

# General Certificate of Secondary Education (GCSE) Maths 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

- 1. What is the formula for the area of a trapezium?**
  - A. Half the sum of the parallel sides, times the height between them**
  - B. Base x height**
  - C. Sum of all sides**
  - D.  $2 \times (\text{Base1} + \text{Base2})$**
- 2. What is the value of  $\sin 0^\circ$ ?**
  - A. 0**
  - B. 1**
  - C. 0.5**
  - D. -1**
- 3. In the context of trigonometric ratios, what does the hypotenuse refer to?**
  - A. The longest side of a right triangle**
  - B. The shortest side of a right triangle**
  - C. The adjacent side to the reference angle**
  - D. Any side of a triangle**
- 4. How should bearings be expressed?**
  - A. As a decimal**
  - B. As a fraction**
  - C. As three figures, e.g.,  $045^\circ$**
  - D. As whole numbers only**
- 5. When two parallel lines are intersected by a transversal, which pair of angles are the same?**
  - A. Vertical angles**
  - B. Same-side interior angles**
  - C. Corresponding angles**
  - D. Complementary angles**

- 6. What is the first step to multiply or divide numbers in standard form?**
- A. Rearranging to group front numbers and powers of ten**
  - B. Converting them to decimals**
  - C. Adding the powers of ten**
  - D. Multiplying the front numbers only**
- 7. How can you calculate an average from a histogram?**
- A. Add frequency and then find the mean**
  - B. Multiply frequency by mid-intervals to find  $fx$**
  - C. Count the total number of bars in the histogram**
  - D. Divide total frequency by the number of intervals**
- 8. What is the correct method for dividing fractions?**
- A. Keep the first fraction and add the second**
  - B. Turn one fraction upside down and multiply**
  - C. Subtract the fractions**
  - D. Multiply both fractions together**
- 9. Which trigonometric function is represented by  $y = \sin x$ ?**
- A. Tangent**
  - B. Cosine**
  - C. Secant**
  - D. Sine**
- 10. What does  $A \cup B$  represent in set notation?**
- A. All the elements in both set A and set B**
  - B. All the elements in either set A or set B**
  - C. All elements not in set A**
  - D. The overlap of set A and set B**



## **Answers**

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

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## **Explanations**

### 1. What is the formula for the area of a trapezium?

- A. Half the sum of the parallel sides, times the height between them**
- B. Base x height
- C. Sum of all sides
- D.  $2 \times (\text{Base1} + \text{Base2})$

The area of a trapezium is defined by taking half the sum of the lengths of the two parallel sides (often referred to as the bases) and multiplying that sum by the height (the perpendicular distance between the bases). This formula effectively calculates the average length of the two bases and then multiplies this average by the height to find the enclosed area. To clarify further, if we denote the lengths of the parallel sides as  $a$  and  $b$ , and the height as  $h$ , the area can be expressed as:  $\text{Area} = \frac{1}{2} \cdot (a + b) \cdot h$ . This approach accounts for the trapezium's shape, as simply using the height multiplied by a base would not accurately capture the total area unless the trapezium were a rectangle. The other options represent different calculations that do not align with the trapezium's geometric properties. Thus, using the correct approach provides the area measurement that properly reflects the trapezium's dimensions.

### 2. What is the value of $\sin 0^\circ$ ?

- A. 0**
- B. 1
- C. 0.5
- D. -1

The value of  $\sin 0^\circ$  is 0 because the sine function measures the ratio of the opposite side to the hypotenuse in a right triangle. When the angle is 0 degrees, the opposite side has a length of 0 while the hypotenuse is a non-zero value. Therefore, the ratio becomes 0 divided by that non-zero value, which yields 0. This concept is also reflected in the unit circle representation of sine, where at  $0^\circ$ , the point on the circle corresponds to the coordinates (1, 0). The y-coordinate, which represents the value of sine, is 0 at this point.

