

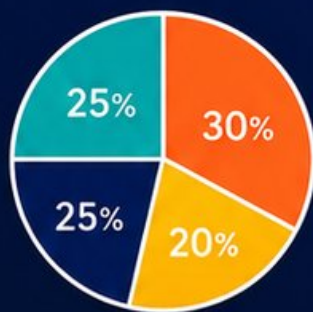
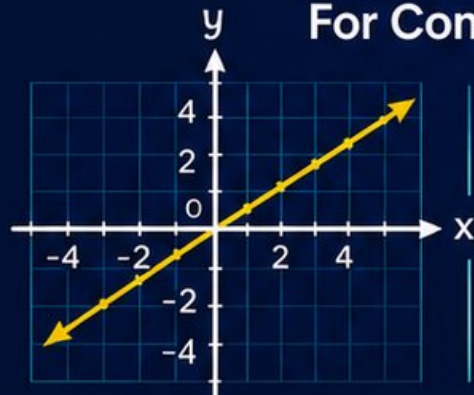
4

Indiana
I LEARN

GRADE 8

MATH

PRACTICE TESTS

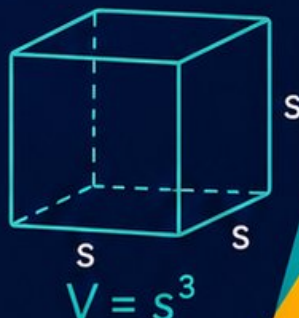
Standards Aligned Problem Solving
For Comprehensive Assessment Programs

$$y = mx + b$$

$$2x - 3y = 6$$

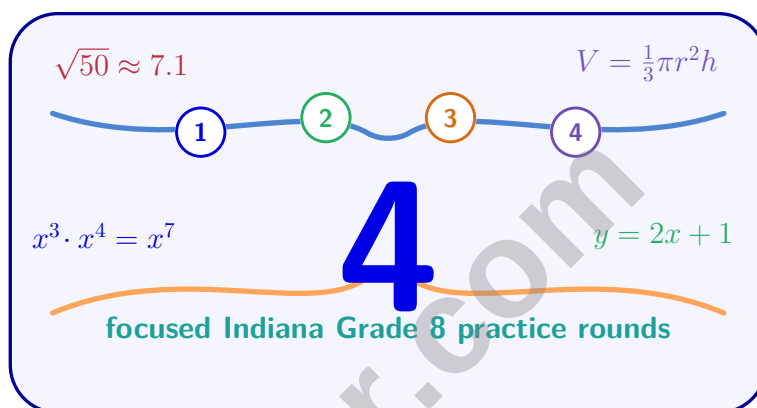
$$\sqrt{x^2 + y^2}$$

$$A = bh$$

4 PRINTED
TESTS2 ONLINE
TESTSUse these **two additional online practice tests**
for extra review after the printed tests in this book.

4 Indiana ILEARN Grade 8 Math Practice Tests

Four ILEARN Tests for Standards Practice and Smarter Review



Four 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!

Four focused rounds for sharper ILEARN math thinking

This book gives you four 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 four-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?

Four ILEARN tests, 160 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–4	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) Solve:
$$\begin{cases} \frac{1}{4}x + y = 2 \\ x - y = 4 \end{cases}$$

☐ A. $(\frac{24}{5}, \frac{4}{5})$

☐ B. $(\frac{20}{3}, \frac{8}{3})$

☐ C. $(5, -1)$

☐ D. $(3, -1)$

- 2) A water tank contains saltwater at 2% concentration. To reduce the concentration to 1%, how much pure water must be added to 100 liters of the 2% solution?

☐ A. 50 L

☐ B. 75 L

☐ C. 100 L

☐ D. 150 L

- 3) A square pyramid has a base with side 8 cm. If the volume is 192 cm^3 , what is the height?

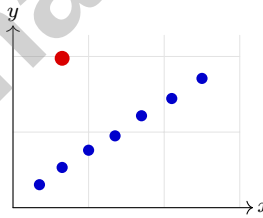
☐ A. 6 cm

☐ B. 9 cm

☐ C. 12 cm

☐ D. 18 cm

4)



A scatter plot displays student class attendance versus final exam grade. The data shows a positive linear association with a strong correlation. One student attended class 80% of the time but scored a 40% on the exam. This point is:

☐ A. An outlier

☐ B. A typical data point

☐ C. The mean of the data

☐ D. An error in measurement



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- 5) A team has 10 players. The coach assigns a captain, a co-captain, and a goalkeeper. How many different leadership combinations are possible?

