

UTAH RISE

GRADE 8 MATH

PRACTICE TESTS

5

PRINTED
TESTS



2

 ONLINE
TESTS

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



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



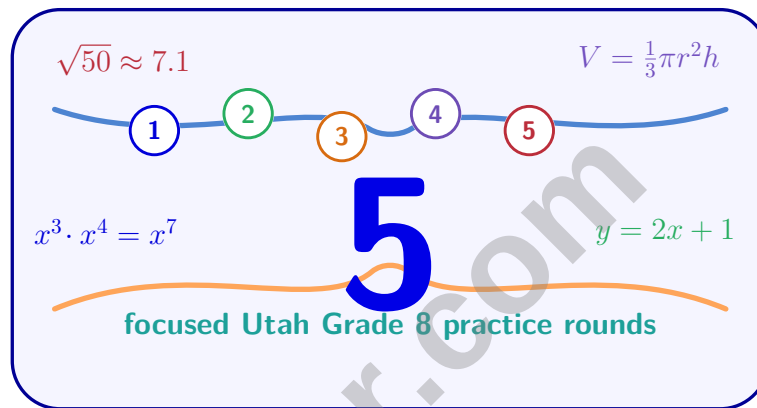
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

5 Utah RISE Grade 8 Math Practice Tests

Five RISE Rounds for Grade 8 Review and Confidence



Five 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!

Five focused rounds for sharper RISE math thinking

This book gives you five 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 five-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?

Five RISE tests, 200 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–5	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 rectangular fields have the same width. The first field is 50 m long and has a perimeter of 180 m. The second field is 60 m long and has a perimeter of 200 m. What is the width?
- ☐ A. 20 m ☐ C. 40 m
☐ B. 30 m ☐ D. 50 m
- 2) A car's fuel consumption shows: rapid decrease at first, then slowing. Which behavior does this match?
- ☐ A. Draining a pool with a pump ☐ C. Linear fuel burn
☐ B. Radioactive decay (initial sharp drop, then levels off) ☐ D. Exponential growth
- 3) A linear equation shows the relationship between time spent studying (x , hours) and test score (y , points): $y = 5x + 60$. What is the slope, and what does it represent?
- ☐ A. Slope is 5; for each additional hour of study, the test score increases by 5 points ☐ C. Slope is $5x$; score changes with study time
☐ B. Slope is 60; the starting test score is 60 points ☐ D. Slope is 60; for each additional hour, the score increases by 60 points
- 4) Triangle A has sides 5, 12, 13. Triangle B has sides 7.5, 18, 19.5. Triangle C has sides 10, 24, 26. Which triangles are similar to Triangle A ?
- ☐ A. Only Triangle B ☐ C. Both Triangle B and C
☐ B. Only Triangle C ☐ D. Neither Triangle B nor C



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

☐ A. 2

☐ C. 5

☐ B. 8

☐ D. 15

6) $F(c) = c + 273$ and G through $(0, 273)$ and $(100, 373)$. Which has greater slope?

☐ A. F

☐ C. Both same.

☐ B. G

☐ D. Cannot be determined.

7) The cost of a gym membership is \$50 per month. If Sarah spends a total of \$200 after t months, write and solve an equation to find t . Verify your answer.

8) Solve the system $\begin{cases} 2x + y = 5 \\ x - y = 4 \end{cases}$ by elimination.

9) A company's profit P (in dollars) after n years is given by $P = 1000n^2 + 500$. Is this linear or nonlinear?

☐ A. Linear; profit increases steadily

☐ C. Linear; the equation has two terms

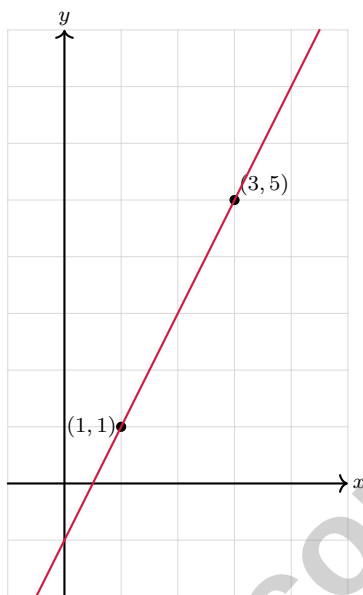
☐ B. Nonlinear; n is squared, creating a parabola

☐ D. Nonlinear; profit must eventually decrease



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10) The graph below shows a line. Which equation represents this line?



