

9

New Hampshire

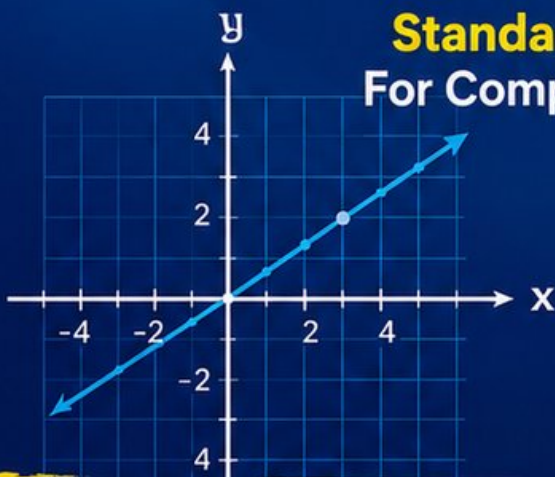
NH SAS

Grade 8

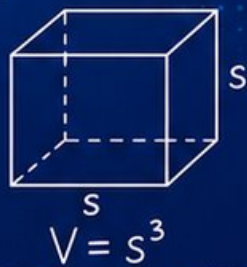
MATH

PRACTICE TESTS

**Standards Aligned Problem Solving**  
For Comprehensive Assessment Programs



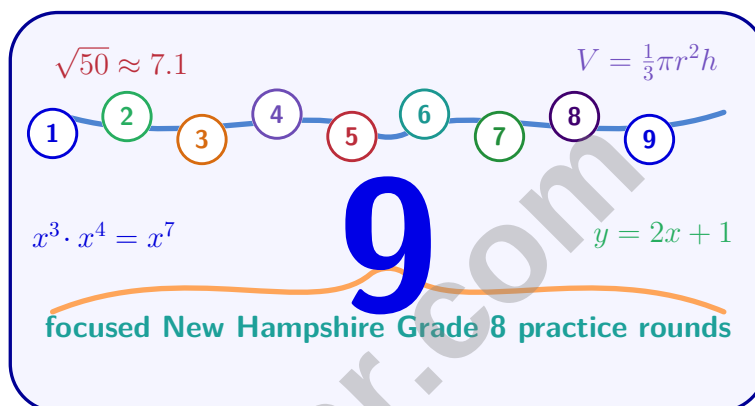
$$2x + 3y = 12$$
$$y = mx + b$$

**9 PRINTED TESTS****2 ONLINE TESTS**

Use these **two additional online practice tests** for extra review after the printed tests in this book.

# 9 New Hampshire NH SAS Grade 8 Math Practice Tests

*Standards-Aligned New Hampshire Prep for Equations, Transformations, Volume, and Data*



Nine complete 40-question Grade 8 NH SAS practice rounds with real numbers, exponents, scientific notation, equations, functions, transformations, geometry, data analysis, probability, answer keys, and clear explanations for every item.

**Jay Daie and Reza Nazari**



# Copyright ©

## Testinar Inc



Published by Testinar Inc

[Testinar.com](http://Testinar.com)

All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the author, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law, including Section 107 or 108 of the 1976 United States Copyright Act.

This publication is independently produced and has no official connection to any state, district, or national testing program.

Test names and organizational names used herein are the property of their respective trademark holders.



*Copyright ©*

# Welcome, New Hampshire Grade 8 Problem Solver!

Nine focused rounds for sharper NH SAS math thinking

This book gives you nine full Grade 8 NH SAS math practice tests. Each round is built to help you recognize structure, reason with real numbers and exponents, analyze linear relationships, connect equations with graphs, and explain your thinking with care.

## Your New Hampshire Practice Promise

I will read every question carefully, choose a strategy that fits, write enough work to prove my answer, and use corrections as training for the next test.

Read

Model

Verify

## How to Use This Book

A nine-session plan for confident Grade 8 review

1. **Warm up with the review pages.** Notice the big ideas before starting the tests.
2. **Complete one test at a time.** Treat each 40-question round like a real practice session.
3. **Show your reasoning.** Jot an exponent rule, equation, graph, transformation, diagram, or quick estimate when it helps.
4. **Correct actively.** Rework missed items before reading the explanation.
5. **Choose the next target.** After each test, name one skill and one habit to improve.

