

INDIANA I LEARN

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.

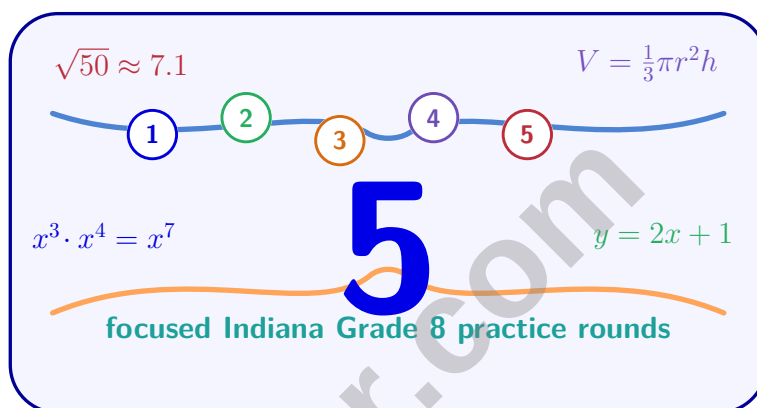


$$a^2 + b^2 = c^2$$



5 Indiana ILEARN Grade 8 Math Practice Tests

Five ILEARN Practices for Algebra, Geometry, and Probability



Five complete 40-question Grade 8 ILEARN 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, Indiana Grade 8 Problem Solver!

Five focused rounds for sharper ILEARN math thinking

This book gives you five full Grade 8 ILEARN 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 Indiana 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.

Indiana 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 ILEARN 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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& answers

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1) $\frac{6 \times 10^5}{2 \times 10^{10}} = ?$

☐ A. 12×10^{-5}

☐ C. 3×10^5

☐ B. 8×10^{-5}

☐ D. 3×10^{-5}

2) Which system represents two lines that intersect at exactly one point?

☐ A. $x = 2$ and $x = 2$

☐ C. $y = x + 1$ and $y = x + 3$

☐ B. $y = 4$ and $y = 4$

☐ D. $y = 2x + 1$ and $y = -x + 7$

3) A video streaming service charges a flat fee plus a per-minute rate. The relationship is shown:

Minutes watched	10	20	30
Cost (\$)	2.50	4.50	6.50

What is the slope?

☐ A. \$0.20 per minute

☐ C. \$0.10 per minute

☐ B. \$2.50 per minute

☐ D. \$0.05 per minute

4) In 6 years, a father will be three times as old as his son. Right now, the father is 30 years older than his son. How old is the son now?

☐ A. 9

☐ C. 15

☐ B. 12

☐ D. 18

5) The table below shows values of function f . What is $f(2)$?

x	0	1	2	3
$f(x)$	5	7	9	11

☐ A. 7

☐ C. 11

☐ B. 9

☐ D. 5



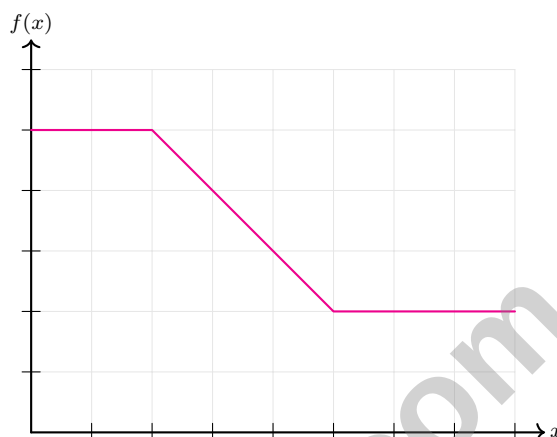
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6) A line passes through $(0.5, 3)$ and $(2, 9)$. What is the slope?

☐ A. 2

☐ C. 6

☐ B. 4

☐ D. $\frac{1}{4}$


7)

Over the interval $[0, 3]$, is the function increasing, decreasing, or constant?

