

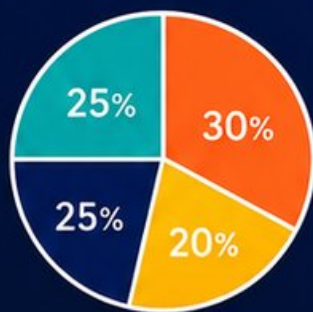
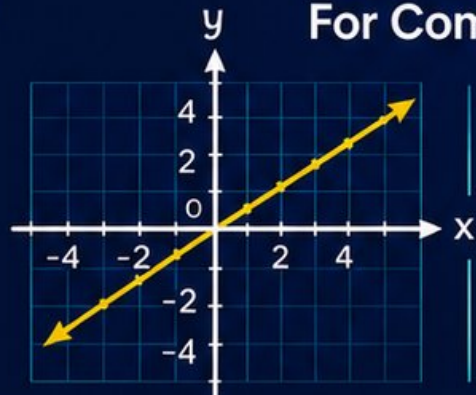
Utah  
**RISE**

**GRADE 8**

**MATH**

**PRACTICE TESTS**

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

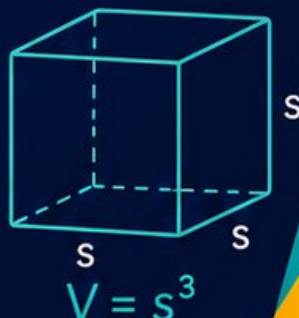


$$y = mx + b$$

$$2x - 3y = 6$$

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

$$A = bh$$



**4 PRINTED TESTS**



**2 ONLINE TESTS**

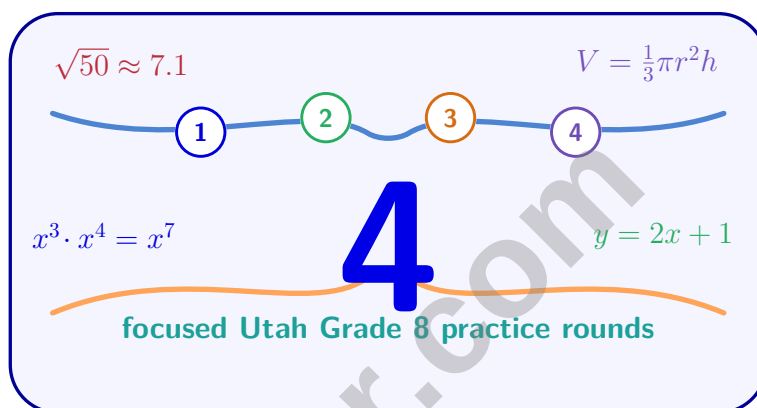


Use these **two additional online practice tests** for extra review after the printed tests in this book.



# 4 Utah RISE Grade 8 Math Practice Tests

*Four RISE Rounds for Equations, Functions, Geometry, and Data*



Four complete 40-question Grade 8 RISE 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, Utah Grade 8 Problem Solver!

Four focused rounds for sharper RISE math thinking

This book gives you four full Grade 8 RISE 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 Utah 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.

**Utah 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 RISE 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) Which pair of equations represents perpendicular lines?

☐ A.  $y = 3x + 1$  and  $y = 3x - 5$

☐ C.  $y = 4x - 2$  and  $y = 4x + 6$

☐ B.  $y = -\frac{3}{5}x + 2$  and  $y = \frac{3}{5}x - 1$

☐ D.  $y = 2x + 4$  and  $y = -\frac{1}{2}x + 1$

2) Each exterior angle of a regular polygon is  $45^\circ$ . How many sides does the polygon have? Show your work.

3) Three points lie on the same line:  $(1, 5)$ ,  $(3, 9)$ , and  $(x, 13)$ . What is the value of  $x$ ?

☐ A. 4

☐ C. 6

☐ B. 7

☐ D. 5

4) A fitness center surveys 200 members: 120 use cardio equipment and 80 use weights. Of the cardio users, 90 report regular attendance (3+ times per week). What is the relative frequency of regular-attendance users among all cardio users? Express as a percentage.