☐ A. $y = 2x - 1$

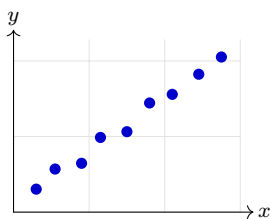
☐ B. $y = x$

☐ C. $y = 2x + 1$

☐ D. $y = \frac{1}{2}x + \frac{1}{2}$

11) Rectangle MNOP has length 15 cm and width 8 cm. Rectangle M'N'O'P' is congruent to MNOP. Which of the following is NOT a possible pair of dimensions for M'N'O'P'?

☐ A. Length 15 cm, width 8 cm☐ B. Length 8 cm, width 15 cm☐ C. Length 16 cm, width 8 cm☐ D. Length 15 cm, width 8 cm (rotated)



1)

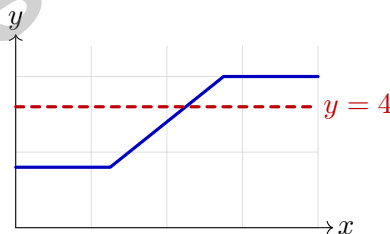
Consider a scatter plot of students' math test scores versus their previous quiz scores. Most points lie close to an imaginary diagonal line, with only a few outliers. Which statement best describes the strength of correlation?

- ☐ A. Very weak correlation ☐ C. Strong positive correlation
☐ B. No correlation between the variables ☐ D. Weak negative correlation

2) What are the domain and range of the relation $\{(-2, 0), (0, 4), (2, 0), (4, 4)\}$?

- ☐ A. Domain: $\{-2, 2\}$; Range: $\{0\}$ ☐ C. Domain: $\{0, 4\}$; Range: $\{0, 4\}$
☐ B. Domain: $\{-2, 0, 2, 4\}$; Range: $\{-2, 0, 2, 4\}$ ☐ D. Domain: $\{-2, 0, 2\}$; Range: $\{4\}$

3) A piecewise function has: constant segment at $y = 2$, then increasing segment, then constant segment at $y = 5$. How many times does it cross a horizontal line $y = 4$?



- ☐ A. Zero times (never) ☐ C. Exactly twice (at two different points)
☐ B. Exactly once (during the increasing segment) ☐ D. Cannot determine without seeing the graph



4) Which scenario describes a negative slope?

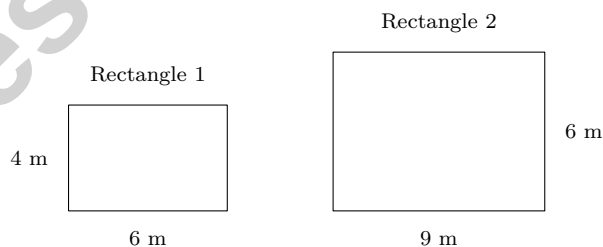
- ☐ A. Population increases each year ☐ C. Your bank account grows with deposits
☐ B. Temperature increases over time ☐ D. Water drains from a tank over time

5) If $3^a \cdot 3^5 = 3^{12}$, what is the value of a ?

6) A chemist mixes a 30% acid solution with an 80% acid solution to make 100 mL of a 50% solution. Let x = volume of 30% solution (mL). Which equation represents the acid content?

- ☐ A. $0.3x + 0.8(100 - x) = 0.5(100)$ ☐ C. $30x + 80x = 50 \cdot 100$
☐ B. $0.3(100 - x) + 0.8x = 50$ ☐ D. $0.3x + 0.8x = 50$

7) Two rectangles are shown with proportional dimensions. Which similarity statement is correct?



- ☐ A. Rectangle 1 $\sim$ Rectangle 2 with scale factor 1.5 ☐ C. Rectangle 1 $\sim$ Rectangle 2 with scale factor 0.5
☐ B. The rectangles are not similar ☐ D. They are congruent



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1) What is $\sqrt{225}$?

