

8

Maine

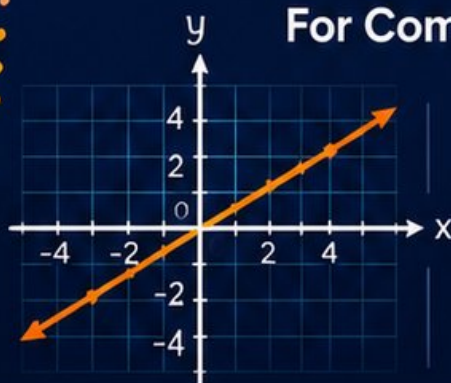
Through Year Assessment

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$
$$C = 2\pi r$$
$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}b^2 h$$



8 PRINTED
TESTS



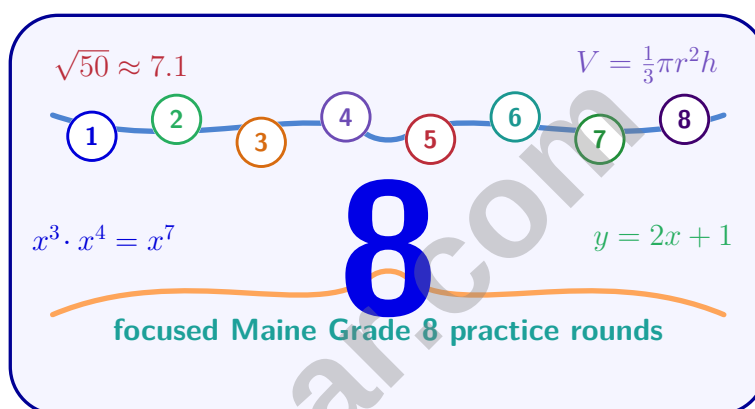
2 ONLINE
TESTS



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

8 Maine Through Year Assessment Grade 8 Math Practice Tests

Maine Practice for Grade 8 Functions, Geometry, Statistics, and Models



Eight 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!

Eight focused rounds for sharper Through Year Assessment math thinking

This book gives you eight 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

An eight-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?

Eight Through Year Assessment tests, 320 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real and irrational numbers, integer exponents, scientific notation, equations, and careful reading.
Tests 4–6	Slope, systems of equations, functions, inequalities, transformations, congruence, and similarity.
Tests 7–8	Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina.
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) Triangle XYZ has angle measures of $45^\circ, 60^\circ, 75^\circ$. Triangle ABC is congruent to triangle XYZ. What are the angle measures of triangle ABC?

☐ A. $30^\circ, 60^\circ, 90^\circ$

☐ C. $50^\circ, 65^\circ, 65^\circ$

☐ B. $45^\circ, 60^\circ, 75^\circ$

☐ D. $40^\circ, 60^\circ, 80^\circ$

2) A cinema tracks 240 moviegoers:

	Action	Comedy	Total
Weekday	72	48	120
Weekend	84	36	120
Total	156	84	240

Among action-movie viewers, what is the relative frequency of weekday watchers?

