NORTH CAROLINA

EOG

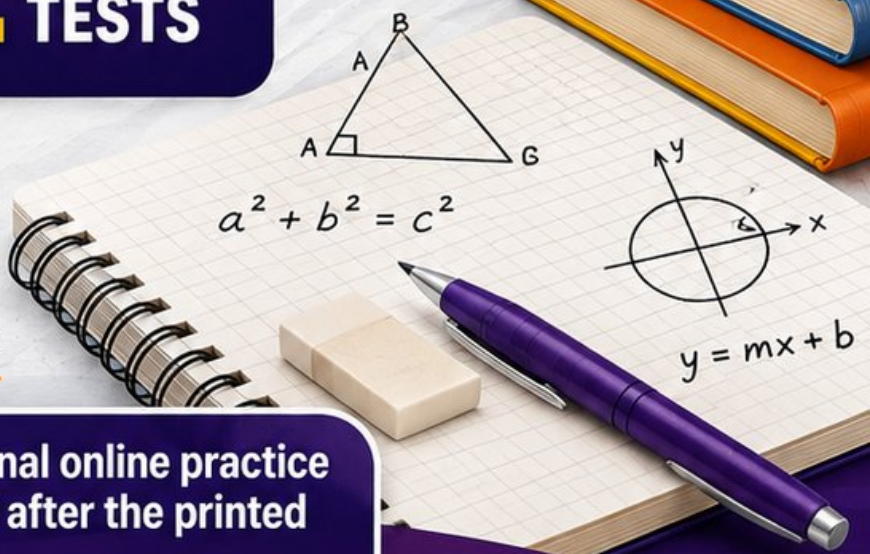
GRADE 8 MATH

PRACTICE TESTS

5 PRINTED TESTS

2 ONLINE TESTS

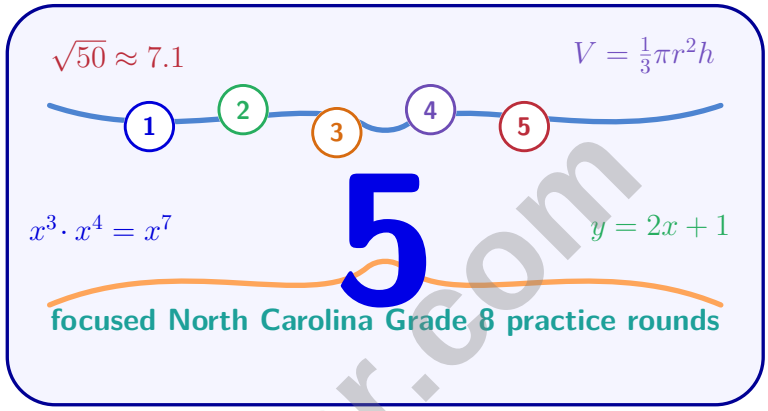
Standards Aligned Problem Solving For
Comprehensive Assessment Programs



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

5 North Carolina EOG Grade 8 Math Practice Tests

Clear EOG Review for Functions, Equations, and Statistics



Five complete 40-question Grade 8 EOG 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, North Carolina Grade 8 Problem Solver!

Five focused rounds for sharper EOG math thinking

This book gives you five full Grade 8 EOG 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 North Carolina 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.

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.

North Carolina 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?

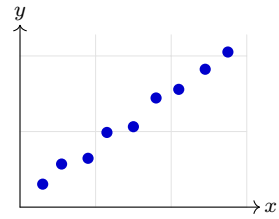
Five EOG tests, 200 questions, and a focused review path

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.

Table of Contents

1)



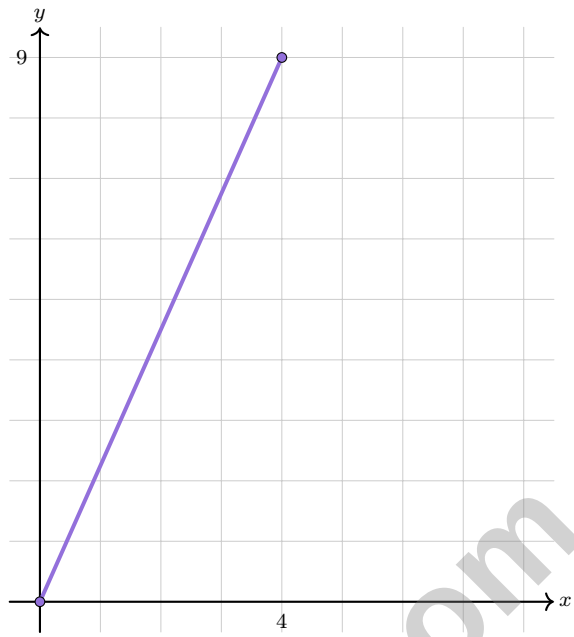
In a scatter plot of height versus shoe size, the relationship is best described as:

☐ A. Negative correlation (taller people wear smaller shoes)
☐ B. No correlation between height and shoe size
☐ C. Weak positive correlation with many outliers
☐ D. Strong positive correlation showing a clear trend

2) What is $\sqrt[3]{729}$?

☐ A. 8
☐ B. 11
☐ C. 10
☐ D. 9

3)



The ratio $y : x$ is:

☐ A. 4 : 9
☐ B. 0.44 : 1
☐ C. 1 : 2.25
☐ D. 9 : 4

4) A car travels 120 miles in 3 hours at a constant speed. What is the slope (speed)?

☐ A. 120 miles per hour
☐ B. 60 miles per hour
☐ C. 30 miles per hour
☐ D. 40 miles per hour

5) What two positive integers multiply to 12 and add to 7?

6) How much of a 100% alcohol solution must be mixed with 500 mL of 20% alcohol solution to create a 50% solution?

☐ A. 100 mL
☐ B. 200 mL
☐ C. 300 mL
☐ D. 400 mL

7) If $g(x) = x + 7$, what is $g(2)$?

☐ A. 5
☐ B. 9
☐ C. 10
☐ D. 14

8) A phone company charges \$25 per month plus \$0.10 per text message. What is the total monthly cost for 100 texts?

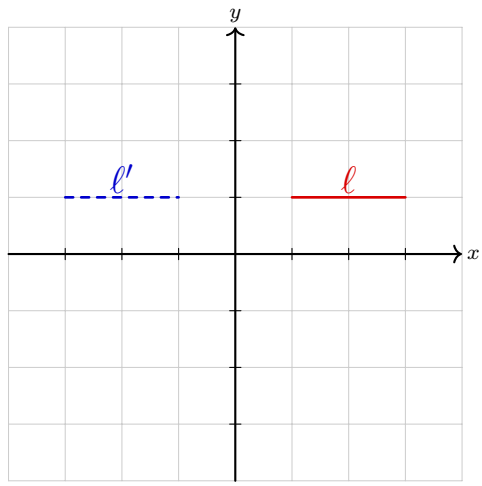
9) A line passes through $(0.5, 3)$ and $(2, 9)$. What is the slope?

☐ A. 2
☐ B. 4
☐ C. 6
☐ D. $\frac{1}{4}$

10) Figure ABCDE is a regular pentagon (all sides equal, all angles equal). It is dilated by a scale factor of 2 to form figure A'B'C'D'E'. How does the dilated pentagon compare to the original?

☐ A. The pentagons are congruent
☐ B. A'B'C'D'E' has twice the side lengths
☐ C. The angles are twice as large
☐ D. The pentagons are identical

1)



Segment ℓ (red) is reflected across the y-axis to produce ℓ' (blue). If the length of ℓ is 2 units, what is the length of ℓ'?

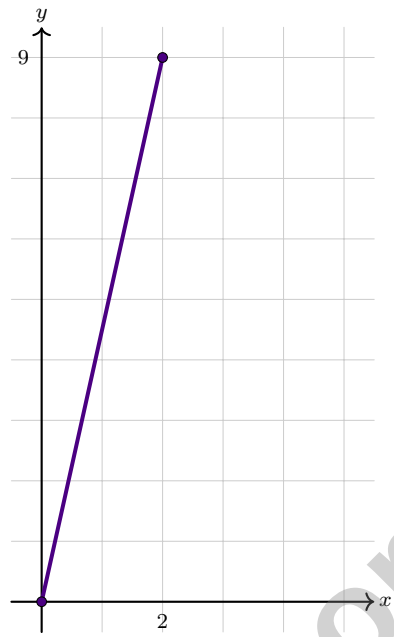
☐ A. 1 unit
☐ B. 2 units
☐ C. 4 units
☐ D. $\sqrt{2}$ units

2) Compute $(2.5 \times 10^3) \times (4 \times 10^2)$ and write your answer in scientific notation.

