

12 Alabama ACAP Grade 8 Math Practice Tests

The Complete Coached Test Prep with Tips & Detailed Answer Keys

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12 Practice Tests

Welcome!

*This book contains **12 full-length practice tests** — the ultimate preparation program for your Grade 8 math assessment. Each test covers all six major topics:*

 *Irrational Numbers*  *Powers & Scientific Notation*

 *Linear Equations*  *Functions*

 *Geometry*  *Data & Relationships*

Twelve tests give you unmatched depth and repetition. By the time you finish, there won't be any surprises on test day.

Champions aren't born — they're prepared.



How to Use This Book

Your complete 12-test championship program

What's Inside

- **12 Full-Length Practice Tests** — each covers all 6 chapters of Grade 8 math: irrational numbers, exponents & scientific notation, linear equations, functions, geometry, and data analysis.
- **Detailed Answer Explanations** — every question includes a step-by-step solution so you learn from every mistake.
- **Formula Reference Sheet** — all the key Grade 8 formulas you need, organized and ready for quick review.
- **Test Tracker** — log your scores across all 12 tests and monitor your progress from start to finish.

Your 12-Test Championship Plan

★ **PHASE 1: Foundation (Tests 1–3)**

Untimed. Learn the format, discover your strengths and weak spots. Focus on understanding, not speed.

★★ **PHASE 2: Building (Tests 4–6)**

Soft-timed. Practice showing full solutions, and study the topics you missed between each test.

★★★ **PHASE 3: Sharpening (Tests 7–9)**

Timed (70 minutes). Build pacing and accuracy under real-time constraints. Review every mistake.

PHASE 4: Championship (Tests 10–12)

Full test conditions: strict timing, quiet space, no notes. These are your final dress rehearsals.

Schedule: Take one test every 3–4 days. Use study days between tests to review and improve.

 Types of Questions

• **Multiple Choice:** Four options — work the problem first, then match. Eliminate obviously wrong answers to narrow your choices.

 **Short Answer & Constructed Response:** Show every step: equations, substitutions, simplifications. Partial credit rewards correct reasoning even if the final answer is off.

 **Graphing & Data Analysis:** Plot points, draw lines, interpret graphs. Label axes clearly.



Tip: Twelve tests is a true championship program. Don't rush — the power is in what you do between tests. Study, review, and master your weak areas before moving on.



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💡 Test-Taking Tips 💡

Your complete test-day toolkit

🕒 Before the Test

- Review your notes from the previous test — focus on your weak topics
- Set up a quiet, clean workspace with all your materials ready
- Start with a positive mindset: you've prepared for this

✎ During the Test

- Read each problem fully before calculating anything
- Write the formula or set up the equation first, then substitute values
- Show all your work — every step, every operation
- If stuck for more than 2 minutes, mark it and move on
- Use estimation to check if your answers are reasonable

📖 After the Test

- Read the full explanation for every question you got wrong
- Write down which topics gave you trouble (not just question numbers)
- Study those topics before taking the next test
- Record your score in the Test Tracker

⚠ Common Mistakes in Grade 8 Math

⚠ Exponents: $(ab)^n = a^n b^n$, but $a^m + a^n \neq a^{m+n}$. Only multiply/divide to combine.

⚠ Slope formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$ — keep the order consistent.

⚠ Systems of equations: The solution must satisfy both equations.

⚠ Transformations: Rotations and reflections change position; dilations change size.

⚠ Volume: Use $\pi \approx 3.14$ or leave as π — match what the question asks.



“ The students who improve the most aren't the ones who take the most tests — they're the ones who carefully review every mistake. Make that your priority. ”



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Grade 8 Formula Reference

Keep this page handy — you may use it during your practice tests!

