

# 3

# Arkansas

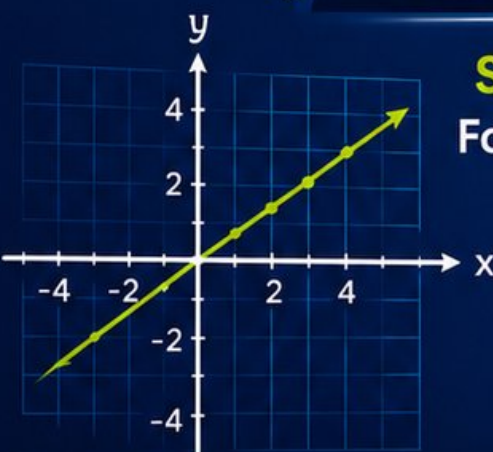
# ATLAS

## GRADE 8

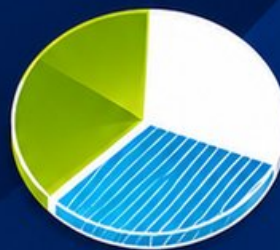
# MATH

## PRACTICE TESTS

**Standards Aligned Problem Solving**  
For Comprehensive Assessment Programs



$$V = s^3$$



$$y = mx + b$$
$$2x + 5 = 13$$
$$x = 4$$



# 3

**PRINTED  
TESTS**



# 2

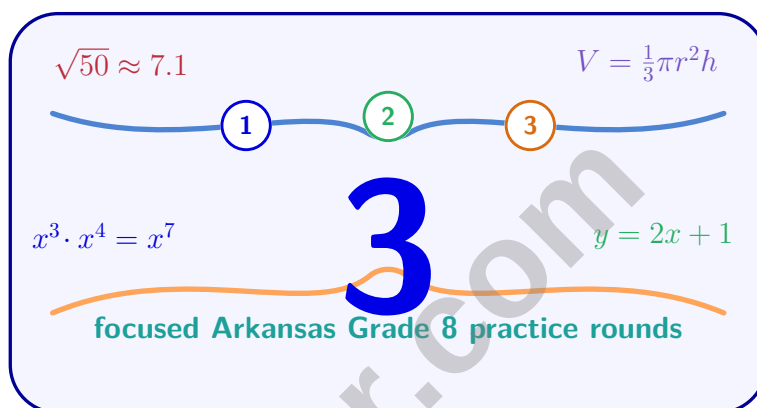
**ONLINE  
TESTS**



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

# 3 Arkansas ATLAS Grade 8 Math Practice Tests

*Focused Grade 8 ATLAS Practice with Clear Explanations*



Three 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!

Three focused rounds for sharper ATLAS math thinking

This book gives you three 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 three-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?

Three ATLAS tests, 120 questions, and a focused review path

| Part         | What You Will Practice                                                                        |
|--------------|-----------------------------------------------------------------------------------------------|
| Tests 1–2    | Real numbers, exponents, scientific notation, equations, and careful reading.                 |
| Test 3       | 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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# Table of Contents



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1) A right triangle has legs of length 6 and 8. What is the length of the hypotenuse?

☐ A. 10

☐ C. 11

☐ B. 12

☐ D. 14

2) A rectangular prism has length  $\frac{3}{2}$  ft, width 1 ft, and height  $\frac{1}{2}$  ft. What is its surface area?

☐ A.  $\frac{11}{4}$  ft<sup>2</sup>

☐ C. 7 ft<sup>2</sup>

☐ B.  $\frac{11}{2}$  ft<sup>2</sup>

☐ D.  $\frac{15}{2}$  ft<sup>2</sup>

3) Express 356,000 in scientific notation.

4) Triangle PQR has angles measuring 45°, 60°, and 75°. If triangle PQR is reflected across the  $y$ -axis, what are the angle measures in the reflected triangle?

☐ A. 45°, 50°, 85°

☐ C. 30°, 60°, 90°

☐ B. 45°, 60°, 75°

☐ D. 50°, 65°, 65°

5) The line  $y = \frac{1}{3}x + k$  passes through the point (3, 5). What is the value of  $k$ ?

