

10

New Hampshire

NH SAS

GRADE

8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

10

**PRINTED
TESTS**



2

**ONLINE
TESTS**



Build Confidence



Master Key Math Skills

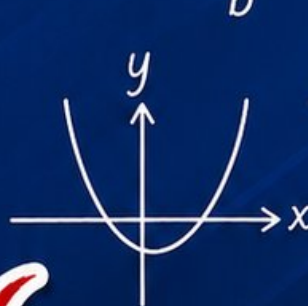
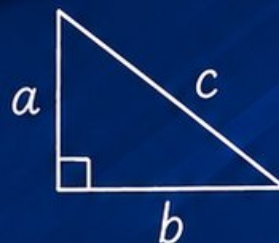


**Answer Explanations for
Every Question**



**Test-Taking Strategies
That Work**

$$y = mx + b$$



$$3x - 7 = 2(x + 5)$$
$$x = 17$$

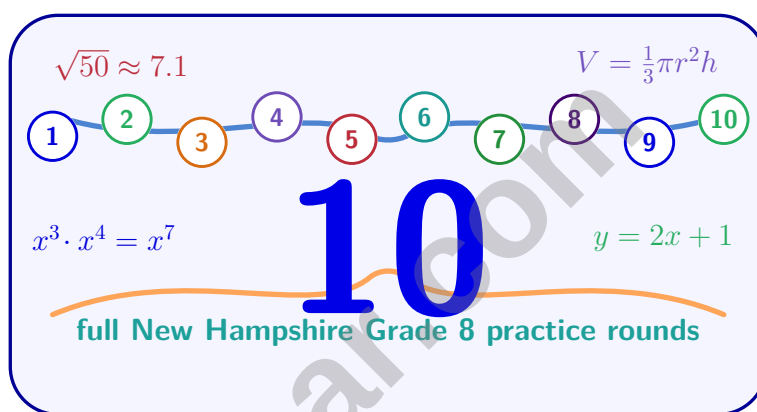


**USE THESE TWO
ADDITIONAL ONLINE
PRACTICE TESTS**

**FOR EXTRA REVIEW AFTER
THE PRINTED TESTS
IN THIS BOOK.**

10 New Hampshire NH SAS Grade 8 Math Practice Tests

New Hampshire Grade 8 NH SAS Practice for trail-ready review across rates, real numbers, equations, geometry, data, and probability



Ten complete 40-question Grade 8 NH SAS practice rounds with linear relationships, scientific notation, real numbers, equations, functions, 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!

Ten focused rounds for sharper New Hampshire NH SAS math thinking

This book gives you ten full Grade 8 NH SAS math practice tests. Each round is built to help you notice structure, compare quantities, use linear reasoning, handle real numbers, and explain your thinking with care.

Grade 8 standards focus: This page supports **Comparing Two Functions** (8.F.A.2): Compare properties of two functions each represented in a different way (algebraically, graphically, numerically, or verbally). The same routine helps with **Understanding Scientific Notation** (8.EE.A.3): Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities.

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 ten-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 a proportion, equation, diagram, number line, 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.

Grade 8 standards focus: Keep the routine connected to **Sketching and Describing Function Graphs** (8.F.B.5): Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits qualitative features described verbally. You will also meet **Solving Linear Equations in One Variable** (8.EE.C.7): Solve linear equations in one variable, including equations with one solution, infinitely many solutions, or no solutions.

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?

Ten New Hampshire NH SAS tests, 400 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Linear relationships, integer exponents, scientific notation, real-number reasoning, and careful reading.
Tests 4–6	Expressions, equations, inequalities, transformations, geometry, and multi-step problem solving.
Tests 7–9	Data analysis, probability, mixed review, stamina, and choosing efficient strategies.
Test 10	A final New Hampshire round to show growth across the whole book.
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.

Grade 8 standards focus: Use these habits while practicing **Transformations on the Coordinate Plane** (8.G.A.3): Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. A second useful connection is **Comparing Two Functions** (8.F.A.2): Compare properties of two functions each represented in a different way (algebraically, graphically, numerically, or verbally).