5) A data set has values  $\{3, 7, 9, 11\}$  with mean 7.5. Find the Mean Absolute Deviation.



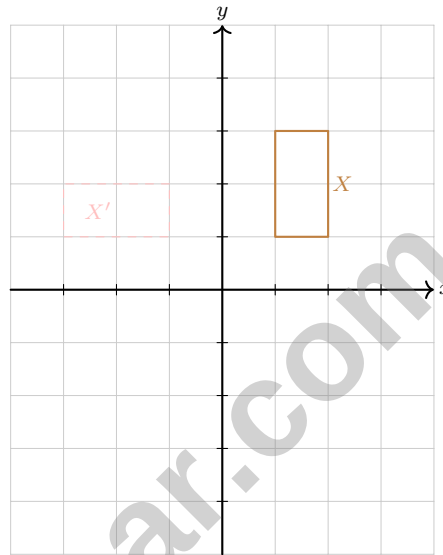
6) A car traveling at 60 mph leaves 1 hour before a car traveling at 75 mph. How long does the faster car take to catch the slower car?

☐ A. 2 hours

☐ C. 4 hours

☐ B. 3 hours

☐ D. 5 hours



7)

Shape  $X$  (brown) is rotated  $90^\circ$  counterclockwise about the origin to produce  $X'$  (pink). Which vertex of  $X'$  corresponds to the vertex at  $(2, 1)$  in  $X$ ?

☐ A.  $(-1, 2)$

☐ C.  $(1, -2)$

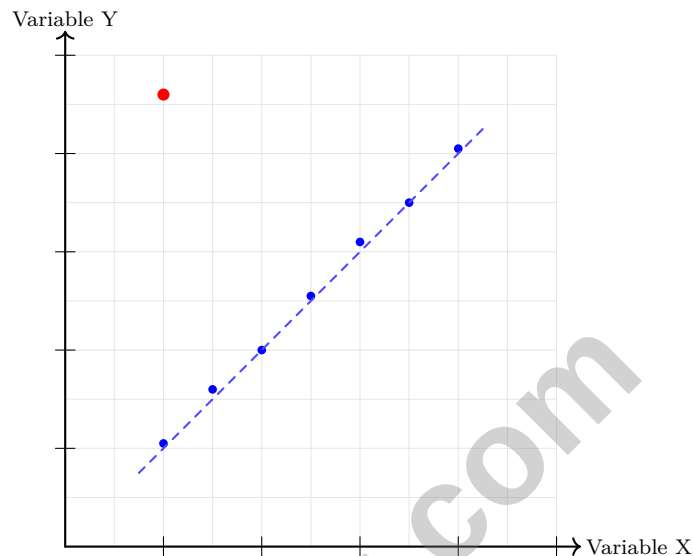
☐ B.  $(-2, 1)$

☐ D.  $(-3, 1)$



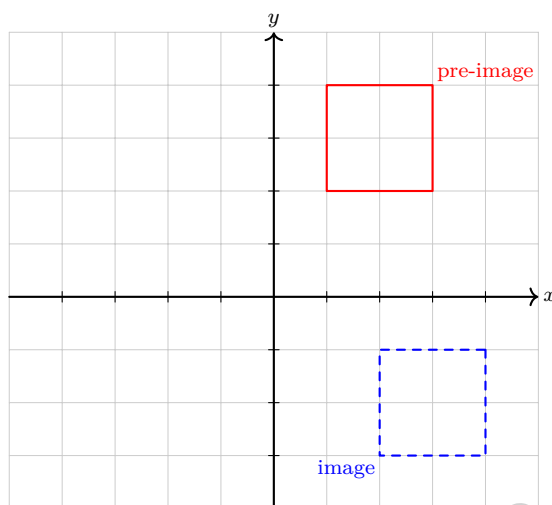
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- 8) Two scatter plots compare the same dataset. Plot A omits one extreme outlier; Plot B includes it. How do you expect the correlation coefficient to change when the outlier is added?