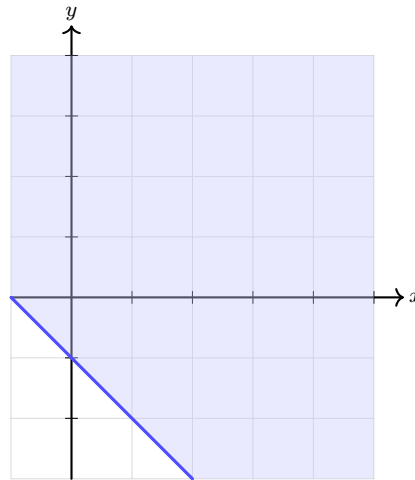
☐ A. 1

☐ C. 3

☐ B. 2

☐ D. 4





6)

The line shown has equation  $y = -x - 1$ . With shading above, the inequality is:

☐ A.  $y > -x - 1$

☐ C.  $y \geq -x - 1$

☐ B.  $y < -x - 1$

☐ D.  $y \leq -x - 1$

7) A cylinder has a radius of 3 cm and a height of 10 cm. Approximately, what is its volume? Use  $\pi \approx 3.14$ .

☐ A.  $94.2 \text{ cm}^3$

☐ C.  $282.6 \text{ cm}^3$

☐ B.  $188.4 \text{ cm}^3$

☐ D.  $565.2 \text{ cm}^3$

8) A biologist records the relationship between a bacteria colony's age (days) and size (cells). The model is  $S = 1500 \cdot 1.2^t$ . This is NOT a linear model. Why?

☐ A. The growth rate (slope) is constant across all days

☐ C. The relationship is between days and cells, so it must be linear

☐ B. The number of new cells added increases each day (exponential growth, not constant rate)

☐ D. Exponential models always have more accuracy than linear ones


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9) Which loan has the lowest total repayment cost for \$3,000 principal?

☐ A. 6% for 2 years

☐ C. 4% for 4 years

☐ B. 5% for 3 years

☐ D. 3% for 5 years

10) A biologist studies bacteria that double every hour. If there are  $10^2$  bacteria initially, how many are there after 9 hours (i.e.,  $3^2$  hours)? Express in exponential form.

☐ A.  $10^2 + 2^9$

☐ C.  $20^2$

☐ B.  $10^6$

☐ D.  $10^2 \cdot 2^9$

11) Convert  $0.\overline{3}$  to a fraction.

12) What is  $\sqrt[3]{729}$ ?

☐ A. 8

☐ C. 10

☐ B. 11

☐ D. 9

13) Divide:  $\frac{8 \times 10^8}{2 \times 10^3}$

☐ A.  $10 \times 10^5$

☐ C.  $4 \times 10^{11}$

☐ B.  $6 \times 10^5$

☐ D.  $4 \times 10^5$

14) Solve for  $x$ :  $6x - 3(x + 2) = 3$

☐ A.  $x = 3$

☐ C.  $x = 1$

☐ B.  $x = 2$

☐ D.  $x = 9$



1) Two triangles are congruent. If one triangle has angles of  $40^\circ, 60^\circ, 80^\circ$ , what are the angles of the other triangle?

☐ A.  $40^\circ, 60^\circ, 90^\circ$

☐ C.  $80^\circ, 60^\circ, 40^\circ$  (different order)

☐ B.  $40^\circ, 60^\circ, 80^\circ$

☐ D.  $50^\circ, 60^\circ, 70^\circ$

0. $\overline{142}$

3-digit repeating block

Denominator: ?

2)

Based on the diagram, what is the denominator when  $0.\overline{142}$  is converted?

☐ A. 99

☐ C. 999

☐ B. 142

☐ D. 1000

3) Which interval contains  $2 + \sqrt{3}$ ?

☐ A. Between 2 and 3

☐ C. Between 4 and 5

☐ B. Greater than 5

☐ D. Between 3 and 4

4) How many times smaller is  $1.5 \times 10^{-6}$  than  $1.5 \times 10^{-3}$ ?

☐ A. 3 times

☐ C. 300 times

☐ B. 30 times

☐ D. 1,000 times

5) If  $a < \sqrt{n} < a + 1$  where  $a$  is a positive integer, then which statement is true?

☐ A.  $n = a^2$

☐ C.  $a^2 < n < (a + 1)^2$

☐ B.  $n = (a + 1)^2$

☐ D.  $n$  is rational



- 6) A composite solid consists of a cube with edge 2 cm on top of a rectangular prism base with dimensions  $4 \times 4 \times 3$  cm (where the cube sits on one face of the prism, sharing a  $2 \times 2$  face). Ignoring the shared face, what is the combined surface area?

