

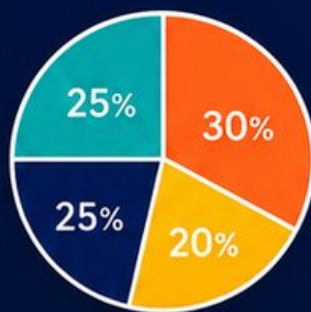
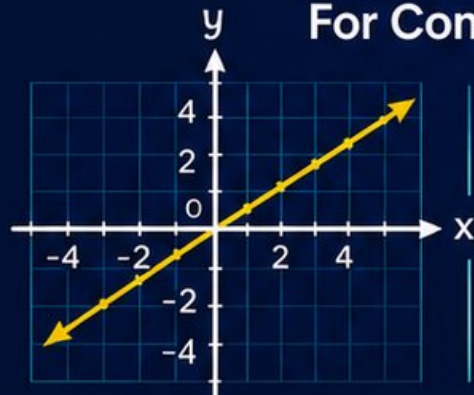
4

Alabama
ACAP

GRADE 8

MATH

PRACTICE TESTS

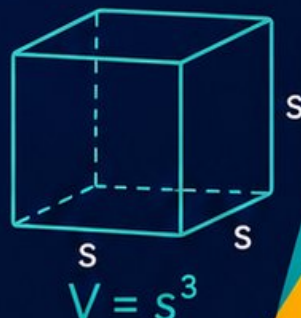
Standards Aligned Problem Solving
For Comprehensive Assessment Programs

$$y = mx + b$$

$$2x - 3y = 6$$

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

$$A = bh$$

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

4 Alabama ACAP Grade 8 Math Practice Tests

Four ACAP Practice Rounds for Equations, Functions, Geometry, Data, and Readiness



Four 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!

Four focused rounds for sharper ACAP math thinking

This book gives you four 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 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.

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?

Four ACAP 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.

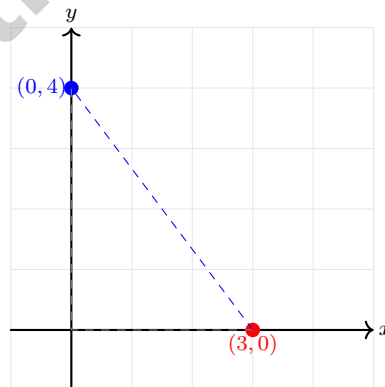


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- 1) A cylinder has volume 628 m^3 and radius 5 m. Approximately, what is its height?
(Use $\pi \approx 3.14$.)
- ☐ A. 4 m ☐ C. 16 m
☐ B. 8 m ☐ D. 20 m
- 2) A 300 mL mixture contains 40% juice and 60% water. How much pure juice must be added to make the mixture 60% juice?
- ☐ A. 75 mL ☐ C. 150 mL
☐ B. 100 mL ☐ D. 200 mL
- 3) A student claims that a triangle with sides 4, 5, and 6 is a right triangle. What is wrong with this claim?
- ☐ A. The sides are too small ☐ C. A triangle cannot have sides that are consecutive
☐ B. $4^2 + 5^2 = 41 \neq 36 = 6^2$ ☐ D. The longest side must be even
- 4) A student is finding the distance between points (3, 0) and (0, 4) and writes: $d = 3 + 4 = 7$. What is the error?



- ☐ A. They should square the differences before adding them. ☐ C. They forgot to take the square root.
☐ B. The answer is actually correct. ☐ D. They added instead of subtracting the coordinates.



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5) A residual plot shows the residuals for a trend line fit to a data set. What would a residual plot with no clear pattern indicate?

- ☐ A. There are no residuals ☐ C. The data is nonlinear
☐ B. The trend line is a good fit ☐ D. The trend line is a poor fit

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

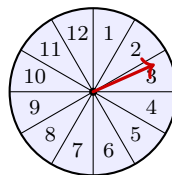
7) A scale factor of 0.75 applied to a figure means the new figure is:

- ☐ A. Larger than the original ☐ C. 25% of the original size
☐ B. 75% of the original size ☐ D. 75% larger than the original

8) Which of the following is rational?

