

North Carolina

EOG

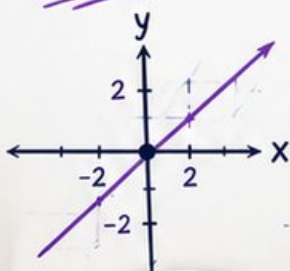
GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

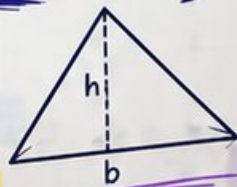
$$y = mx + b$$



**BUILD
CONFIDENCE.
SHARPEN SKILLS.
ACE YOUR
EXAM!**

Practice
Today
Succeed
Tomorrow!

$$A = \frac{1}{2}bh$$



7 PRINTED
TESTS



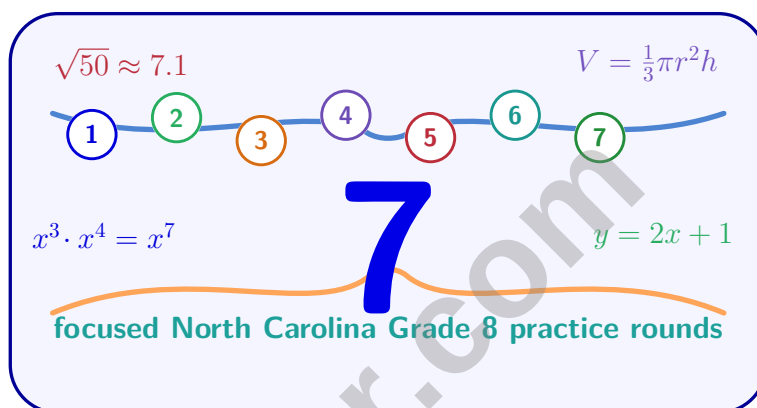
2 ONLINE
TESTS



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

7 North Carolina EOG Grade 8 Math Practice Tests

Seven EOG Tests for Readiness in Key Grade 8 Math Domains



Seven 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!

Seven focused rounds for sharper EOG math thinking

This book gives you seven 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.

Read

Model

Verify

How to Use This Book

A seven-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?

Seven EOG tests, 280 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.
Test 7	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

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- 1) Function f : “starts at 5, increases by 3 each unit.” Function g given in table: $(0, 10)$, $(1, 12)$, $(2, 14)$. Which has the greater y -intercept?

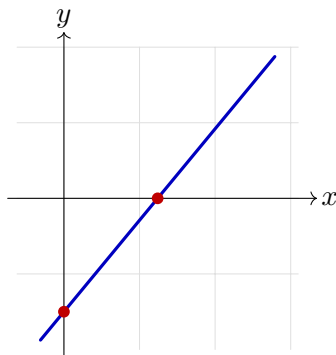
x	0	1	2
$g(x)$	10	12	14

- ☐ A. Function f
☐ C. Both same.
☐ B. Function g
☐ D. Cannot compare.
- 2) A square has area 50 square units. What is the approximate length of its diagonal?
- ☐ A. $\sqrt{50}$ units
 ☐ C. 7.07 units (approximately $5\sqrt{2}$)
☐ B. 10 units
 ☐ D. 25 units
- 3) Factor $9x^2 - 36$ completely.

$$9x^2 - 36$$

$$9(x^2 - 4)$$

- ☐ A. $9(x^2 - 4)$
☐ C. $(3x - 6)^2$
☐ B. $9(x - 2)(x + 2)$
☐ D. $(x - 6)(9x + 6)$
- 4) A function has a y -intercept of -3 and an x -intercept of 2. On the graph, these appear at which points?

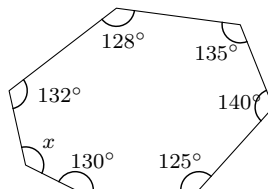


- ☐ A. $(0, -3)$ and $(2, 0)$
☐ C. $(0, 2)$ and $(-3, 0)$
☐ B. $(-3, 0)$ and $(0, 2)$
☐ D. $(2, 0)$ and $(0, 0)$



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- 5) Solve for x : $2(3x - 1) = 4x + 6$. Show all steps and verify your solution.



6)

A heptagon has six interior angles: 130° , 125° , 140° , 135° , 128° , 132° . Find the seventh angle.

☐ A. 100°

☐ C. 110°

☐ B. 105°

☐ D. 115°

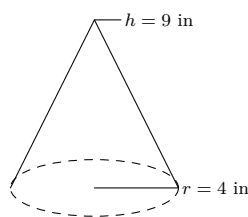
- 7) A photograph is 10 inches wide. A thumbnail is 0.5 inches wide. What is the scale factor from the photograph to the thumbnail?