Scan me!
For more practice
& answers

Table of Contents

★ Practice Test 1	_____	15
★ Practice Test 2	_____	32
★ Practice Test 3	_____	49
★ Practice Test 4	_____	66
★ Practice Test 5	_____	81
★ Practice Test 6	_____	95
★ Practice Test 7	_____	111
★ Practice Test 8	_____	127
★ Practice Test 9	_____	143
★ Practice Test 10	_____	158
Practice Test Answer Keys	_____	174
Practice Test Answers and Explanations	_____	180

1) Which inequality has a solid boundary line?

☐ A. $y > 3x - 2$

☐ C. $y \geq -x + 4$

☐ B. $y < x + 5$

☐ D. $y \neq 2x - 1$

2) A cylindrical paint can has radius 2.5 feet and height 3 feet. The paint covers only the curved side (lateral surface), not the top or bottom. Which expression gives the area that needs paint?

☐ A. $2\pi(2.5)^2 + 2\pi(2.5)(3)$

☐ C. $\pi(2.5)^2 + \pi(2.5)(3)$

☐ B. $2\pi(2.5)(3)$

☐ D. $(2.5)(3)$

3) A furniture store's weekly profit is modeled by $P = 150w - 800$, where P is profit in dollars and w is number of items sold. What does the -800 represent?

☐ A. The profit per item sold

☐ C. The loss when $w = 0$

☐ B. The weekly operating costs

☐ D. The revenue generated

4) The relationship between inches (x) and centimeters (y) is $y = 2.54x$. How many centimeters equal 10 inches?

☐ A. 20.4 cm

☐ C. 25.4 cm

☐ B. 23.4 cm

☐ D. 26.4 cm

5) What is the solution to $6(x + 2) = 30$?

☐ A. $x = 3$

☐ C. $x = 8$

☐ B. $x = 5$

☐ D. $x = -2$



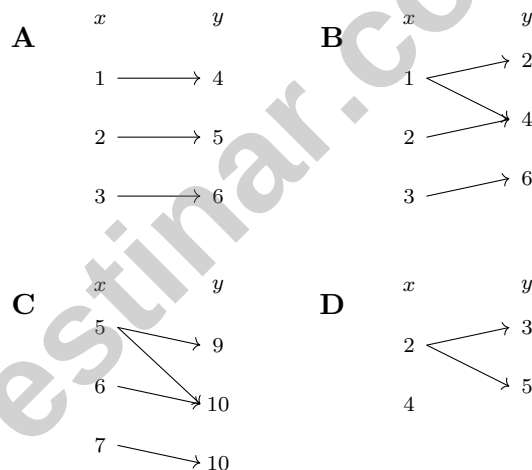
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- 6) A bank account earns 3% simple interest on a principal of \$2,000. How much interest will be earned in 4 years?

- 7) Factor completely: $2x^2 + 10x + 8$.

- ☐ A. $2(x^2 + 5x + 4)$
☐ C. $2(x + 2)(x + 4)$
☐ B. $(x + 2)(2x + 4)$
☐ D. $2x(x + 5) + 8$

- 8) Which mapping diagram represents a function?



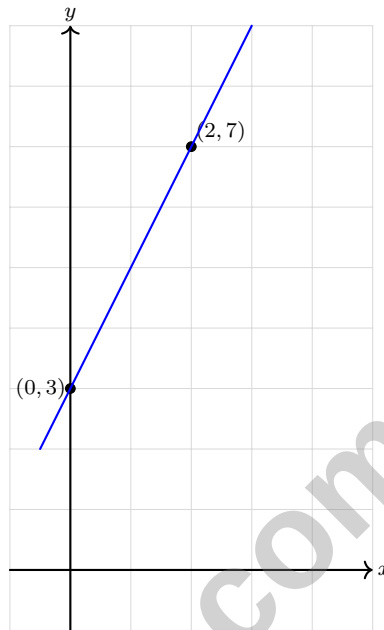
- 9) $\alpha(x) = -3x + 12$ and β table $(0, 12), (2, 6), (4, 0)$. Related how?

x	0	2	4
$\beta(x)$	12	6	0

- ☐ A. Identical
 ☐ C. Different slopes.
☐ B. Same slope, different intercepts.
 ☐ D. Cannot be determined.



10) The graph shows a linear function passing through points $(0, 3)$ and $(2, 7)$.



What is the slope of the line?

