

8

New Hampshire

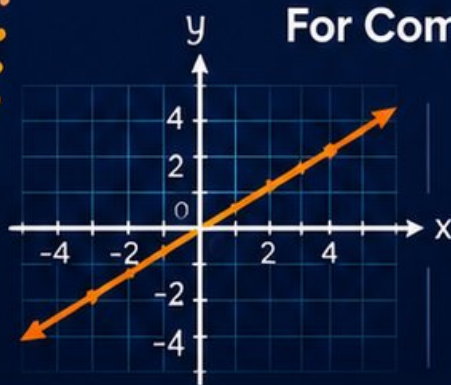
NH SAS

GRADE 8

MATH

PRACTICE TESTS

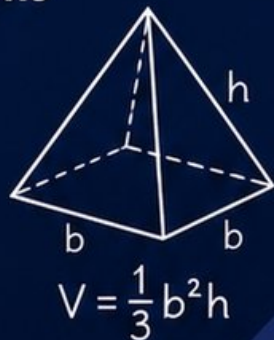
Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$

$$C = 2\pi r$$

$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}b^2 h$$



8 PRINTED
TESTS



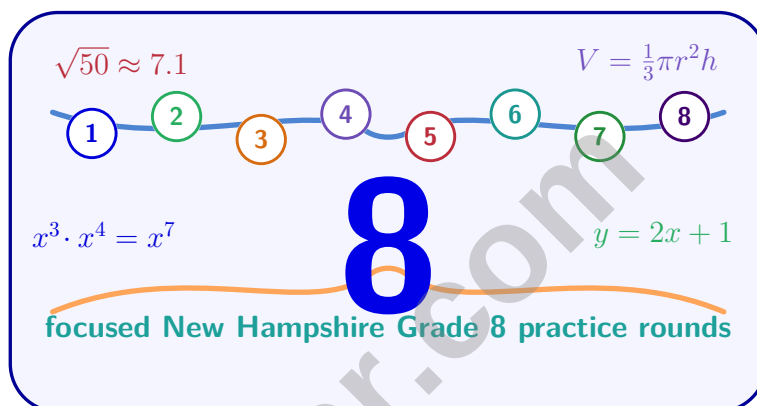
2 ONLINE
TESTS



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

8 New Hampshire NH SAS Grade 8 Math Practice Tests

New Hampshire Practice for Functions, Geometry, and Data Reasoning



Eight 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



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Welcome, New Hampshire Grade 8 Problem Solver!

Eight focused rounds for sharper NH SAS math thinking

This book gives you eight 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

An eight-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?

Eight NH SAS tests, 320 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 7–8	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.



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& answers

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1) Estimate $\sqrt{99}$ to the nearest integer.

☐ A. 8

☐ C. 10

☐ B. 9

☐ D. 11

2)

Sales	\$100	\$150	\$200	\$250	\$300
-------	-------	-------	-------	-------	-------

Five days of sales shown. Mean = \$200. What is the MAD?

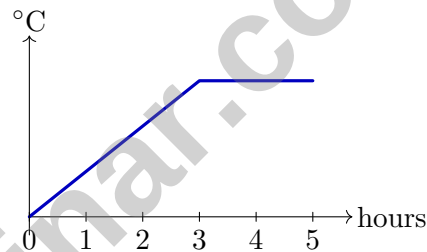
☐ A. \$40

☐ C. \$60

☐ B. \$50

☐ D. \$75

3) A graph shows temperature rising for 3 hours at 5 degrees per hour, then stays constant for 2 hours. If the starting temperature is 10 degrees C, what is the temperature after 5 hours?



4) A scatter plot shows the relationship between hours studied (x) and test score (y). The line of best fit has the equation $y = 8x + 50$. What does the slope of 8 represent?

☐ A. For each hour studied, the test score increases by 8 points on average

☐ C. The y-intercept is 8 units above the origin

☐ B. The test score when 8 hours are studied

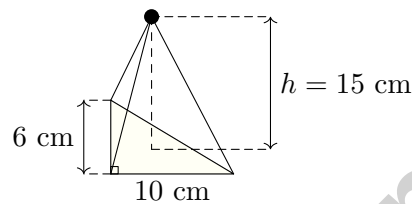
☐ D. For each point increase in test score, hours studied increases by 8


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- 5) Three angles form a straight line. Two of the angles measure 42° and 85° . What is the measure of the third angle?