☐ A.  $60 \text{ cm}^2$  ☐ C.  $84 \text{ cm}^2$   
☐ B.  $76 \text{ cm}^2$  ☐ D.  $96 \text{ cm}^2$

- 7) Which property is preserved under all three rigid transformations (translation, reflection, and rotation)?

☐ A. Position on the coordinate plane ☐ C. Length of sides  
☐ B. Orientation (clockwise vs. counterclockwise) ☐ D. Size relative to other figures

- 8) If  $g(x) = x^2 + 2$  and  $g(x) = 11$ , find the possible values of  $x$ .

- 9) The points  $(-2, -5)$ ,  $(0, -1)$ , and  $(2, 3)$  lie on the same line. What is the  $y$ -intercept?

☐ A.  $-5$  ☐ C.  $-1$   
☐ B.  $-2$  ☐ D.  $2$

- 10) To determine the solution region of an inequality, you can use a test point. Which is the most efficient test point to select?

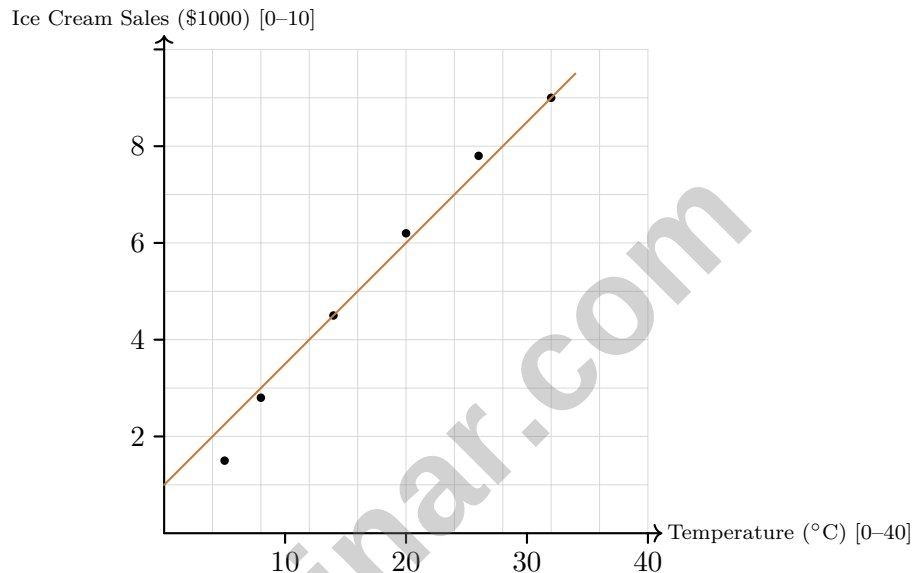
☐ A. A point on the boundary line ☐ C. Any point with negative coordinates  
☐ B. The origin  $(0, 0)$ , provided it is not on the boundary ☐ D. A point in Quadrant III



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& answers

- 1) A decorative shape consists of a circle (radius 5 cm) with four congruent right triangles arranged around it (each with legs 3 cm and 4 cm). What is the total area? Use  $\pi \approx 3.14$ .

- ☐ A.  $66.5 \text{ cm}^2$  ☐ C.  $102.5 \text{ cm}^2$   
☐ B.  $90.5 \text{ cm}^2$  ☐ D.  $147.5 \text{ cm}^2$



2)

The scatter plot shows temperature versus ice cream sales. What is the approximate  $y$ -intercept (sales when temperature is  $0^\circ\text{C}$ )?

- ☐ A. \$1000 ☐ C. \$2000  
☐ B. \$0 ☐ D. \$3000

- 3) A model car is 12 cm long. The actual car is 4.8 m long. What is the scale factor from the model to the actual car?

- ☐ A. 40 ☐ C. 0.4  
☐ B. 4 ☐ D. 0.25



4) 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

5) Which number can be expressed as a fraction?

☐ A.  $\sqrt{11}$

☐ C.  $\frac{8}{3}$

☐ B.  $2\pi$

☐ D.  $\sqrt{2} + 1$

6) A repeating decimal  $0.\overline{d_1d_2d_3}$  (3 digits) will have which denominator when fully simplified?

☐ A. Always exactly 999 (before simplification).

☐ C. A factor of 999 (could be 27, 37, 111, 333, 999, ...).