**New Hampshire review rhythm:** Work a test, score it, study your misses, then come back ready for the next round with one clear goal.



## What Is Inside?

Nine NH SAS tests, 360 questions, and a complete review path

| Part         | What You Will Practice                                                                               |
|--------------|------------------------------------------------------------------------------------------------------|
| Tests 1–3    | Real and irrational numbers, integer exponents, scientific notation, equations, and careful reading. |
| Tests 4–6    | Slope, systems of equations, functions, inequalities, transformations, congruence, and similarity.   |
| Tests 7–9    | Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina. |
| Answer Pages | Compact keys and explanations that show why each answer works.                                       |

The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



Scan me!  
For more practice  
& answers

# Table of Contents

|                                        |       |     |
|----------------------------------------|-------|-----|
| ★ Practice Test 1                      | _____ | 15  |
| ★ Practice Test 2                      | _____ | 31  |
| ★ Practice Test 3                      | _____ | 47  |
| ★ Practice Test 4                      | _____ | 63  |
| ★ Practice Test 5                      | _____ | 79  |
| ★ Practice Test 6                      | _____ | 93  |
| ★ Practice Test 7                      | _____ | 109 |
| ★ Practice Test 8                      | _____ | 125 |
| ★ Practice Test 9                      | _____ | 141 |
| Practice Test Answer Keys              | _____ | 157 |
| Practice Test Answers and Explanations | _____ | 163 |

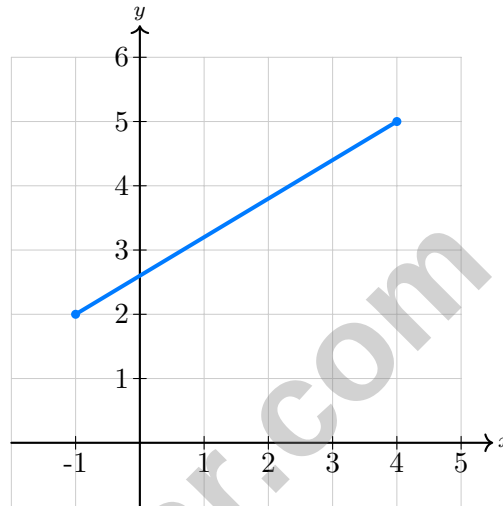
- 1) A pyramid has a rectangular base with dimensions 10 ft by 7 ft and a height of 12 ft. What is the volume?

☐ A.  $210 \text{ ft}^3$

☐ C.  $420 \text{ ft}^3$

☐ B.  $280 \text{ ft}^3$

☐ D.  $840 \text{ ft}^3$



2)

Using the two points marked, which equation represents this line?

☐ A.  $y = \frac{3}{5}x + \frac{13}{5}$

☐ C.  $y = 3x + 5$

☐ B.  $y = \frac{3}{5}x + 3$

☐ D.  $y = \frac{2}{3}x + \frac{8}{3}$

- 3) Solve:  $\frac{x+5}{-2} \leq 3$

☐ A.  $x \geq -11$

☐ C.  $x \leq -11$

☐ B.  $x \leq 1$

☐ D.  $x \geq 1$



Scan me!  
For more practice  
& answers

4) A translation moves a point from  $(a, b)$  to  $(a + 5, b - 3)$ . If another point moves from  $(-2, 4)$  to some image point using the same translation, what is the image point?

☐ A.  $(3, 1)$ ☐ C.  $(-7, 1)$ ☐ B.  $(3, 7)$ ☐ D.  $(-2, 1)$ 

5) A person receives a year-end bonus of \$1,500. She is deciding between: (1) spending it, (2) investing at 6% for 5 years, or (3) using it to pay down debt at 12% APR. Ranking by financial benefit, which is best?

☐ A. Spend it☐ C. Pay down debt at 12%☐ B. Invest at 6%☐ D. Split equally among all three

6) Which expression cannot be simplified using exponent laws?

☐ A.  $\frac{a^3}{b^5} \cdot a^2$ ☐ C.  $a^3 + a^2$ ☐ B.  $\frac{a^3}{b^2}$ ☐ D.  $(c^2)^3$ 

7) Express 356,000 in scientific notation.

8) What is the error in this work:  $\sqrt[3]{100} = 10$ ?