☐ A. 37° ☐ C. 53°
☐ B. 43° ☐ D. 127°

- 6) A pyramid has a right-triangular base with legs 10 cm and 6 cm. The pyramid height is 15 cm. What is its volume?



☐ A. 150 cm^3 ☐ C. 450 cm^3
☐ B. 300 cm^3 ☐ D. 900 cm^3

- 7) In a study of 240 employees, 144 are full-time and 96 are part-time. Among full-time employees, 108 have health insurance. What is the relative frequency of uninsured full-time employees?

☐ A. $\frac{36}{240}$ ☐ C. $\frac{108}{240}$
☐ B. $\frac{36}{144}$ ☐ D. $\frac{108}{144}$

8)

	H	T
1	H1	T1
2	H2	T2

A coin is flipped and a spinner labeled 1, 2 is spun. What is the probability of getting an outcome where the coin is heads?

☐ A. $\frac{1}{4}$ ☐ C. $\frac{1}{3}$
☐ B. $\frac{1}{2}$ ☐ D. $\frac{3}{4}$

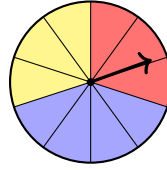


- 9) A library is awarding 3 different prizes to students: first place, second place, and third place. There are 8 students eligible. How many ways can the prizes be awarded?
- ☐ A. $8 \times 7 \times 6 = 336$ ☐ C. $8^3 = 512$
☐ B. $\binom{8}{3} = 56$ ☐ D. $8 + 7 + 6 = 21$
- 10) If $\sqrt{x}$ is rational and x is a positive integer, what must be true about x ?
- ☐ A. x is odd ☐ C. x is prime
☐ B. x is greater than 10 ☐ D. x is a perfect square
- 11) A student calculates that a \$400 purchase at 12% APR for 1 month costs \$48 in interest. What is the error in her reasoning?
- ☐ A. She divided the annual rate by 12 instead of using it directly ☐ C. She calculated 12% of 12% instead of 12% of the principal
☐ B. She forgot that APR stands for Annual Percentage Rate ☐ D. She treated the annual rate as if it applies to one month
- 12) Convert $0.\overline{13}$ to a fraction.
- ☐ A. $\frac{1}{13}$ ☐ C. $\frac{13}{99}$
☐ B. $\frac{13}{100}$ ☐ D. $\frac{2}{15}$
- 13) Solve: $2(3 - x) \geq 4$
- ☐ A. $x \geq 1$ ☐ C. $x \geq -1$
☐ B. $x \leq -1$ ☐ D. $x \leq 1$



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- 1) A spinner has 10 equal sections: 3 red, 4 blue, and 3 yellow. What is the probability of landing on red OR blue?

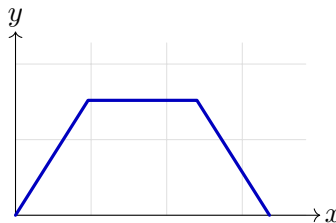


3 red, 4 blue, 3 yellow

- ☐ A. $\frac{4}{10}$
☐ C. $\frac{7}{10}$
☐ B. $\frac{12}{10}$
☐ D. $\frac{3}{10}$
- 2) Function $h(x) = -2x + 7$ and function k shown in the table: $(0, 7)$, $(1, 5)$, $(2, 3)$. Which statement is true?

x	0	1	2
$k(x)$	7	5	3

- ☐ A. h has a steeper slope than k .
 ☐ C. Both have equal slopes.
☐ B. k has a steeper slope than h .
 ☐ D. The slopes cannot be compared.
- 3) A graph shows: starting at origin, increasing to $(2, 4)$, then constant to $(5, 4)$, then decreasing to $(7, 0)$. Where is the y -intercept?