☐ A. 13

☐ C. 15

☐ B. 14

☐ D. 16

2) The mass of the Sun is approximately 2×10^{30} kg. How many times more massive is the Sun than Earth, which has mass 6×10^{24} kg?

3) A side job pays a bonus of \$800, invested at 5% simple interest. How long until the account grows to \$880?

☐ A. 1 year

☐ C. 3 years

☐ B. 4 years

☐ D. 2 years

4) What is $(-2)^4$?

☐ A. -16

☐ C. -8

☐ B. 8

☐ D. 16

5) A fitness trainer charges by the hour. Client pays \$45 for 3 hours of training. What is the hourly rate (unit rate)?

☐ A. \$12 per hour

☐ C. \$18 per hour

☐ B. \$20 per hour

☐ D. \$15 per hour



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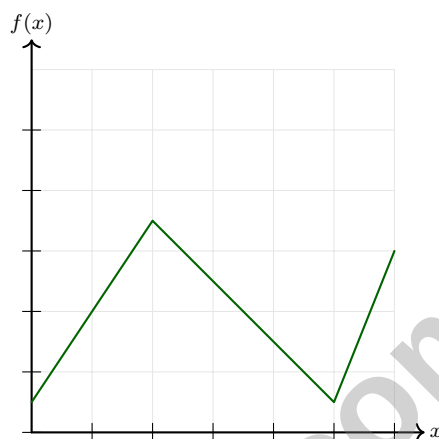
6) Which of the following graphs represents a function?

☐ A. A vertical line.

☐ C. A point.

☐ B. A circle.

☐ D. An ellipse centered at the origin.



7)

At which x -value does the graph reach its maximum?

☐ A. $x = 0$

☐ C. $x = 5$

☐ B. $x = 2$

☐ D. $x = 6$

8) A video streaming service charges a flat fee plus a per-minute rate. The relationship is shown:

Minutes watched	10	20	30
Cost (\$)	2.50	4.50	6.50

What is the slope?

