

RHODE ISLAND RICAS

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.



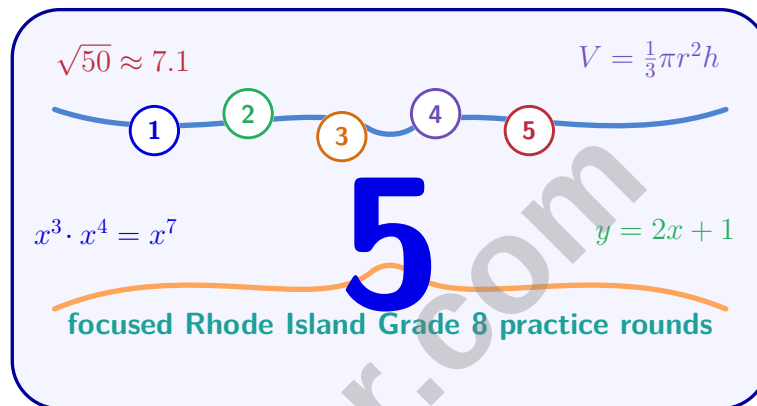
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

5 Rhode Island RICAS Grade 8 Math Practice Tests

Focused RICAS Rounds for Equations, Data, and Reasoning



Five complete 40-question Grade 8 RICAS 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, Rhode Island Grade 8 Problem Solver!

Five focused rounds for sharper RICAS math thinking

This book gives you five full Grade 8 RICAS 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 Rhode Island 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.

Rhode Island 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 RICAS 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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& answers

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1) Factor $x^2 - x - 20$.

☐ A. $(x - 5)(x + 4)$

☐ B. $(x + 5)(x - 4)$

☐ C. $(x - 10)(x + 2)$

☐ D. $(x - 20)(x + 1)$

2) $(4.8 \times 10^{-2}) \times (1.25 \times 10^2) = ?$

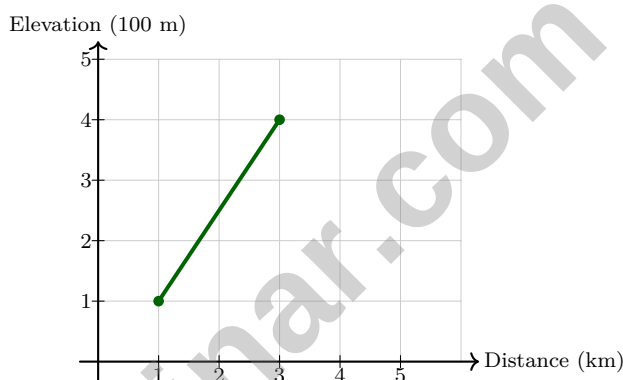
☐ A. 0.6×10^0

☐ B. 6×10^{-1}

☐ C. 6×10^0

☐ D. 6×10^{-4}

3) The graph shows elevation change during a hike.



What is the slope of the line?

☐ A. $\frac{3}{4}$

☐ B. $\frac{2}{3}$

☐ C. $\frac{3}{2}$

☐ D. 2

4) A grandmother is 42 years old. Her grandson is 10 years old. In how many years will the grandmother be exactly 3 times as old as her grandson?

☐ A. 6 years

☐ B. 8 years

☐ C. 10 years

☐ D. 12 years



5) The table shows $f(x)$. If $f(x) = 8$, what is x ?

x	1	2	3	4
$f(x)$	4	6	8	10

☐ A. 1

☐ C. 3

☐ B. 2

☐ D. 4

6) A town's population P (in thousands) at year t (years since 2010) follows this data:

Year since 2010 (t)	0	3	6	9
Population (P, thousands)	45	51	57	63

What is the rate of change of the population per year?