Exponent Rules

$$a^m \cdot a^n = a^{m+n} \quad (a^m)^n = a^{mn} \quad (ab)^n = a^n \cdot b^n$$
$$\frac{a^m}{a^n} = a^{m-n} \quad a^0 = 1 \quad (a \neq 0) \quad a^{-n} = \frac{1}{a^n}$$

Lines & Linear Equations

Slope: $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$

m = slope b = y -intercept

Slope-intercept: $y = mx + b$

Parallel lines: same slope

Proportional: $y = mx$

Proportional: passes through origin

Scientific Notation

$a \times 10^n$ where $1 \leq |a| < 10$

Multiply: add exponents

Divide: subtract exponents

Roots & Number Sense

Perfect squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

Perfect cubes: 1, 8, 27, 64, 125 $\sqrt{2} \approx 1.414$ $\sqrt{3} \approx 1.732$ $\pi \approx 3.14159$

Pythagorean Theorem & Distance

$a^2 + b^2 = c^2$ c = hypotenuse (longest side of a right triangle) **Distance:** $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Volume Formulas

Cylinder $V = \pi r^2 h$ **Cone** $V = \frac{1}{3} \pi r^2 h$ **Sphere** $V = \frac{4}{3} \pi r^3$

Angle Relationships

Triangle angle sum: 180°

Exterior angle = sum of two remote interior angles

Parallel lines + transversal: Alternate interior angles are equal • Co-interior angles sum to 180°

Functions

Each input $\rightarrow$ exactly one output **Vertical line test:** if any vertical line hits graph more than once $\Rightarrow$ not a function

Linear: constant rate of change ($y = mx + b$)

Nonlinear: rate of change varies

Transformations

Translation: slide

Reflection: flip

Rotation: turn

Dilation: resize

Congruent = same shape & size

Similar = same shape, proportional size



Tip: Bookmark this page! Review it before each test so these formulas become second nature.



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PRACTICE TEST

1

Practice Test 1

 10 Questions

Before You Start

- ✓ *Read each question carefully before choosing your answer.*
- ✓ *Show your work on scratch paper when you need to.*
- ✓ *Skip hard questions and come back to them later.*
- ✓ *Check your answers when you're done.*
- ✓ *Take your time — there's no rush!*

★ *You've Got This!* ★

Do your best and show what you know!



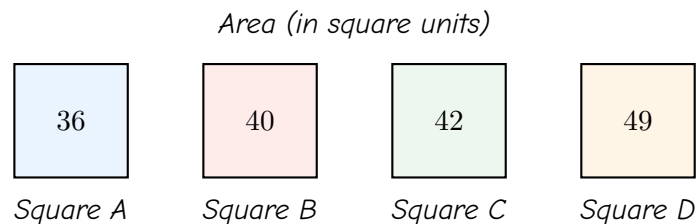
1. Which best explains why $\sqrt{\frac{1}{9}}$ is a rational number?

- (A) Because the fraction $\frac{1}{9}$ is less than 1
- (B) Because $\sqrt{\frac{1}{9}} = \frac{1}{3}$, which is a ratio of two integers
- (C) Because the square root of any fraction is always rational
- (D) Because 9 is a single-digit number

2. What is $0.\overline{3}$ written as a fraction?

- (A) $\frac{3}{10}$
- (B) $\frac{3}{99}$
- (C) $\frac{1}{3}$
- (D) $\frac{3}{100}$

3. The diagram shows four squares with their areas labeled. Which square has a side length closest to 6.5?



- (A) Square A (area 36)
- (B) Square B (area 40)
- (C) Square C (area 42)
- (D) Square D (area 49)

4. Jayden wants to leave an 18% tip at a restaurant where the meal costs \$55. How much tip should he leave?

- (A) \$7.50
- (B) \$9.90
- (C) \$11.00
- (D) \$18.00



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5. Simplify $\frac{11^6}{11^2}$.

(A) 11^3

(B) 11^4

(C) 11^8

(D) 11^{12}

6. The table below lists the first twelve perfect squares. Which number in the table is also a perfect cube?

1	4	9	16	25	36	49	64	81	100	121	144
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(A) 9

