

TEXAS A&M UNIVERSITY (TAMU) MATH 367 STRUCTURE OF MATHEMATICS III TEST 1 PRACTICE (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

VISIT US ONLINE FOR
THE FULL VERSION STUDY GUIDE

<https://tamu-math367test1.examzify.com>



Copyright © 2026 by Examzify - A Kaluba Technologies Inc. product.

ALL RIGHTS RESERVED.

No part of this book may be reproduced or transferred in any form or by any means, graphic, electronic, or mechanical, including photocopying, recording, web distribution, taping, or by any information storage retrieval system, without the written permission of the author.

Notice: Examzify makes every reasonable effort to obtain accurate, complete, and timely information about this product from reliable sources.

SAMPLE

Table of Contents

Copyright	1
Table of Contents	2
Introduction	3
How to Use This Guide	4
Questions	5
Answers	8
Explanations	10
Next Steps	15

SAMPLE

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

SAMPLE

1. Which of the following is not an undefined term in the axiomatic system?
 - A. Segment
 - B. Point
 - C. Line
 - D. Plane
2. Which method of proving P implies Q requires assuming P is true and showing Q must follow?
 - A. Indirect proof
 - B. Direct proof
 - C. Proof by contrapositive
 - D. Proof by cases
3. Which expression represents the conjunction of two propositions p and q ?
 - A. $p \vee q$
 - B. $p \wedge q$
 - C. $\sim p$
 - D. $p \rightarrow q$
4. Which statement is guaranteed by the ruler postulate?
 - A. Every line has a coordinate system.
 - B. Distances between points on a line cannot be defined.
 - C. A line contains finitely many points.
 - D. The ruler postulate guarantees that every line contains infinitely many points.
5. Which statement defines the ASA congruence criterion?
 - A. If two angles and the included side of one triangle are congruent to the corresponding parts of a second triangle, the triangles are congruent.
 - B. If two angles and a non-included side are congruent, the triangles are congruent.
 - C. If two sides and the included angle are congruent, the triangles are congruent.
 - D. If all three sides are congruent, the triangles are congruent.

6. Which of the following is NOT a valid triangle congruence postulate?
- A. SSA
 - B. SAS
 - C. SSS
 - D. AAA
7. What is the inverse of the statement 'If it is raining, then it is Monday'?
- A. If it's Monday, then it's raining.
 - B. If it's not Monday, then it's not raining.
 - C. If it's not raining, then it's not Monday.
 - D. If it's raining, then it's Monday.
8. Which statement about the null set is true?
- A. It has exactly one element
 - B. It has zero elements
 - C. It has at least one element
 - D. It has infinite elements
9. Which statement is true about supplementary angles?
- A. They sum to 180 degrees.
 - B. They must be adjacent.
 - C. They are always equal.
 - D. They sum to 90 degrees.
10. Which of the following numbers is the sum of the digits of 15?
- A. 5
 - B. 10
 - C. 6
 - D. 7

Answers

SAMPLE

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

SAMPLE

Explanations

SAMPLE

1. Which of the following is not an undefined term in the axiomatic system?

A. Segment

B. Point

C. Line

D. Plane

In an axiomatic treatment of geometry, some terms are taken as primitive and not defined. The standard undefined terms are point, line, and plane. A segment is not primitive; it's defined using those notions: a segment is the part of a line between two endpoints, including the endpoints. Because it is defined from the undefined terms, it is not itself an undefined term. That's why the correct choice is the one describing a portion of a line with endpoints. The other terms are treated as undefined primitives in this framework.

2. Which method of proving P implies Q requires assuming P is true and showing Q must follow?

A. Indirect proof

B. Direct proof

C. Proof by contrapositive

D. Proof by cases

To prove P implies Q directly, you take P as given and use logical deductions to arrive at Q . This shows that whenever P is true, Q must follow without assuming anything about Q or its negation beforehand. For example, if P is " n is even" and Q is " n^2 is even," you write $n = 2k$, then $n^2 = (2k)^2 = 4k^2$, which is even. This neatly demonstrates that P leads to Q . Other methods work differently: an indirect proof often assumes not Q (or not P) and seeks a contradiction; a proof by contrapositive shows not Q implies not P ; a proof by cases handles separate possibilities for P and proves Q in each case. The described approach aligns with direct proof.

3. Which expression represents the conjunction of two propositions p and q ?

A. $p \vee q$

B. $p \wedge q$

C. $\sim p$

D. $p \rightarrow q$

The conjunction is true exactly when both parts are true. This is what the symbol for "and" captures, often written as $p \wedge q$ (sometimes shown as $p \wedge q$). So the expression that represents " p and q " is $p \wedge q$, since it is true only when both p and q are true. The other connectives do different things: $p \vee q$ is true if at least one of p or q is true, $\sim p$ negates p , and $p \rightarrow q$ is true except in the case where p is true and q is false.