☐ A. 2

☐ B. 3

☐ C. $\frac{1}{2}$

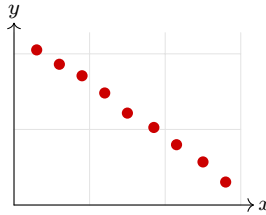
☐ D. $\frac{2}{7}$



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1) For the equation $y = 3x - \frac{1}{5}$, identify the slope and y -intercept. Is it linear?

- ☐ A. Slope 3, intercept $\frac{1}{5}$; nonlinear ☐ D. Cannot determine without more data
☐ B. Slope 3, intercept $-\frac{1}{5}$; linear
☐ C. Slope $-\frac{1}{5}$, intercept 3; linear



2)

A negative slope on a scatter plot indicates:

- ☐ A. There is no relationship between the variables ☐ C. As x increases, y increases on average
☐ B. The line is horizontal ☐ D. As x increases, y decreases on average

3) Triangle ABC is similar to Triangle DEF . Side $AB = 4$ cm, $BC = 5$ cm, $CA = 6$ cm. The perimeter of DEF is 45 cm. Find the length of EF .

- ☐ A. 15 cm ☐ C. 22.5 cm
☐ B. 18 cm ☐ D. 10 cm

4) A savings account has $S(n) = 50 + 10n$ dollars after n weeks. After how many weeks will the account have \$150?

- ☐ A. 5 weeks ☐ C. 15 weeks
☐ B. 10 weeks ☐ D. 20 weeks



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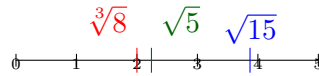
5) Which statement is false?

- ☐ A. Every whole number is rational ☐ C. $\sqrt{9}$ is rational
☐ B. No irrational number can be written as a fraction ☐ D. π is rational

6) What is $0.1\overline{2}$ as a fraction?

- ☐ A. $\frac{12}{100}$ ☐ C. $\frac{12}{99}$
☐ B. $\frac{1}{12}$ ☐ D. $\frac{11}{90}$

7)



Which list orders the values from least to greatest?

- ☐ A. $\sqrt{15}, \sqrt{5}, \sqrt[3]{8}$ ☐ C. $\sqrt{5}, \sqrt{15}, \sqrt[3]{8}$
☐ B. $\sqrt{5}, \sqrt[3]{8}, \sqrt{15}$ ☐ D. $\sqrt[3]{8}, \sqrt{5}, \sqrt{15}$

8) Which is the best estimate of $\sqrt{30}$?

- ☐ A. 4.5 ☐ C. 6.0
☐ B. 15.0 ☐ D. 5.5

9) Convert 3.9×10^0 to standard form.

- ☐ A. 0.39 ☐ C. 39
☐ B. 390 ☐ D. 3.9



- 1) A student can wear a shirt, pants, and shoes. There are 3 shirt colors, 2 pant types, and 4 shoe styles. How many different outfits are possible?

Shirts	Pants	Shoes
3 colors	2 types	4 styles

- ☐ A. $3 + 2 + 4 = 9$
☐ C. $3^2 \times 4 = 36$
☐ B. $3 \times 2 \times 4 = 24$
☐ D. $24 + 3 = 27$

- 2) Solve:
$$\begin{cases} 5x - 2y = 4 \\ 2x + y = 7 \end{cases}$$

- ☐ A. (1, 2)
 ☐ C. (1.2, 1)
☐ B. (2, 1)
 ☐ D. (2, 3)

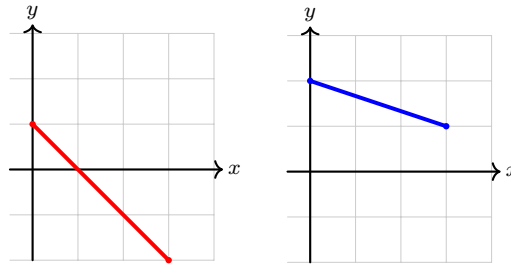
- 3) Function through (1, 2) and (4, 14). y -intercept?

- 4) A quadrilateral is rotated 180° about the origin. If one vertex is at $(-5, 3)$, where is that vertex after the rotation?

- ☐ A. (5, -3)
 ☐ C. (5, 3)
☐ B. (-5, -3)
 ☐ D. (3, 5)



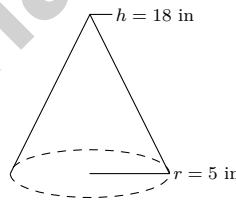
5) Which graph best represents a line with slope $-\frac{1}{3}$?