- ☐ A. $\sqrt{2}$ ☐ C. $\sqrt{\pi}$
☐ B. $\pi + 1$ ☐ D. $\sqrt{64}$

9) A spinner has 12 equal sections. What is the probability of NOT landing on section 7?



- ☐ A. $\frac{5}{12}$ ☐ C. $\frac{1}{12}$
☐ B. $\frac{7}{12}$ ☐ D. $\frac{11}{12}$

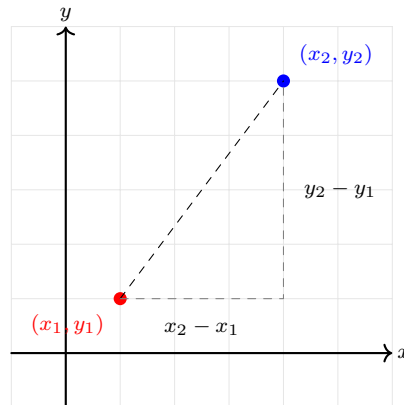


- 10) A business selects 4 employees from 7 to form a team and arranges them in a specific order for a project. How many ways can this be done?
- ☐ A. $7 \times 6 \times 5 \times 4 = 840$ ☐ C. $7^4 = 2,401$
☐ B. $\binom{7}{4} = 35$ ☐ D. $7! = 5,040$
- 11) Convert $0.\overline{7}$ to a fraction. Which step is incorrect?
- ☐ A. Let $x = 0.\overline{7}$. ☐ C. $10x - x = 7.\overline{7} - 0.\overline{7} = 7$ is wrong; should be 0.7.
☐ B. $10x = 7.\overline{7}$. ☐ D. $9x = 7$, so $x = \frac{7}{9}$.
- 12) A person receives a year-end bonus of \$1,500. She is deciding between: (1) spending it, (2) investing at 6% for 5 years, or (3) using it to pay down debt at 12% APR. Ranking by financial benefit, which is best?
- ☐ A. Spend it ☐ C. Pay down debt at 12%
☐ B. Invest at 6% ☐ D. Split equally among all three
- 13) The diameter of an atom is about 2×10^{-10} m. What is this in decimal form?
- ☐ A. 0.00000002 m ☐ C. 0.0000000002 m
☐ B. 0.000000002 m ☐ D. 0.00000000002 m
- 14) Which is larger: $\sqrt{15}$ or $\sqrt{14}$?
- ☐ A. They are equal ☐ C. $\sqrt{14}$
☐ B. Cannot compare ☐ D. $\sqrt{15}$



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- 1) Which of the following represents the distance formula between two points (x_1, y_1) and (x_2, y_2) ?



- ☐ A. $d = |x_2 - x_1| + |y_2 - y_1|$
☐ C. $d = (x_2 - x_1)^2 + (y_2 - y_1)^2$
- ☐ B. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
☐ D. $d = x_2 - x_1 + y_2 - y_1$
- 2) A plant grows at a constant rate. After 2 weeks it is 8 inches tall. After 6 weeks it is 14 inches tall. What is the rate of growth per week (slope)?
- ☐ A. 1.5 inches per week
 ☐ C. 2 inches per week
- ☐ B. 3.5 inches per week
 ☐ D. 7 inches per week
- 3) 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



- 4) A savings account has $S(n) = 50 + 10n$ dollars after n weeks. After how many weeks will the account have \$150?

- ☐ A. 5 weeks ☐ C. 15 weeks
☐ B. 10 weeks ☐ D. 20 weeks

- 5) A rectangular pyramid has a base 8 m by 5 m and a volume of 240 m^3 . What is its height?

- 6) A table tracks 360 students by favorite subject and extracurricular club:

	Debate	Science	Total
Math	36	84	120
English	48	72	120
Science	60	60	120
Total	144	216	360

Among students in the Science club, what relative frequency prefer Math, as a decimal?

