

# ARKANSAS ATLAS

## 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.



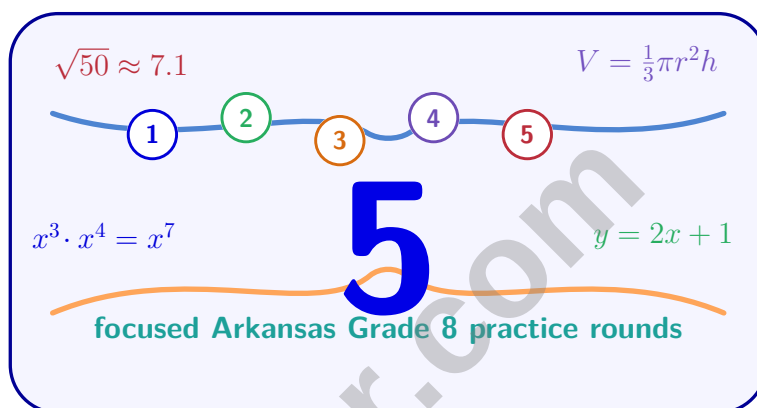
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

# 5 Arkansas ATLAS Grade 8 Math Practice Tests

*Five ATLAS Tests for Real Numbers, Functions, and Geometry*



Five complete 40-question Grade 8 ATLAS 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, Arkansas Grade 8 Problem Solver!

Five focused rounds for sharper ATLAS math thinking

This book gives you five full Grade 8 ATLAS 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 Arkansas 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.

**Arkansas 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 ATLAS 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.



Scan me!  
For more practice  
& answers

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1) A temperature increases by  $3^{\circ}$  per hour. If it starts at  $12^{\circ}\text{C}$  and must stay below  $30^{\circ}\text{C}$ , which inequality represents valid times (in hours)?

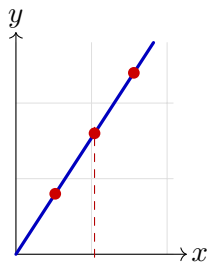
☐ A.  $t < 6$

☐ C.  $t \leq 6$

☐ B.  $t > 6$

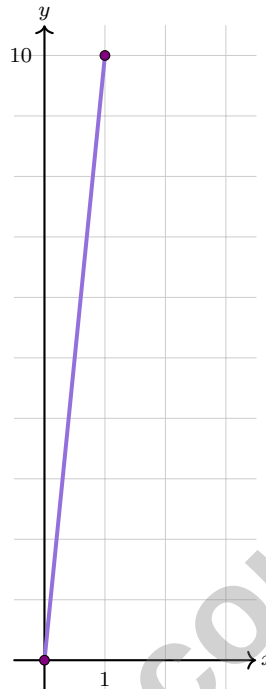
☐ D.  $t \geq 6$

2) Is the graph of a straight line passing through  $(1, 2)$  and  $(3, 6)$  a function?

☐ A. No, it is not steep enough.☐ C. Yes, it passes the vertical line test.☐ B. Yes, because it is a straight line.☐ D. No, because the slope is positive.

3) Evaluate  $(x + 4)(x + 8)$  when  $x = 1$ .





4)

The constant of proportionality is:

☐ A. 1☐ C. 10☐ B. 5☐ D. 20

- 5) A fitness trainer charges a client based on the number of sessions attended. The data table shows:

|           |    |     |     |
|-----------|----|-----|-----|
| Sessions  | 2  | 5   | 8   |
| Cost (\$) | 60 | 150 | 240 |

What is the slope (cost per session)?

