

6 Alabama ACAP

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



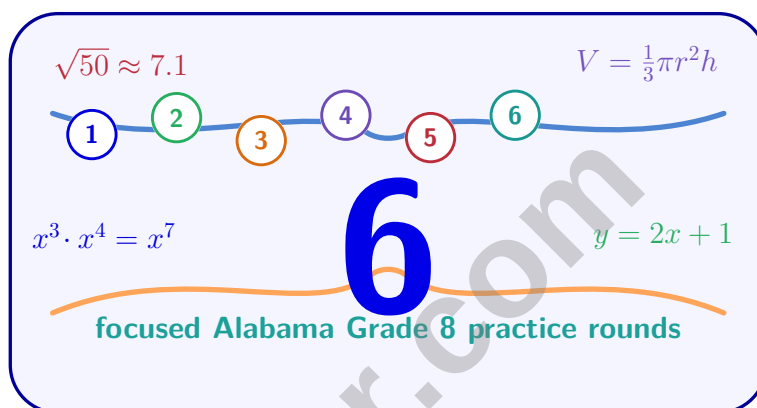
2 ONLINE
TESTS



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

6 Alabama ACAP Grade 8 Math Practice Tests

Six ACAP Rounds for Functions, Geometry, Data, and Reasoning



Six complete 40-question Grade 8 ACAP 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, Alabama Grade 8 Problem Solver!

Six focused rounds for sharper ACAP math thinking

This book gives you six full Grade 8 ACAP 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 Alabama 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 six-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.

Alabama 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?

Six ACAP tests, 240 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 4–6	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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1) Two points are (2, 5) and (4, 11). What is the slope of the line through them?

☐ A. 3

☐ B. $\frac{1}{3}$

☐ C. 6

☐ D. -3

2) Which expression equals a rational number?

☐ A. $\sqrt{2} \times \sqrt{3}$

☐ B. $\sqrt{4} + \sqrt{5}$

☐ C. $\sqrt{3} + \sqrt{3}$

☐ D. $\sqrt{9} \times \sqrt{4}$

3) Which set contains only irrational numbers?

☐ A. {1, 2, 3}

☐ B. $\{\sqrt{4}, \sqrt{9}, \sqrt{16}\}$

☐ C. $\{\sqrt{2}, 3, \sqrt{5}\}$

☐ D. $\{\sqrt{2}, \sqrt{3}, \sqrt{5}\}$

4) A survey asks 240 people about pet ownership. 144 own dogs, and of those, 108 also own cats. Calculate the relative frequency of people who own both dogs and cats among all dog owners. Express as a decimal.

5) Which expression is larger: $\sqrt{5} + \sqrt{6}$ or 4.8?

☐ A. $\sqrt{5} + \sqrt{6}$ is larger

☐ B. Cannot be determined

☐ C. They are equal

☐ D. 4.8 is larger



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6) A student has two options to save money: Option 1 puts \$800 in a savings account at 10% simple interest for 1 year; Option 2 keeps the \$800 in cash (0% return). How much MORE money will Option 1 have compared to Option 2 after 1 year?

- ☐ A. \$40 more ☐ C. \$160 more
☐ B. \$320 more ☐ D. \$80 more

7) Simplify $7^{-4} \cdot 7^6$.

- ☐ A. 7^{-2} ☐ C. 7^3
☐ B. 7^{-10} ☐ D. 7^2

8) A square picture frame has an area of 169 square inches. What is the length of one side of the frame?

- ☐ A. 12 inches ☐ C. 14 inches
☐ B. 15 inches ☐ D. 13 inches

9) Convert 0.0042 to scientific notation.

- ☐ A. 4.2×10^{-4} ☐ C. 0.42×10^{-2}
☐ B. 4.2×10^3 ☐ D. 4.2×10^{-3}

10) A student claims $(4 \times 10^3) \times (5 \times 10^2) = 20 \times 10^5$. The arithmetic steps are correct, but is the final answer in proper scientific notation?

- ☐ A. Yes, it is in proper form. ☐ C. No; the exponent should be 10^6 instead.
☐ B. No; both coefficient and exponent are wrong. ☐ D. No; the coefficient 20 is too large. Should be 2×10^6 .



11) Which graph does NOT represent a function?