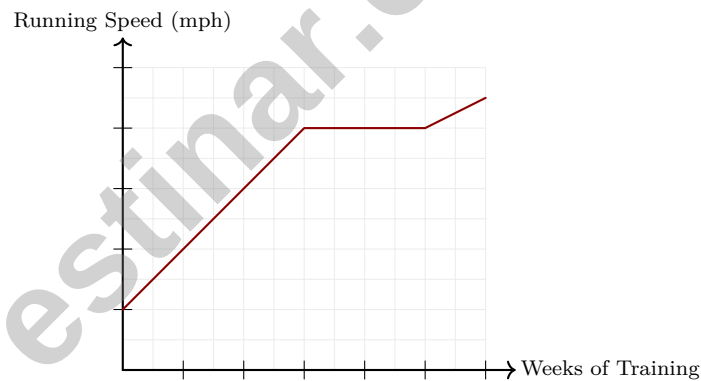
☐ A. 2 thousand per year

☐ C. 6 thousand per year

☐ B. 3 thousand per year

☐ D. 9 thousand per year

7)



A runner trains for 6 weeks. Speed increases for the first 3 weeks, stays constant for 2 weeks (maintenance phase), then improves slightly. During weeks 3–5, what is the runner's speed trend?

☐ A. Speed continues to increase

☐ C. Speed decreases

☐ B. Speed remains constant

☐ D. Speed fluctuates randomly


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8) A quadrilateral has a perimeter of 20 units. If it is dilated by a scale factor of 3, what is the perimeter of the dilated quadrilateral?

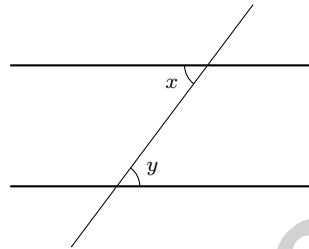
☐ A. 20 units

☐ C. 60 units

☐ B. 40 units

☐ D. 180 units

9) In the diagram, angles x and y are formed by a transversal cutting parallel lines. If $x = 84^\circ$, what is y ?



☐ A. 84°

☐ C. 180°

☐ B. 96°

☐ D. 264°

10) An error was made: a student calculated that if legs are 10 and 10, the hypotenuse is 20. What is the correct hypotenuse?

☐ A. $10\sqrt{2}$

☐ C. 20

☐ B. $\sqrt{200}$

☐ D. 14 (approx)

11) The distance from $(0, 0)$ to a point on the coordinate plane is $\sqrt{50}$ units. Which coordinates could this point have?

☐ A. $(5, 5)$

☐ C. $(5, 2)$

☐ B. $(7, 2)$

☐ D. $(3, 4)$



- 1) An equilateral triangle has sides of 6 cm. It is reflected across one of its altitudes. What is true about the resulting triangle?

- ☐ A. The resulting triangle has sides of 3 cm
- ☐ B. The resulting triangle is congruent to the original
- ☐ C. The resulting triangle is no longer equilateral
- ☐ D. The angles increase to 90°

- 2) Evaluate 2^{-3} and express it as a decimal.

- 3) Factor $x^2 - 11x + 24$.

- ☐ A. $(x - 3)(x - 8)$
- ☐ B. $(x - 4)(x - 6)$
- ☐ C. $(x - 2)(x - 12)$
- ☐ D. $(x + 3)(x + 8)$

- 4) A cube-shaped storage container has a volume of 512 cubic feet. What is the side length of the cube?



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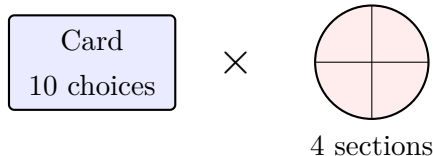
- 5) Which table would represent a NONLINEAR function with constant second differences?

x	0	1	2	3
1st diff.	—	1	3	5
2nd diff.	—	—	2	2

- ☐ A. It is linear because first differences exist
 ☐ C. It is cubic because second differences are positive
- ☐ B. It is quadratic because second differences are constant
 ☐ D. It is exponential because differences vary
- 6) Compute $\frac{(9 \times 10^5) + (3.6 \times 10^5)}{4 \times 10^2}$. Express in scientific notation.
- ☐ A. 3.15×10^2
☐ C. 12.6×10^3
- ☐ B. 3.15×10^4
☐ D. 3.15×10^3
- 7) A swimming pool is being drained. The water level drops $\frac{1}{2}$ foot every $\frac{1}{4}$ hour. What is the slope?
- ☐ A. -2 feet per hour
 ☐ C. $-\frac{1}{8}$ feet per hour
- ☐ B. 2 feet per hour
 ☐ D. $\frac{1}{8}$ feet per hour
- 8) To find the number of \$0.50 postage stamps and \$0.37 postage stamps that total \$3.74 with 10 stamps, which approach is best?
- ☐ A. Guess and check
 ☐ C. Solving a system of equations
- ☐ B. Proportional reasoning
 ☐ D. Trial by tables