☐ A.  $10^3 = 100$ ☐ C.  $10^3 = 1000$ , not 100☐ B.  $10^2 = 1000$ ☐ D.  $\sqrt[3]{100} = 100^3$ 

9) If  $1.5 \times 10^4 = 15,000$ , then  $(1.5 \times 10^4) \times 10 = ?$

☐ A.  $15 \times 10^5$

☐ C. 150,000

☐ B.  $1.5 \times 10^3$

☐ D.  $1.5 \times 10^{40}$

10) Convert  $0.454545\dots$  to a fraction in simplest form.

11) Solve for  $x$ :  $\frac{x+5}{3} = 4$

☐ A.  $x = 7$

☐ C.  $x = 17$

☐ B.  $x = 12$

☐ D.  $x = 2$

12) Factor  $x^2 + 5x - 36$ .

☐ A.  $(x + 9)(x - 4)$

☐ C.  $(x + 12)(x - 3)$

☐ B.  $(x - 9)(x + 4)$

☐ D.  $(x + 6)(x - 6)$

13) For the inequality  $y \leq -\frac{1}{2}x + 3$ , which point is in the solution region?

☐ A. (0, 5)

☐ C. (2, 4)

☐ B. (0, 0)

☐ D. (4, 4)

14) Why is  $y = \sqrt{x}$  considered a function for non-negative  $x$ ?

☐ A. Because  $\sqrt{x}$  is always positive.

☐ C. Because the square root is the inverse of squaring.

☐ B. Because each input  $x \geq 0$  produces exactly one output  $y$ .

☐ D. Because  $x$  and  $y$  are both non-negative.



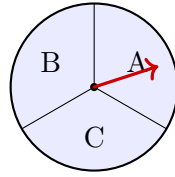
Scan me!  
For more practice  
& answers

- 1) A gardening store surveys 200 customers on plant purchase preferences. 140 bought flowering plants and 60 bought non-flowering. Among flowering-plant buyers, 98 also purchased fertilizer. What percentage of all customers bought both flowering plants and fertilizer?
- ☐ A. 49% ☐ C. 70%
- ☐ B. 56% ☐ D. 82%
- 2) Two variables have a negative correlation. Which scenario best matches this relationship?
- ☐ A. Years of education and age ☐ C. Height and weight for adults
- ☐ B. Speed of travel and time to reach a destination ☐ D. Foot length and shoe size
- 3) A square prism and a square pyramid have the same base side length (5 cm) and height (15 cm). How many times larger is the prism's volume than the pyramid's?
- ☐ A. 1.5 times ☐ C. 3 times
- ☐ B. 2 times ☐ D. 5 times
- 4) A polygon has  $n$  sides. Which formula gives the measure of each interior angle if the polygon is regular?
- ☐ A.  $\frac{(n-2) \times 180}{n}$  ☐ C.  $(n-2) \times 180$
- ☐ B.  $\frac{360}{n}$  ☐ D.  $\frac{180}{n}$



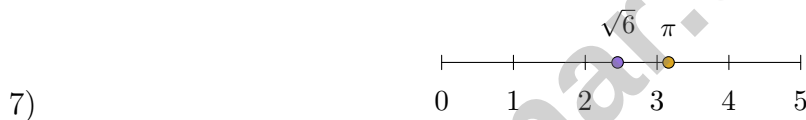
Scan me!  
For more practice  
& answers

- 5) A fair spinner with sections A, B, C (each  $\frac{1}{3}$  probability) is spun three times. What is the probability of getting C on all three spins?



- ☐ A.  $\frac{1}{9}$ 
☐ C.  $\frac{3}{27}$   
☐ B.  $\frac{1}{27}$ 
☐ D.  $\frac{1}{3}$
- 6) How many ways can a principal select 2 teachers from a staff of 12 to attend a conference (where one is the lead attendee and one is the backup)?

- ☐ A.  $\binom{12}{2} = 66$ 
☐ C.  $12^2 = 144$   
☐ B.  $12 \times 11 = 132$ 
☐ D.  $12!$



Which is true based on the number line?

- ☐ A.  $\sqrt{6} > \pi$ 
☐ C.  $\sqrt{6} = \pi$   
☐ B.  $\sqrt{6} + \pi$  is rational
 ☐ D.  $\sqrt{6} < \pi$
- 8) The sum of two people's ages is 35. In 5 years, the older person will be twice the age of the younger person. If the younger person is currently  $y$  years old, find  $y$ .