4. Which statement is guaranteed by the ruler postulate?

- A. Every line has a coordinate system.
- B. Distances between points on a line cannot be defined.
- C. A line contains finitely many points.
- D. The ruler postulate guarantees that every line contains infinitely many points.

The ruler postulate establishes a one-to-one correspondence between the points on a line and the real numbers, with the distance between two points equal to the absolute difference of their corresponding coordinates. This directly provides a coordinate system along every line: choose an origin and a unit length, then assign to each point a real coordinate. That ability to place points with real coordinates is exactly what the statement about a coordinate system on every line expresses. Distances are defined by the postulate, so claiming that distances cannot be defined is false. A line cannot have only finitely many points; since the line corresponds to all real numbers, there are infinitely many points. The fact that there are infinitely many points follows, but the essential guaranteed feature provided by the postulate is the existence of a coordinate system on the line.

5. Which statement defines the ASA congruence criterion?

- A. If two angles and the included side of one triangle are congruent to the corresponding parts of a second triangle, the triangles are congruent.
- B. If two angles and a non-included side are congruent, the triangles are congruent.
- C. If two sides and the included angle are congruent, the triangles are congruent.
- D. If all three sides are congruent, the triangles are congruent.

Two angles determine the shape of a triangle, and the side between those two angles fixes its size. When those two corresponding angles in two triangles are equal and the included side between them is also equal to the corresponding side, the two triangles must match exactly in all parts. That combination—angle, angle, and the included side—gives a unique congruence, so the triangles are congruent. This is the ASA congruence criterion: if two angles and the included side of one triangle are congruent to the corresponding parts of another triangle, the triangles are congruent. The other descriptions refer to different criteria (two angles with a non-included side is a different form, and sides with an included angle or all three sides lead to SAS or SSS), so they do not define the ASA rule.

6. Which of the following is NOT a valid triangle congruence postulate?

- A. SSA
- B. SAS
- C. SSS
- D. AAA

Knowing three angles exactly fixes the shape of a triangle but not its size. If two triangles have all three corresponding angles equal, they are similar, meaning one can be mapped to the other by a scale factor. Congruence, however, requires equal size as well as shape. So a criterion that asserts only angle equality cannot guarantee that the triangles are the same size, and thus cannot be a valid congruence postulate. For example, triangles with angles 60° , 60° , 60° can have side lengths 1-1-1 or 2-2-2, which are similar but not congruent. The valid congruence postulates require matching sides in some way (like SSS or SAS) or matching angles with a side (ASA or AAS), but not just all three angles.

7. What is the inverse of the statement 'If it is raining, then it is Monday'?

- A. If it's Monday, then it's raining.
- B. If it's not Monday, then it's not raining.**
- C. If it's not raining, then it's not Monday.
- D. If it's raining, then it's Monday.

Think in terms of $P \rightarrow Q$. The contrapositive $\neg Q \rightarrow \neg P$ always has the same truth value as the original, so it's a perfect restatement that preserves what's true and what's false. Here, P is "it is raining" and Q is "it is Monday." The contrapositive is $\neg Q \rightarrow \neg P$, i.e., "If it's not Monday, then it's not raining." That matches the given option, which is why it's considered the best choice: it conveys exactly the same condition as the original statement in a logically equivalent form. For context, the inverse would be $\neg P \rightarrow \neg Q$: "If it's not raining, then it's not Monday." The converse would be $Q \rightarrow P$: "If it's Monday, then it's raining." The original remains "If it's raining, then it's Monday."

8. Which statement about the null set is true?

- A. It has exactly one element
- B. It has zero elements**
- C. It has at least one element
- D. It has infinite elements

The null set is the empty set, meaning it contains no elements. In set theory, the size (cardinality) of a set is the number of elements it has. For the empty set, that count is zero. So the statement that it has zero elements is true. Since there are no elements to begin with, it cannot have exactly one element, nor at least one element, nor infinitely many.

9. Which statement is true about supplementary angles?

- A. They sum to 180 degrees.**
- B. They must be adjacent.
- C. They are always equal.
- D. They sum to 90 degrees.

Supplementary angles are two angles whose measures add up to 180 degrees. This means together they form a straight angle. They do not have to be adjacent; they can be separated as long as their measures sum to 180. When two angles share a vertex and their noncommon sides form a straight line, they are a linear pair, which is a specific case of supplementary angles. This defining property—that their measures total 180 degrees—is why the statement is true. The other ideas aren't required: supplementary angles do not have to be adjacent, they are not necessarily equal, and they do not necessarily sum to 90 degrees.

10. Which of the following numbers is the sum of the digits of 15?

- A. 5
- B. 10
- C. 6
- D. 7

Sum of digits means adding each digit of a number. For 15, add 1 and 5 to get 6. So the sum of the digits is 6. The other numbers are sums you'd get from different digit pairs (like $1+4=5$, $1+6=7$, or $1+9=10$), but they don't equal the sum of the digits of 15.

SAMPLE

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://tamu-math367test1.examzify.com>

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

SAMPLE