- 1) A game requires picking a card from a deck of 10 cards and then spinning a spinner with 4 sections. How many possible results are there?



- ☐ A. $10 + 4 = 14$
☐ C. $10 - 4 = 6$
- ☐ B. $10 \times 4 = 40$
☐ D. 4^{10}
- 2) 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
- 3) To simplify $\frac{(w^4)^3}{w^6}$, which law should be applied first?
- ☐ A. Quotient rule
 ☐ C. Product rule
- ☐ B. Zero exponent rule
 ☐ D. Power of a power rule
- 4) What is $\sqrt[3]{64}$?
- ☐ A. 3
 ☐ C. 5
- ☐ B. 6
 ☐ D. 4
- 5) $\frac{1.2 \times 10^4}{4 \times 10^6} = ?$
- ☐ A. 0.3×10^{-2}
☐ C. 3.2×10^{-2}
- ☐ B. 5×10^{-3}
☐ D. 3×10^{-3}



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6) A garden uses 3 gallons of water per crimson plant. After planting 12 crimson plants, how many gallons are needed?

☐ A. 24 gallons

☐ B. 30 gallons

☐ C. 36 gallons

☐ D. 40 gallons

7) Factor completely: $5x^2 + 35x + 50$.

☐ A. $5(x^2 + 7x + 10)$

☐ B. $(5x + 5)(x + 10)$

☐ C. $5(x + 2)(x + 5)$

☐ D. $5(x + 10)(x + 1)$

8) Express 356,000 in scientific notation.

9) A function displays the pattern: $(1, 2)$, $(2, 4)$, $(3, 8)$, $(4, 16)$. What type of function is this?

☐ A. Linear, because y increases

☐ B. Linear, with slope 2 per x -unit

☐ C. Nonlinear, exponential (doubling pattern)

☐ D. Nonlinear, but could still be linear with the right data



Rhode Island RICAS 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 Rhode Island RICAS practice test.



