

PRAxis MATHEMATICS (5165) PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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.

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. What term describes the result of a subtraction operation?
 - A. Minuend
 - B. Subtrahend
 - C. Difference
 - D. Quotient
2. In a direct proportion, if the first quantity doubles, the second:
 - A. Doubles
 - B. Halves
 - C. Remains the same
 - D. Increases by a fixed amount
3. For the inequality $y > 2x + 2$, how should you shade on the graph?
 - A. Dotted boundary, shading above
 - B. Solid boundary, shading above
 - C. Solid boundary, shading below
 - D. Dotted boundary, shading below
4. The inequality $|x - 1| < 4$ has solution set
 - A. $(-3, 5)$
 - B. $(-3, 5]$
 - C. $[-3, 5)$
 - D. $[-3, 5]$
5. In inverse proportion, as one quantity increases, the other:
 - A. One increases as the other decreases.
 - B. Both increase at the same rate.
 - C. Both decrease at the same rate.
 - D. One remains constant while the other changes.
6. Solve for x: $3x - 5 = 16$.
 - A. 4
 - B. 9
 - C. 11
 - D. 7

7. Which statement correctly describes the domain of a function?

- A. All x-values on the graph.
- B. All x-values for which the function is defined.
- C. All y-values produced by the function.
- D. The maximum y-value.

8. Which equation correctly relates part P, whole W, and percent?

- A. $P = W \times \%$
- B. $P = W \div \%$
- C. $P = W \times 100$
- D. $P = W + \%$

9. Find the inverse function of $h(x) = x^3$.

- A. $h^{-1}(x) = x^{1/3}$
- B. $h^{-1}(x) = x^3$
- C. $h^{-1}(x) = 1/x^3$
- D. $h^{-1}(x) = 3x^2$

10. The axis of symmetry of the parabola $y = ax^2 + bx + c$ is $x = -b/(2a)$. Which statement is true?

- A. The axis is independent of a
- B. The axis is $x = -a/(2b)$
- C. The axis is $x = -b/(2a)$
- D. The axis is $x = -c/(2a)$

Answers

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

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Explanations

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1. What term describes the result of a subtraction operation?

- A. Minuend
- B. Subtrahend
- C. Difference**
- D. Quotient

The result of a subtraction is called the difference. In a subtraction, the first number you start with is the minuend, and the number you subtract is the subtrahend. When you perform minuend minus subtrahend, you obtain the difference. For example, 7 minus 4 equals 3—the 7 is the minuend, the 4 is the subtrahend, and 3 is the difference. The term quotient is used for division, not subtraction, so it describes a different operation.

2. In a direct proportion, if the first quantity doubles, the second:

- A. Doubles**
- B. Halves
- C. Remains the same
- D. Increases by a fixed amount

In a direct proportion, the second quantity scales with the first: y is proportional to x , so $y = kx$ for some constant k . That means the ratio y/x stays the same no matter what x is. If the first quantity doubles, the second must also double to keep $y/x = k$. For example, if $y = 3x$, doubling x makes y become $6x$, which is twice as large as before. The other options describe different relationships: halving would happen in an inverse proportion, remaining the same would mean y does not depend on x , and increasing by a fixed amount implies a linear relationship with an added constant, not a direct proportional relationship.

3. For the inequality $y > 2x + 2$, how should you shade on the graph?

- A. Dotted boundary, shading above**
- B. Solid boundary, shading above
- C. Solid boundary, shading below
- D. Dotted boundary, shading below

When graphing a linear inequality in two variables, the boundary line is drawn as a dashed (dotted) line if the inequality is strict (no equal sign). Here the boundary is $y = 2x + 2$, and since the inequality is $y > 2x + 2$, the line is not included. The region that satisfies the inequality is where y is greater than $2x + 2$, which is the area above that line. You can confirm this by testing a point known to be above, say $(0,3)$: $3 > 2(0) + 2$, which is true, so that region is shaded. So the correct description is a dotted boundary with shading above.

4. The inequality $|x - 1| < 4$ has solution set

A. $(-3, 5)$

B. $(-3, 5]$

C. $[-3, 5)$

D. $[-3, 5]$

Absolute value inequalities express a distance constraint. Here, $|x - 1| < 4$ means x is within distance 4 of the point 1. Write $-4 < x - 1 < 4$ and then add 1 to all parts to get $-3 < x < 5$. This describes all real numbers strictly between -3 and 5, which is the open interval $(-3, 5)$. The endpoints aren't included because the inequality is strict. If the inequality were ≤ 4 , the endpoints would be included, giving $[-3, 5]$.