☐ A. $10 + 9 + 8 = 27$

☐ C. $\binom{10}{3} = 120$

☐ B. $10 \times 9 \times 8 = 720$

☐ D. $10^3 = 1,000$

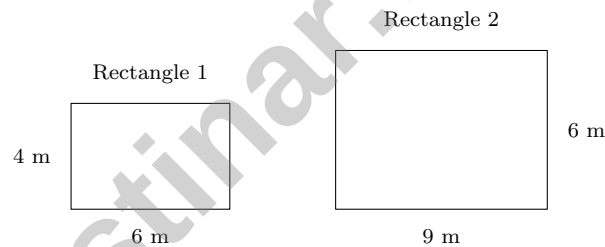
- 6) A line of best fit for a data set is $y = 2x + 5$. What is the y -intercept, and what does it represent?

☐ A. The intercept is 2; it is the starting value

☐ C. The intercept is 7; it is the sum of slope and starting value

☐ B. The intercept is 5; it is the predicted value when $x = 0$
☐ D. The intercept is $2x$; it is the slope

- 7) Two rectangles are shown with proportional dimensions. Which similarity statement is correct?


☐ A. Rectangle 1 $\sim$ Rectangle 2 with scale factor 1.5

☐ C. Rectangle 1 $\sim$ Rectangle 2 with scale factor 0.5

☐ B. The rectangles are not similar

☐ D. They are congruent

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

☐ A. 5

☐ C. 10

☐ B. 9

☐ D. 14



9) Which of the following is rational?

☐ A. $\sqrt{2}$

☐ B. $\pi + 1$

☐ C. $\sqrt{\pi}$

☐ D. $\sqrt{64}$

10) A car travels 180 miles in 3 hours. What is the slope (speed in miles per hour)?

11) Convert $0.\overline{18}$ to a fraction in simplest form.

☐ A. $\frac{1}{18}$

☐ B. $\frac{18}{100}$

☐ C. $\frac{18}{90}$

☐ D. $\frac{18}{99} = \frac{2}{11}$

12) Which best approximates $\sqrt{50}$?

☐ A. 6.5

☐ B. 7.5

☐ C. 5.0

☐ D. 7.1

13) Which is the best estimate of $\sqrt{50}$?

☐ A. 5.0

☐ B. 6.5

☐ C. 7.1

☐ D. 8.9

14) Convert 3.9×10^0 to standard form.

☐ A. 0.39

☐ B. 390

☐ C. 39

☐ D. 3.9

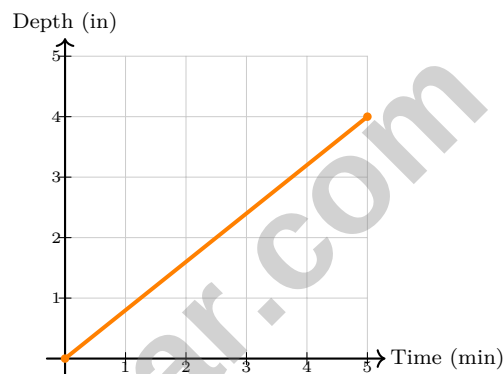


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1) Which scenario requires permutation (order matters)?

- ☐ A. Selecting 2 students from a group of 10 to form a study pair.
- ☐ B. Arranging 2 students from a group of 10 in a line (first and second position).
- ☐ C. Picking 2 toppings from a pizza menu.
- ☐ D. Choosing 2 books to bring home from a library shelf.

2) A graph shows depth of water versus time as a pool is filled.



What is the filling rate (slope)?

- ☐ A. $\frac{4}{5}$ inches per minute
- ☐ B. $\frac{5}{4}$ inches per minute
- ☐ C. 4 inches per minute
- ☐ D. 5 inches per minute

3) A water tank holds 200 gallons at 15% salinity. To reduce salinity to 10%, how much fresh water (0% salinity) should be added?

- ☐ A. 50 gal
- ☐ B. 150 gal
- ☐ C. 100 gal
- ☐ D. 200 gal



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4)

	Basketball	Volleyball	Total
Boys	12	8	20
Girls	10	15	25
Total	22	23	45

Based on the table, if one student is selected at random, what is the probability of selecting a girl who plays volleyball?

- ☐ A. $\frac{15}{25}$
☐ B. $\frac{15}{23}$

- ☐ C. $\frac{15}{45}$
☐ D. $\frac{10}{45}$

5) A right triangle has a hypotenuse of 10 and one leg of 6. What is the other leg?

- ☐ A. 4
☐ B. 8

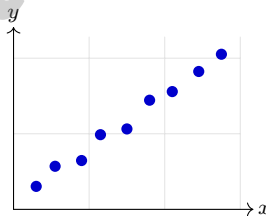
- ☐ C. 16
☐ D. 100

6) A gift box in the shape of a triangular pyramid has a right-triangular base with legs 5 in and 12 in. The pyramid is 4 in tall. What is the volume?