### 3. In the context of trigonometric ratios, what does the hypotenuse refer to?

- A. The longest side of a right triangle**
- B. The shortest side of a right triangle
- C. The adjacent side to the reference angle
- D. Any side of a triangle

The hypotenuse in a right triangle is defined as the longest side of the triangle, specifically opposite the right angle. This characteristic is crucial in the context of trigonometric ratios, as the hypotenuse is used in formulas for sine, cosine, and tangent. For instance, in the sine function, the ratio is taken of the length of the opposite side to the hypotenuse, emphasizing the hypotenuse's role as a reference side when calculating trigonometric values. In right triangles, the other two sides are referred to as the adjacent and opposite sides, which are shorter than the hypotenuse. Understanding this designation helps in correctly applying trigonometric functions and solving problems related to right triangles. The other options do not accurately define the hypotenuse, either referring to the opposite characteristics or suggesting a side that does not fit the specific definition of the hypotenuse in a right triangle context.

#### 4. How should bearings be expressed?

- A. As a decimal
- B. As a fraction
- C. As three figures, e.g., 045°**
- D. As whole numbers only

Bearings are a way of expressing direction in navigation and geometry, specifically indicating the direction of one point from another using angles measured clockwise from the north. To maintain consistency and clarity in communication, bearings are expressed in three figures, which includes a leading zero when necessary. For example, a bearing of 45 degrees is written as 045°, ensuring that it consists of three digits. This format helps distinguish between angles less than 100 degrees and aids in precise navigation and orientation. Using three figures allows for a uniform method that makes it easier to understand and prevents confusion when reading the bearings. The use of degrees is particularly useful in fields such as surveying, aviation, and maritime navigation, where accuracy is crucial. This systematic approach is why the correct expression of bearings is in the format of three figures, such as 045°.

#### 5. When two parallel lines are intersected by a transversal, which pair of angles are the same?

- A. Vertical angles
- B. Same-side interior angles
- C. Corresponding angles**
- D. Complementary angles

When two parallel lines are intersected by a transversal, corresponding angles are formed. Corresponding angles are located in the same position relative to the parallel lines and the transversal. For example, if one parallel line is at the top and one is at the bottom, the angles that are in the same relative position on each line—one in the upper line and one in the lower line—are equal in measure. This property is based on the fact that the parallel lines create specific angles with the transversal that maintain this equality. Therefore, if one angle measures 40 degrees, the corresponding angle in the same relative position will also measure 40 degrees. This concept is fundamental in understanding geometrical relationships involving parallel lines and transversals. The other relationships such as vertical angles, same-side interior angles, and complementary angles do apply to the angles formed, but they do not maintain the specific property of being equal in measure in the context of parallel lines and a transversal in the same way corresponding angles do.

**6. What is the first step to multiply or divide numbers in standard form?**

- A. Rearranging to group front numbers and powers of ten**
- B. Converting them to decimals**
- C. Adding the powers of ten**
- D. Multiplying the front numbers only**

When working with numbers in standard form, the first step to multiplying or dividing them is to rearrange them in such a way that you can easily handle the significant figures (the numbers in front) and the powers of ten separately. This involves separating the coefficients (the front numbers) from the powers of ten so that you can manipulate each part according to the rules of multiplication or division. By grouping the front numbers and the powers of ten, you set a clear path for the operations. For example, when multiplying, you can multiply the coefficients together and then add the exponents of the powers of ten. Conversely, when dividing, you still work with the coefficients separately from the powers of ten but you would then subtract the exponents. This method organizes the calculation, making it simpler to apply the appropriate arithmetic operations correctly. It lays the groundwork for applying the rules of exponents efficiently once the coefficients are dealt with.