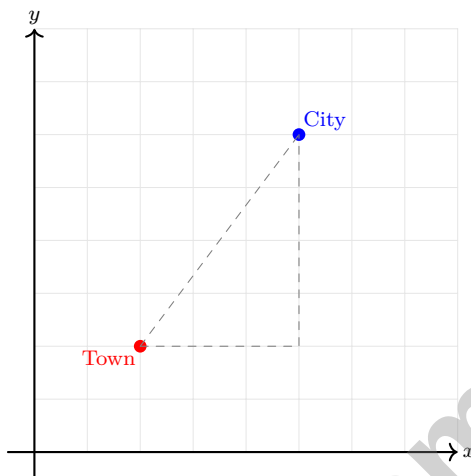


- ☐ A. $(0, 0)$
☐ C. $(5, 4)$
☐ B. $(2, 4)$
☐ D. $(7, 0)$



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- 4) On a map, a town is located at $(2, 2)$ and a city is located at $(5, 6)$. If each grid unit represents 2 kilometers, what is the straight-line distance between the town and city?

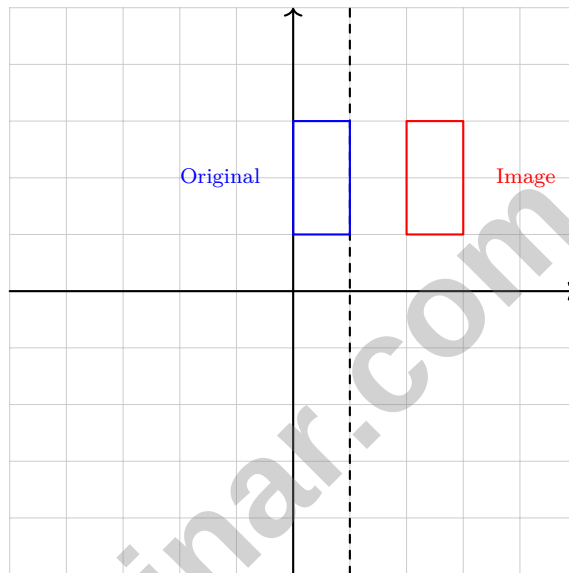


- ☐ A. 5 km ☐ C. 20 km
☐ B. 10 km ☐ D. 2.5 km
- 5) Which interpretation of MAD is correct?
- ☐ A. MAD tells you the largest value in the data ☐ C. MAD is always equal to the mean
☐ B. MAD measures the typical distance of data points from the mean ☐ D. MAD is usually negative
- 6) When the correlation between two variables is weak, the trend line:
- ☐ A. Has a slope of zero ☐ D. Will be very accurate for predictions
☐ B. Should not be used at all
☐ C. Will have large residuals and less reliable predictions



1) A car's fuel consumption shows: rapid decrease at first, then slowing. Which behavior does this match?

- ☐ A. Draining a pool with a pump ☐ C. Linear fuel burn
☐ B. Radioactive decay (initial sharp drop, then levels off) ☐ D. Exponential growth



2)

The figure shows a reflection across the dashed line $x = 1$. If a point on the original was at $(0, 2)$, where is it in the image?

- ☐ A. $(1, 2)$ ☐ C. $(0, 2)$
☐ B. $(2, 2)$ ☐ D. $(3, 2)$

3) If $(2.5 \times 10^3) \times (?) = 5 \times 10^6$, what is the missing value?

- ☐ A. 0.5×10^3 ☐ C. 2×10^3
☐ B. 2×10^2 ☐ D. 200



4) Which is the solution to $4(2x - 1) = 3x + 9$?

