

8

North Carolina

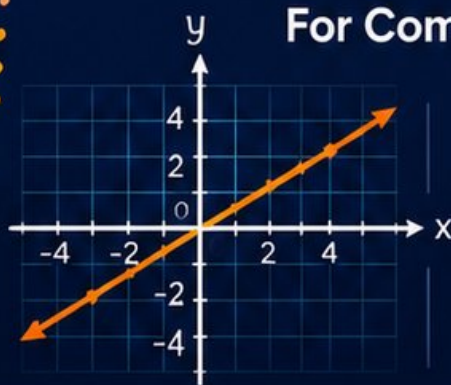
EOG

GRADE 8

MATH

PRACTICE TESTS

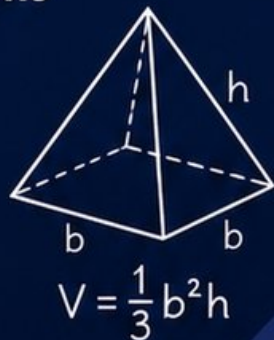
Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$

$$C = 2\pi r$$

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



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



8 PRINTED TESTS



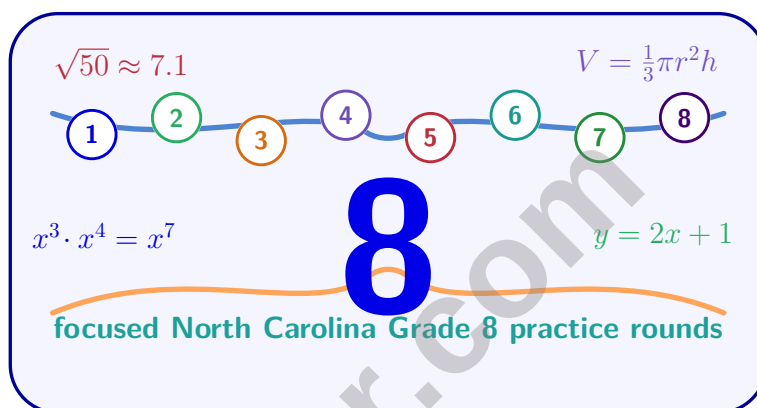
2 ONLINE TESTS



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

8 North Carolina EOG Grade 8 Math Practice Tests

North Carolina Practice for Functions, Geometry, and Data Skills



Eight 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!

Eight focused rounds for sharper EOG math thinking

This book gives you eight 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

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.

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?

Eight EOG 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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1) When sketching a line of best fit by eye, the line should:

- ☐ A. Pass through every single point ☐ D. Have approximately equal numbers of points above and below it
☐ B. Have the steepest possible slope
☐ C. Avoid all outliers completely

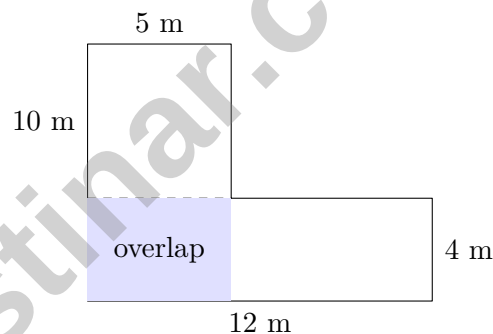
2)

Points	20	25	30	35
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Four games scored as shown. The mean is 27.5 points. What is the MAD?

- ☐ A. 4 ☐ C. 5.625
☐ B. 5 ☐ D. 6.25

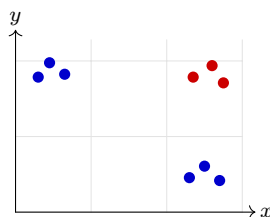
3) A composite figure is an L-shape where a 5 m by 10 m vertical rectangle overlaps with a 12 m by 4 m horizontal rectangle. The overlap is 5 m by 4 m. Which calculation finds the correct total area?



- ☐ A. $(5 \times 10) + (12 \times 4) = 98 \text{ m}^2$ ☐ C. $(5 + 10 + 12 + 4) \times 2 = 62 \text{ m}$
☐ B. $(5 \times 10) + (12 \times 4) - (5 \times 4) = 78 \text{ m}^2$ ☐ D. $\sqrt{50^2 + 48^2} \approx 69.3 \text{ m}$



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4)

Two groups appear in a scatter plot of video game experience (x-axis) versus reaction time (y-axis). Experienced players (many hours played) have fast reaction times (lower y-values). Inexperienced players (few hours played) have slow reaction times (higher y-values). What does this clustering pattern tell you about the relationship?

