

Maine

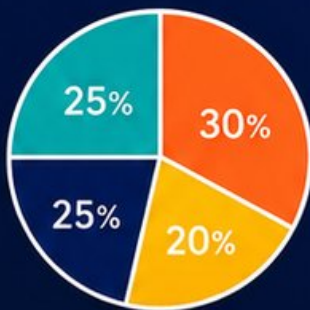
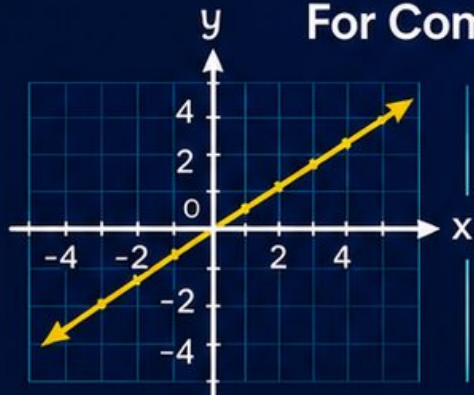
Through Year Assessment

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

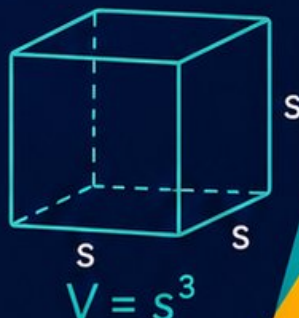


$$y = mx + b$$

$$2x - 3y = 6$$

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

$$A = bh$$



4 PRINTED TESTS



2 ONLINE TESTS

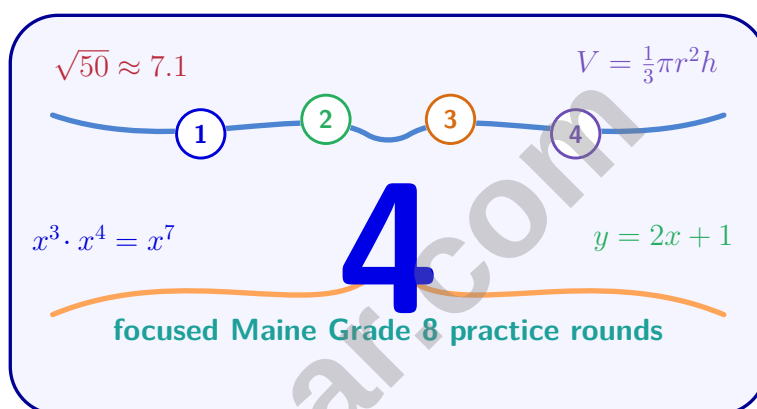


Use these **two additional online practice tests** for extra review after the printed tests in this book.



4 Maine Through Year Assessment Grade 8 Math Practice Tests

Targeted Through Year Assessment Review for Algebra, Geometry, and Data Confidence



Four complete 40-question Grade 8 Through Year Assessment 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, Maine Grade 8 Problem Solver!

Four focused rounds for sharper Through Year Assessment math thinking

This book gives you four full Grade 8 Through Year Assessment 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 Maine 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.

Maine 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 Through Year Assessment 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 bakery's two-way table shows 300 purchases by time and product type. Morning purchases: 120 bread, 80 pastries. Afternoon purchases: 60 bread, 40 pastries. What is the marginal relative frequency for pastries, rounded to the nearest hundredth?

	Bread	Pastries	Total
Morning	120	80	200
Afternoon	60	40	100
Total	180	120	300

- ☐ A. 0.27 ☐ C. 0.40
☐ B. 0.33 ☐ D. 0.47
- 2) A table shows values for x and y . What is the rate of change?

x	0	2	4	6
y	-2	2	6	10

- ☐ A. 2 ☐ C. 4
☐ B. $\frac{1}{2}$ ☐ D. -2
- 3) A register contains pennies, nickels, and dimes. There are twice as many nickels as pennies, and twice as many dimes as nickels. If there are 70 coins total, how many pennies are there?

- ☐ A. 5 ☐ C. 10
☐ B. 8 ☐ D. 12
- 4) The Great Pyramid of Giza has an approximate square base with side 230 m and height 147 m. Estimate its volume using $V = \frac{1}{3} \times B \times h$.

- ☐ A. $1.5 \times 10^6 \text{ m}^3$ ☐ C. $3.8 \times 10^6 \text{ m}^3$
☐ B. $2.6 \times 10^6 \text{ m}^3$ ☐ D. $7.7 \times 10^6 \text{ m}^3$



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5) 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
- ☐ B. There is little or no linear relationship between study time and test score
- ☐ C. Test performance decreases with study time
- ☐ D. The data contains no measurement error

6) A parallelogram has base 6 in and height 4 in. It is dilated by a scale factor of 2.5. What is the new height?