☐ A. $x = 1$

☐ B. $x = 3$

☐ C. $x = \frac{13}{5}$

☐ D. $x = -5$

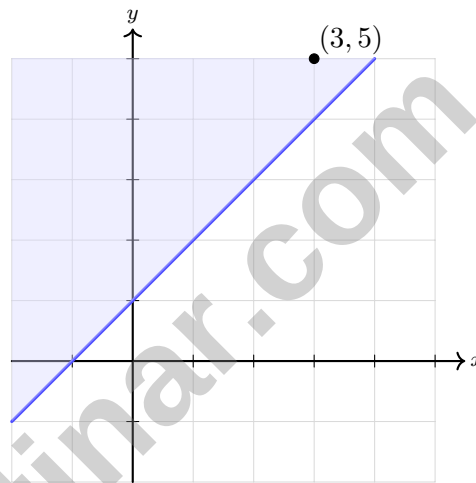
5) Multiply: $(4x - 3)(x + 2)$

☐ A. $4x^2 + 5x - 6$

☐ B. $4x^2 + 8x - 3x - 6$

☐ C. $4x^2 + 2x - 6$

☐ D. $4x^2 - 6x + 2$



6)

The graph shows a solid line and shading above. The point $(3, 5)$ is marked in the shaded region. Which inequality is represented?

☐ A. $y > x + 1$

☐ B. $y \geq x + 1$

☐ C. $y < x + 1$

☐ D. $y \leq x + 1$



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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.



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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice C is correct.** (8.EE.A.2) $9^2 = 81$ and $10^2 = 100$. Since 99 is very close to 100, $\sqrt{99} \approx 9.95 \approx 10$.
- 2) **Choice C is correct.** (8.G.B.8) Absolute deviations: $|100 - 200| = 100$, $|150 - 200| = 50$, $|200 - 200| = 0$, $|250 - 200| = 50$, $|300 - 200| = 100$. Sum = 300. MAD = $300/5 = 60$.
- 3) **The correct answer is 25.** (8.F.B.5) After 3 hours: $10 + 3 \times 5 = 25$ degrees C. Then it stays constant for 2 hours, so the final temperature is 25 degrees C.
- 4) **Choice A is correct.** (8.SP.A.2) The slope represents the rate of change. A slope of 8 means for every 1-unit increase in x , y increases by 8 units.
- 5) **Choice C is correct.** (8.G.B.7) Angles on a straight line sum to 180° . The third angle is $180 - 42 - 85 = 53^\circ$.
- 6) **Choice A is correct.** (8.G.C.9) Base area: $B = \frac{1}{2} \times 10 \times 6 = 30 \text{ cm}^2$. Volume: $V = \frac{1}{3} \times 30 \times 15 = 150 \text{ cm}^3$.
- 7) **Choice B is correct.** (8.SP.A.4) Uninsured full-time = $144 - 108 = 36$. Relative frequency among full-time only: $\frac{36}{144} = \frac{1}{4} = 0.25$. This is row-conditional.
- 8) **Choice B is correct.** (8.G.B.7) Outcomes with H: H1, H2. That's 2 of 4 outcomes. $P = \frac{2}{4} = \frac{1}{2}$.
- 9) **Choice A is correct.** (8.EE.C.7b) First place: 8 choices. Second place: 7 remaining students. Third place: 6 remaining students. Total: $8 \times 7 \times 6 = 336$ ways.
- 10) **Choice D is correct.** (8.NS.A.1) For $\sqrt{x}$ to be rational when x is a positive integer, x must be a perfect square (like 1, 4, 9, 16, 25, etc.). Non-perfect squares have irrational square roots.
- 11) **Choice D is correct.** (8.G.B.7) Correct: $I = 400 \times (0.12/12) \times 1 = \4 . She incorrectly applied 12% for 1 month (should use the monthly rate of 1%), mistaking APR as a monthly rate.
- 12) **Choice D is correct.** (8.NS.A.1) Let $x = 0.1\bar{3} = 0.1333\dots$. Then $10x = 1.\bar{3}$ and $100x = 13.\bar{3}$. Subtracting: $100x - 10x = 12$, so $90x = 12$ and $x = \frac{12}{90} = \frac{2}{15}$.
- 13) **Choice D is correct.** (8.EE.C.8b) Distribute: $6 - 2x \geq 4$. Subtract 6: $-2x \geq -2$. Divide by -2 (FLIP): $x \leq 1$.
- 14) **Choice C is correct.** (8.NS.A.2) The midpoint between 4 and 5 is 4.5. Check: $(4.5)^2 = 20.25$. Since $17 < 20.25$, we have $\sqrt{17} < 4.5$. Therefore $\sqrt{17}$ is closer to 4.
- 15) **Choice D is correct.** (8.EE.A.1) Multiply exponents sequentially: $(d^2)^2 = d^{2 \cdot 2} = d^4$; then $(d^4)^3 = d^{4 \cdot 3} = d^{12}$. OR multiply all three: $2 \times 2 \times 3 = 12$, so d^{12} .
