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. Don't worry about getting everything right, 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, and take breaks to retain information better.

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.

7. Use Other Tools

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 relationship between the hypotenuse and the other two sides in a right triangle?

A. Hypotenuse = Side 1 + Side 2

B. Hypotenuse = Side 1 - Side 2

C. Hypotenuse² = Side 1² + Side 2²

D. Hypotenuse² = Side 1² - Side 2²

2. Which of the following is classified as whole numbers?

A. Negative numbers and zero

B. Only positive numbers

C. Positive and negative whole numbers

D. Positive whole numbers and zero

3. What is the equivalent expression for 2 raised to the power of -3?

A. 1/8

B. 3/2

C. 8

D. 2/3

4. Which equation correctly represents the area of a rectangle?

A. Length + Width

B. 2(Length + Width)

C. Length X Width

D. Length - Width

5. In the inequality -3x ≥ 1, what happens when you divide by a negative number?

A. The inequality stays the same

B. The inequality sign reverses

C. The solution becomes negative

D. No change occurs in the inequality

6. What type of base does a cone have?

A. Square

B. Rectangle

C. Circular

D. Triangular

7. What is known as the counting principle used for finding the number of elements in one event?

A. Combinations

B. Permutations

C. Variable analysis

D. Matrix expansion

8. How many fluid ounces are there in one pint?

A. 4 fluid oz

B. 8 fluid oz

C. 12 fluid oz

D. 16 fluid oz

9. In a proportional relationship, how do you find the cross products?

A. Multiply corresponding outcomes

B. Add both distances

C. Divide to obtain a ratio

D. Subtract the outcomes

10. What are figures that possess the same size and shape called?

A. Similar figures

B. Congruent figures

C. Identical figures

D. Equivalent figures

Answers

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

Explanations

1. What is the relationship between the hypotenuse and the other two sides in a right triangle?

A. Hypotenuse = Side 1 + Side 2

B. Hypotenuse = Side 1 - Side 2

C. Hypotenuse² = Side 1² + Side 2²

D. Hypotenuse² = Side 1² - Side 2²

In a right triangle, the relationship between the lengths of the hypotenuse and the other two sides is described by the Pythagorean theorem. This theorem states that the square of the length of the hypotenuse (the side opposite the right angle) is equal to the sum of the squares of the lengths of the other two sides. Mathematically, this is represented as hypotenuse² = side 1² + side 2². This relationship is foundational in geometry, particularly in the study of right triangles, and applies universally regardless of the specific measurements of the sides, as long as it is indeed a right triangle. The other options, although they suggest different mathematical relationships, do not accurately capture the essence of the Pythagorean theorem. For instance, a sum or difference of the lengths of the sides does not describe any standard relationship observed in right triangles. Thus, the correct relationship articulated by the Pythagorean theorem confirms that option C is the only one that accurately portrays how the hypotenuse relates to the other two sides in a right triangle.

2. Which of the following is classified as whole numbers?

A. Negative numbers and zero

B. Only positive numbers

C. Positive and negative whole numbers

D. Positive whole numbers and zero

Whole numbers include all non-negative integers, starting from zero and extending upwards to infinity. This means whole numbers include zero and all the positive integers (1, 2, 3, etc.) but do not include any negative numbers or fractions. Therefore, the correct classification as whole numbers consists of positive whole numbers and zero, which validates the choice. While some options mention negative numbers or only positive numbers, they do not accurately encompass the complete definition of whole numbers, which clearly includes zero as part of the set.

3. What is the equivalent expression for 2 raised to the power of -3?

A. 1/8

B. 3/2

C. 8

D. 2/3

The expression for 2 raised to the power of -3 can be understood using the properties of exponents. When dealing with a negative exponent, the rule is that you take the reciprocal of the base raised to the positive exponent. Therefore, 2 raised to the power of -3 can be rewritten as 1 divided by 2 raised to the power of 3. Calculating that gives: 1 / (2^3) = 1 / 8 This shows that the equivalent expression for 2 raised to the power of -3 is indeed 1/8. The understanding of negative exponents is fundamental in mathematics, as it opens up the understanding of how numbers can be manipulated, especially in contexts involving fractions, ratios, or decaying values.

4. Which equation correctly represents the area of a rectangle?

A. Length + Width

B. 2(Length + Width)

C. Length X Width

D. Length - Width

The area of a rectangle is calculated by multiplying its length by its width. This is expressed mathematically as "Length X Width." When you multiply these two dimensions, you obtain the total area enclosed by the rectangle, measured in square units. The other options do not accurately represent the area of a rectangle. For example, adding the length and width simply yields a perimeter-related figure rather than an area. Similarly, doubling that sum, as in option B, also relates to perimeter calculation rather than the actual area. Lastly, subtracting width from length does not pertain to area calculation at all, as it merely provides a difference between the two linear measurements. Thus, the correct representation of the area remains Length X Width.