**7. How can you calculate an average from a histogram?**

- A. Add frequency and then find the mean**
- B. Multiply frequency by mid-intervals to find  $fx$**
- C. Count the total number of bars in the histogram**
- D. Divide total frequency by the number of intervals**

To calculate an average from a histogram, it is essential to understand how to utilize the data represented within the histogram effectively. The correct method involves calculating the mid-interval value for each bar (or bin) of the histogram, then multiplying each mid-interval by its corresponding frequency to get a product, known as  $fx$ . This process captures the contribution of each interval to the overall average. Once you have calculated the sum of these products ( $fx$ ), you can then find the total frequency by adding together all the frequencies from each interval. Finally, the average (mean) is obtained by dividing the total of the  $fx$  values by the total frequency. This approach allows you to accurately account for all data points represented in the histogram, weighted by how many times they occur. Other options do not effectively lead to an accurate calculation of the average. For instance, simply adding frequencies and finding a mean or counting the number of bars does not consider the values represented by those frequencies. Dividing total frequency by the number of intervals would yield a value that does not represent the true average since it doesn't factor in the actual values of the mid-intervals. Thus, the second option is a comprehensive and rigorous method for calculating the average from the data shown in a histogram

## 8. What is the correct method for dividing fractions?

- A. Keep the first fraction and add the second
- B. Turn one fraction upside down and multiply**
- C. Subtract the fractions
- D. Multiply both fractions together

Dividing fractions follows a specific rule that makes the process straightforward and effective. The correct method involves flipping the second fraction, which is referred to as finding its reciprocal, and then changing the division operation into multiplication. When you have a division of fractions, such as  $\frac{a}{b} \div \frac{c}{d}$ , you can rewrite the expression by multiplying  $\frac{a}{b}$  by the reciprocal of  $\frac{c}{d}$ . This becomes  $\frac{a}{b} \times \frac{d}{c}$ . Multiplying fractions is simply done by multiplying the numerators together and the denominators together, resulting in  $\frac{a \times d}{b \times c}$ . This method works because dividing by a number is equivalent to multiplying by its reciprocal. Thus, using the reciprocal ensures the division is correctly carried out, leading to the desired result. This procedural approach is one of the foundational concepts in fraction arithmetic and is essential for solving problems involving multiple fractions.

## 9. Which trigonometric function is represented by $y = \sin x$ ?

- A. Tangent
- B. Cosine
- C. Secant
- D. Sine**

The function represented by  $y = \sin x$  is indeed the sine function. The sine function describes the ratio of the length of the opposite side to the hypotenuse of a right triangle for a given angle. It is a fundamental trigonometric function that oscillates between -1 and 1 as  $x$  varies, typically measured in radians or degrees. In the context of the unit circle, the sine of an angle corresponds to the y-coordinate of a point on the circumference of the circle. This makes the sine function particularly important in many areas of mathematics, physics, and engineering, as it relates to waveforms and oscillatory motion. The other functions mentioned—tangent, cosine, and secant—are distinct from the sine function. The cosine function, for example, refers to the ratio of the length of the adjacent side to the hypotenuse, while the tangent function is the ratio of sine to cosine. Secant, on the other hand, is the reciprocal of cosine. Each serves its unique purpose in trigonometric calculations, but  $y = \sin x$  specifically indicates the sine function.

**10. What does  $A \cup B$  represent in set notation?**

- A. All the elements in both set A and set B**
- B. All the elements in either set A or set B**
- C. All elements not in set A**
- D. The overlap of set A and set B**

In set notation,  $A \cup B$  represents the union of sets A and B. The union includes all the elements that are in either set A, set B, or in both sets. This means that if an element is found in at least one of the two sets, it will be included in the resulting set from the union. For example, if set A contains the elements {1, 2, 3} and set B contains the elements {3, 4, 5}, then  $A \cup B$  will consist of {1, 2, 3, 4, 5}. This clearly demonstrates that the union combines all unique elements from both sets. This interpretation is vital in understanding set operations, and it articulates a fundamental concept in set theory that applies across various mathematical contexts.



## 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://gcse-maths.examzify.com>**

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