- 16) **Choice C is correct.** (8.EE.A.4) Multiply coefficients: $2 \times 3 \times 5 = 30 = 3 \times 10^1$. Add exponents: $10^{2+3+1} = 10^6$. Combine: $3 \times 10^1 \times 10^6 = 3 \times 10^7$.
- 17) **Choice D is correct.** (8.EE.B.6) Using $y = mx + b$: $3 = -1(1) + b$, so $3 = -1 + b$, thus $b = 4$.
- 18) **Choice D is correct.** (8.EE.C.7) Find common denominator (6): $\frac{3y}{6} + \frac{2y}{6} = 10 \Rightarrow \frac{5y}{6} = 10$. Multiply by 6: $5y = 60$. Divide by 5: $y = 12$.
- 19) **Choice C is correct.** (8.EE.C.7) $(x - 7)^2 = (x - 7)(x - 7) = x^2 - 7x - 7x + 49 = x^2 - 14x + 49$.
- 20) **The correct answer is A,C.** (8.F.A.2) A is correct because the coefficient of x is $\frac{2}{3}$. C is correct because $\frac{9-5}{3-1} = 2$. B has slope $\frac{2}{3}$, D has slope $\frac{4}{5}$, and E has slope 2, so those statements are false.
- 21) **Choice B is correct.** (8.G.B.6, 8.G.B.7) The 7-24-25 triple applies directly: $d^2 = 7^2 + 24^2 = 49 + 576 = 625$, so $d = 25$ cm.
- 22) **Choice D is correct.** (8.NS.A.2) $\frac{\pi}{2} \approx \frac{3.14}{2} = 1.57$.
- 23) **Choice C is correct.** (8.EE.A.3) In scientific notation, the coefficient must be at least 1 and less than 10. Only 1.23×10^5 satisfies this.
- 24) **Choice C is correct.** (8.EE.B.5) Store A: $6/3 = 2$ per pound. Store B: $11/5 = 2.20$ per pound. Store C: $5/2 = 2.50$ per pound. Store A is cheapest.
- 25) **Choice A is correct.** (8.EE.C.8a) Substitute $y = 2x - 5$ into $4x - y = 7$: $4x - (2x - 5) = 7$, so $2x + 5 = 7$ and $x = 1$. Then $y = 2(1) - 5 = -3$, so the solution is $(1, -3)$.
- 26) **Choice B is correct.** (8.F.A.3) When second differences are constant, the function is quadratic (nonlinear). Linear functions have constant first differences, not second.



Hi, Momentum Builder!

◇ Finishing a Grade 8 practice book is not a small thing. It means you practiced persistence, patience, and flexible problem solving. ◇

★ **Remember this:** Some questions were quick. Others probably made you stop and think. Both kinds helped you grow because practice turns effort into confidence. This version gave you 8 opportunities to rehearse test-day habits. ★

Momentum Habits

- **Start Clean:** Write down what the problem gives you.
- **Pick a Tool:** Use a table, model, equation, or graph.
- **Keep Moving:** Skip and return when needed.
- **Review Smart:** Study mistakes without judging yourself.

Grade 8 test-day tip: If a problem feels stuck, change tools. A graph, table, or sketch can make the same idea clearer.

If you want to share something or ask a question, please email me at jay@testinar.com.

Jay Daie

Your Math Momentum Partner

PRACTICE TODAY, SUCCEED TOMORROW!

Give your child the confidence and skills they need with **8 full-length Grade 8** Math practice tests that mirror real test formats and cover all key math standards. Perfect for building skills, strengthening problem-solving abilities, and achieving success on test day!

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



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

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More Practice. More Confidence.
Better Results.