- ☐ A. More experience causes longer reaction times
 ☐ C. Reaction time improves with experience in a curved way
- ☐ B. Experience and reaction time are unrelated
 ☐ D. More experience is associated with faster reaction times

- 5) A school newsletter reports that 250 students were surveyed about lunch preferences. The two-way table shows:

	Packed Lunch	School Lunch	Total
Elementary	60	65	125
Middle	55	70	125
Total	115	135	250

What is the marginal frequency for middle school students?

- ☐ A. 55
 ☐ C. 115
- ☐ B. 70
 ☐ D. 125



- 6) A student says the probability of rolling a 1 or 2 on a die is $\frac{1}{3}$, so the probability of rolling 3, 4, 5, or 6 is also $\frac{1}{3}$. What is the error?
- ☐ A. The student forgot to multiply by 2.
- ☐ B. The student did not use the complement correctly.
- ☐ C. There is no error; both probabilities are $\frac{1}{3}$.
- ☐ D. The student should add $\frac{1}{6}$ instead.
- 7) A login code uses 3 distinct digits from the set $\{0, 1, 2, 3, 4, 5\}$. How many codes are possible?
- ☐ A. $6 + 5 + 4 = 15$
- ☐ B. $6 \times 5 \times 4 = 120$
- ☐ C. $6^3 = 216$
- ☐ D. $\binom{6}{3} = 20$
- 8) Which value is irrational?
- ☐ A. $0.5 + 0.25$
- ☐ B. $\frac{1}{2} + \frac{1}{3}$
- ☐ C. $\sqrt{10} + 1$
- ☐ D. 2^2
- 9) Trapezoid MNOP has parallel sides of 8 cm and 14 cm. If trapezoid MNOP is congruent to trapezoid QRST, and side $QR = 8$ cm, find the length of the side that corresponds to the 14 cm side of MNOP.



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1) A security code consists of 3 digits, each from 0 to 9, with no repetition allowed. How many different codes are possible?

☐ A. $10^3 = 1,000$

☐ C. $10!$

☐ B. $10 \times 9 \times 8 = 720$

☐ D. $\binom{10}{3} = 120$

2) Plant X : $H(d) = 2d + 10$ cm. Plant Y at days 0, 5, 10 has heights 15, 20, 25 cm. Which started taller?

☐ A. Plant X ☐ C. Both same.☐ B. Plant Y ☐ D. Cannot be determined.

3) A rectangle has length ℓ and fixed width 5. Which equation expresses area A as a function of length?

☐ A. $A = 5\ell$

☐ C. $A = 10\ell + 5$

☐ B. $A = \ell(10 - \ell)$

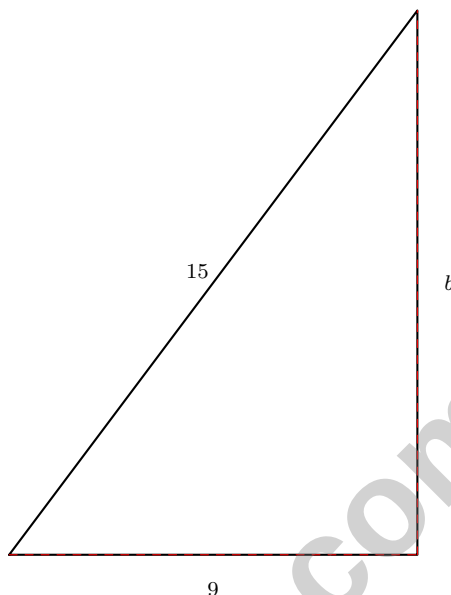
☐ D. $A = \ell^2$



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- 4) A right triangle has a hypotenuse of 15 units and one leg of 9 units. Which equation finds the other leg b ?



- ☐ A. $15^2 = 9^2 + b^2$ ☐ C. $b = 15 - 9$
☐ B. $9^2 = 15^2 + b^2$ ☐ D. $b^2 = 9 + 15$
- 5) A bag contains 4 white socks and 6 black socks. If two socks are drawn without replacement, what is the probability that both are black?

- ☐ A. $\frac{1}{3}$ ☐ C. $\frac{6}{10}$
☐ B. $\frac{3}{10}$ ☐ D. $\frac{6}{25}$



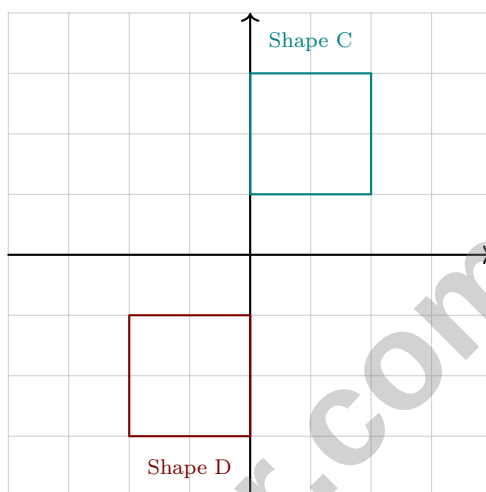
1) A grandmother is 42 years old. Her grandson is 10 years old. In how many years will the grandmother be exactly 3 times as old as her grandson?