- ☐ A. 4 in
- ☐ B. 10 in
- ☐ C. 15 in
- ☐ D. 6.5 in

7) If $h(x) = -x + 4$, what is $h(1)$?

- ☐ A. 3
- ☐ B. 5
- ☐ C. -3
- ☐ D. 4

8) Which shows an error in classification?

- ☐ A. $\sqrt{36} = 6$ is classified as rational
- ☐ B. π is classified as irrational
- ☐ C. $0.\overline{27}$ is classified as irrational
- ☐ D. $\sqrt{50}$ is classified as irrational

9) What fraction equals $0.8\overline{3}$?

- ☐ A. $\frac{83}{100}$
- ☐ B. $\frac{83}{99}$
- ☐ C. $\frac{8}{30}$
- ☐ D. $\frac{75}{90} = \frac{5}{6}$



10) Is $\sqrt{22}$ closer to 4.6 or 4.7?

- ☐ A. 4.6 ☐ C. Equally close
☐ B. Cannot determine ☐ D. 4.7

11) Which is the best estimate of π ?

- ☐ A. 2.14 ☐ C. 3.14
☐ B. 3.0 ☐ D. 3.5

12) A computer hard drive has a storage capacity of 1.5×10^{12} bytes. How many times larger is this than a USB stick with capacity 1.5×10^{10} bytes?

- ☐ A. 200 times ☐ C. 10,000 times
☐ B. 1,000 times ☐ D. 100 times

13) A square pyramid has a base with side length 8 cm and height 3 cm. Approximate the slant height and then calculate the surface area. (Use $\sqrt{25} = 5$.)

- ☐ A. Slant height ≈ 5 cm, SA ≈ 129 cm² ☐ C. Slant height ≈ 4 cm, SA ≈ 113 cm²
☐ B. Slant height ≈ 5 cm, SA ≈ 144 cm² ☐ D. Slant height ≈ 6 cm, SA ≈ 161 cm²

14) A trapezoid is transformed by rotating it 90° counterclockwise about the origin. If a vertex was at $(3, -2)$ before the rotation, where is it after?

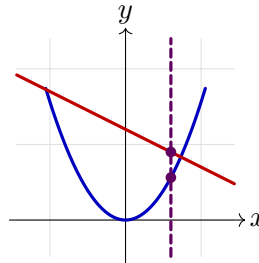
- ☐ A. $(3, 2)$ ☐ C. $(2, 3)$
☐ B. $(-3, -2)$ ☐ D. $(-2, 3)$

15) A line passes through the points $(2, 5)$ and $(6, 17)$. Find the slope of the line.



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- 1) Two curves are drawn on the same coordinate plane. The first curve is a parabola, and the second is a straight line (not vertical). How many times will a vertical line intersect both curves combined?



- ☐ A. At most twice (once per curve). ☐ C. At most three times.
- ☐ B. Exactly once. ☐ D. More than four times.
- 2) A ladder leans against a wall. The slope of the ladder line is undefined. What does this indicate?
- ☐ A. The ladder is horizontal ☐ C. The ladder is at a 45° angle
- ☐ B. The ladder is on the ground ☐ D. The ladder is vertical
- 3) Two rectangles are considered separately. The first rectangle is x cm long and 5 cm wide. The second rectangle is y cm long and 5 cm wide. The sum of their perimeters is 56 cm, and the difference in their lengths is 2 cm. If $x > y$, what is x ?
- ☐ A. 8 cm ☐ C. 10 cm
- ☐ B. 12 cm ☐ D. 14 cm



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- 4) A library tracks 420 patrons by age and material preference:

	Books	Digital	Total
Youth (< 18)	140	70	210
Adult (≥ 18)	140	70	210
Total	280	140	420

Is there an association between age group and material preference? Why or why not?

