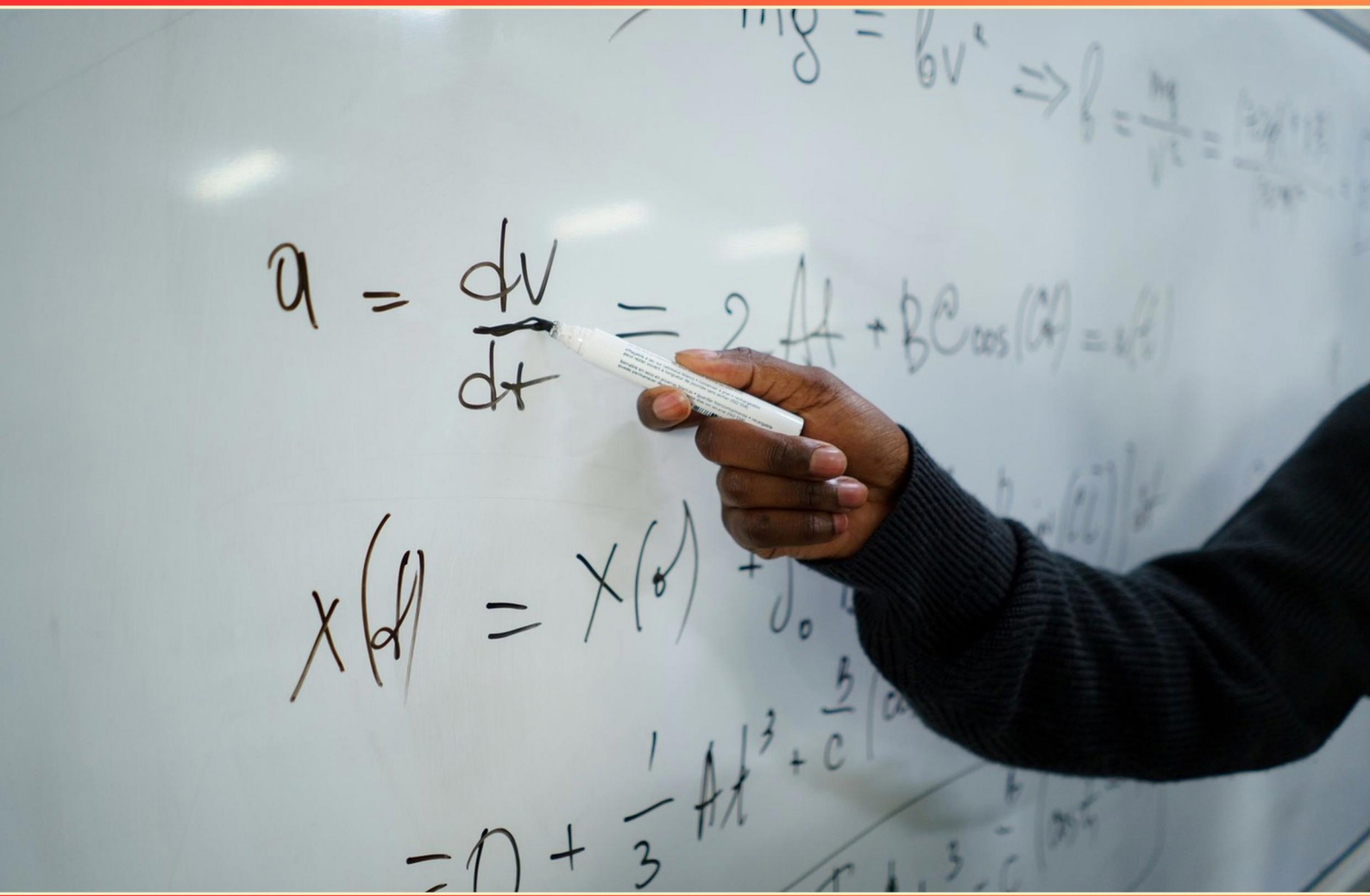
ACT MATHEMATICS PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR THE FULL VERSION STUDY GUIDE

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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.

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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!

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Questions

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1. The range of the data set {6, 10, 14, 14, 20} is?