- ☐ A. Increase dramatically      ☐ C. Remain unchanged  
☐ B. Decrease (become weaker)      ☐ D. Become undefined
- 9) 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      ☐ C. Test performance decreases with study time  
☐ B. There is little or no linear relationship between study time and test score      ☐ D. The data contains no measurement error





1)

The red rectangle (pre-image) is transformed to the blue rectangle (image). Which sequence of transformations applies?

- ☐ A. Reflect across  $x$ -axis, then translate right 1 and up 1
- ☐ B. Translate right 1 and up 1, then reflect across  $x$ -axis
- ☐ C. Reflect across the line  $y = x$
- ☐ D. Rotate  $180^\circ$ , translate right 3

2) Two points on a line are  $(-3, 2)$  and  $(3, -4)$ . What is the slope?

- ☐ A.  $-1$
- ☐ B.  $1$
- ☐ C.  $-\frac{1}{6}$
- ☐ D.  $6$

3) A point on a coordinate grid is at distance  $\sqrt{50}$  from the origin. If one coordinate is 5, what is the other coordinate?



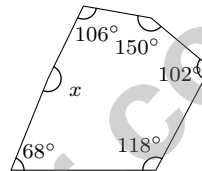
- 4) Train A travels at 60 mph. Train B travels at 75 mph. If Train B leaves 1 hour later but they meet after Train A has traveled for 5 hours, which equation is correct?

- ☐ 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.  $60 \cdot 5 = 75 \cdot 5$

- 5) 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



6)

A hexagon has five interior angles:  $68^\circ$ ,  $118^\circ$ ,  $102^\circ$ ,  $150^\circ$ ,  $106^\circ$ . What is the sixth angle?

- ☐ A.  $172^\circ$ 
☐ C.  $180^\circ$   
☐ B.  $176^\circ$ 
☐ D.  $184^\circ$

- 7) A food truck's two-way table shows 500 orders:

|            | Dine-In | Takeout | Total |
|------------|---------|---------|-------|
| Vegetarian | 75      | 125     | 200   |
| Meat       | 100     | 200     | 300   |
| Total      | 175     | 325     | 500   |

What is the marginal relative frequency for takeout orders?

- ☐ A. 0.35
 ☐ C. 0.60  
☐ B. 0.50
 ☐ D. 0.65



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1) A cell phone plan costs \$20 per month plus \$0.10 per text message. If cost is graphed against number of texts sent (x-axis texts, y-axis cost in \$), what is the slope?

☐ A. \$20 per text

☐ C. 20 texts per dollar

☐ B. \$20.10 per text

☐ D. \$0.10 per text

2) An equilateral triangle has side length 5 cm. A similar equilateral triangle has perimeter 60 cm. What is the scale factor?

☐ A. 3

☐ C. 12

☐ B. 4

☐ D.  $\frac{1}{4}$

3) Sarah is 5 years older than Tom. In 5 years, the sum of their ages will be 45. How old is Tom now?

☐ A. 12

☐ C. 15

☐ B. 18

☐ D. 20

4) Function  $f(x) = 2x + 3$  and another through (0, 1) and (2, 7). Difference in slopes?

5) A student evaluated  $f(x) = 3x + 2$  at  $x = 4$  and wrote  $f(4) = 3 + 2 + 4 = 9$ . What error did the student make?

☐ A. Did not multiply  $x$  by the coefficient 3

☐ C. Added the constant instead of substituting correctly

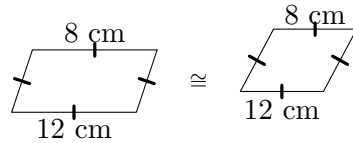
☐ B. Multiplied 3 by 4 correctly but made an arithmetic mistake