1) A figure is translated 6 units left and 3 units up. Which rule describes this translation?

- ☐ A.  $(x, y) \rightarrow (x - 6, y + 3)$       ☐ C.  $(x, y) \rightarrow (x - 6, y - 3)$   
☐ B.  $(x, y) \rightarrow (x + 6, y - 3)$       ☐ D.  $(x, y) \rightarrow (x + 6, y + 3)$

2) A student finds the surface area of a triangular prism with a right-triangle base (legs 3 cm and 4 cm, hypotenuse 5 cm) and prism height 10 cm. The student calculates: Base areas:  $2 \times \frac{1}{2}(3)(4) = 12 \text{ cm}^2$ . Lateral:  $10 \times 3 + 10 \times 4 + 10 \times 5 = 120 \text{ cm}^2$ . Total:  $12 + 120 = 132 \text{ cm}^2$ . Is this correct?

- ☐ A. Yes, the calculation is correct      are only  $12 \text{ cm}^2$  total, so the answer  
☐ B. No, the lateral area should be      is  $132 \text{ cm}^2$  (correct)  
 $12 + 120 = 132$  but the student forgot      ☐ D. The student used the wrong  
the second base      formula for the triangular base area  
☐ C. No, the lateral area is calculated  
correctly but the two triangular bases

3) A fitness app models burned calories as  $C = 0.08w + 50$ , where  $C$  is calories and  $w$  is weight in pounds. The app predicts a 150-lb person burns 62 calories. A user actually burns 65 calories. Which is true?

- ☐ A. The model overestimated by 3      ☐ C. The residual is  $-3$   
calories      ☐ D. The model is perfectly accurate  
☐ B. The model underestimated by 3  
calories

4) Which of the following is a real-world function?

- ☐ A. A person and every address they      ☐ C. A person and the cars they have  
have lived at.      ever owned.  
☐ B. A student's student ID and their      ☐ D. A website URL and every person  
grade in math class.      who has visited it.



Scan me!  
For more practice  
& answers

5) Error analysis: A student says “ $y = 2x$  and  $y = 2x + 5$  have the same slope.” Is this correct?

☐ A. Yes, both slopes are 2

☐ C. No, slopes are 0 and 2

☐ B. No, slopes are 2 and 5

☐ D. Cannot determine

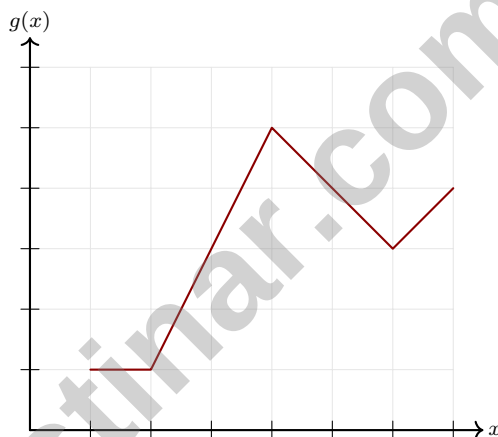
6) A gym charges a \$25 sign-up fee plus \$15 per month. Which function gives the total cost  $C$  after  $m$  months?

☐ A.  $C = 15m + 25$

☐ C.  $C = 40m$

☐ B.  $C = 25m + 15$

☐ D.  $C = 15m - 25$



7)

State the domain of the function shown.

☐ A.  $[0, 5]$

☐ C.  $[1, 5]$

☐ B.  $[0, 6]$

☐ D. All real numbers



## New Hampshire NH SAS Grade 8 Practice Test Answer Keys

**How to use this section with a Grade 8 student:**

1. check the answer first and circle any item that needs another look
2. retry the problem with fresh work before reading the explanation
3. write one short lesson learned from each missed or guessed item