3) What is $\sqrt[3]{1728}$?

☐ A. 10
☐ B. 11
☐ C. 12
☐ D. 13

4)



The constant of proportionality for this line is:

☐ A. $\frac{2}{9}$
☐ B. 9
☐ C. 2
☐ D. $\frac{9}{2}$

5) Which statement best explains why the table represents a linear function?

x	-2	-1	0	1
y	-5	-2	1	4

☐ A. The first differences are constant (3)
☐ B. The equation is $y = x + 3$
☐ C. The y-values are all positive
☐ D. It is nonlinear because x includes negative values

1) A triangular pyramid has a right-triangular base with legs 6 in and 8 in, and a pyramid height of 10 in. What is its volume?

☐ A. 40 in^3
☐ B. 80 in^3
☐ C. 120 in^3
☐ D. 240 in^3

2) A principal of \$5,000 is invested at 6% compound interest annually for 2 years. What is the total amount?

☐ A. \$5,300
☐ B. \$5,600
☐ C. \$5,618
☐ D. \$5,900

3) Simplify $\frac{a^4b^3}{a^2b}$.

☐ A. a^2b^{-2}
☐ B. a^2b^3
☐ C. a^6b^4
☐ D. $\frac{a^2b^2}{1}$ or a^2b^2

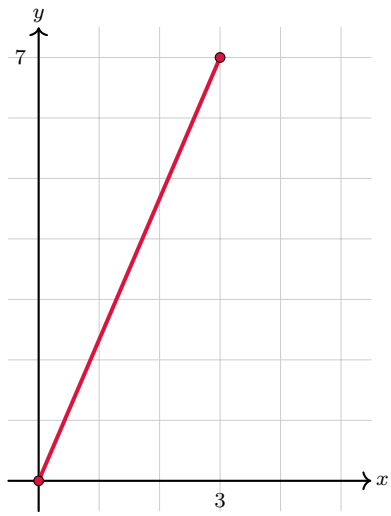
4) A square picture frame has an area of 169 square inches. What is the length of one side of the frame?

☐ A. 12 inches
☐ B. 15 inches
☐ C. 14 inches
☐ D. 13 inches

5) $\frac{(4\times10^6)\times(3\times10^2)}{6\times10^4} = ?$

☐ A. 2×10^2
☐ B. 12×10^8
☐ C. 2×10^4
☐ D. 0.2×10^4

6)



At $x = 6$, what is the value of y?

☐ A. 12
☐ B. 13
☐ C. 14
☐ D. 15

7) Solve by elimination: $\begin{cases} 4x + 3y = 18 \\ 2x - 3y = 6 \end{cases}$

☐ A. $(2, 2)$
☐ B. $(3, 2)$
☐ C. $(4, 2/3)$
☐ D. $(4, 1)$

North Carolina EOG 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 North Carolina EOG practice test.

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

1) **Choice D is correct.** NC.8.SP.1 Taller people generally wear larger shoe sizes, forming a clear upward trend. The relationship is positive (both increase together) and reasonably strong.

2) **Choice D is correct.** NC.8.EE.2 $9 \times 9 \times 9 = 729$, so $\sqrt[3]{729} = 9$.

3) **Choice D is correct.** NC.8.EE.1 At $(4, 9)$, the ratio $y : x = 9 : 4$. This is equivalent to $2.25 : 1$. Slope $k = 9/4 = 2.25$.

4) **Choice D is correct.** NC.8.F.5 Slope (speed) $= \dfrac{120 \text{ miles}}{3 \text{ hours}} = 40$ miles per hour.

5) **The correct answer is** $(3, 4)$ **.** NC.8.EE.8 The integers 3 and 4 multiply to 12 and add to 7.

6) **Choice C is correct.** NC.8.EE.7 Let $x =$ mL of 100% alcohol solution. The 500 mL of 20% solution contains 100 mL of alcohol. Set up $\frac{x+100}{x+500} = 0.50$. Then $x + 100 = 0.5x + 250$, so $0.5x = 150$ and $x = 300$.