- ☐ A. $\frac{60}{360} = 0.167$ ☐ C. $\frac{84}{216} \approx 0.39$
☐ B. $\frac{60}{120} = 0.50$ ☐ D. $\frac{84}{360} \approx 0.23$



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

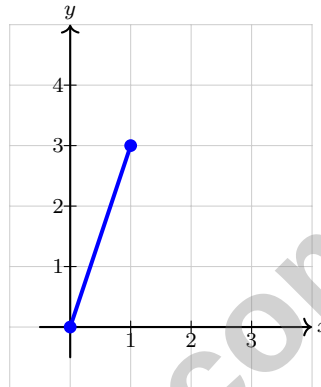
☐ A. $n = a^2$

☐ C. $a^2 < n < (a + 1)^2$

☐ B. $n = (a + 1)^2$

☐ D. n is rational

2) What is the slope of the line shown?



☐ A. 2

☐ C. 3

☐ B. $\frac{1}{3}$

☐ D. $\frac{3}{2}$

3) Three similar figures X , Y , and Z have corresponding sides in the ratios $X : Y = 3 : 4$ and $Y : Z = 4 : 7$. If X has a side of 6 cm, what is the length of the corresponding side in Z ?

☐ A. 14 cm

☐ C. 8 cm

☐ B. 10.5 cm

☐ D. 18 cm

4) Train A travels at 60 mph. Train B travels at 75 mph. If Train B leaves 1 hour later but they meet after Train A has traveled for 5 hours, which equation is correct?

☐ A. $60 \cdot 5 = 75 \cdot 4$

☐ C. $60 \cdot 4 = 75 \cdot 5$

☐ B. $60 \cdot 5 + 75 \cdot 4 = \text{total distance}$

☐ D. $60 \cdot 5 = 75 \cdot 5$



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5) If $g(x) = 5x - 3$ and $g(x) = 12$, what is x ?

☐ A. 3

☐ C. 4

☐ B. 2

☐ D. 15

6) 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. $50^\circ, 60^\circ, 70^\circ$

7) A 270° counterclockwise rotation about the origin is applied to the point $(4, -3)$. What is the image?

☐ A. $(-3, -4)$

☐ C. $(-4, 3)$

☐ B. $(3, 4)$

☐ D. $(4, 3)$

8) Two parallel lines cut by a transversal have alternate exterior angles measuring $(7k - 3)^\circ$ and $(5k + 17)^\circ$. Find k .