**A strong review routine turns every correction into a sharper plan for the next New Hampshire NH SAS practice test.**



Scan me!  
For more practice  
& answers

## Practice Test Answers and Explanations

### Practice Test 1 Answers and Explanations

- 1) **Choice B is correct.** (8.G.C.9)  $B = 10 \times 7 = 70 \text{ ft}^2$ .  $V = \frac{1}{3} \times 70 \times 12 = 280 \text{ ft}^3$ .
- 2) **Choice A is correct.** (8.EE.B.6) Slope =  $\frac{5-2}{4-(-1)} = \frac{3}{5}$ . Using  $(-1, 2)$ :  $2 = \frac{3}{5}(-1) + b$  gives  $b = \frac{13}{5}$ .
- 3) **Choice A is correct.** (8.EE.C.8b) Multiply by  $-2$  (FLIP):  $x + 5 \geq -6$ . Subtract 5:  $x \geq -11$ .
- 4) **Choice A is correct.** (8.G.A.1) Apply the translation rule to the second point:  $(-2, 4) \rightarrow (-2 + 5, 4 - 3) = (3, 1)$ .
- 5) **Choice C is correct.** (8.G.B.7) Avoiding 12% interest is better than earning 6% return. For the same \$1,500 over 5 years, paying down 12% debt avoids about \$900 of simple interest, while a 6% investment earns about \$450 of simple interest.
- 6) **Choice C is correct.** (8.EE.A.1) Addition/subtraction of powers requires like terms with same base AND exponent.  $a^3 + a^2$  are not like terms.
- 7) **The correct answer is  $3.56 \times 10^5$ .** (8.EE.A.3) Move the decimal 5 places left to get 3.56; since the original number is greater than 1, the exponent is positive 5.
- 8) **Choice C is correct.** (8.EE.A.2) A cube root asks what number cubed gives 100. Since  $10^3 = 1000$ , 10 is not the cube root of 100.
- 9) **Choice C is correct.** (8.EE.A.4)  $1.5 \times 10^4 \times 10 = 1.5 \times 10^{4+1} = 1.5 \times 10^5 = 150,000$ .
- 10) **The correct answer is  $\frac{5}{11}$ .** (8.NS.A.1) Let  $x = 0.454545 \dots$ . Then  $100x = 45.454545 \dots$ , so  $99x = 45$  and  $x = \frac{45}{99} = \frac{5}{11}$ .
- 11) **Choice A is correct.** (8.EE.C.7) Multiply both sides by 3:  $x + 5 = 12$ . Subtract 5:  $x = 7$ .
- 12) **Choice A is correct.** (8.EE.C.7) Find two numbers that multiply to  $-36$  and add to 5: 9 and  $-4$ . Verify:  $9 \cdot (-4) = -36$  and  $9 - 4 = 5$ .
- 13) **Choice B is correct.** (8.EE.C.8b) Test each point in  $y \leq -\frac{1}{2}x + 3$ : (A)  $5 \leq -\frac{1}{2}(0) + 3 = 3$ ? NO. (B)  $0 \leq 3$ ? YES. (C)  $4 \leq -\frac{1}{2}(2) + 3 = 2$ ? NO. (D)  $4 \leq -\frac{1}{2}(4) + 3 = 1$ ? NO.
- 14) **Choice B is correct.** (8.F.A.1) A function requires each input to have exactly one output. For  $y = \sqrt{x}$ , each non-negative input  $x$  has exactly one non-negative square root.
- 15) **Choice A is correct.** (8.F.B.5) The graph shows a spike from 0 to 5 mg in 1 hour, then a gradual decrease from 5 to 2 mg over 3 hours. The steepest positive slope is in the first hour.
- 16) **Choice B is correct.** (8.G.A.2) Both reflection and rotation are rigid motions that preserve area. A sequence of rigid motions preserves the original area, so the final triangle has area 35 sq cm.
- 17) **Choice B is correct.** (8.G.B.6, 8.G.B.7) The 3-4-5 triple scaled by 10 is 30-40-50. The diagonal  $d^2 = 30^2 + 40^2 = 900 + 1600 = 2500$ , so  $d = 50$  m.
- 18) **The correct answer is A, D.** (8.G.A.5) A: Corresponding angles formed by parallel lines and a transversal are congruent—TRUE. B: Not all angles are equal; some are supplementary—FALSE. C: Alternate interior angles are congruent, not supplementary—FALSE. D: Alternate exterior angles are congruent—TRUE. E: Co-interior angles are supplementary (sum to  $180^\circ$ ), not complementary—FALSE.
- 19) **Choice C is correct.** (8.NS.A.2)  $5\sqrt{2} \approx 5 \times 1.41 = 7.05$  cm.
- 20) **Choice C is correct.** (8.EE.B.5) Slope =  $\frac{2}{7} \approx 0.286 \approx 0.29$ . This is a shallow line (slope less than 1).
- 21) **Choice C is correct.** (8.EE.C.8a) The two lines intersect at the marked point, which is  $(1, 1)$ .
- 22) **Choice A is correct.** (8.F.A.2)  $A(20) = 2.99 + 0.50(20) = 12.99$ .  $B$  slope:  $(6-1)/10 = 0.5$ , so  $B(20) = 1 + 0.5(20) = 11$ . Since  $12.99 > 11$ , Plan A costs more.
- 23) **Choice B is correct.** (8.F.A.3) Linear functions are represented by straight lines. The graph clearly shows a straight line, confirming a linear relationship.
- 24) **Choice B is correct.** (8.F.B.4) Slope:  $m = \frac{9-3}{2-0.5} = \frac{6}{1.5} = 4$ .
- 25) **Choice B is correct.** (8.G.A.3) The point  $(1, 1)$  maps to  $(-1, 1)$ , and  $(2, 2)$  maps to  $(-2, 2)$ . This is reflection across the  $y$ -axis:  $(x, y) \rightarrow (-x, y)$ .
- 26) **Choice B is correct.** (8.G.B.8) Since both points have  $y = 5$ , the horizontal distance is  $|12 - 0| = 12$ .
- 27) **Choice C is correct.** (8.G.B.7) Rectangle =  $9 \times 6 = 54 \text{ m}^2$ . Triangle =  $\frac{1}{2} \times 9 \times 5 = 22.5 \text{ m}^2$ . Total =  $54 + 22.5 = 76.5 \text{ m}^2$ . Missing the triangle piece leads to undercounting.