- ☐ A. Yes; youth prefer books at $\frac{140}{210} = \frac{2}{3}$ while adults also do at $\frac{140}{210} = \frac{2}{3}$.
☐ B. Yes; youth prefer books more than adults.
☐ C. No; both groups prefer books at identical relative frequencies.
☐ D. No; the total for books (280) exceeds digital (140).
- 5) Two fair coins are tossed. How many total outcomes are in the sample space?
- ☐ A. 2
☐ B. 4
☐ C. 8
☐ D. 3
- 6) A bicycle rental costs \$20 per day plus a \$15 deposit. Which equation gives total cost C for d days?
- ☐ A. $C = 20d + 15$
☐ B. $C = 15d + 20$
☐ C. $C = 35d$
☐ D. $C = 20d - 15$
- 7) A 270° counterclockwise rotation about the origin is applied to the point $(4, -3)$. What is the image?
- ☐ A. $(-3, -4)$
☐ B. $(3, 4)$
☐ C. $(-4, 3)$
☐ D. $(4, 3)$



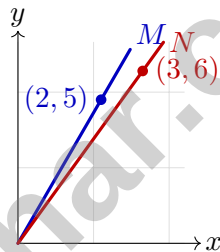
- 1) A segment has endpoints $E(2, 3)$ and $F(5, 7)$. After a translation, E maps to $E'(-1, 2)$. Where does F map to?

☐ A. $(2, 6)$ ☐ C. $(2, 4)$
☐ B. $(4, 8)$ ☐ D. $(1, 6)$

- 2) Is the equation $y = 7$ (a horizontal line) a function?

☐ A. No, because y never changes. ☐ C. Yes, each x produces exactly one output ($y = 7$).
☐ B. No, because there is no variable x . ☐ D. Yes, only if x is positive.

- 3) Two lines are shown on the same graph. Line M passes through $(0, 0)$ and $(2, 5)$. Line N passes through $(0, 0)$ and $(3, 6)$. Which statement is true?



- ☐ A. Line M is steeper ☐ D. Cannot be determined from the information
☐ B. Line N is steeper
☐ C. Both lines have the same steepness
- 4) A piggy bank holds 25 coins consisting of nickels (5¢) and dimes (10¢). The total value is \$1.70. How many nickels are in the bank?

☐ A. 10 ☐ C. 12
☐ B. 16 ☐ D. 8



Maine Through Year Assessment 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 Maine Through Year Assessment practice test.