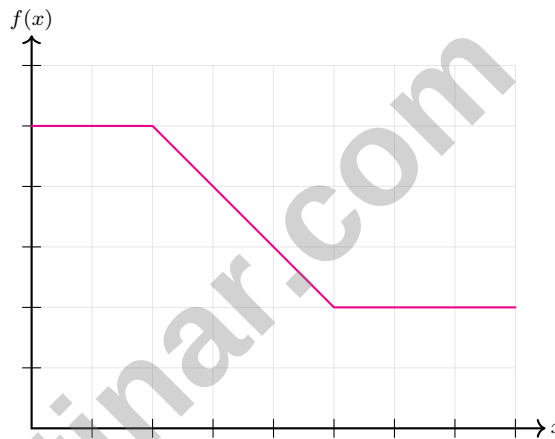


☐ A. A line passing through $(0, 2)$ and $(2, 6)$.

☐ B. A horizontal line at $y = 5$.

☐ C. A curve shaped like a sideways parabola opening right.

☐ D. A diagonal line with negative slope.



12)

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

☐ A. Constant

☐ B. Both increasing and constant

☐ C. Increasing

☐ D. Decreasing

13) A scientist measures bacterial growth. At time $t = 0$ min, there are 100 bacteria. At $t = 5$ min, there are 300 bacteria. What is the rate of change (slope)?

☐ A. 40 bacteria per minute

☐ B. 200 bacteria per minute

☐ C. 60 bacteria per minute

☐ D. 20 bacteria per minute



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1) From the table below, which relative frequency calculation is incorrect?

	Apparel	Electronics	Total
Teen	48	32	80
Adult	72	88	160
Total	120	120	240

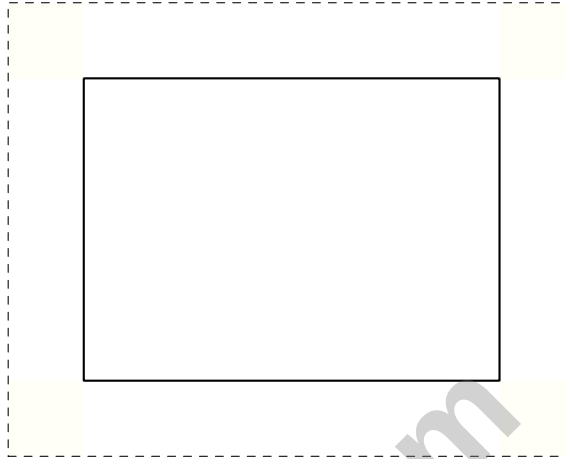
- ☐ A. Among teens, $\frac{32}{80} = 0.40$ buy electronics.
☐ B. Among electronics buyers, $\frac{32}{120} \approx 0.27$ are teens.
☐ C. Of all shoppers, $\frac{48}{240} = 0.20$ are teen apparel buyers.
☐ D. Of all shoppers, $\frac{32}{80} = 0.40$ are teen electronics buyers.

2) A student plots study time versus test performance and finds that the regression line is nearly horizontal with a slope near zero. What does this suggest?

- ☐ A. Study time strongly predicts test performance
☐ B. There is little or no linear relationship between study time and test score
☐ C. Test performance decreases with study time
☐ D. The data contains no measurement error



- 3) A floor has a rectangular base (15 ft by 12 ft) with four corner triangles cut out (each 2 ft by 2 ft). What is the remaining area?



- ☐ A. 144 ft^2 ☐ C. 176 ft^2
☐ B. 172 ft^2 ☐ D. 180 ft^2
- 4) If each exterior angle of a regular polygon is 18° , what is the polygon?
- ☐ A. 15-sided polygon ☐ C. 20-sided polygon
☐ B. 18-sided polygon ☐ D. 24-sided polygon
- 5) A right triangle has a hypotenuse of 25 meters and one leg of 7 meters. What is the length of the other leg?



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1) Solve for x : $-5x + 12 = -2x - 6$

☐ A. $x = -6$

☐ C. $x = -2$

☐ B. $x = 2$

☐ D. $x = 6$

2) Graphical comparison: Two lines cross the y -axis at $(0, 1)$ and $(0, -4)$ respectively. Both have positive slope. Which statement is true?

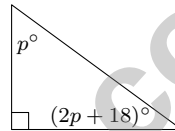
☐ A. First line is always above second

☐ D. Both can be true or false depending on slopes

☐ B. Lines intersect in Quadrant I

☐ C. Second line never crosses y -axis

3) In a right triangle, one acute angle is $(2p + 18)^\circ$. The other acute angle is p° . Find p .