☐ A. 20

☐ C. 0.5

☐ B. 0.05

☐ D. 2



8)

The cone shown has radius 4 in and height 9 in. What is its volume? (Use $\pi \approx 3.14$.)

☐ A. 113.04 in^3

☐ C. 301.44 in^3

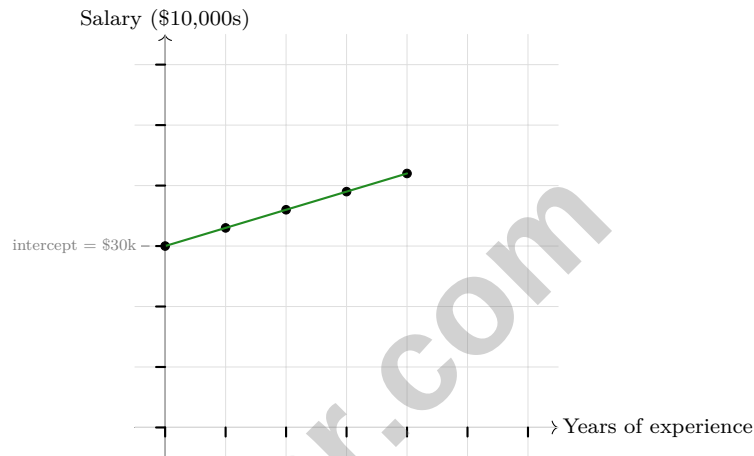
☐ B. 150.72 in^3

☐ D. 452.16 in^3



- 9) Pyramid A has dimensions: base edge 4 cm, height 6 cm. Pyramid B has all linear dimensions scaled by a factor of $\frac{3}{2}$. How does the volume of Pyramid B compare to Pyramid A?

- ☐ A. $\frac{3}{2}$ times larger ☐ C. $\frac{27}{8}$ times larger
☐ B. $\frac{9}{4}$ times larger ☐ D. 3 times larger



10)

What is the rate of salary increase per year of experience?

- ☐ A. \$1000 per year ☐ C. \$6000 per year
☐ B. \$3000 per year ☐ D. \$10000 per year

- 11) A company requires workers to complete at least 100 units per day. If a worker has completed 45 units, how many more units must the worker complete?



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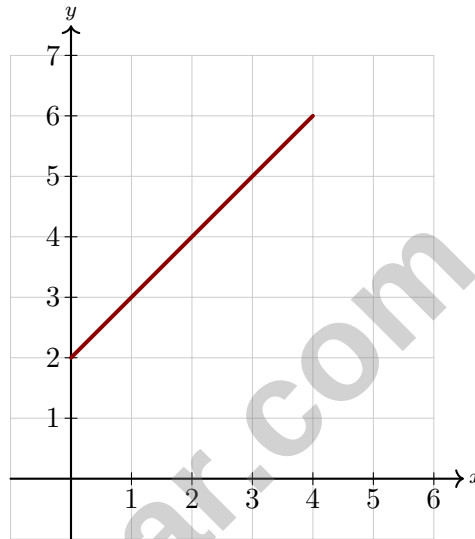
- 1) A phone plan costs \$30 per month plus \$0.15 per text message. If Marcus paid \$45 last month, which equation represents the situation, where t is the number of texts?

☐ A. $30 + 0.15t = 45$

☐ C. $45 + 30t = 0.15$

☐ B. $30t + 0.15 = 45$

☐ D. $0.15t - 30 = 45$



2)

What is the y -intercept of the line shown?

☐ A. 1

☐ C. 3

☐ B. 4

☐ D. 2

- 3) A student graphs $y < x + 2$ and shades ABOVE the line. What error did they make?

☐ A. The line should be solid, not dashed

☐ C. The y -intercept should be -2

☐ B. The shading should be BELOW, not above

☐ D. The slope should be positive



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4) A square has a side length of 10 cm. What is the length of its diagonal?

☐ A. $10\sqrt{2}$ cm

☐ B. 20 cm

☐ C. 10 cm

☐ D. 100 cm

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

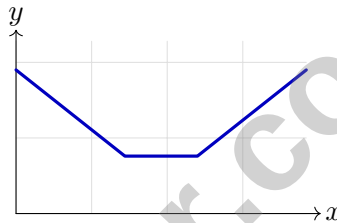
☐ A. $(x + 9)(x - 4)$

☐ B. $(x - 9)(x + 4)$

☐ C. $(x + 12)(x - 3)$

☐ D. $(x + 6)(x - 6)$

6) An elevator moves: down for 10 seconds, stops for 5 seconds, up for 8 seconds. Sketch the height-vs.-time graph. Which shape describes it?