A. 14

B. 16

C. 12

D. 10

2. Factor and solve: x^2 - 5x + 6 = 0. Which of the following expresses the solutions?

A. x = 4 or x = 1

B. x = 1 or x = 6

C. x = -2 or x = -3

D. x = 2 or x = 3

3. What is the inverse function of f(x) = 2x + 3?

A. (x+3)/2

B. (2x+3)

C. x/2 - 3

D. (x-3)/2

4. Find the area of a trapezoid with bases 3 and 9 and height 5.

A. 25

B. 30

C. 45

D. 35

5. What is the mean of the numbers 3, 8, 10, and 15?

A. 6.5

B. 9

C. 9.5

D. 10

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6. A sector of a circle has radius 8 and central angle 120 degrees. What is its area?

A. 32π/3

B. 128π/3

C. 64π/3

D. 8π

7. Solve the system 2x + y = 5 and x - y = 1. What are the values of x and y?

A. x=1, y=3

B. x=0, y=5

C. x=2, y=1

D. x=3, y=-1

8. Which equation expresses the Law of Cosines for the angle opposite the largest side 20 in a triangle with sides 14, 18, and 20?

A. 20^2 = 14^2 + 18^2 - 2(14)(18)cosθ

B. 18^2 = 14^2 + 20^2 - 2(14)(20)cosθ

C. 14^2 = 18^2 + 20^2 - 2(18)(20)cosθ

D. cosθ = (14^2 + 18^2 - 20^2)/(2·14·18)

9. If log base 10 of x equals 2, what is x?

A. 10

B. 0.01

C. 100

D. 1000

10. Which statement describes the domain of y = sqrt(x - 1)?

A. x ≥ 1

B. x > 1

C. x ≥ 0

D. x > 0

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Answers

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

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Explanations

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1. The range of the data set {6, 10, 14, 14, 20} is?

A. 14

B. 16

C. 12

D. 10

The range is the spread of the data, found by subtracting the smallest value from the largest value. Here the smallest number is 6 and the largest is 20, so the range is 20 − 6 = 14. Duplicates don't affect the range unless they are the extremes, and in this set the extremes stay 6 and 20, giving 14. The other numbers would imply different extremes, which isn't the case for this data.

2. Factor and solve: x^2 - 5x + 6 = 0. Which of the following expresses the solutions?

A. x = 4 or x = 1

B. x = 1 or x = 6

C. x = -2 or x = -3

D. x = 2 or x = 3

To solve by factoring, find two numbers that multiply to the constant term (6) and add to the coefficient of x (-5). Those numbers are -2 and -3, so the quadratic factors as (x - 2)(x - 3) = 0. When a product is zero, each factor can be zero, giving x - 2 = 0 or x - 3 = 0, hence x = 2 or x = 3. These are the solutions because they make the original equation true. The other choices don't satisfy the equation; for instance, x = 4 gives 16 - 20 + 6 = 2, which is not zero, and x = -2 gives 4 + 10 + 6 = 20, also not zero.

3. What is the inverse function of f(x) = 2x + 3?

A. (x+3)/2

B. (2x+3)

C. x/2 - 3

D. (x-3)/2

Inverse functions undo what the original function does, so you reverse the operations step by step and swap the input and output roles. Let y = 2x + 3. To find the inverse, swap x and y: x = 2y + 3. Solve for y: 2y = x − 3, so y = (x − 3)/2. Therefore, the inverse is $f^{-1}(x) = (x - 3)/2$. This form subtracts 3 from the input and then divides by 2, which is exactly reversing the original "multiply by 2, then add 3." The other expressions either don't undo the +3 in the correct order or apply the operations differently, so they don't give the inverse.

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4. Find the area of a trapezoid with bases 3 and 9 and height 5.

A. 25

B. 30

C. 45

D. 35

Area of a trapezoid is found by multiplying the height by the average of its two bases. With bases 3 and 9, the average is (3+9)/2 = 6. Multiply by the height 5 to get 6×5 = 30. So the area is 30. Common slips come from using only one base (9×5 = 45 or 3×5 = 15) or miscomputing the base average, but the correct method always uses the average of both bases.