☐ A. 16°

☐ C. 32°

☐ B. 24°

☐ D. 40°

4) A pyramid with height 10 m has a volume of 1200 m^3 . What is the area of its base?

☐ A. 120 m^2

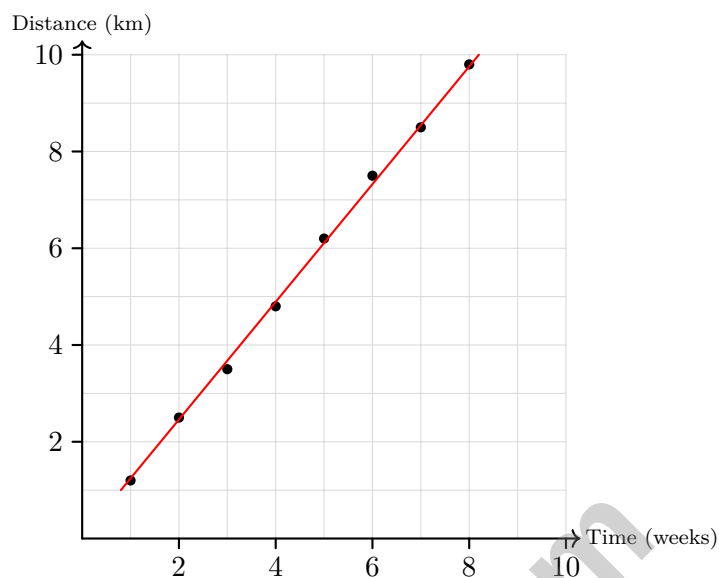
☐ C. 360 m^2

☐ B. 240 m^2

☐ D. 400 m^2



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5)

A runner training program tracks distance over time. Based on the trend line, what is the approximate slope (distance per week)?

☐ A. 1 km per week☐ C. 2 km per week☐ B. 1.2 km per week☐ D. 0.5 km per week

6) A proportional relationship passes through $(0, 0)$ and $(3, 12)$. What is the constant of proportionality k ? (Give your answer as a simplified fraction or decimal.)



Alabama ACAP 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 Alabama ACAP practice test.