- ☐ A. Three straight segments: decreasing, flat, increasing
- ☐ B. One decreasing line across all time
- ☐ C. One increasing line across all time
- ☐ D. A parabola opening upward

7) What is the sum of the interior angles of a hexagon?

☐ A. 900°

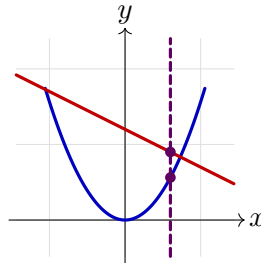
☐ B. 540°

☐ C. 360°

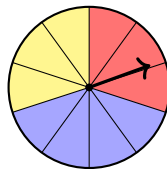
☐ D. 720°



- 1) Two curves are drawn on the same coordinate plane. The first curve is a parabola, and the second is a straight line (not vertical). How many times will a vertical line intersect both curves combined?



- ☐ A. At most twice (once per curve). ☐ C. At most three times.
☐ B. Exactly once. ☐ D. More than four times.
- 2) A data set has a linear relationship modeled by the line $y = 0.5x + 10$. Which point lies exactly on the trend line?
- ☐ A. (2, 10) ☐ C. (6, 12)
☐ B. (8, 15) ☐ D. (4, 12)
- 3) 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. $\frac{3}{10}$



4) 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. $8 + 7 + 6 = 21$

5) Which statement about the square roots of perfect squares is true?

☐ A. They cannot be classified as rational

☐ C. They never equal an integer

☐ B. They are always irrational

☐ D. They can always be written as whole numbers

6) Convert $0.\overline{7}$ to a fraction.

☐ A. $\frac{1}{9}$

☐ C. $\frac{7}{99}$

☐ B. $\frac{7}{10}$

☐ D. $\frac{7}{9}$

7) A student estimates $\sqrt{99} \approx 9.9$. Is this estimate above or below the actual value?

☐ A. Too high

☐ C. Exactly correct

☐ B. Cannot be determined

☐ D. Too low

8) Sarah wants to buy a car for \$15,000. She can pay cash or finance it at 7% APR over 5 years. What is the total finance cost (interest only)?

☐ A. \$1,050

☐ C. \$5,250

☐ B. \$2,100

☐ D. \$10,500

9) Solve for x : $8x - 12 = 4x + 8$

☐ A. $x = 5$

☐ C. $x = 4$

☐ B. $x = 2$

☐ D. $x = 1$



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& answers

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.



