

NEW HAMPSHIRE

NH SAS

GRADE 8 MATH

PRACTICE TESTS

5

PRINTED
TESTS



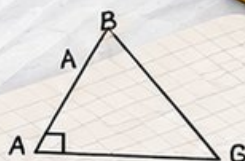
2

 ONLINE
TESTS

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



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



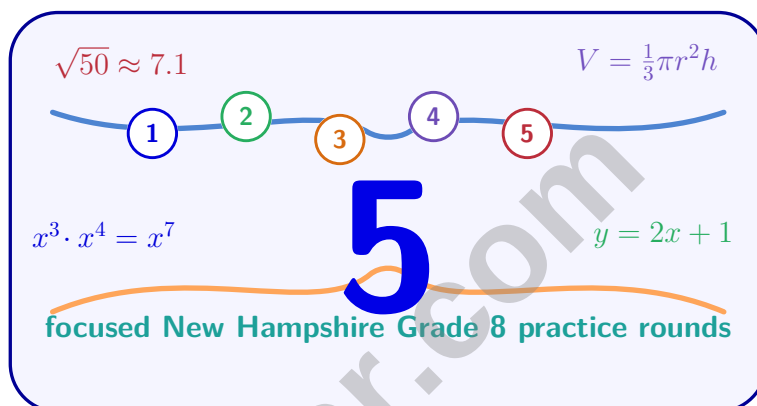
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

5 New Hampshire NH SAS Grade 8 Math Practice Tests

Steady NH SAS Prep for Real Numbers, Graphs, and Data



Five 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!

Five focused rounds for sharper NH SAS math thinking

This book gives you five 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 five-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?

Five NH SAS tests, 200 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–5	Functions, systems, transformations, geometry, data analysis, and multi-step problem solving.
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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- 1) A menu has 4 drink types and 5 snack types. A customer orders one drink and one snack. How many different orders are possible?

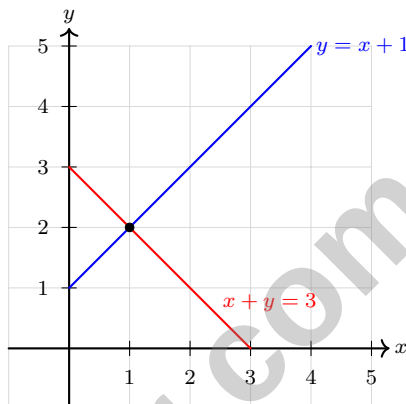
☐ A. $4 + 5 = 9$

☐ B. $4 \times 5 = 20$

☐ C. $5^4 = 625$

☐ D. $4^5 = 1,024$

- 2) Use the graph below to find the solution to the system of $y = x + 1$ and $x + y = 3$.



☐ A. (1, 2)

☐ B. (0, 3)

☐ C. (2, 1)

☐ D. (3, 0)

- 3) Triangle PQR has vertices $P(1, 2)$, $Q(4, 2)$, and $R(2, 5)$. A translation moves P to $P'(4, 5)$. What is the image of Q after this translation?

☐ A. (7, 3)

☐ B. (7, 5)

☐ C. (5, 7)

☐ D. (6, 4)

- 4) A bicycle rental costs \$5 base fee plus \$3 per hour. If the relationship is graphed with hours on the x -axis and cost on the y -axis, what is the slope?

☐ A. $\frac{3}{5}$

☐ B. 8

☐ C. 3

☐ D. 5



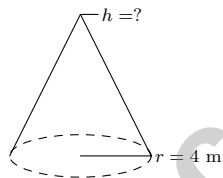
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- 5) Two hikers start from the same trailhead and walk in the same direction. One walks at 3 mph and the other at 4 mph. If they walk for the same amount of time, after how many hours will the faster hiker be 2 miles ahead?

☐ A. 0.5 hours ☐ C. 1.5 hours
☐ B. 1 hour ☐ D. 2 hours

- 6) If $g(x) = 5x - 3$ and $g(x) = 12$, what is x ?

☐ A. 3 ☐ C. 4
☐ B. 2 ☐ D. 15



7)

A cone has a base radius of 4 m and volume of 201.06 m^3 . What is its height? (Use $\pi \approx 3.14$.)

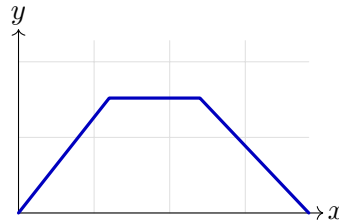
☐ A. 12 m ☐ C. 18 m
☐ B. 15 m ☐ D. 24 m

- 8) A student claims the line through (1, 3) and (3, 6) has slope $\frac{2}{3}$. What error did the student make?