- ☐ A. Red line (left)
 ☐ C. Both have slope $-\frac{1}{3}$
- ☐ B. Neither has slope $-\frac{1}{3}$
☐ D. Blue line (right)
- 6) A 300 mL mixture contains 40% juice and 60% water. How much pure juice must be added to make the mixture 60% juice?

- ☐ A. 75 mL
 ☐ C. 150 mL
- ☐ B. 100 mL
 ☐ D. 200 mL

7)



A cone has radius 5 in and height 18 in. What is its volume? (Use $\pi \approx 3.14$.)

- ☐ A. 235.5 in³
☐ C. 706.5 in³
- ☐ B. 471 in³
☐ D. 1413 in³



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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.C.8b) The symbols $>$ and $<$ (strict inequalities) use DASHED lines. The symbols $\geq$ and $\leq$ (non-strict) use SOLID lines because the boundary points are INCLUDED in the solution.
- 2) **Choice B is correct.** (8.G.C.9) Lateral (curved side) surface area $= 2\pi rh = 2\pi(2.5)(3)$. Options A includes the bases; C mixes formulas; D ignores π entirely.
- 3) **Choice C is correct.** (8.SP.A.3) When $w = 0$, $P = -800$, meaning there is a \$800 loss with no sales. This represents fixed costs or initial loss.
- 4) **Choice C is correct.** (8.EE.B.5) $y = 2.54(10) = 25.4$ cm. The unit rate is 2.54 cm per inch.
- 5) **Choice A is correct.** (8.EE.C.7) Distribute: $6x + 12 = 30$. Subtract 12: $6x = 18$. Divide by 6: $x = 3$.
- 6) **The correct answer is \$240.** (8.G.B.7) $I = Prt = 2000 \times 0.03 \times 4 = \240 .
- 7) **Choice C is correct.** (8.EE.C.7) GCF is 2: $2x^2 + 10x + 8 = 2(x^2 + 5x + 4) = 2(x+2)(x+4)$.
- 8) **Choice A is correct.** (8.F.A.1) Option A has each input mapping to exactly one output. Option B has input 1 mapping to two outputs. Option C has input 5 mapping to two outputs. Option D has input 2 mapping to two outputs.
- 9) **Choice A is correct.** (8.F.A.2) β slope: $(6 - 12)/2 = -3$. Using $(0, 12)$: $\beta(x) = -3x + 12$. Same as α .
- 10) **Choice A is correct.** (8.F.B.4) Slope is $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 3}{2 - 0} = \frac{4}{2} = 2$.
- 11) **Choice C is correct.** (8.F.B.5) The graph shows a flat segment at 100% from hours 0 to 2, indicating no charge change during idle time. From hour 2 onward, the slope is negative (draining). Option D is false because the battery approaches 1.5%, not 0%.
- 12) **Choice B is correct.** (8.G.A.2) Comparing the triangles: Triangle ABC has vertex A at the bottom left, B at the bottom right, and C at the top. Triangle DEF has vertices in a different orientation with D at the bottom left, E at the bottom right, and F at the top. A reflection flips triangle ABC, and then a translation (shift) moves it to the position of triangle DEF.
- 13) **Choice B is correct.** (8.G.A.5) The angles sum to 180° : $(n + 15) + (n + 20) + (2n + 25) = 180$. Thus $4n + 60 = 180$, so $4n = 120$ and $n = 30$.
- 14) **Choice B is correct.** (8.G.B.6, 8.G.B.7) If area $= 50$, then side $s = \sqrt{50} = 5\sqrt{2}$. Diagonal $= s\sqrt{2} = 5\sqrt{2} \cdot \sqrt{2} = 10$ units, or use $d^2 = 50 + 50 = 100$, so $d = 10$ units.
- 15) **Choice B is correct.** (8.G.C.9) $V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times 3.14 \times 81 \times 14 = \frac{1}{3} \times 3560.76 = 1186.92 \text{ cm}^3$.
- 16) **Choice B is correct.** (8.G.B.7) Vertical angles are congruent. So $y = 54^\circ$.
- 17) **Choice C is correct.** (8.G.C.9) Half-filled: $\frac{1}{2} \times 360 = 180 \text{ ft}^3$.
- 18) **Choice C is correct.** (8.G.A.5) Each interior angle of a regular octagon: $\frac{(8-2) \times 180}{8} = \frac{1080}{8} = 135^\circ$.
- 19) **Choice C is correct.** (8.SP.A.1) Shoe size is determined by body size, while favorite color is a personal preference unrelated to shoe size. There is no logical connection.
- 20) **Choice B is correct.** (8.SP.A.4) Row-conditional frequencies differ: high GPA (0.40 tutored) vs. low GPA (0.53 tutored). Different conditional frequencies within groups suggest an association. Option D uses raw counts instead of relative frequencies, which can be misleading.
- 21) **Choice D is correct.** (8.EE.C.8a) Subtract the second from the first: $(3x + 4y) - (3x - 2y) = 10 - 4$, so $6y = 6$, giving $y = 1$. Substitute: $3x + 4(1) = 10$, so $x = 2$. Solution: $(2, 1)$.
- 22) **The correct answer is B, E.** (8.G.B.7) There are 10 marbles total. B is true because $P(\text{blue}) = \frac{3}{10}$. E is true because $P(\text{red or blue}) = \frac{5+3}{10} = \frac{8}{10} = \frac{4}{5}$. A is false because $P(\text{red}) = \frac{1}{2}$. C is false because $P(\text{green}) = \frac{1}{5}$. D is false because $P(\text{yellow}) = 0$.
- 23) **Choice C is correct.** (8.F.A.3) Only $y = 6x - 9$ is in the form $y = mx + b$. Options A, B, and D involve exponents, reciprocals, or square roots, making them nonlinear.
- 24) **Choice A is correct.** (8.G.A.3) Points $(1, 1) \rightarrow (-1, 1)$ and $(3, 3) \rightarrow (-3, 3)$. The y -coordinates are unchanged while x -coordinates negate, confirming reflection across the y -axis.
- 25) **Choice C is correct.** (8.G.B.7) Circle area $= \pi r^2 = 3.14 \times 5^2 = 78.5 \text{ cm}^2$. Each triangle area $= \frac{1}{2} \times 3 \times 4 = 6 \text{ cm}^2$. Four triangles $= 24 \text{ cm}^2$. Total $= 78.5 + 24 = 102.5 \text{ cm}^2$.



