radius of 3 cm is  $28.26 \text{ cm}^2$ . This shows why the correct answer is the one corresponding to  $28.26 \text{ cm}^2$ , as it is derived directly from the area formula using the given radius. This solution provides the necessary mathematical reasoning to arrive at the correct area.

**10. A rectangle formed from pipe cleaner has a length of 1/2 feet and width of 1.5 inches. What is its area in square inches?**

- A. 30 inch<sup>2</sup>**
- B. 33 inch<sup>2</sup>**
- C. 27 inch<sup>2</sup>**
- D. 36 inch<sup>2</sup>**

To find the area of a rectangle, you multiply its length by its width. In this case, the length is given in feet while the width is in inches. To calculate the area accurately in square inches, both dimensions need to be converted to the same unit. First, convert the length from feet to inches. Since 1 foot equals 12 inches, the length of 1/2 foot can be converted as follows:  $[\text{Length in inches}] = \frac{1}{2} \text{ feet} \times 12 \text{ inches/foot} = 6 \text{ inches}$  Now, you have the dimensions in inches: - Length: 6 inches - Width: 1.5 inches Next, calculate the area by multiplying the length and width:  $[\text{Area}] = \text{Length} \times \text{Width} = 6 \text{ inches} \times 1.5 \text{ inches} = 9 \text{ inch}^2$  Since the final calculation shows that the area is 9 square inches, which does not match any options listed, it suggests there may have been an error in the

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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://saemathematics.examzify.com>**

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

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