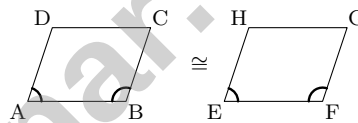
☐ A. Inverted the slope as $\frac{\Delta x}{\Delta y}$ ☐ C. Used (1, 3) twice
☐ B. Subtracted incorrectly ☐ D. Used the y -intercept as the slope



- 9) A graph of a function shows distance from home (in miles) vs. time. The graph rises, then is flat, then falls. Which real-world scenario matches?



- ☐ A. Drive somewhere, stop, then drive home
☐ B. Walk faster and faster until stopping
☐ C. Stay home, then drive faster
☐ D. Drive home directly from work
- 10) Two congruent quadrilaterals are shown. A student reasons: "Since two angles are equal, the quadrilaterals must be congruent." What is wrong with this reasoning?



- ☐ A. Two equal angles alone do NOT guarantee congruence
☐ B. Equal angles guarantee equal side lengths
☐ C. The student's reasoning is correct; angle equality proves congruence
☐ D. Congruent figures never have equal angles



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1) Point $Z(6, 8)$ is rotated 90° counterclockwise about the origin. What is the image Z' ?

☐ A. $(8, 6)$

☐ B. $(-8, 6)$

☐ C. $(-6, -8)$

☐ D. $(6, -8)$

2) Solve by elimination:
$$\begin{cases} 2x + y = 7 \\ x - y = 2 \end{cases}$$

☐ A. $(2, 3)$

☐ B. $(1, 5)$

☐ C. $(3, 1)$

☐ D. $(4, -1)$

3) A company's profit P (in dollars) after n years is given by $P = 1000n^2 + 500$. Is this linear or nonlinear?

☐ A. Linear; profit increases steadily

☐ B. Nonlinear; n is squared, creating a parabola

☐ C. Linear; the equation has two terms

☐ D. Nonlinear; profit must eventually decrease

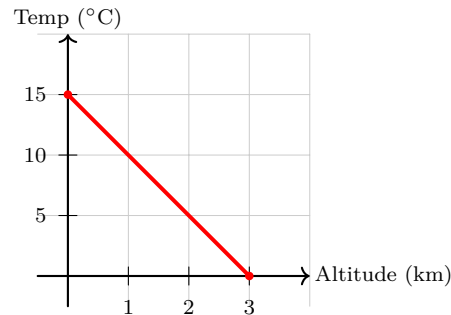
4) If $3^a \cdot 3^5 = 3^{12}$, what is the value of a ?



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- 5) A graph shows temperature (in $^{\circ}\text{C}$) versus altitude (in km). The line passes through $(0, 15)$ and $(3, 0)$.



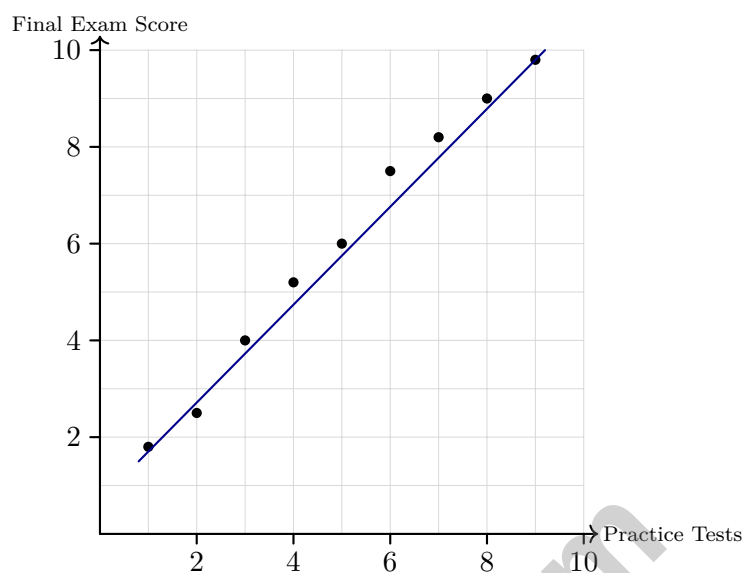
What is the slope?

- ☐ A. -5°C per km
- ☐ B. 5°C per km
- ☐ C. $-\frac{1}{5}^{\circ}\text{C}$ per km
- ☐ D. 3°C per km
- 6) A cube-shaped storage container has a volume of 512 cubic feet. What is the side length of the cube?

- 7) A slower cyclist riding 12 mph has a 9-mile head start. A faster cyclist riding 15 mph starts from the same point and rides in the same direction. How long will it take the faster cyclist to catch up?

- ☐ A. 2 hours
- ☐ B. 2.5 hours
- ☐ C. 3 hours
- ☐ D. 4 hours





1)

A student takes 5 practice tests. Based on the trend line, what is the predicted final exam score?