The Power of Showing Work

Hi, Organized Solver!

◇ You practiced Grade 8 skills that often require more than one step. That means your written work matters. ◇

★ **Remember this:** Showing work is not extra. It is how you track your thinking, find errors, and prove that your answer did not happen by luck. You practiced across 10 full Grade 8 practice tests, and that repeated effort matters. ★

Organized Work Habits

- **One Line Per Step:** Keep the path readable.
- **Box the Answer:** Make the final result easy to find.
- **Use Labels:** Tell what each value represents.
- **Check the Path:** Follow your steps backward if needed.

Grade 8 test-day tip: When a problem has several steps, write less on each line. Space makes checking easier.

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

Jay Daie

Your Organized-Work Coach

PRACTICE TODAY. SUCCEED TOMORROW!

This book includes **10** full-length Math practice tests and **2** online tests to help Grade 8 students build confidence, strengthen skills, and excel on standardized assessments.

Each practice test is carefully crafted to reflect the latest standards and includes a variety of question types, realistic test conditions, and detailed answer explanations.

Perfect for classroom use, homework, test preparation, and extra practice at home.



THIS BOOK INCLUDES:

10

Full-Length
Printed Tests

2

Online
Practice Tests



Detailed Answers
& Explanations



MORE PRACTICE. GREATER RESULTS.

Give your child the tools to build strong math skills, confidence, and a positive attitude toward learning.

WHAT YOU'LL GAIN



Build Confidence

Practice regularly to feel prepared and test-ready.



Master Key Skills

Develop strong math skills and problem solving abilities.



Improve Understanding

Learn with clear explanations and step-by-step solutions.



Test Strategies

Learn proven strategies to approach every question with confidence.



Boost Performance

Apply your knowledge and achieve your best score!

TOPICS COVERED

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



2 ONLINE TESTS

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



2 EXTRA ONLINE TEST ACCESS CODE IS INSIDE THE BOOK!

Don't lose it—your extra practice and success start here!



PRACTICE
REGULARLY



STAY
FOCUSED



SOLVE
CONFIDENTLY



SUCCEED
BRIGHTLY