5. What is the mean of the numbers 3, 8, 10, and 15?

A. 6.5

B. 9

C. 9.5

D. 10

Mean is the average value you get by adding all the numbers and dividing by how many numbers there are. For 3, 8, 10, and 15, add them: 3 + 8 + 10 + 15 = 36. There are four numbers, so 36 ÷ 4 = 9. The mean is 9. If you see the other options, they would come from a different total or a different count, but with these four numbers the total is 36 and the count is 4, giving 9.

6. A sector of a circle has radius 8 and central angle 120 degrees. What is its area?

A. 32π/3

B. 128π/3

C. 64π/3

D. 8π

The area of a sector is the fraction of the circle's area that corresponds to the central angle. Since 120 degrees is one third of a full 360-degree circle, this sector represents one third of the circle. The full circle with radius 8 has area πr^2 = π(8^2) = 64π. One third of that is 64π/3, which is the sector's area. Using the standard formula as a check: area = (θ/360)πr^2 = (120/360)π(8^2) = (1/3)·64π = 64π/3. If you prefer radians, θ = 2π/3 and area = (1/2)r^2θ = (1/2)·64·(2π/3) = 64π/3.

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7. Solve the system 2x + y = 5 and x - y = 1. What are the values of x and y?

A. x=1, y=3

B. x=0, y=5

C. x=2, y=1

D. x=3, y=-1

Solving a system of linear equations means finding values that satisfy every equation at once. Use substitution by expressing one variable from one equation and plugging into the other. From the second equation, x = y + 1. Substitute into the first: 2(y + 1) + y = 5, which simplifies to 2y + 2 + y = 5, so 3y = 3 and y = 1. Then x = y + 1 = 2. Therefore, x = 2 and y = 1. Check: 2x + y = 4 + 1 = 5 and x − y = 2 − 1 = 1, both true. Other options fail to satisfy at least one equation (for example, x=1, y=3 makes the first true but the second false).

8. Which equation expresses the Law of Cosines for the angle opposite the largest side 20 in a triangle with sides 14, 18, and 20?

A. 20^2 = 14^2 + 18^2 - 2(14)(18)cosθ

B. 18^2 = 14^2 + 20^2 - 2(14)(20)cosθ

C. 14^2 = 18^2 + 20^2 - 2(18)(20)cosθ

D. cosθ = (14^2 + 18^2 - 20^2)/(2·14·18)

The Law of Cosines shows how a triangle's side lengths relate to the cosine of the angle opposite a given side. For the angle opposite a side, the relation is c^2 = a^2 + b^2 − 2ab cos(angle), where c is the side opposite that angle and a and b are the other two sides forming the angle. In this triangle, the largest side is 20, so the angle in question is opposite 20. The two sides that meet to form that angle are 14 and 18. Plugging in, you get 20^2 = 14^2 + 18^2 − 2(14)(18) cos(theta). This is the standard form of the Law of Cosines for the angle opposite the side 20. The other forms would either correspond to the angle opposite a different side (not the one opposite the largest side) or, in the last option, just a rearranged version that solves for cos(theta) rather than keeping the Law of Cosines in its usual form.

9. If log base 10 of x equals 2, what is x?

A. 10

B. 0.01

C. 100

D. 1000

Logarithms tell you what power the base must be raised to to get x. If log base 10 of x equals 2, then x is 10 raised to the power 2, which is 100. So x equals 100. The other numbers correspond to different powers of 10: 10 is 10^1, 0.01 is 10^-2, and 1000 is 10^3, so they don't satisfy the given log value.

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10. Which statement describes the domain of y = sqrt(x - 1)?

A. x ≥ 1

B. x > 1

C. x ≥ 0

D. x > 0

The key idea is that the domain of a square root in the real numbers is restricted to when the radicand is nonnegative. For y = sqrt(x - 1), you need x - 1 ≥ 0, which means x ≥ 1. At x = 1, you get sqrt(0) = 0, which is allowed. If x is less than 1, the inside becomes negative and the expression isn't real. So the domain consists of all x with x ≥ 1. That matches the statement x ≥ 1.

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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.

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

https://actmath.examzify.com

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

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