☐ A. ≈ 0.30

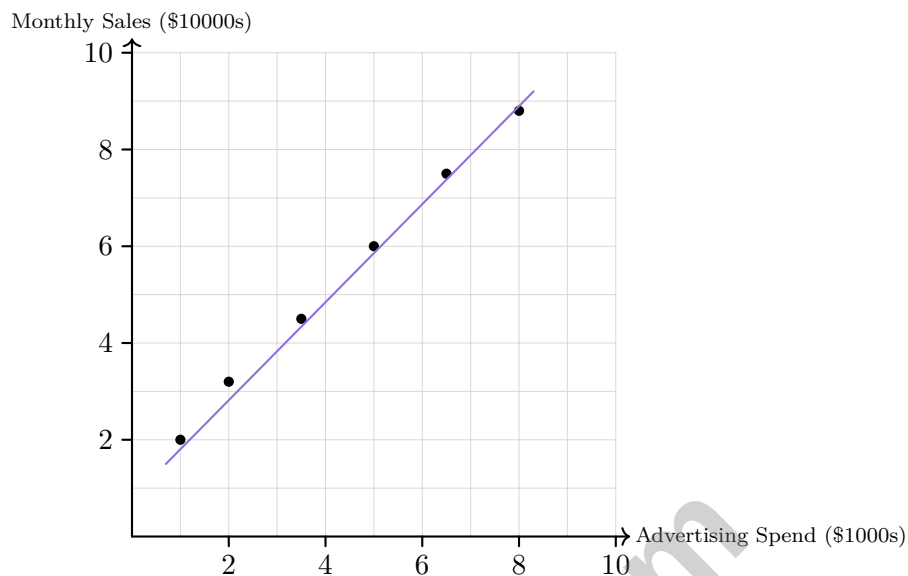
☐ C. ≈ 0.50

☐ B. ≈ 0.46

☐ D. ≈ 0.60



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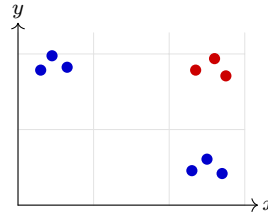
3)

A business tracks advertising spend versus monthly sales. Based on the trend line, what is the approximate y -intercept (sales with no advertising)?

☐ A. \$30,000☐ C. \$10,000☐ B. \$20,000☐ D. \$0

4) A triangular pyramid has an equilateral triangular base with side 6 cm and a pyramid height of 8 cm. The area of an equilateral triangle with side 6 cm is $9\sqrt{3} \text{ cm}^2 \approx 15.59 \text{ cm}^2$. What is the volume?

☐ A. $\approx 37 \text{ cm}^3$ ☐ C. $\approx 52 \text{ cm}^3$ ☐ B. $\approx 42 \text{ cm}^3$ ☐ D. $\approx 62 \text{ cm}^3$ 

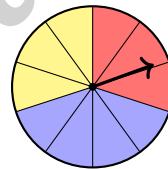


5)

Two groups appear in a scatter plot of video game experience (x-axis) versus reaction time (y-axis). Experienced players (many hours played) have fast reaction times (lower y-values). Inexperienced players (few hours played) have slow reaction times (higher y-values). What does this clustering pattern tell you about the relationship?

- ☐ A. More experience causes longer reaction times
- ☐ B. Experience and reaction time are unrelated
- ☐ C. Reaction time improves with experience in a curved way
- ☐ D. More experience is associated with faster reaction times

6) A spinner has 10 equal sections: 3 red, 4 blue, and 3 yellow. What is the probability of landing on red OR blue?



3 red, 4 blue, 3 yellow

- ☐ A. $\frac{4}{10}$
- ☐ B. $\frac{12}{10}$
- ☐ C. $\frac{7}{10}$
- ☐ D. $\frac{3}{10}$



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1) Multiply: $(3x + 4)(2x - 1)$

☐ A. $5x^2 + 5x - 4$

☐ C. $6x^2 + 5x - 4$

☐ B. $6x^2 + 11x - 4$

☐ D. $6x^2 - 3x - 4$

2) A function with equally spaced x -values shows second differences of 2, 2, 2. What type of function is it?

☐ A. Linear (constant first differences)

☐ C. Exponential (growing rates)

☐ B. Quadratic (constant second differences)

☐ D. Cannot be determined from second differences alone

3) An angle and its complement differ by 12° . What is the measure of the larger of the two angles?

☐ A. 39°

☐ C. 51°

☐ B. 45°

☐ D. 63°

4) Data from 280 households shows: 168 have broadband internet, 112 do not. Among those with broadband, 126 subscribed to streaming services. What is the relative frequency of streaming subscribers among broadband users?