☐ A. 6 years

☐ C. 10 years

☐ B. 8 years

☐ D. 12 years



2)

If Shape C is rotated 180° about the origin, which shape results?

☐ A. Shape D

☐ D. A shape above the x -axis in Quadrant II

☐ B. The same shape (unchanged)

☐ C. A shape in Quadrant II

3) Solve: $-4x > 12$

☐ A. $x > -3$

☐ C. $x < -3$

☐ B. $x > 3$

☐ D. $x < 3$



4) The inequality has x -intercept 6 and y -intercept -3 . The boundary line passes through both. Which inequality has shading that includes the origin?

☐ A. $x - 2y \leq 6$

☐ C. $2y - x \leq 6$

☐ B. $x - 2y \geq 6$

☐ D. $2y - x \geq 6$

5) Which set of ordered pairs represents a function?

☐ A. $\{(0, 1), (0, 2), (1, 3)\}$

☐ C. $\{(1, 1), (1, 2), (2, 2)\}$

☐ B. $\{(2, 4), (3, 5), (4, 6)\}$

☐ D. $\{(5, 3), (5, 4), (6, 5)\}$

6) Linear function same y at $x = 2$ and $x = 5$. Slope is?

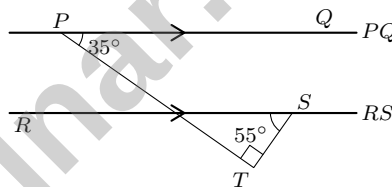
☐ A. Positive

☐ C. Zero

☐ B. Negative

☐ D. Impossible

7) In the figure, $PQ \parallel RS$. If angle $QPT = 35^\circ$ and angle $RST = 55^\circ$, find angle PTS .



☐ A. 90°

☐ C. 110°

☐ B. 100°

☐ D. 120°

8) A television screen is advertised as having a diagonal of 50 inches. If the width is 40 inches, what is the height?