(B) 36

(C) 64

(D) 81

7. The speed of light is approximately 300,000,000 meters per second. What is this speed in scientific notation?

(A) 3×10^7

(B) 3×10^8

(C) 30×10^7

(D) 3×10^9

8. What is $8 \times 10^4 + 6 \times 10^3$? Write your answer in scientific notation.

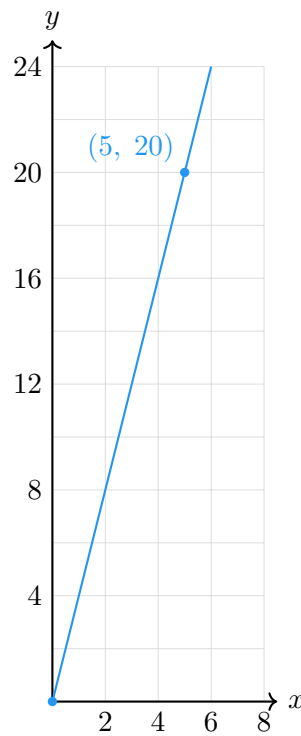
Your Answer:



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9. The graph below shows a proportional relationship. Use the labeled point to find the unit rate.



Your Answer:

10. The equation $y = -\frac{1}{2}x + 4$ represents a line. What happens to y when x increases by 6?

- (A) y increases by 3 (B) y decreases by 3
(C) y increases by 6 (D) y decreases by 6



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★ End of Practice Test 1 ★

Great job finishing the test!

My Score

I got _____ out of 10 questions right.

*Check your answers in the **Answer Key** at the back of the book.*

 *Review any questions you missed. That's how we learn!*

Answer Key & Explanations



Answer Key

First try each test on your own, then check your work here.

Practice Test 1 — Answer Key

- | | | | | | | | |
|-----|------|-----|-----|-----|-----|-----|---------------------|
| 1 B | 2 C | 3 C | 4 B | 5 B | 6 C | 7 B | 8 8.6×10^4 |
| 9 4 | 10 B | | | | | | |

Time to Learn!

Review the explanations below, *especially for the questions you missed*.

Understanding why each answer is correct builds stronger problem-solving skills.

Tip: Circle any questions you got wrong, then read their explanation carefully.

Practice Test 1 — Detailed Explanations

1 $\sqrt{\frac{1}{9}} = \frac{\sqrt{1}}{\sqrt{9}} = \frac{1}{3}$, which can be written as a fraction of integers. Choice C is false: $\sqrt{\frac{1}{2}}$ is irrational.

2 Let $x = 0.333 \dots$. Then $10x = 3.333 \dots$. Subtracting: $9x = 3$, so $x = \frac{3}{9} = \frac{1}{3}$.



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3 Side lengths: $\sqrt{36} = 6$, $\sqrt{40} \approx 6.32$, $\sqrt{42} \approx 6.48$, $\sqrt{49} = 7$. Since 6.48 is closest to 6.5, Square C is the answer.

4 A tip is calculated as a percentage of the meal cost. $\text{Tip} = 55 \times 0.18 = \9.90 .

5 Using the quotient rule: $\frac{11^6}{11^2} = 11^{6-2} = 11^4$.

6 $64 = 4^3$, so it is both a perfect square ($8^2 = 64$) and a perfect cube. None of the other choices are perfect cubes (e.g., $\sqrt[3]{9} \approx 2.08$, $\sqrt[3]{81} \approx 4.33$).

7 To write a large number in scientific notation, move the decimal left until the coefficient is between 1 and 10. Move 8 places left: $300,000,000 = 3 \times 10^8$ m/s.

8 To add with different exponents, rewrite to match the larger exponent. $6 \times 10^3 = 0.6 \times 10^4$. Then $8 \times 10^4 + 0.6 \times 10^4 = 8.6 \times 10^4$.

9 The unit rate in a proportional relationship equals $k = \frac{y}{x}$. From the labeled point: $k = \frac{20}{5} = 4$.

10 Change in $y = m \times \text{change in } x = -\frac{1}{2} \times 6 = -3$. So y decreases by 3.



Well done checking your answers!

Keep practicing to strengthen your skills.



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THANK YOU

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Get the Full Book!

This preview shows just a small sample of what's inside.

The complete book includes:

- ✓ *All chapters and topics*
- ✓ *Hundreds of practice problems*
- ✓ *Complete answer key with explanations*
- ✓ *Colorful visuals and step-by-step examples*
- ✓ *Reference sheets and progress trackers*

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