5. In inverse proportion, as one quantity increases, the other:

A. One increases as the other decreases.

B. Both increase at the same rate.

C. Both decrease at the same rate.

D. One remains constant while the other changes.

Inverse proportionality means the two quantities multiply to a constant, so as one grows, the other must shrink to keep the product the same. If one quantity doubles, the other becomes half, assuming the constant stays the same. So the situation described—one increases while the other decreases—fits inverse proportionality. The other possibilities describe different relationships: both increasing at the same rate would be a direct proportionality; both decreasing at the same rate is also a direct-type stretch; one staying constant while the other changes doesn't reflect an inverse link.

6. Solve for x : $3x - 5 = 16$.

A. 4

B. 9

C. 11

D. 7

To solve a simple linear equation, you isolate the variable by undoing the operations on it. Here, undo the subtracting 5 by adding 5 to both sides: $3x = 21$. Then undo the multiplication by 3 by dividing both sides by 3, which gives $x = 7$. Substituting back checks out: $3(7) - 5 = 16$. Numbers like 4 or 9 or 11 wouldn't work because they'd produce left-hand values such as 7, 22, or 28, not 16. The steps show why 7 is the correct solution.

7. Which statement correctly describes the domain of a function?

- A. All x-values on the graph.
- B. All x-values for which the function is defined.**
- C. All y-values produced by the function.
- D. The maximum y-value.

The domain is the set of input values for which the function is defined. In other words, these are the x-values you can plug into the function so the expression makes sense (no negative numbers under even roots, no division by zero, arguments of logs positive, etc.). The domain captures all permissible inputs, and any restriction from the formula (like $x \neq 0$ in a denominator or $x \geq 0$ under a square root) trims away the invalid x-values. Think of the graph: for every x in the domain, there is a corresponding point $(x, f(x))$ on the graph. The set of x-coordinates that actually appear on the graph matches the domain, while the y-values produced are the range. The other statements pull in a different direction: the range is all the y-values the function outputs, and a maximum y-value concerns that range, not the inputs.

8. Which equation correctly relates part P, whole W, and percent?

- A. $P = W \times \%$**
- B. $P = W \div \%$
- C. $P = W \times 100$
- D. $P = W + \%$

Percent tells us what fraction of the whole we have. The part is that fraction of the whole, so you multiply the whole by the percent written as a decimal. That's why the relation $P = W \times \%$ works: the percent is used in decimal form (for example, 25% becomes 0.25). For instance, if the whole is 200 and the percent is 25%, then $P = 200 \times 0.25 = 50$. Dividing by a percent would not give a part of the whole, multiplying by 100 scales the whole by 100, not by the desired fraction, and adding the percent to the whole doesn't form a part of the whole.

9. Find the inverse function of $h(x) = x^3$.

- A. $h^{-1}(x) = x^{1/3}$**
- B. $h^{-1}(x) = x^3$
- C. $h^{-1}(x) = 1/x^3$
- D. $h^{-1}(x) = 3x^2$

When a function is inverted, you're asking for a rule that reverses what the original rule does. For $h(x) = x^3$, the inverse should undo cubing. Start with $y = x^3$ and solve for x: $x^3 = y$ implies $x = \sqrt[3]{y}$. Replace y with x to express the inverse as a function of x: $h^{-1}(x) = \sqrt[3]{x}$ (which is $x^{1/3}$). This works for all real x because the cube root is defined for every real number, and x^3 is strictly increasing on the real line, so it has a unique inverse. So the inverse function is the cube root function. The other forms don't fit as the inverse: they don't undo cubing (the original function itself, the reciprocal $1/x^3$, and the derivative $3x^2$).

10. The axis of symmetry of the parabola $y = ax^2 + bx + c$ is $x = -b/(2a)$. Which statement is true?

- A. The axis is independent of a
- B. The axis is $x = -a/(2b)$
- C. The axis is $x = -b/(2a)$
- D. The axis is $x = -c/(2a)$

The axis of symmetry is the vertical line that passes through the vertex of the parabola. For a quadratic $y = ax^2 + bx + c$, the x -coordinate of the vertex is $-b/(2a)$. This comes from completing the square: $y = a[(x + b/(2a))^2] + (c - b^2/(4a))$. The squared term reaches its minimum when $x + b/(2a) = 0$, so the vertex lies at $x = -b/(2a)$. Equivalently, taking the derivative $dy/dx = 2ax + b$ and setting it to zero gives the same x -coordinate, $x = -b/(2a)$. Since this value depends on both a and b , the axis cannot be $x = -a/(2b)$ or $x = -c/(2a)$, and it is not independent of a . Therefore the axis is $x = -b/(2a)$.

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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://praxis5165.examzify.com>

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

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