☐ A. 8

☐ C. 12

☐ B. 10

☐ D. 14



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 B is correct.** (8.30) From $V = \pi r^2 h$, we get $h = \frac{V}{\pi r^2} = \frac{628}{3.14 \times 25} = \frac{628}{78.5} = 8$ m.
- 2) **Choice C is correct.** (8.12) Initial juice: $0.40(300) = 120$ mL. After adding x mL pure juice: total juice = $120 + x$, total volume = $300 + x$. Setting to 60%: $\frac{120+x}{300+x} = 0.60$, so $120 + x = 0.60(300 + x) = 180 + 0.60x$, giving $0.40x = 60$, thus $x = 150$ mL.
- 3) **Choice B is correct.** (8.28) Error analysis: Verify using the converse. $16 + 25 = 41$ but $36 \neq 41$, so this is NOT a right triangle.
- 4) **Choice A is correct.** (8.27) Correct method: $d = \sqrt{(3-0)^2 + (0-4)^2} = \sqrt{9+16} = \sqrt{25} = 5$ units. The student used addition instead of the Pythagorean Theorem.
- 5) **Choice B is correct.** (8.19) A residual plot with no clear pattern means residuals are scattered randomly and close to zero. This indicates the linear model explains the data well and assumptions are met.
- 6) **The correct answer is 60.** (8.9) Slope = $\frac{180 \text{ miles}}{3 \text{ hours}} = 60$ miles per hour.
- 7) **Choice B is correct.** (8.24) A scale factor of 0.75 means each length in the new figure is 75% of the matching original length.
- 8) **Choice D is correct.** (8.1) $\sqrt{64} = 8$, 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.
- 9) **Choice D is correct.** (8.30) $P(\text{not } 7) = 1 - P(7) = 1 - \frac{1}{12} = \frac{11}{12}$.
- 10) **Choice A is correct.** (8.11) Position 1: 7 choices. Position 2: 6 remaining. Position 3: 5 remaining. Position 4: 4 remaining. Total: $7 \times 6 \times 5 \times 4 = 840$.
- 11) **Choice C is correct.** (8.1) When we subtract $10\overline{x} - x = 7.\overline{7} - 0.\overline{7}$, we get 7 (not 0.7). The repeating parts cancel perfectly, leaving the integer 7.
- 12) **Choice C is correct.** (8.30) Avoiding 12% interest is better than earning 6% return. For the same \$1,500 over 5 years, paying down 12% debt avoids about \$900 of simple interest, while a 6% investment earns about \$450 of simple interest.
- 13) **Choice D is correct.** (8.5) A negative exponent means move the decimal to the left. With 10^{-10} , move 10 places left: $2 \times 10^{-10} = 0.0000000002$ m.
- 14) **Choice D is correct.** (8.2) Since the square root function is increasing and $15 > 14$, we have $\sqrt{15} > \sqrt{14}$.
- 15) **The correct answer is 132.** (8.25) Let the angle be x . Its supplement is $180 - x$. Since $x = 3(180 - x) - 12$, we get $x = 540 - 3x - 12$, so $4x = 528$ and $x = 132$.
- 16) **The correct answer is 0.45.** (8.21) Joint relative frequency: $\frac{144}{320} = 0.45$.
- 17) **Choice C is correct.** (8.2) $\sqrt{5} \approx 2.24$, so $3\sqrt{5} \approx 3 \times 2.24 = 6.72$.
- 18) **Choice B is correct.** (8.30) When composites solids touch, the shared face is covered on both objects. It must be subtracted twice (once from each solid's SA). Student B is correct: $96 - 18 = 78 \text{ cm}^2$.
- 19) **Choice A is correct.** (8.22) Reflection across the line $y = x$ swaps coordinates: $(x, y) \rightarrow (y, x)$. So $(4, 7) \rightarrow (7, 4)$. Distractor D represents reflection across $y = -x$.
- 20) **The correct answer is A,B.** (8.14) Verify each value: $f(1) = 3$ and $f(3) = 7$, so A and B are correct. Also, $f(2) = 5$, $f(0) = 1$, and $f(4) = 9$, so C, D, and E are false.
- 21) **Choice D is correct.** (8.9) Using $y = mx + b$: $5 = \frac{1}{2}(1) + b$, so $5 = \frac{1}{2} + b$, thus $b = \frac{9}{2}$.
- 22) **Choice A is correct.** (8.11) Subtract $5x$ and 2 : $x = 7$.
- 23) **Choice D is correct.** (8.11) Distribute: $6 - 2x \geq 4$. Subtract 6: $-2x \geq -2$. Divide by -2 (FLIP): $x \leq 1$.
- 24) **Choice B is correct.** (8.12) For $y < x + 2$, the y values are LESS than the line, so shade BELOW. The dashed line is correct for the strict inequality $<$.
- 25) **Choice B is correct.** (8.20) The magnitude (absolute value) of the residual tells us the size of the error. Model 2's error of 5 units is larger than Model 1's error of 2 units, regardless of whether the prediction was too high or too low.
- 26) **Choice D is correct.** (8.3) (D) is $x^6 + 1$, not x^6 , because addition is not an exponent law.



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Hi, Strategy Solver!

◇ Grade 8 math rewards students who think before they calculate. You practiced choosing strategies, not just hunting for answers. This carefully paced book gave you four steady Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. ◇

★ **Remember this:** That matters because stronger math students do not use one method for every question. They notice the structure and choose the tool that fits. ★

Strategy Moves

- **Estimate:** Know the neighborhood of the answer.
- **Simplify:** Rewrite numbers in friendlier forms.
- **Model:** Draw what the words describe.
- **Verify:** Put the answer back into the problem.

Grade 8 test-day tip: Pause for ten seconds before hard questions. A short plan can save several minutes.

If you want to share something or ask a question, please email me at jay@testinar.com.

Jay Daie

Your Strategy Guide

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.