☐ A. Approximately 5

☐ C. Approximately 7

☐ B. Approximately 6

☐ D. Approximately 8

2) Marco deposits \$1,500 at an annual simple-interest rate of 4%. How much interest does he earn after 2 years?

☐ A. \$60

☐ C. \$240

☐ B. \$150

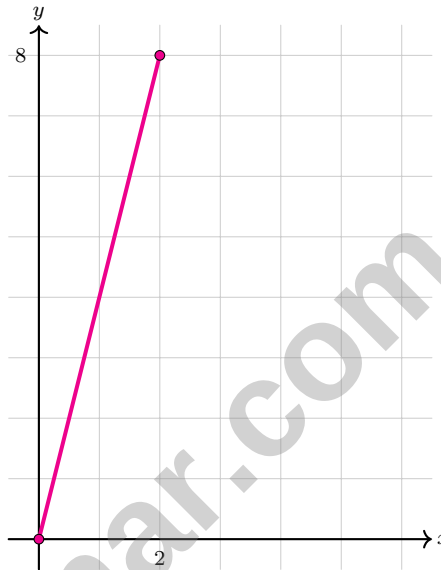
☐ D. \$120

3) Simplify $\left(\frac{x}{y}\right)^2$ where $y \neq 0$.

☐ A. $\frac{2x}{2y}$
☐ C. $\frac{x^2}{y^2}$
☐ B. $\frac{x}{y^2}$
☐ D. $\frac{x^2}{y}$


4) A student claims that $\sqrt{49} + \sqrt{64} = \sqrt{113}$. Is this correct?

- ☐ A. Yes, because $49 + 64 = 113$ ☐ C. No, because square roots cannot be added
- ☐ B. Yes, but only if we simplify the radicals first ☐ D. No, because $\sqrt{49} + \sqrt{64} = 15$



5)

Which equation represents this line?

- ☐ A. $y = 2x$ ☐ C. $y = 6x$
- ☐ B. $y = 8x$ ☐ D. $y = 4x$

6) Which system below can be solved by the elimination shown: adding the two equations to eliminate y ?

- ☐ A. $3x + y = 10$ and $2x + y = 7$ ☐ C. $x - 2y = 3$ and $2x + y = 5$
- ☐ B. $4x + 3y = 12$ and $2x - 3y = 6$ ☐ D. $5x + 2y = 11$ and $3x + y = 6$