Scan me!  
For more practice  
& answers

**You Are Building Test Stamina**

---

**Hi, Stamina Builder!**

◇ This high-stamina book gave you nine substantial Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. Completing practice tests builds more than math knowledge. It builds the focus needed to think clearly for a long stretch. ◇

★ **Remember this:** That stamina matters. On real test day, calm pacing can be just as important as remembering a formula. ★

**Stamina Skills**

- **Breathe:** Reset before a difficult page.
- **Pace:** Do not spend too long in one place.
- **Return:** Come back to skipped questions with fresh eyes.
- **Finish Strong:** Use the last minutes to check.

**Grade 8 test-day tip:** Practice a simple reset: pause, breathe, reread, then choose your next step.

If you want to share something or ask a question, please email me at [jay@testinar.com](mailto:jay@testinar.com).

**Jay Daie**

Your Test-Stamina Coach

# CONFIDENCE TODAY, SUCCESS TOMORROW!

GRADE

8

Help your child excel in math with **9 full-length Grade 8 practice tests** designed to reflect real test formats and cover all key math standards.

With a wide variety of questions and real-world applications, this book builds the skills and confidence students need to achieve their best!



## WHAT'S INSIDE?



### Standards-Aligned Practice

Questions designed to cover essential Grade 8 math standards.



### Variety of Question Types

Multiple-choice, short answer, and more to build well-rounded skills.



### Real-World Applications

Engaging problems that connect math to everyday life.



### Step-by-Step Progress

Track improvement and build confidence with every test.



### Build Skills & Boost Confidence

Strengthen understanding and feel prepared for test day.

## COVERS ALL ESSENTIAL TOPICS

- |                                       |                            |
|---------------------------------------|----------------------------|
| ✓ The Number System                   | ✓ Statistics & Probability |
| ✓ Expressions & Equations             | ✓ Pythagorean Theorem      |
| ✓ Ratios & Proportional Relationships | ✓ Volume & Surface Area    |
| ✓ Linear Equations                    | ✓ Transformations          |
| ✓ Functions                           | ✓ Inequalities             |
| ✓ Geometry                            | ✓ Data Analysis & Graphing |
| ✓ Measurement & Data                  | ✓ And More!                |



### 2 Extra Online Practice Tests Included!

Use these two additional online practice tests for extra review after the printed tests.

[testinar.com/math8](https://testinar.com/math8)



## PRACTICE. PREPARE. SUCCEED.



# Testinar

More Practice. More Confidence.  
Better **Results**.