☐ A. 10 inches

☐ C. 45 inches

☐ B. 30 inches

☐ D. 90 inches



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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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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** (NC.8.SP.3) A good trend line balances points on both sides. This balance minimizes residuals overall and captures the true trend, even if the line passes through no individual points.
- 2) **Choice B is correct.** (NC.8.G.8) Absolute deviations: $|20 - 27.5| = 7.5$, $|25 - 27.5| = 2.5$, $|30 - 27.5| = 2.5$, $|35 - 27.5| = 7.5$. Sum = 20. MAD = $20/4 = 5$.
- 3) **Choice B is correct.** (NC.8.NS.2) L-shape overlap requires subtracting the shared region. Total area = $50 + 48 - 20 = 78$ m². Option A forgets the overlap; C is perimeter; D is diagonal length.
- 4) **Choice D is correct.** (NC.8.SP.1) The pattern shows: high experience (right) → low reaction time (bottom), and low experience (left) → high reaction time (top). This is a negative association: as one increases, the other decreases.
- 5) **Choice D is correct.** (NC.8.SP.4) The marginal frequency for middle school is the row total: $55 + 70 = 125$.
- 6) **Choice B is correct.** (NC.8.G.7) $P(\text{rolling 1 or 2}) = \frac{2}{6} = \frac{1}{3}$. The complement is $P(\text{rolling 3, 4, 5, or 6}) = 1 - \frac{1}{3} = \frac{2}{3}$, not $\frac{1}{3}$.
- 7) **Choice B is correct.** (NC.8.NS.1) First digit: 6 choices. Second digit: 5 remaining (no repetition). Third: 4 remaining. Total: $6 \times 5 \times 4 = 120$.
- 8) **Choice C is correct.** (NC.8.NS.1) The sum of an irrational number ($\sqrt{10}$) and a rational number (1) is always irrational. So $\sqrt{10} + 1$ is irrational. The others are rational: $0.5 + 0.25 = 0.75$, $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$, and $2^2 = 4$.
- 9) **The correct answer is 14.** (NC.8.G.9) Since the trapezoids are congruent and $QR = 8$ cm corresponds to one of the parallel sides of MNOP, the other parallel side of QRST must also be 14 cm.
- 10) **Choice D is correct.** (NC.8.NS.1) Let $x = 0.999 = 0.999\ldots$. Then $1000x = 999.999$. Subtracting: $999x = 999$, so $x = 1$.
- 11) **The correct answer is 6.** (NC.8.G.3) Reflections preserve length. The original segment GH has length $|8 - 2| = 6$, so $G'H'$ also has length 6.
- 12) **Choice D is correct.** (NC.8.NS.2) Since $\sqrt{2}$ is irrational and 1 is rational, $\sqrt{2} + 1$ is irrational. (The sum of an irrational and a rational is irrational.)
- 13) **Choice D is correct.** (NC.8.G.7) Interest: $I = 25000 \times 0.06 \times 5 = \$7,500$. Total: $25000 + 7500 = \$32,500$.
- 14) **Choice A is correct.** (NC.8.EE.8) Subtract 8 from both sides: $2x = 12$. Divide by 2: $x = 6$. Check: $2(6) + 8 = 12 + 8 = 20$ ✓.
- 15) **Choice D is correct.** (NC.8.EE.1) Add exponents: $n^6 \cdot n^{-4} \cdot n^3 = n^{6-4+3} = n^5$.
- 16) **Choice D is correct.** (NC.8.EE.3) 10^{24} is 1 septillion (each set of 3 powers of 10 adds one step up: million, billion, trillion, etc.).
- 17) **The correct answer is ± 5 .** (NC.8.G.8) $\sqrt{5^2 + y^2} = \sqrt{50}$, so $25 + y^2 = 50$. Thus $y^2 = 25$ and $y = \pm 5$.
- 18) **Choice A is correct.** (NC.8.G.8) The line passes through (0, 4) and (3, 1), so slope = -1 and $y = -x + 4$. For $x = 1$, the equation gives $y = 3$, so (1, 3) is on the line.
- 19) **Choice C is correct.** (NC.8.EE.7) Multiply by -1 (FLIP): $x \geq -5$.
- 20) **Choice A is correct.** (NC.8.EE.8) Solid horizontal line at $y = 3$ with shading ABOVE means $y \geq 3$.
- 21) **Choice B is correct.** (NC.8.G.6, NC.8.G.7) The correct calculation uses the Pythagorean Theorem: $5^2 + b^2 = 13^2$ gives $25 + b^2 = 169$, so $b = 12$. The student's error was subtracting instead of using $a^2 + b^2 = c^2$.
- 22) **The correct answer is A, D.** (NC.8.F.5) Option A is correct because the slope of d_1 is 3 km/h. Option D is correct because $3 > 2$, so Hiker 1 travels faster. Hiker 2 starts 5 km from the trailhead, Hiker 1 starts 2 km from the trailhead, and the hikers are at the same distance when $t = 3$, not $t = 2$.
- 23) **Choice D is correct.** (NC.8.NS.1) $\sqrt{9} = 3$, $\sqrt{4} = 2$, and $0.5 = \frac{1}{2}$ are all rational. $\sqrt{8} = 2\sqrt{2}$ is irrational.
- 24) **Choice D is correct.** (NC.8.EE.2) $\sqrt{16} = 4$ and $\sqrt{25} = 5$, so $4 \times 5 = 20$. Alternatively, $\sqrt{16} \times \sqrt{25} = \sqrt{16 \times 25} = \sqrt{400} = 20$.
- 25) **Choice D is correct.** (NC.8.EE.4) Rewrite: $3 \times 10^8 + 0.05 \times 10^8 = (3 + 0.05) \times 10^8 = 3.05 \times 10^8$.
- 26) **Choice C is correct.** (NC.8.EE.1) Substitute $x = 7$ into $y = 2x$: $y = 2(7) = 14$. The cost is \$14.



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You Know More Than You Think

Hi, Skilled Learner!

◇ After working through Grade 8 practice, you now have more tools than you may realize: models, formulas, graphs, equations, and reasoning habits. ◇

★ **Remember this:** The next step is learning when to use each tool. That comes from practice, review, and the courage to try a method even when you are unsure. This version gave you 8 opportunities to rehearse test-day habits. ★

Tools You Can Use

- **Models:** Make relationships visible.
- **Equations:** Represent unknowns clearly.
- **Graphs:** Show change and location.
- **Formulas:** Organize measurement problems.

Grade 8 test-day tip: Before solving, name the tool you plan to use. That small choice makes your work more intentional.

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

Jay Daie

Your Skill-Building Coach

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!



2 EXTRA ONLINE PRACTICE TESTS INCLUDED!

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PRACTICE. PREPARE. SUCCEED.



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More Practice. More Confidence.
Better Results.