☐ D. The answer is correct

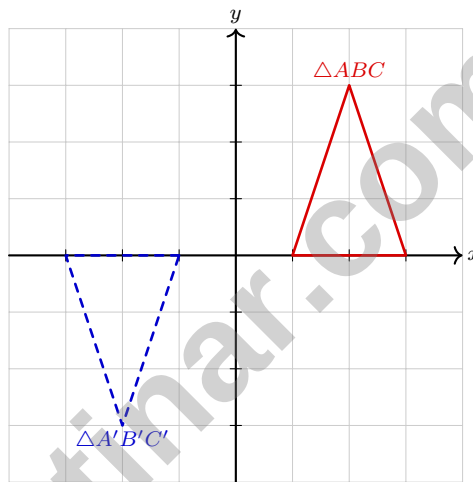


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- 6) Two congruent trapezoids are shown. One trapezoid has parallel sides of 8 cm and 12 cm. What are the parallel sides of the congruent trapezoid?



- ☐ A. 4 cm and 6 cm                      ☐ C. 16 cm and 24 cm  
☐ B. 8 cm and 12 cm                    ☐ D. Cannot be determined



7)

Triangle  $ABC$  (red) is transformed to  $\triangle A'B'C'$  (dark blue). Which transformation is shown?

- ☐ A. Reflection across the  $y$ -axis                      ☐ C. Rotation  $180^\circ$   
☐ B. Rotation  $90^\circ$  counterclockwise                    ☐ D. Translation left 2, down 3



**Utah RISE 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 Utah RISE practice test.**

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## Practice Test Answers and Explanations

### Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** (8.EE.6) Perpendicular slopes are negative reciprocals. Here, 2 and  $-\frac{1}{2}$  are negative reciprocals.
- 2) **The correct answer is 8.** (8.G.5) The sum of all exterior angles is  $360^\circ$ . Number of sides =  $\frac{360}{45} = 8$  (regular octagon).
- 3) **Choice D is correct.** (8.EE.8) Slope from (1, 5) to (3, 9) is  $\frac{9-5}{3-1} = 2$ . From (3, 9) to (x, 13):  $2 = \frac{13-9}{x-3}$ , so  $2 = \frac{4}{x-3}$ , giving  $x = 5$ .
- 4) **The correct answer is 75%.** (8.SP.4) Relative frequency among cardio users:  $\frac{90}{120} = 0.75 = 75\%$ .
- 5) **The correct answer is 2.5.** (8.G.8) Absolute deviations:  $|3-7.5| = 4.5$ ,  $|7-7.5| = 0.5$ ,  $|9-7.5| = 1.5$ ,  $|11-7.5| = 3.5$ . Sum = 10. MAD =  $10/4 = 2.5$ .
- 6) **Choice C is correct.** (8.EE.7) When the faster car catches up, they've traveled the same distance. Let  $t$  = time the faster car travels. The slower car travels  $60(t+1) = 60t + 60$ . The faster car travels  $75t$ . Setting them equal:  $75t = 60t + 60$ , so  $15t = 60$ , giving  $t = 4$  hours.
- 7) **Choice A is correct.** (8.G.3) Under  $90^\circ$  counterclockwise rotation,  $(x, y) \rightarrow (-y, x)$ . So  $(2, 1) \rightarrow (-1, 2)$ .
- 8) **Choice B is correct.** (8.SP.1) In this plot, the outlier sits far from the upward trend line, so it increases scatter and weakens the correlation coefficient.
- 9) **Choice B is correct.** (8.SP.2) A near-zero slope indicates weak or no correlation between the variables.
- 10) **Choice C is correct.** (8.G.4) Volume scales by the cube of the scale factor:  $27 \times 2^3 = 27 \times 8 = 216 \text{ cm}^3$ .
- 11) **Choice D is correct.** (8.NS.1) From the number line,  $\sqrt{5} \approx 2.236$  and  $\sqrt{7} \approx 2.646$ , both between 2 and 3. So  $2 < \sqrt{5} < \sqrt{7} < 3$ . All three numbers are plotted, and only 3 is rational;  $\sqrt{5}$  and  $\sqrt{7}$  are irrational.
- 12) **Choice B is correct.** (8.NS.2) Each of the 3 initial branches splits into 2 outcomes:  $3 \times 2 = 6$  final outcomes.
- 13) **Choice D is correct.** (8.G.1) Let  $x = 0.\overline{32} = 0.3222\dots$ . Then  $10x = 3.\overline{2}$  and  $100x = 32.\overline{2}$ . Subtracting:  $90x = 29$ , so  $x = \frac{29}{90}$ .
- 14) **Choice C is correct.** (8.NS.2) The midpoint between 4 and 5 is 4.5. Check:  $(4.5)^2 = 20.25$ . Since  $17 < 20.25$ , we have  $\sqrt{17} < 4.5$ . Therefore  $\sqrt{17}$  is closer to 4.
- 15) **Choice D is correct.** (8.NS.2) Using  $\pi \approx 3.14$  and  $\sqrt{10} \approx 3.16$  (since  $3.16^2 \approx 9.99$ ), the sum is approximately 6.30.
- 16) **Choice D is correct.** (8.EE.3) Move the decimal 4 places left to get 4.2; the exponent is positive 4. Thus  $42,000 = 4.2 \times 10^4$ .
- 17) **Choice C is correct.** (8.G.9) A cube has 6 faces. Each face has area  $3^2 = 9 \text{ in}^2$ . Total =  $6 \times 9 = 54 \text{ in}^2$ .
- 18) **Choice C is correct.** (8.G.1) A  $45^\circ$  clockwise rotation tilts all sides by  $45^\circ$  downward. A horizontal side becomes a line sloping downward at  $45^\circ$  (parallel to  $y = -x$  region).
- 19) **Choice C is correct.** (8.EE.7) Divide by  $-4$  (FLIP the inequality):  $x < \frac{12}{-4} = -3$ .
- 20) **Choice C is correct.** (8.G.8) The inequality  $\geq$  means "greater than or equal," so shade ABOVE the line. The SOLID line is included in the solution.
- 21) **The correct answer is A,B.** (8.F.1) 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.
- 22) **Choice B is correct.** (8.G.9)  $V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times 3.14 \times 49 \times 12 = \frac{1}{3} \times 1846.32 = 615.44 \text{ cm}^3$ .
- 23) **Choice B is correct.** (8.SP.3) 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.
- 24) **Choice C is correct.** (8.G.7)  $A = 10000(1.05)^4 \approx 10000 \times 1.2155 = \$12,155$ .
- 25) **Choice D is correct.** (8.EE.1)  $(b^3)^2 = b^6$ ; then  $b^6 \cdot b^4 = b^{10}$ ; then  $\frac{b^{10}}{b^5} = b^5$ .
- 26) **Choice D is correct.** (8.EE.2)  $9 \times 9 \times 9 = 729$ , so  $\sqrt[3]{729} = 9$ .
- 27) **Choice C is correct.** (8.EE.4)  $1.5 \times 10^4 \times 10 = 1.5 \times 10^{4+1} = 1.5 \times 10^5 = 150,000$ .
- 28) **The correct answer is 0.7.** (8.G.7) Total: 10 marbles. Not blue:  $5 + 2 = 7$ .  $P(\text{not blue}) = \frac{7}{10} = 0.7$ .



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## Hi, Momentum Builder!

◇ Finishing a Grade 8 practice book is not a small thing. It means you practiced persistence, patience, and flexible problem solving. ◇

★ **Remember this:** Some questions were quick. Others probably made you stop and think. Both kinds helped you grow because practice turns effort into confidence. This version gave you 4 opportunities to rehearse test-day habits. ★

### Momentum Habits

- **Start Clean:** Write down what the problem gives you.
- **Pick a Tool:** Use a table, model, equation, or graph.
- **Keep Moving:** Skip and return when needed.
- **Review Smart:** Study mistakes without judging yourself.

**Grade 8 test-day tip:** If a problem feels stuck, change tools. A graph, table, or sketch can make the same idea clearer.

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

**Jay Daie**

Your Math Momentum Partner

# 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.