- ☐ A. 20 in^3
☐ B. 30 in^3

- ☐ C. 40 in^3
☐ D. 60 in^3

7)



A scatter plot shows hours of study and test scores for 30 students. As study hours increase, test scores also increase. What type of correlation does this show?

- ☐ A. Positive correlation
☐ B. Negative correlation

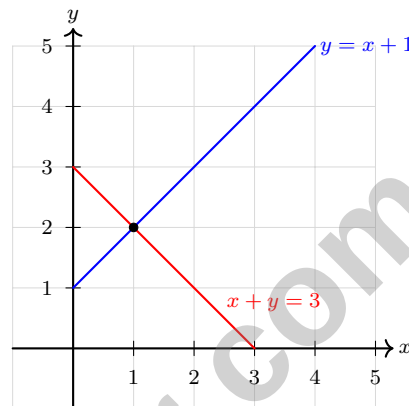
- ☐ C. No correlation
☐ D. Causal relationship



- 1) A square pyramid has a volume of 343 cm^3 and a height of 7 cm. What is the length of each base edge?

- ☐ A. 7 cm
☐ B. $7\sqrt{3}$ cm
☐ C. 14 cm
☐ D. 21 cm

- 2) Use the graph below to find the solution to the system of $y = x + 1$ and $x + y = 3$.



- ☐ A. (1, 2)
☐ B. (0, 3)
☐ C. (2, 1)
☐ D. (3, 0)
- 3) $(4.5 \times 10^{-6}) \times (2 \times 10^{-4}) = ?$
- ☐ A. 9×10^{-2}
☐ B. 6.5×10^{-10}
☐ C. 9×10^{-10}
☐ D. 9×10^{24}
- 4) A ladder leans against a wall. The slope of the ladder line is undefined. What does this indicate?
- ☐ A. The ladder is horizontal
☐ B. The ladder is on the ground
☐ C. The ladder is at a 45° angle
☐ D. The ladder is vertical



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- 5) A balloon starts at 300 meters and descends at 2 meters per second. What is the slope of the height model?

- 6) A slower cyclist riding 12 mph has a 9-mile head start. A faster cyclist riding 15 mph starts from the same point and rides in the same direction. How long will it take the faster cyclist to catch up?

- ☐ A. 2 hours
☐ B. 2.5 hours

- ☐ C. 3 hours
☐ D. 4 hours

- 7) If $f(x) = \begin{cases} 2x & \text{if } x < 2 \\ 5 & \text{if } x \geq 2 \end{cases}$, what is $f(3)$?

- ☐ A. 6
☐ B. 3

- ☐ C. 5
☐ D. 8

- 8) A function shows distance from home vs. time. The distance is zero at time $t = 0$, increases to a maximum of 150 miles at $t = 2$, then decreases back to zero at $t = 4$. Is this best described as one linear function or a piecewise linear function?