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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** (8.EE.C.7) Find two numbers that multiply to -20 and add to -1 : -5 and 4 . Check: $-5 \cdot 4 = -20$ and $-5 + 4 = -1$.
- 2) **Choice C is correct.** (8.EE.A.4) Multiply coefficients: $4.8 \times 1.25 = 6$. Add exponents: $10^{-2+2} = 10^0 = 1$. Result: $6 \times 10^0 = 6 \times 1 = 6$.
- 3) **Choice C is correct.** (8.EE.B.5) From $(1, 1)$ to $(3, 4)$: slope $= \frac{4-1}{3-1} = \frac{3}{2}$.
- 4) **Choice A is correct.** (8.G.C) Let t = the number of years from now. Then $42 + t = 3(10 + t)$. This gives $42 + t = 30 + 3t$, so $12 = 2t$ and $t = 6$ years.
- 5) **Choice C is correct.** (8.F.A.1) Find the output value 8 in the table; it corresponds to $x = 3$.
- 6) **Choice A is correct.** (8.F.B.4) Slope is $\frac{\Delta P}{\Delta t} = \frac{6}{3} = 2$ thousand per year from $t = 0$ to $t = 3$ (or any consecutive pair).
- 7) **Choice B is correct.** (8.F.B.5) The graph shows a flat horizontal line from week 3 to week 5 at 4 mph, indicating no change in speed. This is the maintenance phase after rapid early gains.
- 8) **Choice C is correct.** (8.G.A.3) Under dilation by scale factor k , all lengths (including perimeter) are multiplied by k . So $20 \times 3 = 60$.
- 9) **Choice A is correct.** (8.G.A.5) Angles x and y are alternate interior angles formed by parallel lines and a transversal, so they are congruent: $y = 84^\circ$.
- 10) **Choice A is correct.** (8.G.B.8, 8.G.B.7) Correct calculation: $10^2 + 10^2 = 100 + 100 = 200$, so $c = \sqrt{200} = \sqrt{100 \cdot 2} = 10\sqrt{2} \approx 14.14$. The student added the legs directly instead of using the Pythagorean Theorem.
- 11) **Choice A is correct.** (8.G.B.8) $\sqrt{5^2 + 5^2} = \sqrt{25 + 25} = \sqrt{50}$. Check others: $(7, 2)$ gives $\sqrt{53}$; $(5, 2)$ gives $\sqrt{29}$; $(3, 4)$ gives 5 .
- 12) **The correct answer is $(3, 6)$.** (8.EE.C) Substitute $y = 2x$ into $x + y = 9$: $x + 2x = 9$, so $3x = 9$, giving $x = 3$. Then $y = 2(3) = 6$.
- 13) **Choice C is correct.** (8.G.B.7) If the angles are $3k$ and $7k$, then $3k + 7k = 90$, so $10k = 90$ and $k = 9^\circ$. The smaller angle is $3 \times 9 = 27^\circ$.
- 14) **Choice C is correct.** (8.G.C.9) Prism: $V_p = B \times h = 25 \times 15 = 375 \text{ cm}^3$. Pyramid: $V_{py} = \frac{1}{3} \times 25 \times 15 = 125 \text{ cm}^3$. Ratio: $\frac{375}{125} = 3$.
- 15) **Choice C is correct.** (8.G.B.7) Two semicircles form one complete circle. Area $= \pi r^2 = 3.14 \times 3^2 = 28.26 \text{ m}^2$.
- 16) **Choice B is correct.** (8.G.A.5) The sum of interior angles in a quadrilateral is 360° . So $D = 360 - 85 - 95 - 100 = 80^\circ$.
- 17) **Choice B is correct.** (8.SP.A.1) As speed increases, time to reach a destination decreases—a clear negative correlation. The other choices show positive or no clear correlation.
- 18) **Choice B is correct.** (8.SP.A.4) This is a row-conditional relative frequency. Among cream-adders (50 total), 35 are office workers: $\frac{35}{50} = 0.70 = 70\%$.
- 19) **The correct answer is A, D.** (8.EE.B.5) The line goes through $(0, 0)$ and $(8, 4)$, so the slope and constant of proportionality are $\frac{4}{8} = 0.5$. A point on the line must have $y = 0.5x$; when $x = 6$, $y = 3$, so $(6, 3)$ is on the line.
- 20) **Choice B is correct.** (8.G.B.8) Set P: $\text{MAD} = (2 + 1 + 0 + 1 + 2)/5 = 1.2$. Set Q: $\text{MAD} = (9 + 5 + 0 + 5 + 9)/5 = 5.6$. Q has much larger spread.
- 21) **Choice A is correct.** (8.G.B.7) $P(\text{not rain}) = 1 - P(\text{rain}) = 1 - \frac{2}{5} = \frac{3}{5}$.
- 22) **Choice C is correct.** (8.NS.A.2) Arrange all 5 cards in sequence: $5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$ arrangements.
- 23) **Choice B is correct.** (8.G.A.2) Figures A and C are both 4×2 rectangles. Figure B is a 2×2 square, so it is not congruent to either rectangle.
- 24) **Choice B is correct.** (8.SP.A.2) $\text{MAD} = \frac{|-3| + |2| + |-1| + |4| + |-2|}{5} = \frac{3+2+1+4+2}{5} = \frac{12}{5} = 2.4$.
- 25) **Choice C is correct.** (8.G.A.4) Volume scales by the cube of the linear scale factor: $3^3 = 27$. This is a common error.
- 26) **Choice D is correct.** (8.NS.A.1) This is false. π is irrational; it cannot be written as a fraction of two integers and has a non-terminating, non-repeating decimal expansion. All other statements are true.



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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
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