

FTCE General Knowledge Math 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

1. What is the term for a mathematical expression where one number is divided by another?
 - A. Mixed number
 - B. Ratio
 - C. Fraction
 - D. Decimal
2. How many inches are equivalent to 1 foot?
 - A. 6 inches
 - B. 10 inches
 - C. 12 inches
 - D. 14 inches
3. What is the formula for calculating combinations?
 - A. $n!/(n+r)!$
 - B. $n!/(r!(n-r)!)$
 - C. $(n-r)!/n!$
 - D. $n^r/r!$
4. Which of the following is not a characteristic of the standard deviation?
 - A. It indicates the average distance of data points from the mean
 - B. It provides a measure of variability within a data set
 - C. It can only take positive values
 - D. It will always equal the range of the data set
5. What is the relationship between permutations and combinations?
 - A. Permutations count order, combinations do not
 - B. Permutations and combinations are the same
 - C. Combinations count order, permutations do not
 - D. Permutations are used for larger sets only

- 6. What type of angle measures exactly 90 degrees?**
- A. Right angle**
 - B. Acute angle**
 - C. Obtuse angle**
 - D. Straight angle**
- 7. Which of the following is a characteristic of integers?**
- A. All integers are positive.**
 - B. Integers cannot be fractions.**
 - C. Integers include only whole numbers.**
 - D. Integers can be negative, zero, or positive.**
- 8. What is the equivalent of 2.54 centimeters in inches?**
- A. 1 in**
 - B. 1.5 in**
 - C. 2 in**
 - D. 0.5 in**
- 9. If $n = 6$ and $r = 2$, how many combinations can be formed?**
- A. 15**
 - B. 12**
 - C. 20**
 - D. 30**
- 10. What is the area of a rectangle with a length of 5 meters and a width of 3 meters?**
- A. 15 square meters**
 - B. 8 square meters**
 - C. 10 square meters**
 - D. 20 square meters**

Answers

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

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Explanations

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1. What is the term for a mathematical expression where one number is divided by another?

- A. Mixed number**
- B. Ratio**
- C. Fraction**
- D. Decimal**

The correct term for a mathematical expression where one number is divided by another is indeed a fraction. A fraction is represented as two numbers separated by a slash, where the number above the slash (the numerator) indicates how many parts are being considered, and the number below the slash (the denominator) indicates into how many equal parts the whole is divided. In contrast, a mixed number integrates a whole number with a fraction, representing a quantity that is greater than one but still includes fractional parts. A ratio compares two quantities and is not confined to the format of division, while a decimal is another way of expressing fractions, represented in a base ten format but distinct in its construction.

2. How many inches are equivalent to 1 foot?

- A. 6 inches**
- B. 10 inches**
- C. 12 inches**
- D. 14 inches**

One foot is equivalent to 12 inches because this is the standardized conversion factor in the imperial measurement system. The relationship between feet and inches is fundamental and is often memorized for quick reference. Knowing that 1 foot equals 12 inches is essential for various practical applications, such as measuring heights, lengths, and in construction or craft projects where precise measurements are important. The other options reflect incorrect conversions, making it clear that 12 inches is the accurate measure for one foot.

3. What is the formula for calculating combinations?

- A. $n!/(n+r)!$**
- B. $n!/(r!(n-r)!)$**
- C. $(n-r)!/n!$**
- D. $n^r/r!$**

The correct formula for calculating combinations is indeed $n!/(r!(n-r)!)$. This formula is used to find how many ways you can choose r items from a set of n items without regard to the order of selection. In the formula, $n!$ represents the factorial of n , which is the product of all positive integers up to n . The term $r!$ accounts for the arrangements of the selected items, as the order of the chosen items does not matter in combinations. Meanwhile, $(n-r)!$ represents the factorial of the remaining items that are not chosen. This combination formula is essential in various mathematical and statistical applications, especially in probability and counting problems, as it allows you to determine the number of possible subsets that can be formed from a larger set. The other options provided do not correctly yield the combination count; they either represent permutations or erroneous constructions of factorials that don't accurately address the concept of combinations.

4. Which of the following is not a characteristic of the standard deviation?
- A. It indicates the average distance of data points from the mean
 - B. It provides a measure of variability within a data set
 - C. It can only take positive values
 - D. It will always equal the range of the data set**

The correct answer is indeed the statement that the standard deviation will always equal the range of the data set. This is not a characteristic of standard deviation. Standard deviation is a measure of the amount of variation or dispersion in a set of values. It indicates the average distance of each data point from the mean, making it a valuable tool for understanding the spread of the data. Unlike the range, which is simply the difference between the highest and lowest values in the dataset, standard deviation takes into account how each data point varies from the mean. While standard deviation can only take positive values (since it involves squaring the differences from the mean), its relationship with the range is not fixed; they can be very different depending on the distribution of the data. For example, a dataset can have a large range but a small standard deviation if most of the values are clustered together. This further illustrates that standard deviation and range are distinct measures with different interpretations in the context of statistics.