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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 B is correct.** (8.EE.C.7b) Choose from 4 drinks and 5 snacks: $4 \times 5 = 20$ possible orders.
- 2) **Choice A is correct.** (8.EE.C.8a) The two lines intersect at the point marked on the graph. At this point, both $x = 1$ and $y = 2$. Verify: $y = 1 + 1 = 2$ ✓ and $1 + 2 = 3$ ✓.
- 3) **Choice B is correct.** (8.G.A.3) The translation vector is $(4, 5) - (1, 2) = (3, 3)$. So $Q' = Q + (3, 3) = (4, 2) + (3, 3) = (7, 5)$.
- 4) **Choice C is correct.** (8.EE.B.5) The rate of change is the hourly cost, which is \$3 per hour. The slope is 3.
- 5) **Choice D is correct.** (8.EE.C.8c) Let t be the number of hours. The faster hiker gains $4t - 3t = t$ miles on the slower hiker. Set $t = 2$, so the faster hiker is 2 miles ahead after 2 hours.
- 6) **Choice A is correct.** (8.F.A.1) Solve $5x - 3 = 12$: add 3 to both sides to get $5x = 15$, so $x = 3$.
- 7) **Choice A is correct.** (8.G.C.9) From $V = \frac{1}{3}\pi r^2 h$: $201.06 = \frac{1}{3} \times 3.14 \times 16 \times h = \frac{3.14 \times 16}{3} \times h = 16.747... \times h$. Thus $h = \frac{201.06}{16.747} \approx 12$ m.
- 8) **Choice A is correct.** (8.F.B.4) Correct: $m = \frac{6-3}{3-1} = \frac{3}{2}$. The student used $\frac{\Delta x}{\Delta y} = \frac{2}{3}$ instead of $\frac{\Delta y}{\Delta x}$, so the rise and run were inverted.
- 9) **Choice A is correct.** (8.F.B.5) Rising = increasing distance (driving away). Flat = constant distance (stopped). Falling = decreasing distance (returning home).
- 10) **Choice A is correct.** (8.G.A.2) For quadrilaterals, having two equal angles is not sufficient to prove congruence. Many quadrilaterals can share two angles but have different side lengths and shapes. Congruence requires all corresponding sides and angles to be equal.
- 11) **Choice B is correct.** (8.G.A.5) The vertex angle plus the two equal base angles sum to 180° : $(5r - 5) + 2(2r + 25) = 180$. This simplifies to $9r + 45 = 180$, so $9r = 135$ and $r = 15$.
- 12) **Choice B is correct.** (8.G.B.6, 8.G.B.7) From $(\sqrt{24})^2 + 1^2 = c^2$, we get $24 + 1 = 25$, so $c = \sqrt{25} = 5$.
- 13) **Choice A is correct.** (8.G.B.8) $d = \sqrt{(5-0)^2 + (12-0)^2} = \sqrt{25 + 144} = \sqrt{169} = 13$.
- 14) **Choice C is correct.** (8.G.B.7) Let the angle be x . Its supplement is $180 - x$. So $x = (180 - x) + 8 \Rightarrow x = 188 - x \Rightarrow 2x = 188 \Rightarrow x = 94^\circ$.
- 15) **Choice B is correct.** (8.G.C.9) $343 = \frac{1}{3} \times s^2 \times 7$, so $s^2 = 147$. Therefore $s = \sqrt{147} = 7\sqrt{3}$ cm.
- 16) **Choice C is correct.** (8.G.B.7) Rectangle = $10 \times 3 = 30$ in². Trapezoid = $\frac{1}{2}(6 + 10) \times 4 = 32$ in². Add the two parts: $30 + 32 = 62$ in².
- 17) **Choice B is correct.** (8.G.A.5) Sum of interior angles in a quadrilateral is 360° . So $x = 360 - 72 - 88 - 95 = 105^\circ$.
- 18) **Choice D is correct.** (8.SP.A.1) The red points form one cluster, and the blue points form another. The graph therefore contains two distinct groups rather than one random set or one common linear pattern.
- 19) **The correct answer is 20.** (8.EE.C.7) Compute $9(2)^2 - 16 = 36 - 16 = 20$.
- 20) **Choice A is correct.** (8.SP.A.4) Men voting yes = $120 - 75 = 45$. Relative frequency = $\frac{45}{120} = 0.375 = 37.5\%$.
- 21) **The correct answer is A,D.** (8.EE.B.5) Line 1: $k = \frac{6}{4} = 1.5$, so $y = 1.5x$ (\$1.50/lb). Line 2: $k = \frac{12}{6} = 2$, so $y = 2x$ (\$2.00/lb). A is correct (Line 1 equation and price). D is correct (Line 2 has greater slope: $2 > 1.5$). C is wrong (Line 2 is steeper, not Line 1). B is correct but not a correct pair; E is subjective (worse deal, not better). Answer: A and D.
- 22) **Choice A is correct.** (8.G.B.8) Mean = 10.4. Deviations: 0.4, 0.6, 0.4, 0.6, 0.4. MAD = $(0.4 + 0.6 + 0.4 + 0.6 + 0.4)/5 = 2.4/5 = 0.48 < 1$. Set A clusters within 0.6 of the mean, so small MAD. Other sets are more spread.
- 23) **Choice C is correct.** (8.G.B.7) Girls playing volleyball: 15. Total students: 45. $P = \frac{15}{45} = \frac{1}{3}$.
- 24) **Choice C is correct.** (8.SP.A.2) A line of best fit minimizes the overall distance between itself and the data points, capturing the general trend. It rarely passes through every point.
- 25) **Choice C is correct.** (8.G.A.4) The area ratio smaller:larger is $\frac{9}{16}$. The linear ratio is $\sqrt{\frac{9}{16}} = \frac{3}{4}$, so the scale factor from the smaller polygon to the larger polygon is the reciprocal, $\frac{4}{3}$.
- 26) **The correct answer is \$35.** (8.F.A.1) Compute $25 + 0.10(100) = 35$.



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Hi, Persistent Problem Solver!

◇ Some Grade 8 questions ask you to hold several ideas in your mind at once. That can feel hard, and that is exactly why practice matters. ◇

★ **Remember this:** You showed persistence by continuing through the set. That habit is powerful because difficult problems often open after one more good attempt. You practiced across 5 full Grade 8 practice tests, and that repeated effort matters. ★

Persistence Tools

- **Try a Smaller Case:** Use an easier number to see the pattern.
- **Draw It:** Make the situation visible.
- **Restate It:** Say the question in your own words.
- **Check One Step:** Fix the first unclear place.

Grade 8 test-day tip: When stuck, do not restart everything. Find the first step you trust, then rebuild from there.

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

Jay Daie

Your Persistence Coach

Practice Today. Succeed Tomorrow!

Give your child the confidence and skills they need with **5 full-length Grade 8 Math** practice tests that reflect 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.

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! |

5
PRINTED
TESTS



2 ONLINE
TESTS



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