☐ B. Always exactly 1000.

☐ D. A factor of 1000 (could be 8, 125, 200, ...).

7) Is  $\sqrt{12}$  greater than or less than 3.5?

☐ A. Greater than 3.5

☐ C. Exactly 3.5

☐ B. Cannot determine

☐ D. Less than 3.5

8) Write 0.000284 in scientific notation.

☐ A.  $2.84 \times 10^4$

☐ C.  $28.4 \times 10^{-5}$

☐ B.  $2.84 \times 10^{-3}$

☐ D.  $2.84 \times 10^{-4}$



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**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.GM.3, 8.GM.4)** Pythagorean Theorem:  $a^2 + b^2 = c^2$ , so  $6^2 + 8^2 = c^2$ ,  $36 + 64 = 100$ ,  $c = \sqrt{100} = 10$ .
- 2) **Choice B is correct.** **(8.GM.1)**  $SA = 2(\frac{3}{2} \times 1 + \frac{3}{2} \times \frac{1}{2} + 1 \times \frac{1}{2}) = 2(\frac{3}{2} + \frac{3}{4} + \frac{1}{2}) = 2(\frac{11}{4}) = \frac{11}{2}$  ft<sup>2</sup>.
- 3) **The correct answer is  $3.56 \times 10^5$ .** **(8.NCC.3)** Move the decimal 5 places left to get 3.56; since the original number is greater than 1, the exponent is positive 5.
- 4) **Choice B is correct.** **(8.GM.10)** Reflections preserve angle measures. The reflected triangle has the same angles as the original (rigid transformation).
- 5) **Choice D is correct.** **(8.FN.2)** Substitute (3, 5):  $5 = \frac{1}{3}(3) + k$ , so  $5 = 1 + k$ , thus  $k = 4$ .
- 6) **Choice C is correct.** **(8.GM.6)** SOLID line (includes boundary) with shading ABOVE means  $y \geq -x - 1$ .
- 7) **Choice C is correct.** **(8.GM.1)** Volume of a cylinder:  $V = \pi r^2 h \approx 3.14 \times 3^2 \times 10 = 3.14 \times 90 = 282.6$  cm<sup>3</sup>.
- 8) **Choice B is correct.** **(8.SP.6)** In a linear model (8.SP.3), the rate of change is constant—the same number of cells are added each day. Here, the exponent  $t$  makes the rate accelerate: day 1 might add 300 cells, day 2 adds 360 cells, etc. This violates the constant-slope assumption of linear models.
- 9) **Choice A is correct.** **(8.GM.1)** A: \$360 interest. B: \$450 interest. C: \$480 interest. D: \$450 interest. Option A has the lowest total cost.
- 10) **Choice D is correct.** **(8.NCC.3)** After  $3^2 = 9$  hours, doubling 9 times means multiply by  $2^9$ . Total:  $10^2 \cdot 2^9$ .
- 11) **The correct answer is  $\frac{1}{3}$ .** **(8.SP.2)** Let  $x = 0.\overline{3}$ . Then  $10x = 3.\overline{3}$ , so  $9x = 3$  and  $x = \frac{1}{3}$ .
- 12) **Choice D is correct.** **(8.NCC.7)**  $9 \times 9 \times 9 = 729$ , so  $\sqrt[3]{729} = 9$ .
- 13) **Choice D is correct.** **(8.NCC.6)** Divide coefficients:  $8 \div 2 = 4$ . Subtract exponents:  $10^{8-3} = 10^5$ . Result:  $4 \times 10^5$ .
- 14) **Choice A is correct.** **(8.ALG.1)** Distribute:  $6x - 3x - 6 = 3$ . Combine:  $3x - 6 = 3$ . Add 6:  $3x = 9$ . Divide by 3:  $x = 3$ .
- 15) **Choice D is correct.** **(8.ALG.3)** Substitute  $x = y - 4$  into  $2x + 3y = 2$ :  $2(y - 4) + 3y = 2$ , so  $2y - 8 + 3y = 2$ , giving  $5y = 10$  and  $y = 2$ . Then  $x = 2 - 4 = -2$ . Solution:  $(-2, 2)$ .
- 16) **Choice A is correct.** **(8.ALG.1)** Multiply by  $-2$  (FLIP):  $x + 5 \geq -6$ . Subtract 5:  $x \geq -11$ .
- 17) **Choice A is correct.** **(8.ALG.1)** Sum:  $x^2 + 5x + 5x + 25 = x^2 + 10x + 25 = (x + 5)^2$ .
- 18) **The correct answer is  $\sqrt{10}$ .** **(8.SP.2)** Since square root is an increasing function, compare the radicands:  $10 < 19 < 35$ . Therefore  $\sqrt{10} < \sqrt{19} < \sqrt{35}$ .
- 19) **Choice B is correct.** **(8.FN.4)** Plan A base cost: \$15. Plan B at  $m = 0$ : \$20. Since  $20 > 15$ , Plan B is higher.
- 20) **Choice B is correct.** **(8.FN.3)** First differences:  $8 - 5 = 3$ ,  $12 - 8 = 4$ ,  $17 - 12 = 5$ . Non-constant differences indicate nonlinear growth.
- 21) **The correct answer is A,C.** **(8.NCC.5)** Statement A is true because rational numbers are closed under addition. Statement C is true because any terminating decimal, such as  $0.75 = \frac{3}{4}$ , is rational. Statement B is false because two irrational numbers can multiply to a rational number, for example  $\sqrt{2} \times \sqrt{8} = 4$ . Statement D is false because integers are rational. Statement E is false because perfect squares have rational square roots, not irrational ones.
- 22) **Choice B is correct.** **(8.FN.4)** Current value \$18,000 (intercept). Depreciates (decreases) by \$2000 per year (negative slope). Equation:  $V = -2000t + 18000$ .
- 23) **Choice A is correct.** **(8.GM.10)** Reflection across  $y = x$  swaps coordinates:  $(x, y) \rightarrow (y, x)$ . So  $(-3, 2) \rightarrow (2, -3)$ .
- 24) **Choice B is correct.** **(8.FN.7)** The exterior angle at  $C$  is  $123^\circ$ , so the interior angle  $\angle ACD = 180 - 123 = 57^\circ$ .
- 25) **Choice A is correct.** **(8.GM.5)**  $d = \sqrt{(3 - (-1))^2 + (1 - (-2))^2} = \sqrt{4^2 + 3^2} = \sqrt{16 + 9} = \sqrt{25} = 5$ .
- 26) **Choice A is correct.** **(8.GM.1)**  $B = 7 \times 9 = 63$  m<sup>2</sup>.  $V = \frac{1}{3} \times 63 \times 15 = \frac{945}{3} = 315$  m<sup>3</sup>.
- 27) **Choice D is correct.** **(8.GM.1)** The sum of exterior angles is always  $360^\circ$ . If each exterior angle is  $24^\circ$ , then  $n = \frac{360}{24} = 15$ .
- 28) **Choice B is correct.** **(8.SP.1)** The downward trend shows negative correlation: as exercise increases, resting heart rate decreases. This is a typical physiological response.