☐ A. 0.45

☐ C. 0.75

☐ B. 0.67

☐ D. 0.85

5) Two students sketch different trend lines through the same scatter plot. Student A's line has a gentler slope, while Student B's line has a steeper slope. What could explain this difference?

☐ A. One student made a calculation error

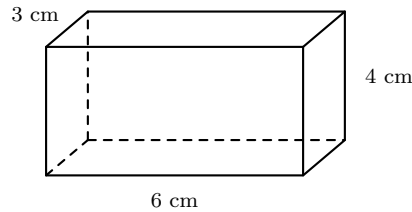
☐ C. Only one line can ever be correct

☐ B. The students used different data sets

☐ D. Sketching a trend line by eye allows for reasonable variation



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6)

A rectangular prism is shown with dimensions $6\text{ cm} \times 4\text{ cm} \times 3\text{ cm}$. What is its surface area?

☐ A. 72 cm^2
☐ C. 144 cm^2
☐ B. 108 cm^2
☐ D. 168 cm^2

7) If a figure is rotated 360° about the origin, what happens to the figure?

☐ A. It is reduced in size by one-fourth

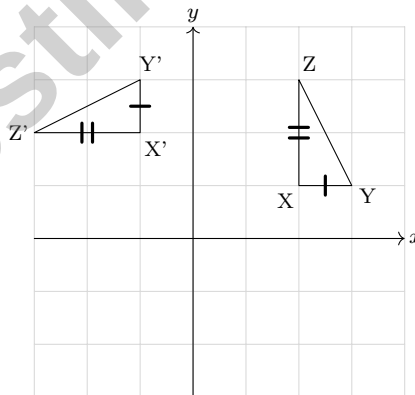
☐ D. It returns to its original position

☐ B. It is reflected across the origin

☐ and orientation

☐ C. It moves to a different quadrant

8) Triangle XYZ is mapped onto triangle X'Y'Z' by a 90-degree counterclockwise rotation about the origin. If the triangles are congruent, which of the following is true?


☐ A. Side XY has a different length than side $X'Y'$
☐ C. Side $XZ = \text{side } X'Z'$
☐ B. The angle at Z differs from the angle at Z'
☐ D. All angles are different after rotation


1) A restaurant offers 5 types of bread, 4 types of cheese, and 3 types of meat. How many different sandwich combinations are possible if you pick one of each?

☐ A. 12☐ C. 35☐ B. 20☐ D. 60

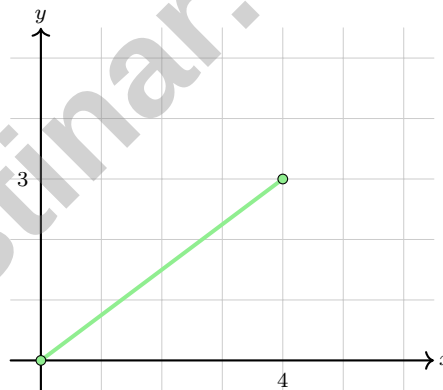
2) Which type of transformation maps a figure to a congruent image without changing its position relative to orientation?

☐ A. Reflection☐ C. Translation☐ B. Rotation☐ D. Dilation

3) Which is the best estimate of $\pi - \sqrt{2}$?

☐ A. 0.8☐ C. 1.7☐ B. 1.2☐ D. 2.4

4)



The equation of the line is:

☐ A. $y = 3x$ ☐ C. $y = \frac{3}{4}x$ ☐ B. $y = \frac{4}{3}x$ ☐ D. $y = 4x$ 

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5) A line has equation $y = \frac{3}{2}x + 5$. Which statement is true?

- ☐ A. The line has slope 5 and passes through $(0, \frac{3}{2})$
- ☐ B. The line is perpendicular to $y = \frac{2}{3}x + 1$
- ☐ C. The line has y -intercept $\frac{3}{2}$
- ☐ D. The line passes through $(2, 8)$

6) Simplify $\frac{x^{10} \cdot x^{-3}}{x^4}$. What is the exponent on x in the final answer?