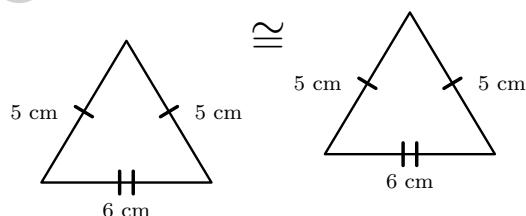
☐ A. Constant

☐ C. Increasing

☐ B. Both increasing and constant

☐ D. Decreasing

8) Two congruent isosceles triangles are shown with tick marks indicating equal sides. Triangle 1 has a base of 6 cm and equal sides of 5 cm each. What is the perimeter of Triangle 2?


☐ A. 11 cm

☐ C. 22 cm

☐ B. 16 cm

☐ D. 30 cm


9) A point is reflected across the line $y = -x$. The image is at $(2, -5)$. What is the pre-image?

☐ A. $(-5, 2)$

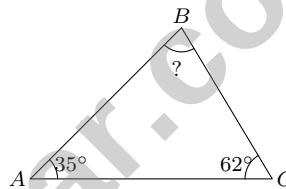
☐ C. $(2, 5)$

☐ B. $(-2, 5)$

☐ D. $(5, -2)$

10) Evaluate $9x^2 - 16$ when $x = 2$.

11) In triangle ABC , angle A measures 35° and angle C measures 62° . What is angle B ?



☐ A. 73°

☐ C. 93°

☐ B. 83°

☐ D. 103°



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- 1) A rectangular field is 70 meters long and 24 meters wide. A diagonal path crosses from one corner to the opposite corner. How many meters shorter is the diagonal path than walking the length and width?

☐ A. 46 m☐ C. 50 m☐ B. 20 m☐ D. 94 m

2) $(6.5 \times 10^5) - (3.2 \times 10^5) = ?$

☐ A. 3.3×10^0 ☐ C. 3.3×10^5 ☐ B. 9.7×10^5 ☐ D. 0.33×10^5

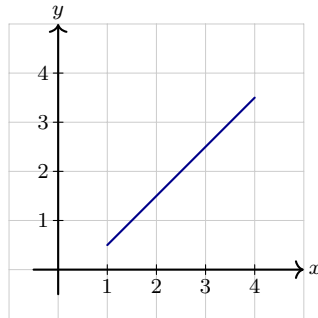
3) Simplify: $\sqrt{36} + \sqrt[3]{8}$

4) Solve by elimination:
$$\begin{cases} 2x + 5y = 19 \\ 2x + y = 7 \end{cases}$$

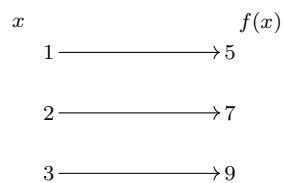
☐ A. (1, 5)☐ C. (3, 1)☐ B. (2, 3)☐ D. (4, -1)

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5) Which graph BEST represents a linear function?



- ☐ A. The curved path
 ☐ C. Only if it starts at origin
☐ B. The straight line shown
 ☐ D. The slopes of individual segments
- 6) A line passes through the points (2, 5) and (6, 13). What is the slope of the line?
- ☐ A. $\frac{1}{2}$
☐ C. $\frac{3}{2}$
☐ B. 4
 ☐ D. 2
- 7) Two rectangles are considered separately. The first rectangle is x cm long and 5 cm wide. The second rectangle is y cm long and 5 cm wide. The sum of their perimeters is 56 cm, and the difference in their lengths is 2 cm. If $x > y$, what is x ?
- ☐ A. 8 cm
 ☐ C. 10 cm
☐ B. 12 cm
 ☐ D. 14 cm
- 8) The mapping diagram shows function f . What is $f(2)$?



- ☐ A. 5
 ☐ C. 9
☐ B. 7
 ☐ D. 2



1) Expand $(x - 7)^2$.