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 A is correct.** **(8.AF.8)** From the second equation, $y = x - 4$. Substitute into the first: $\frac{1}{4}x + (x - 4) = 2$, so $\frac{5}{4}x = 6$, giving $x = \frac{24}{5}$. Then $y = \frac{24}{5} - 4 = \frac{24}{5} - \frac{20}{5} = \frac{4}{5}$.
- 2) **Choice C is correct.** **(8.AF.8)** Initial salt amount: $0.02(100) = 2$ L. After adding x liters of pure water, total volume is $100 + x$ and salt amount is still 2 L. Setting concentration to 1%: $\frac{2}{100+x} = 0.01$, so $2 = 0.01(100 + x) = 1 + 0.01x$, giving $0.01x = 1$, thus $x = 100$ L.
- 3) **Choice B is correct.** **(8.GM.2)** $192 = \frac{1}{3} \times 64 \times h \Rightarrow h = \frac{192 \times 3}{64} = \frac{576}{64} = 9$ cm.
- 4) **Choice A is correct.** **(8.DSP.1)** The point lies far below the line of best fit, deviating from the expected positive correlation between attendance and exam grade.
- 5) **Choice B is correct.** **(8.DSP.5)** Captain: 10 choices. Co-captain: 9 remaining. Goalkeeper: 8 remaining. Total: $10 \times 9 \times 8 = 720$.
- 6) **Choice B is correct.** **(8.DSP.2)** In $y = mx + b$, $b = 5$ is the y -intercept, representing the y -value when $x = 0$.
- 7) **Choice A is correct.** **(8.GM.1)** Ratio of corresponding sides: $\frac{9}{6} = 1.5$ and $\frac{6}{4} = 1.5$. Constant ratio confirms similarity.
- 8) **Choice B is correct.** **(8.AF.3)** Substitute $x = 2$: $g(2) = 2 + 7 = 9$.
- 9) **Choice D is correct.** **(8.NS.1)** $\sqrt{64} = 8$, a whole number and therefore rational. The other values involve irrational numbers: $\sqrt{2}$ is irrational, $\pi + 1$ is the sum of an irrational and a rational, $\sqrt{\pi}$ is the square root of an irrational number.
- 10) **The correct answer is 60.** **(8.AF.2)** Slope = $\frac{180 \text{ miles}}{3 \text{ hours}} = 60$ miles per hour.
- 11) **Choice D is correct.** **(8.NS.1)** Let $x = 0.\overline{18}$. Then $100x = 18.\overline{18}$. Subtracting: $99x = 18$, so $x = \frac{18}{99} = \frac{2}{11}$.
- 12) **Choice D is correct.** **(8.NS.2)** $7^2 = 49$ and $8^2 = 64$. Since 50 is just above 49, $\sqrt{50} \approx 7.07$, closest to 7.1 (not 7.5).
- 13) **Choice C is correct.** **(8.NS.4)** Since $7^2 = 49$ and $7.1^2 = 50.41$, we have $\sqrt{50} \approx 7.07$.
- 14) **Choice D is correct.** **(8.NS.3)** $10^0 = 1$, so $3.9 \times 10^0 = 3.9 \times 1 = 3.9$.
- 15) **Choice C is correct.** **(8.GM.2)** $SA = 2\pi r^2 + 2\pi rh = 2(3.14)(2.5)^2 + 2(3.14)(2.5)(4) = 39.25 + 62.8 = 102.05 \text{ m}^2$.
- 16) **Choice D is correct.** **(8.GM.1)** Reflecting across $y = -x$ uses $(x, y) \rightarrow (-y, -x)$. A point like $(1, 2)$ maps to $(-2, -1)$ in Quadrant III (both coordinates negative).
- 17) **Choice C is correct.** **(8.AF.1)** Distribute: $8x - 4 = 3x + 9$. Subtract $3x$ from both sides and add 4 to both sides to get $5x = 13$, so $x = \frac{13}{5}$.
- 18) **Choice D is correct.** **(8.AF.1)** Subtract 3: $-2x < -4$. Divide by -2 (FLIP): $x > 2$. Open circle and right ray.
- 19) **The correct answer is A,B.** **(8.NS.3)** Division rule: divide coefficients ($6.4 \div 1.6 = 4$, choice A) and subtract exponents ($-3 - (-5) = 2$, choice B). This gives 4×10^2 . Choice C is wrong, choice D incorrectly adds exponents, and choice E has the wrong exponent sign.
- 20) **Choice B is correct.** **(8.AF.2)** Shading ABOVE the line requires $\geq$ or $>$. A solid line is shown, so $\geq$ is correct.
- 21) **Choice C is correct.** **(8.GM.2)** From $V = \frac{1}{3}\pi r^2 h$: $314 = \frac{1}{3} \times 3.14 \times r^2 \times 12 \Rightarrow r^2 = 25 \Rightarrow r = 5$ cm.
- 22) **Choice C is correct.** **(8.DSP.2)** Set $P = 500$: $500 = 3.2c - 250 \Rightarrow 3.2c = 750 \Rightarrow c = \frac{750}{3.2} \approx 234.4$. Since cakes are whole items, the bakery must sell at least 235 cakes.
- 23) **Choice D is correct.** **(8.NS.3)** $(x^3)^2 = x^6$; then $\frac{x^6}{x^4} = x^2$. Substitute $x = 2$: $2^2 = 4$.
- 24) **Choice D is correct.** **(8.NS.3)** If the area is 169 square inches, then $s^2 = 169$, so $s = \sqrt{169} = 13$ inches.
- 25) **The correct answer is 3.** **(8.GM.3)** From $(\sqrt{6})^2 + (\sqrt{3})^2 = c^2$, we get $6 + 3 = 9$, so $c = \sqrt{9} = 3$.
- 26) **Choice C is correct.** **(8.AF.2)** $k = \frac{10}{1} = 10$. The line is very steep, passing through $(0, 0)$ and $(1, 10)$.
- 27) **Choice A is correct.** **(8.AF.2)** Substitute: $-3 = -\frac{3}{4}(4) + b$, so $-3 = -3 + b$, thus $b = 0$.
- 28) **Choice A is correct.** **(8.AF.2)** FOIL: $(4x - 3)(x + 2) = 4x^2 + 8x - 3x - 6 = 4x^2 + 5x - 6$.
- 29) **Choice C is correct.** **(8.AF.3)** Non-vertical straight lines pass the vertical line test and are functions. Every vertical line intersects the graph at most once.



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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 4 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, ACHIEVE TOMORROW!

Give your child the confidence and skills they need with **4 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!

4



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!



4 PRINTED TESTS



2 ONLINE TESTS



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