☐ A. \$30 per session☐ C. \$20 per session☐ B. \$60 per session☐ D. \$150 per session

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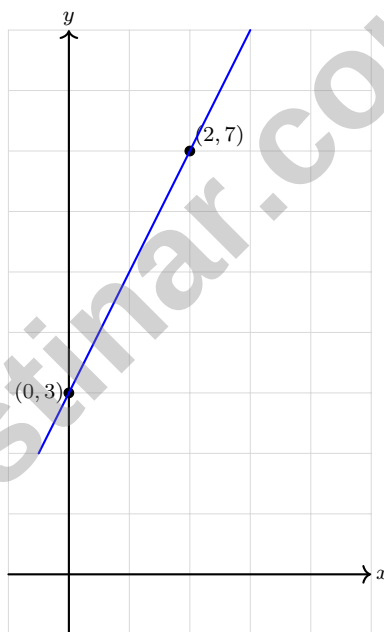
6) A father is currently 32 years older than his son. In 8 years, the father will be twice as old as the son. What is the son's current age?

☐ A. 16☐ C. 24☐ B. 20☐ D. 28

7) If  $f(x) = \frac{x+4}{2}$  and  $f(x) = 5$ , what is  $x$ ?

☐ A. 2☐ C. 6☐ B. 4☐ D. 10

8) The graph shows a linear function passing through points  $(0, 3)$  and  $(2, 7)$ .



What is the slope of the line?

☐ A. 2☐ C.  $\frac{1}{2}$ ☐ B. 3☐ D.  $\frac{2}{7}$ 

1) A recipe calls for 3 cups of flour per batch of cookies. How many batches can be made with 12 cups of flour? (Assume a proportional relationship.)

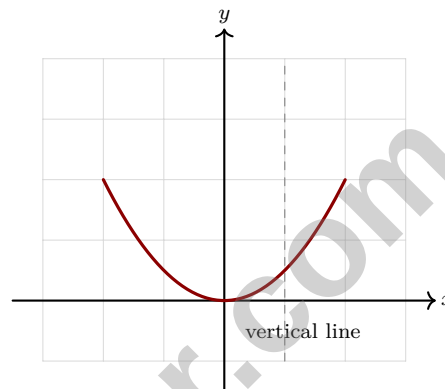
☐ A. 2 batches

☐ C. 4 batches

☐ B. 3 batches

☐ D. 6 batches

2) A vertical line test is performed on the graph below. How many times does a vertical line intersect the curve?



☐ A. Zero times (the line misses the curve).

☐ C. Twice (the line intersects at two points).

☐ B. Once (the line intersects at one point).

☐ D. More than twice.

3) Which is a NONLINEAR function?

☐ A.  $y = 11x$

☐ C.  $y = x^2 + 7$

☐ B.  $y = -9 + x$

☐ D.  $y = \frac{1}{2}x - 3$



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- 4) A table shows the relationship between hours worked and pay earned.

| Hours    | 2  | 4  | 6  | 8  |
|----------|----|----|----|----|
| Pay (\$) | 18 | 36 | 54 | 72 |

What is the rate of change (slope) of pay with respect to hours worked?

- ☐ A. \$8 per hour                      ☐ C. \$10 per hour  
☐ B. \$12 per hour                    ☐ D. \$9 per hour
- 5) A piggy bank holds 25 coins consisting of nickels (5¢) and dimes (10¢). The total value is \$1.70. How many nickels are in the bank?

- ☐ A. 10                                      ☐ C. 12  
☐ B. 16                                      ☐ D. 8

- 6) If  $f(x) = |x - 2|$ , what is  $f(5)$ ?

- ☐ A. 3                                        ☐ C. 7  
☐ B. -3                                      ☐ D. -7

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

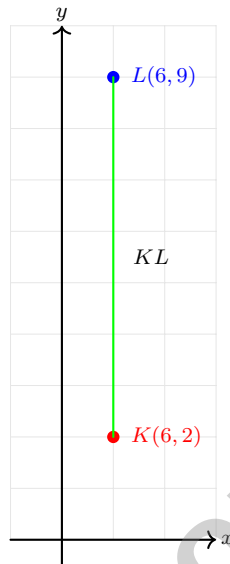
- ☐ A.  $(x + 9)(x - 4)$                       ☐ C.  $(x + 12)(x - 3)$   
☐ B.  $(x - 9)(x + 4)$                       ☐ D.  $(x + 6)(x - 6)$

- 8) Gym X:  $\text{Cost}(m) = 30m$ . Gym Y at month 1: \$50, month 3: \$115. Higher monthly fee?