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## Hi, Grade 8 Math Star!

◇ You finished this practice set with real effort. Grade 8 math asks you to connect ideas, explain your thinking, and stay steady through multi-step problems. ◇

★ **Remember this:** Every page you completed helped build stronger habits: reading carefully, choosing a method, showing work, and checking whether the answer makes sense. You practiced across 3 full Grade 8 practice tests, and that repeated effort matters. ★

### What You Built

- **Focus:** You stayed with challenging questions.
- **Accuracy:** You learned to slow down when details matter.
- **Reasoning:** You practiced explaining why a method works.
- **Readiness:** You are more prepared than when you started.

**Grade 8 test-day tip:** Before test day, review the questions that made you pause. Those are the best teachers.

If you want to share something or ask a question, please email me at [jay@testinar.com](mailto:jay@testinar.com).

**Jay Daie**

Your Grade 8 Math Friend

# PRACTICE TODAY, ACHIEVE TOMORROW!

GRADE  
**8**

Give your child the edge they need with **3 full-length** Grade 8 Math practice tests that reflect real test formats and cover all key math standards. Perfect for building skills, boosting confidence, and preparing for success on test day!



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- ✓ Ratios & Proportional Relationships
- ✓ Linear Equations
- ✓ Functions
- ✓ Geometry
- ✓ Measurement & Data
- ✓ Statistics & Probability
- ✓ Pythagorean Theorem
- ✓ Volume & Surface Area
- ✓ Transformations
- ✓ Inequalities
- ✓ Data Analysis & Graphing
- ✓ And More!



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Better **Results.**