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For more practice
& answers

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- Choice B is correct.** (NC.8.F.2) From verbal description, f has y -intercept 5. From table g , the y -intercept is 10. Since $10 > 5$, g is greater.
- Choice B is correct.** (NC.8.G.6, NC.8.G.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.
- Choice B is correct.** (NC.8.EE.8) Factor out GCF of 9: $9(x^2 - 4)$. Then difference of squares: $9(x - 2)(x + 2)$.
- Choice A is correct.** (NC.8.F.5) A y -intercept occurs where $x = 0$, giving point $(0, -3)$. An x -intercept occurs where $y = 0$, giving point $(2, 0)$.
- The correct answer is $x = 4$.** (NC.8.EE.8) Distribute the 2: $6x - 2 = 4x + 6$. Subtract $4x$ from both sides: $2x - 2 = 6$. Add 2 to both sides: $2x = 8$. Divide by 2: $x = 4$. Verify: $2(3(4) - 1) = 2(11) = 22$ and $4(4) + 6 = 22$ ✓.
- Choice C is correct.** (NC.8.G.5) A heptagon's interior angles add to $(7 - 2) \times 180 = 900^\circ$. The known angles add to $130 + 125 + 140 + 135 + 128 + 132 = 790^\circ$, so the seventh angle is $900 - 790 = 110^\circ$.
- Choice B is correct.** (NC.8.G.9) Scale factor is $\frac{0.5}{10} = 0.05$, a reduction.
- Choice B is correct.** (NC.8.G.9) $V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times 3.14 \times 16 \times 9 = \frac{1}{3} \times 452.16 = 150.72 \text{ in}^3$.
- Choice C is correct.** (NC.8.G.7) When linear scale is $k = \frac{3}{2}$, volume scales by $k^3 = \left(\frac{3}{2}\right)^3 = \frac{27}{8}$.
- Choice B is correct.** (NC.8.SP.3) The line goes from $(0, 3.0)$ to $(4, 4.2)$ on the graph (representing \$30,000 to \$42,000). Slope = $\frac{4.2 - 3.0}{4 - 0} = \frac{1.2}{4} = 0.3$ (in units of \$10,000), or \$3000/year.
- The correct answer is 55 units.** (NC.8.EE.7) The inequality is $45 + x \geq 100$. Subtract 45: $x \geq 55$. The worker must complete at least 55 more units.
- Choice A is correct.** (NC.8.F.1) Input 3 appears twice. For the relation to be a function, both ordered pairs with input 3 must have the same output, so the question mark must be 12.
- Choice A is correct.** (NC.8.F.5) Slope: $\frac{48 - 24}{2 - 1} = 24$ cupcakes per hour. The line passes through the origin (when $h = 0$, $c = 0$). Equation: $c = 24h$.
- Choice A is correct.** (NC.8.G.9) The vertices must be listed in corresponding order. The matching arcs and tick marks show $J \leftrightarrow M$, $K \leftrightarrow N$, and $L \leftrightarrow O$, so the congruence statement is $\triangle JKL \cong \triangle MNO$.
- Choice B is correct.** (NC.8.G.3) Start at $(0, 0)$. After translation right 2: $(2, 0)$. After rotation 90° counterclockwise: $(-2, 0)$. After reflection across x -axis: $(-2, -2)$.
- Choice B is correct.** (NC.8.G.5) By the exterior angle theorem, the exterior angle equals the sum of the two remote interior angles: $52 + 74 = 126^\circ$.
- The correct answer is 3.** (NC.8.EE.8) The boundary line is $y = 3$.
- The correct answer is A, B.** (NC.8.G.8) Options A and B both have slope 4, making them parallel. Option C has slope -4 , option D has slope $\frac{1}{4}$, and option E has slope 2, so none of these match.
- Choice A is correct.** (NC.8.G.8) $c = \sqrt{9^2 + 12^2} = \sqrt{81 + 144} = \sqrt{225} = 15$. (This is a 9-12-15 triple, a multiple of 3-4-5.)
- Choice B is correct.** (NC.8.G.5) Vertical angles are congruent. So $y = 54^\circ$.
- Choice D is correct.** (NC.8.NS.2) Decompose using subtraction: outer rectangle minus inner rectangle. Outer area = $20 \times 10 = 200 \text{ m}^2$. Inner area = $16 \times 6 = 96 \text{ m}^2$. Path area = $200 - 96 = 104 \text{ m}^2$.
- Choice C is correct.** (NC.8.SP.1) The relationship changes from steeply increasing to flat to decreasing. This curve (inverted parabola) is nonlinear—the rate of change is not constant and the direction reverses.
- Choice A is correct.** (NC.8.SP.4) Joint relative frequency: $\frac{32}{240} \approx 0.133 \approx 13\%$. Cell count divided by grand total.
- Choice C is correct.** (NC.8.G.8) Group 1's smaller MAD (2) shows less spread and more consistent performance. Group 2's larger MAD (10) indicates greater variability in scores.
- Choice A is correct.** (NC.8.G.7) $P(A \text{ then } B) = \frac{1}{3} \times \frac{2}{3} = \frac{2}{9}$.
- Choice B is correct.** (NC.8.NS.1) Choose a main leader (6 choices) then an assistant from the remaining 5 students: $6 \times 5 = 30$.



Hi, Thoughtful Reader!

◇ A strong Grade 8 test taker is also a strong reader. You practiced turning words, tables, graphs, and diagrams into math decisions. ◇

★ **Remember this:** That skill grows each time you slow down enough to ask what the problem is really telling you and what it is really asking for. This version gave you 7 opportunities to rehearse test-day habits. ★

Reader-to-Solver Skills

- **Circle the Ask:** Make the target visible.
- **Sort Information:** Separate useful facts from extra words.
- **Match Units:** Keep quantities connected.
- **Answer Fully:** Include the value and what it means.

Grade 8 test-day tip: After solving, reread only the final question. Make sure your answer matches it exactly.

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

Jay Daie

Your Reading-and-Math Helper

PRACTICE TODAY SUCCEED TOMORROW!

Give your child the confidence and skills they need with **7 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!

GRADE 8

Practice
Today
Succeed
Tomorrow!

Algebra

Geometry

Statistics

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.

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BUILD CONFIDENCE. SHARPEN SKILLS. ACE YOUR EXAM!