☐ A. \$0.20 per minute

☐ C. \$0.10 per minute

☐ B. \$2.50 per minute

☐ D. \$0.05 per minute



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 C is correct.** (8.EE.7) Let w = width. First field: $2(50) + 2w = 180$, so $100 + 2w = 180$, giving $2w = 80$ and $w = 40$ m. Check with second field: $2(60) + 2w = 200$, so $120 + 2w = 200$, giving $w = 40$ m. ✓
- 2) **Choice B is correct.** (8.F.5) Exponential decay starts steep and flattens, like fuel tank levels as the engine runs less frequently. A is linear, C is linear, D grows.
- 3) **Choice A is correct.** (8.EE.8) In the form $y = mx + b$, the slope is $m = 5$. This means the rate of change is 5 points per hour. The constant term $+60$ is the y -intercept (starting score).
- 4) **Choice C is correct.** (8.G.4) For B: $\frac{7.5}{5} = \frac{18}{12} = \frac{19.5}{13} = 1.5$ (proportional). For C: $\frac{10}{5} = \frac{24}{12} = \frac{26}{13} = 2$ (proportional). Both are similar.
- 5) **Choice B is correct.** (8.F.1) Solve $x - 3 = 5$ for x : $x = 5 + 3 = 8$.
- 6) **Choice C is correct.** (8.F.2) Slope of F: 1. Slope of G: $(373 - 273)/100 = 1$. Both slopes are 1.
- 7) **The correct answer is $t = 4$ months.** (8.EE.7) The equation is $50t = 200$. Divide both sides by 50: $t = 4$ months. Verify: $50(4) = 200$ ✓.
- 8) **The correct answer is $(3, -1)$.** (8.EE.8) Add the equations: $(2x + y) + (x - y) = 5 + 4$, so $3x = 9$, giving $x = 3$. Substitute: $3 - y = 4$, so $y = -1$.
- 9) **Choice B is correct.** (8.F.3) The term n^2 makes this a quadratic function (nonlinear). Linear functions have only the first power of the variable.
- 10) **Choice A is correct.** (8.F.4) Slope: $m = \frac{5-1}{3-1} = \frac{4}{2} = 2$. Using point $(1, 1)$: $1 = 2(1) + b \Rightarrow b = -1$. Equation: $y = 2x - 1$.
- 11) **Choice C is correct.** (8.G.2) Congruent rectangles have the same dimensions. M'N'O'P' must have dimensions 15 cm and 8 cm (possibly rotated). A rectangle with dimensions 16 cm and 8 cm is NOT congruent.
- 12) **Choice A is correct.** (8.G.3) $P(0, 1) \rightarrow P'(1, 4)$ means the translation is right 1 and up 3: $(x, y) \rightarrow (x + 1, y + 3)$.
- 13) **Choice A is correct.** (8.G.5) Alternate exterior angles are congruent when lines are parallel.
- 14) **Choice B is correct.** (8.G.6, 8.G.7) From $(\sqrt{32})^2 + (\sqrt{4})^2 = c^2$, we get $32 + 4 = 36$, so $c = \sqrt{36} = 6$.
- 15) **Choice A is correct.** (8.G.8) $c = \sqrt{9^2 + 12^2} = \sqrt{81 + 144} = \sqrt{225} = 15$. (This is a 9-12-15 triple, a multiple of 3-4-5.)
- 16) **Choice C is correct.** (8.G.7) A linear pair is supplementary. Let the smaller angle be x . Then $x + 2x = 180$, so $3x = 180$ and $x = 60^\circ$. The larger angle is $2 \times 60 = 120^\circ$.
- 17) **Choice B is correct.** (8.G.9) Volume of a pyramid: $V = \frac{1}{3} \cdot B \cdot h = \frac{1}{3} \times (6 \times 6) \times 9 = \frac{1}{3} \times 36 \times 9 = 108 \text{ in}^3$.
- 18) **The correct answer is 45.** (8.EE.7) Substitute $x = 1$: $(1 + 4)(1 + 8) = 5 \cdot 9 = 45$.
- 19) **The correct answer is A, D.** (8.EE.5) Line 1: $k = \frac{6}{4} = 1.5$, so $y = 1.5x$ (\$1.50/lb). Line 2: $k = \frac{12}{6} = 2$, so $y = 2x$ (\$2.00/lb). A is correct (Line 1 equation and price). D is correct (Line 2 has greater slope: $2 > 1.5$). C is wrong (Line 2 is steeper, not Line 1). B is correct but not a correct pair; E is subjective (worse deal, not better). Answer: A and D.
- 20) **Choice C is correct.** (8.G.7) The perimeter includes two straight sides of 16 m and two semicircles that make one full circle with diameter 4 m. So $P = 16 + 16 + 3.14(4) = 44.56$ m.
- 21) **Choice A is correct.** (8.G.5) The sum of interior angles in a hexagon is 720° . The known angles add to $85 + 125 + 140 + 110 + 98 = 558^\circ$, so $x = 720 - 558 = 162^\circ$.
- 22) **Choice C is correct.** (8.SP.4) Dividing a cell by its row total is the definition of row-conditional frequency. The researcher either mislabeled their calculation or confused marginal (row total / grand total) with conditional (cell / row total).
- 23) **Choice B is correct.** (8.G.8) Absolute deviations: $|20 - 27.5| = 7.5$, $|25 - 27.5| = 2.5$, $|30 - 27.5| = 2.5$, $|35 - 27.5| = 7.5$. Sum = 20. MAD = $20/4 = 5$.
- 24) **Choice D is correct.** (8.G.7) Red or green: $5 + 3 = 8$ marbles. Total: 15. So $P = \frac{8}{15}$.
- 25) **Choice B is correct.** (8.NS.2) Each position is independent: $26 \times 10 \times 26 \times 10 = 26^2 \times 10^2 = 676,000$.
- 26) **Choice C is correct.** (8.SP.1) The relationship changes from steeply increasing to flat to decreasing. This curve (inverted parabola) is nonlinear—the rate of change is not constant and the direction reverses.
- 27) **The correct answer is 1.** (8.F.1) A nonvertical line has exactly one y -value for each x -value.



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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 5 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. Succeed Tomorrow!

Give your child the confidence and skills they need with **5 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 |
| ✓ Measurement & Data | ✓ And More! |

5
PRINTED
TESTS



2 ONLINE
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