5. What is the relationship between permutations and combinations?
- A. Permutations count order, combinations do not**
 - B. Permutations and combinations are the same
 - C. Combinations count order, permutations do not
 - D. Permutations are used for larger sets only

The relationship between permutations and combinations is fundamentally rooted in the concept of order. Permutations refer to arrangements in which the order of elements matters. For example, if you are arranging the letters A, B, and C, the arrangement ABC is considered different from ACB. In this case, each arrangement represents a unique permutation because the sequence in which the letters are arranged makes a difference. On the other hand, combinations focus on selecting items where the order does not matter. Using the same letters A, B, and C, the selection {A, B} is equivalent to {B, A} in combinations because both selections represent the same group of letters without regard to order. Therefore, the distinction that permutations count order while combinations do not accurately summarizes their relationship. This understanding is crucial in various applications, such as statistics, probability, and problem-solving, as it affects how one calculates outcomes based on whether the arrangement or the group is of primary concern.

6. What type of angle measures exactly 90 degrees?

- A. Right angle**
- B. Acute angle**
- C. Obtuse angle**
- D. Straight angle**

A right angle is defined as the angle that measures exactly 90 degrees. This specific measurement is crucial in various fields such as geometry, construction, and engineering, as it indicates a perpendicular relationship between intersecting lines or surfaces. In contrast, an acute angle measures less than 90 degrees, which means it is smaller than a right angle. An obtuse angle is characterized by measuring greater than 90 degrees but less than 180 degrees, indicating a more expansive opening. Lastly, a straight angle measures exactly 180 degrees, representing a straight line. Understanding these distinctions helps in identifying different types of angles and their properties within various mathematical contexts.

7. Which of the following is a characteristic of integers?

- A. All integers are positive.**
- B. Integers cannot be fractions.**
- C. Integers include only whole numbers.**
- D. Integers can be negative, zero, or positive.**

Integers are defined as the set of whole numbers that can be either positive, negative, or zero. This means they include all positive whole numbers (like 1, 2, 3), all negative whole numbers (like -1, -2, -3), and zero itself. This broad definition allows integers to encompass a range of values along the number line. The assertion that all integers can be negative, zero, or positive accurately captures the essential nature of integers, making it the best choice among the options provided. It reflects the complete set of integers and highlights their inclusive property of having both negative and positive values as well as zero. Understanding this characteristic is important in recognizing how integers function in various mathematical contexts. The other options do not accurately represent the nature of integers. For instance, stating that all integers are positive excludes negative integers and zero, which are fundamental parts of the integer set. The claim that integers cannot be fractions implies that only whole numbers can be considered, but integers specifically do not include fractional or decimal representations. Lastly, the suggestion that integers include only whole numbers ignores the critical element of negative values, which are equally considered part of the integer set. Thus, the comprehensive understanding presented in the correct option encapsulates what integers

8. What is the equivalent of 2.54 centimeters in inches?

- A. 1 in**
- B. 1.5 in**
- C. 2 in**
- D. 0.5 in**

To determine the equivalent of 2.54 centimeters in inches, it's important to understand the conversion factor between these two units of measurement. The conversion factor is that 1 inch is equal to 2.54 centimeters. Thus, to convert centimeters to inches, you divide the number of centimeters by the conversion factor. In this case, for 2.54 centimeters, the conversion to inches would be:
$$\text{Number of inches} = \frac{2.54 \text{ cm}}{2.54 \text{ cm/inch}} = 1 \text{ inch}$$
 Therefore, 2.54 centimeters corresponds exactly to 1 inch. This understanding facilitates accurate unit conversions in various applications, especially in measurements where both metric and imperial systems are used.

9. If $n = 6$ and $r = 2$, how many combinations can be formed?

- A. 15**
- B. 12**
- C. 20**
- D. 30**

To determine how many combinations can be formed with $(n = 6)$ and $(r = 2)$, you can use the combinations formula, which is given by:
$$C(n, r) = \frac{n!}{r!(n - r)!}$$
 In this case: - (n) represents the total number of items, which is 6. - (r) represents the number of items to choose, which is 2. Substituting the values into the formula, we get:
$$C(6, 2) = \frac{6!}{2!(6 - 2)!} = \frac{6!}{2! \cdot 4!}$$
 Now, let's break down $(6!)$:
$$6! = 6 \times 5 \times 4!$$
 So the calculation simplifies to:
$$C(6, 2) = \frac{6 \times 5 \times 4!}{2! \times 4!}$$
 The $(4!)$ in the numerator and denominator cancels out:
$$C(6, 2) = \frac{6 \times 5}{2 \times 1} = 15$$

10. What is the area of a rectangle with a length of 5 meters and a width of 3 meters?

- A. 15 square meters**
- B. 8 square meters**
- C. 10 square meters**
- D. 20 square meters**

To determine the area of a rectangle, you multiply the length by the width. In this case, the rectangle has a length of 5 meters and a width of 3 meters. Calculating the area involves:
$$\text{Area} = \text{Length} \times \text{Width}$$
 Substituting the given values:
$$\text{Area} = 5 \text{ meters} \times 3 \text{ meters} = 15 \text{ square meters}$$
 This shows that the area of the rectangle is indeed 15 square meters, making the correct choice the first one. The other options do not reflect the correct calculation of multiplying the length and width together, leading to incorrect area measurements.

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.

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

<https://ftcegeneralknowledgemath.examzify.com>

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