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



- 1) On a coordinate plane, point  $K = (6, 2)$  and point  $L = (6, 9)$ . What is  $KL$ ?



- ☐ A. 7
- ☐ B. 6
- ☐ C.  $\sqrt{48}$
- ☐ D. 15
- 2) The mass of the Sun is approximately  $2 \times 10^{30}$  kg. How many times more massive is the Sun than Earth, which has mass  $6 \times 10^{24}$  kg?

- 3) Which loan option has the lowest total cost (principal + interest) for borrowing \$2,000?

- ☐ A. 12% APR for 1 year (total cost: \$2,240)
- ☐ B. 8% APR for 2 years (total cost: \$2,320)
- ☐ C. 6% APR for 3 years (total cost: \$2,360)
- ☐ D. 4% APR for 4 years (total cost: \$2,320)



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& answers

4) Visual: Expanded form.  $2^5$  means:

$$\underbrace{2 \times 2 \times 2 \times 2 \times 2}_{5 \text{ factors}}$$

If we multiply  $2^3 \times 2^4$ , how many total factors of 2 do we have?

☐ A. 2

☐ C. 24

☐ B. 12

☐ D. 7

5) If  $x^3 = 125$ , what is  $x$ ?

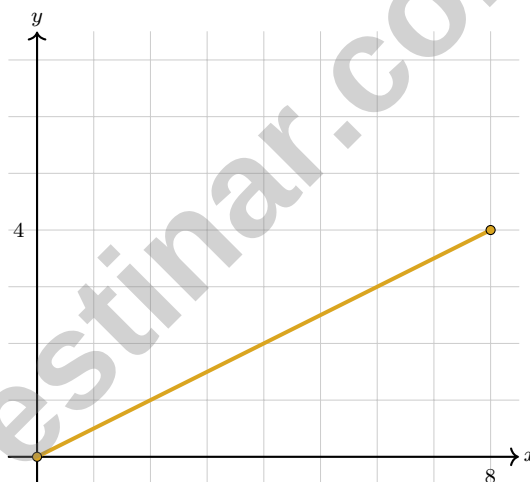
☐ A. 4

☐ C. 6

☐ B. 7

☐ D. 5

6)



The constant of proportionality is:

☐ A. 2

☐ C. 0.5

☐ B. 1

☐ D. 4



**Arkansas ATLAS 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 Arkansas ATLAS practice test.**

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## Practice Test Answers and Explanations

### Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** (8.ALG.1) Set up:  $12 + 3t < 30$ . Subtract 12:  $3t < 18$ . Divide by 3:  $t < 6$  hours.
- 2) **Choice C is correct.** (8.FN.3) Non-vertical straight lines pass the vertical line test and are functions. Every vertical line intersects the graph at most once.
- 3) **The correct answer is 45.** (8.ALG.1) Substitute  $x = 1$ :  $(1 + 4)(1 + 8) = 5 \cdot 9 = 45$ .
- 4) **Choice C is correct.** (8.FN.1)  $k = \frac{10}{1} = 10$ . The line is very steep, passing through  $(0, 0)$  and  $(1, 10)$ .
- 5) **Choice A is correct.** (8.FN.8) Using  $(2, 60)$  and  $(5, 150)$ : slope  $= \frac{150 - 60}{5 - 2} = \frac{90}{3} = \$30$  per session.
- 6) **Choice C is correct.** (8.NCC.6) Let  $s$  = son's current age. Then father's age  $= s + 32$ . In 8 years:  $s + 32 + 8 = 2(s + 8)$ , so  $s + 40 = 2s + 16$ , giving  $s = 24$  years.
- 7) **Choice C is correct.** (8.FN.1) Solve  $\frac{x+4}{2} = 5$ : multiply both sides by 2 to get  $x + 4 = 10$ , so  $x = 6$ .
- 8) **Choice A is correct.** (8.FN.4) Slope is  $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 3}{2 - 0} = \frac{4}{2} = 2$ .
- 9) **Choice B is correct.** (8.FN.9) Cost equals price times quantity, which is a linear function with constant slope. A is oscillating, C and D are exponential.
- 10) **Choice A is correct.** (8.GM.6) 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  $\triangle JKL \cong \triangle MNO$ .
- 11) **Choice A is correct.** (8.GM.10) Points  $(1, 1) \rightarrow (-1, 1)$  and  $(3, 3) \rightarrow (-3, 3)$ . The  $y$ -coordinates are unchanged while  $x$ -coordinates negate, confirming reflection across the  $y$ -axis.
- 12) **Choice A is correct.** (8.FN.7) Alternate interior angles formed by parallel lines and a transversal are congruent.
- 13) **The correct answer is 1.** (8.FN.4) The rate of change is  $\frac{-1 - (-3)}{2 - 0} = 1$ .
- 14) **Choice B is correct.** (8.GM.3, 8.GM.4) The 7-24-25 triple applies directly:  $d^2 = 7^2 + 24^2 = 49 + 576 = 625$ , so  $d = 25$  cm.
- 15) **Choice A is correct.** (8.GM.5)  $d = \sqrt{(5 - 0)^2 + (12 - 0)^2} = \sqrt{25 + 144} = \sqrt{169} = 13$ .
- 16) **Choice C is correct.** (8.GM.1) If height triples, volume triples (linear relationship with  $h$  in  $V = \frac{1}{3}Bh$ ). New volume:  $3 \times 240 = 720 \text{ ft}^3$ .
- 17) **Choice C is correct.** (8.GM.6) The perimeter includes two straight sides of 16 m and two semicircles that make one full circle with diameter 4 m. So  $P = 16 + 16 + 3.14(4) = 44.56$  m.
- 18) **Choice B is correct.** (8.GM.1) Sum of interior angles in a quadrilateral is  $360^\circ$ . So  $x = 360 - 72 - 88 - 95 = 105^\circ$ .
- 19) **Choice C is correct.** (8.SP.1) When most points cluster tightly around an imaginary upward line with few outliers far from it, the correlation is strong. Wide scatter indicates weak correlation.
- 20) **The correct answer is 2.** (8.FN.3) The change in  $y$  is 4 when  $x$  increases by 2, so the slope is  $4 \div 2 = 2$ .
- 21) **Choice C is correct.** (8.SP.2) Column-conditional frequency among online purchases:  $\frac{57}{193} \approx 0.30 \approx 30\%$ .
- 22) **The correct answer is B,D.** (8.ALG.3) 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.
- 23) **Choice A is correct.** (8.GM.5) Deviations:  $|50 - 60| = 10$ ,  $|60 - 60| = 0$ ,  $|55 - 60| = 5$ ,  $|65 - 60| = 5$ ,  $|70 - 60| = 10$ . Sum = 30. MAD =  $30/5 = 6$ .
- 24) **Choice C is correct.** (8.SP.5) With replacement, first draw has 6 choices, second draw has 6 choices. Total:  $6 \times 6 = 36$  outcomes.
- 25) **Choice B is correct.** (8.GM.4) Vertical angles are congruent. So  $s = 87^\circ$ .
- 26) **Choice B is correct.** (8.SP.2) A near-zero slope indicates weak or no correlation between the variables.
- 27) **The correct answer is 192.** (8.SP.4) Multiply the number of choices:  $6 \times 8 \times 4 = 192$  different complete meals.
- 28) **Choice C is correct.** (8.GM.11) If two triangles have all three corresponding angles congruent, they are similar by AAA (Angle-Angle-Angle). Here, both triangles have the same three angles, so they must be similar regardless of side lengths.



## 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](mailto: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



**2** ONLINE  
TESTS



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