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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice C is correct.** (8.SP.A.4) Total pastries: $80 + 40 = 120$. Marginal relative frequency: $\frac{120}{300} = 0.40$.
- 2) **Choice A is correct.** (8.EE.B.5) Using any two points, e.g., $(0, -2)$ and $(2, 2)$: slope $= \frac{2 - (-2)}{2 - 0} = \frac{4}{2} = 2$.
- 3) **Choice C is correct.** (8.EE.C.8c) Let p = pennies, n = nickels, and d = dimes. Then $n = 2p$ and $d = 2n = 4p$. The total is $p + 2p + 4p = 7p = 70$, so $p = 10$.
- 4) **Choice B is correct.** (8.G.B.7) $B = 230^2 = 52900 \text{ m}^2$. $V = \frac{1}{3} \times 52900 \times 147 \approx \frac{7776300}{3} \approx 2.6 \times 10^6 \text{ m}^3$.
- 5) **Choice B is correct.** (8.SP.A.2) A near-zero slope indicates weak or no correlation between the variables.
- 6) **Choice B is correct.** (8.G.A.4) $4 \times 2.5 = 10$ in.
- 7) **Choice A is correct.** (8.F.A.1) Substitute $x = 1$: $h(1) = -(1) + 4 = -1 + 4 = 3$.
- 8) **Choice C is correct.** (8.NS.A.1) The repeating decimal $0.\overline{27} = 0.272727\ldots = \frac{27}{99} = \frac{3}{11}$ is rational, not irrational. All repeating decimals are rational. The other classifications are correct.
- 9) **Choice D is correct.** (8.NS.A.1) Let $x = 0.\overline{83} = 0.8333\ldots$. Then $10x = 8.\overline{3}$ and $100x = 83.\overline{3}$. Subtracting: $90x = 75$, so $x = \frac{75}{90} = \frac{5}{6}$.
- 10) **Choice D is correct.** (8.NS.A.2) $(4.6)^2 = 21.16$ and $(4.7)^2 = 22.09$. Since 22 is closer to 22.09, $\sqrt{22}$ is closer to 4.7.
- 11) **Choice C is correct.** (8.NS.A.2) $\pi \approx 3.14159\ldots$, commonly estimated as 3.14 or 3.2 for Grade 8 work. Distractors: A (underestimate), B (rounds down), D (rounds up).
- 12) **Choice D is correct.** (8.EE.A.3) Divide: $\frac{1.5 \times 10^{12}}{1.5 \times 10^{10}} = 1 \times 10^2 = 100$ times larger.
- 13) **Choice B is correct.** (8.G.A.3) The distance from the center to the midpoint of a base edge is 4 cm. Slant height $\ell = \sqrt{3^2 + 4^2} = \sqrt{25} = 5$ cm. Base area $= 64 \text{ cm}^2$ and lateral area $= 4 \times \frac{1}{2}(8)(5) = 80 \text{ cm}^2$, so total surface area is 144 cm^2 .
- 14) **Choice C is correct.** (8.G.A.1) A 90° counterclockwise rotation uses $(x, y) \rightarrow (-y, x)$. So $(3, -2) \rightarrow (-(-2), 3) = (2, 3)$.
- 15) **The correct answer is 3.** (8.F.B.4) Slope formula: $m = \frac{17-5}{6-2} = \frac{12}{4} = 3$.
- 16) **Choice D is correct.** (8.EE.B.6) Using $y = mx + b$: $3 = -1(1) + b$, so $3 = -1 + b$, thus $b = 4$.
- 17) **Choice A is correct.** (8.EE.C.7) Base fee is \$50, hourly rate is \$40 per hour, total is \$170. Equation: $50 + 40h = 170$. Solving: $40h = 120 \Rightarrow h = 3$ hours.
- 18) **Choice C is correct.** (8.EE.C.7a) Multiply by -1 (FLIP): $x \geq -5$.
- 19) **Choice C is correct.** (8.EE.C.8c) Test $(2, 4)$: $3(2) + 4 = 10 > 9$ TRUE. Others fail: $(2, 2)$: $8 \not> 9$; $(3, 0)$: $9 \not> 9$; $(1, 6)$: $9 \not> 9$.
- 20) **Choice B is correct.** (8.G.B.7) From $V = \frac{4}{3}\pi r^3$, solving: $523.33 = \frac{4}{3} \times 3.14 \times r^3 \Rightarrow r^3 = 125 \Rightarrow r = 5$ m.
- 21) **The correct answer is B,D.** (8.F.A.1) Option B: each input $(0, 1, 2, 3)$ has exactly one output $(0, 1, 2, 3)$ —a function. Option D: each input $(5, 6, 7)$ has exactly one output $(1, 2, 3)$ —a function. Option A: input 1 maps to both 2 and 3—not a function. Option C: input 2 maps to both 4 and 5—not a function. Option E: input 1 maps to both 1 and 3—not a function.
- 22) **Choice B is correct.** (8.SP.A.3) Extrapolation means predicting beyond observed data. Since only $q \in [1, 5]$ was observed, $q = 8$ requires extrapolation and carries risk.
- 23) **Choice D is correct.** (8.G.B.7) 18 months $= 1.5$ years. $I = 5000 \times 0.06 \times 1.5 = \450 .
- 24) **Choice C is correct.** (8.EE.A.1) New side is s^2 , so new area is $(s^2)^2 = s^{2 \cdot 2} = s^4$.
- 25) **Choice D is correct.** (8.EE.A.2) $3^3 = 27$ and $4^3 = 64$. Since $27 < 50 < 64$, we have $3 < \sqrt[3]{50} < 4$.
- 26) **Choice D is correct.** (8.EE.A.4) Add first: $(9 + 3.6) \times 10^5 = 12.6 \times 10^5 = 1.26 \times 10^6$. Then divide: $\frac{1.26 \times 10^6}{4 \times 10^2} = 0.315 \times 10^4 = 3.15 \times 10^3$.
- 27) **Choice D is correct.** (8.EE.B.5) $y = 25x$. Solve $200 = 25x$: $x = 200/25 = 8$ days.
- 28) **Choice D is correct.** (8.EE.C.8a) Subtract the second from the first: $(2x + 3y) - (2x - y) = 11 - 3$, so $4y = 8$, giving $y = 2$. Substitute: $2x - 2 = 3$, so $2x = 5$ and $x = \frac{5}{2}$. Solution: $(\frac{5}{2}, 2)$.



Hi, Calm Solver!

◇ This carefully paced book gave you four steady Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. A calm mind can see choices more clearly. That matters in Grade 8, where one problem may have several possible entry points. ◇

★ **Remember this:** You practiced building calm by doing full tests. Each completed page is rehearsal for staying steady when the real test feels serious. ★

Calm-Test Moves

- **Pause:** Give your brain one quiet second.
- **Choose:** Pick the first useful step.
- **Continue:** Do not demand perfection immediately.
- **Check:** Use review time wisely.

Grade 8 test-day tip: If you feel rushed, slow your reading for one sentence. Clear reading saves time.

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

Jay Daie

Your Calm-Test Coach

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



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