7) Solve by substitution: $\begin{cases} x = 4 - y \\ x + 3y = 8 \end{cases}$

- ☐ A. $(0, 4)$
- ☐ B. $(1, 3)$
- ☐ C. $(2, 2)$
- ☐ D. $(3, 1)$

8) If a square has side length $(x + 3)$, and a smaller square inside has side length $(x - 3)$, what is the difference in their areas?

- ☐ A. 6
- ☐ B. 9
- ☐ C. $12x$
- ☐ D. x^2



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 B is correct.** **(8.G.A.2)** Congruent triangles have equal corresponding angles. Triangle ABC has the same angle measures as triangle XYZ: $45^\circ, 60^\circ, 75^\circ$.
- 2) **Choice B is correct.** **(8.SP.A.4)** Column-conditional frequency among action viewers (156 total): $\frac{72}{156} \approx 0.46$.
- 3) **Choice C is correct.** **(8.SP.A.2)** Tracing back to $x = 0$, the trend line intersects the y -axis at approximately 1 on the scale, or \$10,000.
- 4) **Choice B is correct.** **(8.G.B.7)** $V = \frac{1}{3} \times B \times h = \frac{1}{3} \times 9\sqrt{3} \times 8 = 24\sqrt{3} \approx 41.57 \text{ cm}^3$, rounded to $\approx 42 \text{ cm}^3$.
- 5) **Choice D is correct.** **(8.SP.A.1)** The pattern shows: high experience (right) $\rightarrow$ low reaction time (bottom), and low experience (left) $\rightarrow$ high reaction time (top). This is a negative association: as one increases, the other decreases.
- 6) **Choice C is correct.** **(8.G.B.7)** $P(\text{red or blue}) = P(\text{red}) + P(\text{blue}) = \frac{3}{10} + \frac{4}{10} = \frac{7}{10}$.
- 7) **Choice B is correct.** **(8.EE.C.7b)** Choose one bread and one topping: $2 \times 7 = 14$ different sandwiches.
- 8) **Choice D is correct.** **(8.NS.A.1)** Dividing an irrational number by a nonzero rational number always yields an irrational result. For example, $\frac{\sqrt{2}}{2}$ is irrational. If the result were rational, then multiplying by the rational divisor would give a rational number, contradicting the fact that the original numerator is irrational.
- 9) **Choice D is correct.** **(8.G.B.7)** Correct: $I = 400 \times (0.12/12) \times 1 = \4 . She incorrectly applied 12% for 1 month (should use the monthly rate of 1%), mistaking APR as a monthly rate.
- 10) **Choice D is correct.** **(8.NS.A.1)** Let $x = 0.4\overline{2} = 0.4222\dots$. Then $10x = 4.2\overline{2}$ and $100x = 42.2\overline{2}$. Subtracting: $90x = 38$, so $x = \frac{38}{90} = \frac{19}{45}$.
- 11) **Choice D is correct.** **(8.NS.A.2)** $(2.4)^2 = 5.76 < 6$, so $2.4 < \sqrt{6}$. Therefore $\sqrt{6}$ is greater than 2.4.
- 12) **Choice A is correct.** **(8.EE.C.7a)** Set up: $12 + 3t < 30$. Subtract 12: $3t < 18$. Divide by 3: $t < 6$ hours.
- 13) **Choice D is correct.** **(8.EE.A.1)** After $3^2 = 9$ hours, doubling 9 times means multiply by 2^9 . Total: $10^2 \cdot 2^9$.
- 14) **Choice D is correct.** **(8.EE.A.3)** $57,000 = 5.7 \times 10^4$ (move decimal 4 places left from 57,000 to get 5.7).
- 15) **Choice D is correct.** **(8.EE.B.5)** Slope $= \frac{2}{9} \approx 0.222 \approx 0.22$. This is a very shallow line.
- 16) **Choice D is correct.** **(8.EE.B.6)** The correct slope is $\frac{9-3}{4-1} = \frac{6}{3} = 2$. The student computed $\frac{4-1}{9-3} = \frac{3}{6} = \frac{1}{2}$, reversing the roles of Δx and Δy .