7) **Choice B is correct.** NC.8.F.3 Substitute $x = 2$: $g(2) = 2 + 7 = 9$.

8) **The correct answer is** \$35 **.** NC.8.F.1 Compute $25 + 0.10(100) = 35$.

9) **Choice B is correct.** NC.8.F.5 Slope: $m = \frac{9-3}{2-0.5} = \frac{6}{1.5} = 4$.

10) **Choice B is correct.** NC.8.G.9 Dilation by scale factor 2 enlarges all side lengths by a factor of 2, but angles remain unchanged. The dilated pentagon is SIMILAR to the original, not congruent (unless the scale factor is 1).

11) **Choice B is correct.** NC.8.G.5 One angle at each intersection is supplementary to the 135° angle, giving 45°. At each of the 2 intersections, there are 2 such 45° angles (vertical to each other), for a total of 4.

12) **Choice A is correct.** NC.8.G.6, NC.8.G.7 The diagonal is the hypotenuse of a right triangle with legs 8 and 6: $d^2 = 8^2 + 6^2 = 64 + 36 = 100$, so $d = 10$ m.

13) **Choice A is correct.** NC.8.G.8 By the Pythagorean Theorem, $c^2 = 6^2 + 8^2 = 36 + 64 = 100$. Taking the square root: $c = \sqrt{100} = 10$.

14) **Choice A is correct.** NC.8.G.5 Co-interior angles are supplementary. So $u = 180 - 106 = 74°$.

15) **Choice A is correct.** NC.8.G.7 Base area: $B = \frac{1}{2} \times 10 \times 6 = 30$ cm^2. Volume: $V = \frac{1}{3} \times 30 \times 15 = 150$ cm^3.

16) **Choice A is correct.** NC.8.NS.2 Square area $= 8 \times 8 = 64$ m^2. Each triangle area $= \frac{1}{2} \times 4 \times 2 = 4$ m^2. Two triangles $= 8$ m^2. Remaining $= 64 - 8 = 56$ m^2.

17) **Choice C is correct.** NC.8.G.5 Set $(n - 2) \times 180 = 900$. Then $n - 2 = 5$, so $n = 7$ (a heptagon).

18) **Choice B is correct.** NC.8.SP.4 Among high-income households (total 60), those without internet $= 5$. Relative frequency $= \dfrac{5}{60} \approx 0.083$.

19) **Choice B is correct.** NC.8.G.8 Mean $= 6$. Absolute deviations: $|2 - 6| = 4$, $|4 - 6| = 2$, $|6 - 6| = 0$, $|8 - 6| = 2$, $|10 - 6| = 4$. Sum $= 12$. MAD $= 12/5 = 2.4$.

20) **The correct answer is B,D.** NC.8.EE.8 Option A is false: identical equations create the same line (infinitely many solutions). Option B is true: parallel lines never intersect. Option C is false: lines with different slopes intersect once. Option D is true: all points on the line satisfy both equations. Option E is false: perpendicularity means the lines meet at a right angle, so they still have one solution.

21) **The correct answer is** 1 **.** NC.8.F.2 The rate of change is $\frac{-1-(-3)}{2-0} = 1$.

22) **Choice C is correct.** NC.8.G.7 With replacement, first draw has 6 choices, second draw has 6 choices. Total: $6 \times 6 = 36$ outcomes.

23) **Choice B is correct.** NC.8.F.5 From 0 to 2s: flat (height constant at 4m). From 2 to 3s: the height drops to 1m. From 3 to 4s: flat at 1m. From 4 to 5s: the height rises to 3m. From 5 to 6s: flat at 3m.

24) **Choice A is correct.** NC.8.G.3 The y-coordinate stays the same while the x-coordinate negates. This is reflection across the y-axis: $(x, y) \to (-x, y)$.

25) **The correct answer is** 2 **.** NC.8.F.3 Slope $= \frac{1-(-3)}{2-0} = 2$.

26) **Choice B is correct.** NC.8.SP.3 Smaller residuals indicate better fit. A set of small residuals close to zero suggests the line passes near all data points.

Author's Note

A Page for Persistence

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
- 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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