☐ A. $x^2 - 49$

☐ C. $x^2 - 14x + 49$

☐ B. $x^2 + 14x + 49$

☐ D. $x^2 - 7x + 49$

2) What is the slope of a line that is perpendicular to the line $y = 2x + 5$?

☐ A. 2

☐ C. $-\frac{1}{2}$

☐ B. $\frac{1}{2}$

☐ D. -2

3) A laptop costs \$1,200 cash. The store's installment offer is \$110/month for 12 months. Which analysis correctly explains why someone might choose installments despite the extra cost?

☐ A. Installments save money (\$120 is refunded later)

☐ C. Installments are always cheaper than paying cash

☐ B. The store benefits, so customers should too

☐ D. The customer doesn't have \$1,200 cash now but can afford \$110/month

4) Express 356,000 in scientific notation.



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& answers

5) Using the quotient rule, explain why $x^0 = 1$ (for $x \neq 0$).

Step 1	Step 2	Step 3
$\frac{x^5}{x^5}$	$= x^{5-5}$	$= x^0 = ?$

Since $\frac{x^5}{x^5} = 1$, what must x^0 equal?

- ☐ A. Because the exponent is 0, so the result is 0.
 ☐ B. Because the quotient rule says so.
 ☐ C. Because when exponents are equal, the quotient is 0.
 ☐ D. 1 (any nonzero number divided by itself equals 1)

6) Convert $0.454545\dots$ to a fraction in simplest form.

7) Estimate $\sqrt{68}$ to the nearest tenth.

8) Which statement is true?

- ☐ A. $\sqrt[3]{8} = 2$ and $\sqrt[3]{27} = 3$
☐ B. $\sqrt{36} = 6$ and $\sqrt{64} = 7$
☐ C. $\sqrt{100} = 5$ and $\sqrt[3]{125} = 25$
☐ D. $\sqrt[3]{64} = 8$ and $\sqrt{144} = 11$