5. In the inequality -3x ≥ 1, what happens when you divide by a negative number?

A. The inequality stays the same

B. The inequality sign reverses

C. The solution becomes negative

D. No change occurs in the inequality

When dividing or multiplying both sides of an inequality by a negative number, the direction of the inequality sign must be reversed. This is a fundamental rule in algebra that ensures the relationship remains true even after performing the operation. In the given inequality, -3x ≥ 1, if we divide both sides by -3, the sign changes from '≥' to '≤'. This results in the inequality -3x ≥ 1 becoming x ≤ -1. Thus, your selection reflects this crucial principle of inequalities, confirming that the inequality sign indeed reverses when dividing by a negative number.

6. What type of base does a cone have?

A. Square

B. Rectangle

C. Circular

D. Triangular

The base of a cone is circular, giving it a unique shape that distinguishes it from other three-dimensional figures. This circular base allows the cone to transition smoothly to its apex (the tip), resulting in the characteristic pointed structure that we associate with cones. In geometry, the circle serves as the foundational shape from which the sides of the cone rise to the apex, making it essential to define the cone accurately. The other shapes mentioned, such as square, rectangle, and triangular, represent different types of bases found in other geometrical figures, but none accurately describe the base of a cone.

7. What is known as the counting principle used for finding the number of elements in one event?

A. Combinations

B. Permutations

C. Variable analysis

D. Matrix expansion

The counting principle you are referring to, which is commonly acknowledged for finding the number of elements in one event, is, in fact, related to combinations. Combinations refer to the selection of items from a larger set where the order of selection does not matter. This is particularly useful when trying to determine how many different groups or subsets can be formed when the arrangement of those groups is irrelevant. In problems where the question specifically focuses on counting the number of ways to choose a subset from a larger set without regard to the order, combinations provide a precise method for calculating that number. For instance, if you have a group of five students and want to know how many ways you can choose three of them to form a committee, you would use the combination formula, which is based on the counting principle. Other options, while relevant in their contexts, represent different concepts. Permutations focus on arrangements where the order does matter, variable analysis deals with understanding how different variables interact with each other, and matrix expansion relates to operations in linear algebra and does not apply directly to counting principles in combinatorial mathematics.

8. How many fluid ounces are there in one pint?

A. 4 fluid oz

B. 8 fluid oz

C. 12 fluid oz

D. 16 fluid oz

One pint is equivalent to 16 fluid ounces. This conversion is based on the typical measurement standard used in the United States, where one pint consists of 2 cups, and each cup contains 8 fluid ounces. Therefore, when you multiply 2 cups by 8 fluid ounces per cup, it results in 16 fluid ounces in total. Knowing this helps with measurements in cooking, mixing drinks, or understanding fluid capacities in various contexts.

9. In a proportional relationship, how do you find the cross products?

A. Multiply corresponding outcomes

B. Add both distances

C. Divide to obtain a ratio

D. Subtract the outcomes

In a proportional relationship, finding the cross products involves multiplying the corresponding outcomes of two ratios. When you set up a proportion, it typically takes the form of two equivalent fractions, such as a/b = c/d. The cross products are obtained by multiplying the numerator of one fraction by the denominator of the other fraction, resulting in ad and bc. This method is used to determine if two ratios are equivalent, as the cross products should be equal for the ratios to represent a true proportion. The other options are not applicable to finding cross products: adding, dividing, or subtracting outcomes does not give the necessary relationship needed to verify proportionality. Therefore, multiplying corresponding outcomes is the fundamental operation that defines the cross products in proportional relationships.

10. What are figures that possess the same size and shape called?

A. Similar figures

B. Congruent figures

C. Identical figures

D. Equivalent figures

Figures that possess the same size and shape are referred to as congruent figures. Congruent figures have matching dimensions and angles, meaning that one can be transformed into the other through rotations, translations, or reflections without any alteration of size or shape. This concept is crucial in geometry, where understanding the properties of shapes in relation to one another allows for effective problem-solving and proof construction. In contrast, similar figures have the same shape but are different in size, which means their corresponding sides are proportional, but they do not necessarily coincide. Identical figures would imply they are the same object, often used informally, but isn't a geometrical term. Equivalent figures can refer to figures that have the same area or volume but may not share the same shape. Therefore, the clarity of congruency highlights the precise relationship between figures in geometry, providing a foundational understanding for further mathematical concepts and applications.

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!