- 17) **The correct answer is 4 intervals.** **(8.F.B.5)** The function changes sign at each x -intercept. For a polynomial, the sign pattern depends on the behavior of the function in regions between intercepts. Students should understand that zeros (intercepts) divide the domain into intervals where the function maintains a constant sign.
- 18) **Choice C is correct.** **(8.EE.C.7)** Expand the right side: $6x - 4 = 6x - 4$. Both sides are identical, so every value of x is a solution.
- 19) **Choice B is correct.** **(8.G.B.8)** Distance $= \sqrt{(5-0)^2 + (12-0)^2} = \sqrt{25+144} = \sqrt{169} = 13.0$. (This is a 5-12-13 Pythagorean triple.)
- 20) **Choice C is correct.** **(8.NS.A.2)** Since $7^2 = 49$ and $7.1^2 = 50.41$, we have $\sqrt{50} \approx 7.07$.
- 21) **Choice D is correct.** **(8.EE.A.2)** Volume of a cube $= s^3 = 5^3 = 125 \text{ cm}^3$.
- 22) **The correct answer is B,C.** **(8.EE.C.7)** $(x+6)^2 = (x+6)(x+6) = x^2 + 12x + 36$. Choice B is the expanded form, and choice C is the factored form. Choice A ignores the middle term. Choice D has an error. Choice E is a different factorization that does not equal $(x+6)^2$.
- 23) **Choice C is correct.** **(8.EE.A.4)** Divide coefficients: $5 \div 2.5 = 2$. Subtract exponents: $10^{-2-(-5)} = 10^3$. Result: 2×10^3 .
- 24) **Choice D is correct.** **(8.EE.C.8a)** Substitute $x = y - 4$ into $2x + 3y = 2$: $2(y - 4) + 3y = 2$, so $2y - 8 + 3y = 2$, giving $5y = 10$ and $y = 2$. Then $x = 2 - 4 = -2$. Solution: $(-2, 2)$.
- 25) **Choice C is correct.** **(8.F.A.1)** A sideways parabola (opening right or left) fails the vertical line test because some vertical lines intersect it twice. The other options all pass the vertical line test.
- 26) **Choice C is correct.** **(8.F.A.2)** If $f(2) = f(5)$, slope $= (f(5) - f(2))/(5 - 2) = 0/3 = 0$. Horizontal line.



Hi, Number Sense Builder!

◇ Grade 8 mathematics connects numbers, algebra, geometry, and data. It helps you model linear change, compare functions, estimate irrational values, measure distance, and explain patterns. ◇

★ **Remember this:** You practiced listening to that story. When the answer makes sense in the situation, your math becomes much stronger. This version gave you 8 opportunities to rehearse test-day habits. ★

Number Sense Checks

- **Too Big?:** Compare with an estimate.
- **Too Small?:** Use the context to judge.
- **Right Sign?:** Positive and negative values matter.
- **Right Unit?:** A number needs meaning.

Grade 8 test-day tip: Before choosing an answer, ask whether it fits the story of the problem.

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

Jay Daie

Your Number-Sense Friend

PRACTICE TODAY, SUCCEED TOMORROW!

Give your child the confidence and skills they need with **8 full-length Grade 8** Math practice tests that mirror 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.



BUILD SKILLS & BOOST CONFIDENCE

Strengthen understanding and feel prepared for test day.



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!



2 EXTRA ONLINE PRACTICE TESTS INCLUDED!

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Testinar

More Practice. More Confidence.
Better Results.