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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** (8.15) Slope = $\frac{11-5}{4-2} = \frac{6}{2} = 3$.
- 2) **Choice D is correct.** (8.1) $\sqrt{9} \times \sqrt{4} = 3 \times 2 = 6$, which is rational. The other expressions yield irrationals: $\sqrt{3} + \sqrt{3} = 2\sqrt{3}$, $\sqrt{4} + \sqrt{5} = 2 + \sqrt{5}$, and $\sqrt{2} \times \sqrt{3} = \sqrt{6}$.
- 3) **Choice D is correct.** (8.2) A is all integers (rational). B contains perfect square roots (rational). C is mixed. D contains $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$, all irrational.
- 4) **The correct answer is 0.75.** (8.21) Among dog owners: $\frac{108}{144} = 0.75$. This is a row-conditional frequency.
- 5) **Choice D is correct.** (8.2) $\sqrt{5} \approx 2.24$ and $\sqrt{6} \approx 2.45$, so $\sqrt{5} + \sqrt{6} \approx 4.69 < 4.8$.
- 6) **Choice D is correct.** (8.30) Option 1: $I = 800 \times 0.10 \times 1 = \80 . Option 2: \$0 interest. Difference: $\$80 - \$0 = \$80$.
- 7) **Choice D is correct.** (8.3) Apply product rule: $7^{-4} \cdot 7^6 = 7^{-4+6} = 7^2$.
- 8) **Choice D is correct.** (8.4) If the area is 169 square inches, then $s^2 = 169$, so $s = \sqrt{169} = 13$ inches.
- 9) **Choice D is correct.** (8.5) Move the decimal 3 places right to get 4.2; the exponent is -3 since the original is less than 1.
- 10) **Choice D is correct.** (8.6) $4 \times 5 = 20$ and $10^{3+2} = 10^5$, so the arithmetic is correct. However, 20×10^5 violates the standard form requirement that the coefficient be between 1 and 10. Proper form: 2×10^6 .
- 11) **Choice C is correct.** (8.13) A sideways parabola (opening right or left) fails the vertical line test because some vertical lines intersect it twice. The other options all pass the vertical line test.
- 12) **Choice D is correct.** (8.17) From $x = 0$ to $x = 3$, the function values drop from 5 to 2, so the function is decreasing over this interval.
- 13) **Choice A is correct.** (8.9) Slope = $\frac{300 - 100}{5 - 0} = \frac{200}{5} = 40$ bacteria per minute.
- 14) **Choice C is correct.** (8.12) When flying in opposite directions, combined speed = $480 + 520 = 1000$ mph. Distance = speed $\times$ time: $3000 = 1000t$, so $t = 3$ hours.
- 15) **Choice B is correct.** (8.24) Scale factor is $\frac{15}{10} = 1.5$. Shorter base is $6 \times 1.5 = 9$ cm.
- 16) **Choice A is correct.** (8.14) Substitute $x = 5$: $f(5) = |5 - 2| = |3| = 3$.
- 17) **The correct answer is 5.** (8.27) Absolute deviations: $|72 - 80| = 8$, $|78 - 80| = 2$, $|75 - 80| = 5$, $|81 - 80| = 1$, $|84 - 80| = 4$, $|90 - 80| = 10$. Sum = 30. MAD = $30/6 = 5$.
- 18) **Choice C is correct.** (8.30) $SA = 2\pi r^2 + 2\pi rh = 2\pi(3)^2 + 2\pi(3)(8) = 18\pi + 48\pi = 66\pi \approx 66 \times 3.14 = 207.24 \text{ cm}^2$.
- 19) **Choice C is correct.** (8.22) Reflection across $y = -x$ maps $(x, y) \rightarrow (-y, -x)$. The point $(1, 2)$ maps to $(-2, -1)$ in the image.
- 20) **Choice D is correct.** (8.9) Using any two points: $\frac{7-3}{2-0} = \frac{4}{2} = 2$. Same slope for all pairs confirms collinearity.
- 21) **The correct answer is B, C.** (8.19) A is false: lines don't need to pass through actual data points. D is false: predictions are estimates with uncertainty. E is false: slopes can be negative, zero, or positive.
- 22) **Choice C is correct.** (8.11) Subtract 8: $-2x = -8$. Divide by -2 : $x = 4$.
- 23) **Choice A is correct.** (8.11) Dividing by -5 requires flipping: $x \geq -3$, not $x \leq -3$.
- 24) **Choice C is correct.** (8.12) Test: $4 \leq 2 + 1 \Rightarrow 4 \leq 3$ FALSE. So $(2, 4)$ is NOT in the solution region.
- 25) **Choice A is correct.** (8.30) $V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times 3.14 \times 9 \times 20 = \frac{1}{3} \times 565.2 = 188.4 \text{ ft}^3$.
- 26) **The correct answer is $\frac{1}{6}$.** (8.30) Favorable outcomes: $(1, 6)$, $(2, 5)$, $(3, 4)$, $(4, 3)$, $(5, 2)$, $(6, 1)$. That's 6 of 36. $P = \frac{6}{36} = \frac{1}{6}$.
- 27) **The correct answer is $\frac{1}{3}$.** (8.1) Let $x = 0.\bar{3}$. Then $10x = 3.\bar{3}$, so $9x = 3$ and $x = \frac{1}{3}$.
- 28) **Choice C is correct.** (8.20) Predictions are most reliable within or near the observed data range (1–4 miles). Option (C) uses 2.5 miles, which is centered in this range; (D) is far extrapolation.
- 29) **Choice B is correct.** (8.11) Multiply independent choices: $3 \text{ styles} \times 5 \text{ colors} \times 4 \text{ designs} \times 2 \text{ engines} = 120$ configurations.



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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 6 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.

6

Give your child the confidence and skills they need with **6 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.



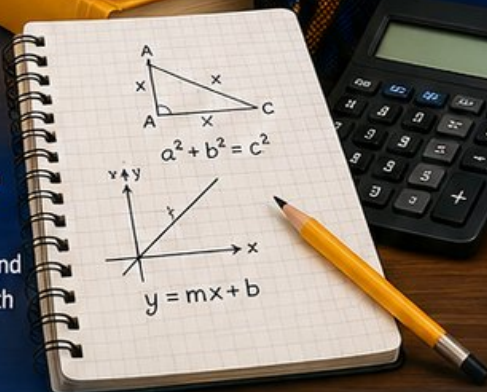
Real-World Applications

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 |
| | ✓ And More! |



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