Indiana ILEARN 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 Indiana ILEARN practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** (8.NS.3) Divide coefficients: $6 \div 2 = 3$. Subtract exponents: $10^{5-10} = 10^{-5}$. Result: 3×10^{-5} .
- 2) **Choice D is correct.** (8.AF.8) The first two systems are lines with different equations but the same form (both are $x = 2$ or $y = 4$, not two distinct lines). Option C has parallel lines (same slope, different intercepts). Option D has different slopes, so the lines intersect at exactly one point.
- 3) **Choice A is correct.** (8.AF.2) Using (10, 2.50) and (20, 4.50): slope = $\frac{4.50 - 2.50}{20 - 10} = \frac{2.00}{10} = \0.20 per minute.
- 4) **Choice A is correct.** (8.AF.8) Let s = son's current age. Then father's age is $s + 30$. In 6 years, $s + 36 = 3(s + 6)$. So $s + 36 = 3s + 18$, which gives $18 = 2s$ and $s = 9$.
- 5) **Choice B is correct.** (8.AF.3) Locate $x = 2$ in the table; the corresponding $f(x)$ value is 9.
- 6) **Choice B is correct.** (8.AF.6) Slope: $m = \frac{9-3}{2-0.5} = \frac{6}{1.5} = 4$.
- 7) **Choice D is correct.** (8.AF.4) From $x = 0$ to $x = 3$, the function values drop from 5 to 2, so the function is decreasing over this interval.
- 8) **Choice B is correct.** (8.GM.1) Perimeter of Triangle 1 = $5 + 5 + 6 = 16$ cm. Even though Triangle 2 is oriented differently (rotated or reflected), congruent figures have equal corresponding sides. Therefore, Triangle 2 also has sides of 5 cm, 5 cm, and 6 cm, giving a perimeter of 16 cm.
- 9) **Choice D is correct.** (8.GM.1) Reflection across $y = -x$ maps $(x, y) \rightarrow (-y, -x)$. Reversing: $(2, -5) \rightarrow (-(-5), -2) = (5, -2)$.
- 10) **The correct answer is 20.** (8.AF.2) Compute $9(2)^2 - 16 = 36 - 16 = 20$.
- 11) **Choice B is correct.** (8.GM.1) Triangle angle sum: $180 - 35 - 62 = 83^\circ$.
- 12) **Choice A is correct.** (8.GM.3) $d = \sqrt{(7-1)^2 + (5-2)^2} = \sqrt{6^2 + 3^2} = \sqrt{36 + 9} = \sqrt{45}$.
- 13) **Choice B is correct.** (8.GM.3) Vertical angles are congruent. Adjacent angles are supplementary: $180 - 72 = 108^\circ$. The four angles are $72^\circ, 108^\circ, 72^\circ, 108^\circ$.
- 14) **Choice B is correct.** (8.GM.2) $V = \frac{1}{3} \times 16 \times 3\sqrt{2} = 16\sqrt{2}$ cm³.
- 15) **Choice B is correct.** (8.GM.1) Decompose the perimeter: two long sides of rectangle plus two semicircles (which form one complete circle). Long sides: $100 + 100 = 200$ m. Circle circumference: $\pi d = 3.14 \times 50 \approx 157$ m. Total = $200 + 157 = 357$ m.
- 16) **The correct answer is 3.** (8.AF.3) The domain contains the three inputs 2, 4, and 6.
- 17) **Choice B is correct.** (8.GM.2) A nonagon's interior angles sum to $(9 - 2) \times 180 = 1260^\circ$. The eight known angles sum to $140 + 142 + 138 + 140 + 136 + 141 + 139 + 137 = 1113^\circ$, so the ninth angle is $1260 - 1113 = 147^\circ$.
- 18) **Choice A is correct.** (8.DSP.1) The rate of change is not constant, showing a curved or leveling pattern rather than a straight line. This indicates a nonlinear association.
- 19) **Choice A is correct.** (8.DSP.1) Men voting yes = $120 - 75 = 45$. Relative frequency = $\frac{45}{120} = 0.375 = 37.5\%$.
- 20) **Choice B is correct.** (8.DSP.3) Prime: 2, 3, 5, 7. Even: 2, 4, 6, 8, 10. Prime OR even: 2, 3, 4, 5, 6, 7, 8, 10 = 8 numbers. Note: 2 is both prime and even, counted once. $P = \frac{8}{10} = \frac{4}{5}$.
- 21) **Choice C is correct.** (8.DSP.5) Choose 1st (5 choices), then 2nd (4 remaining), then 3rd (3 remaining): $5 \times 4 \times 3 = 60$.
- 22) **The correct answer is B,E.** (8.AF.2) The equation has slope $-\frac{2}{3}$ and y -intercept 5, so B and E are correct. The point (5, 0) is not on the line because $-\frac{2}{3}(5) + 5 = \frac{5}{3}$, not 0. A perpendicular line would have slope $\frac{3}{2}$, not $-\frac{3}{2}$.
- 23) **Choice A is correct.** (8.GM.3) Using $a^2 + b^2 = c^2$: $20^2 + 21^2 = 400 + 441 = 841$, so $c = 29$ (the 20-21-29 triple).
- 24) **Choice B is correct.** (8.DSP.2) Residual = actual - predicted = $3500 - 3000 = 500$.
- 25) **Choice C is correct.** (8.GM.1) Volume scales by the cube of the linear scale factor: $3^3 = 27$. This is a common error.
- 26) **Choice D is correct.** (8.NS.1) $\sqrt[3]{8} = 2$ because $2 \times 2 \times 2 = 8$. Since 2 is an integer, it is rational.
- 27) **Choice B is correct.** (8.AF.7) Mean = 10. Deviations: $|7 - 10| = 3$, $|9 - 10| = 1$, $|11 - 10| = 1$, $|13 - 10| = 3$. Sum = 8. MAD = $8/4 = 2$.



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



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