

10

Connecticut

Smarter Balanced

GRADE

8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

10

PRINTED TESTS



2

ONLINE TESTS



Build Confidence



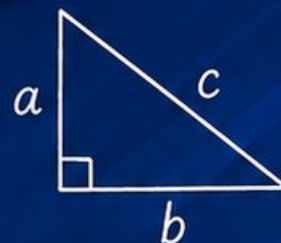
Master Key Math Skills



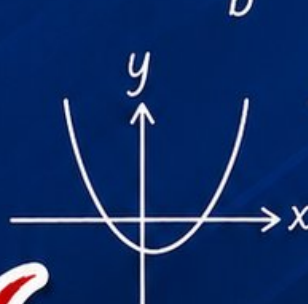
Answer Explanations for
Every Question



Test-Taking Strategies
That Work



$$y = mx + b$$



$$3x - 7 = 2(x + 5)$$
$$x = 17$$

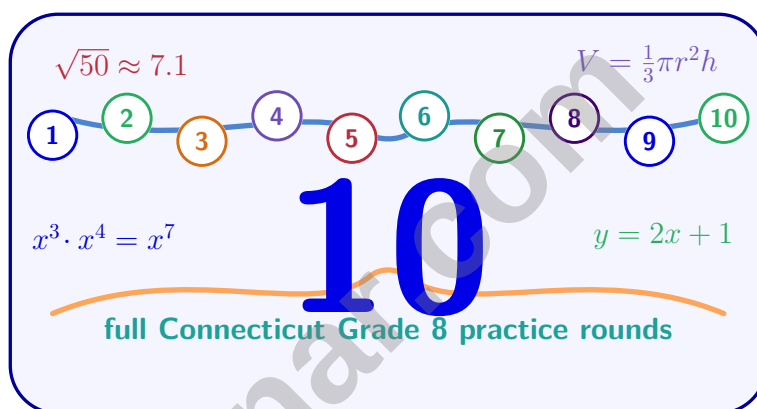


USE THESE TWO
**ADDITIONAL ONLINE
PRACTICE TESTS**

FOR EXTRA REVIEW AFTER
THE PRINTED TESTS
IN THIS BOOK.

10 Connecticut Smarter Balanced Grade 8 Math Practice Tests

Connecticut Grade 8 Smarter Balanced Practice for precise Grade 8 practice in rates, scientific notation, expressions, geometry, inference, and probability



Ten complete 40-question Grade 8 Smarter Balanced practice rounds with linear relationships, scientific notation, real numbers, equations, functions, geometry, data analysis, probability, answer keys, and clear explanations for every item.

Jay Daie and Reza Nazari



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Welcome, Connecticut Grade 8 Problem Solver!

Ten focused rounds for sharper Connecticut Smarter Balanced math thinking

This book gives you ten full Grade 8 Smarter Balanced math practice tests. Each round is built to help you notice structure, compare quantities, use linear reasoning, handle real numbers, and explain your thinking with care.

Grade 8 standards focus: This page supports **Mean Absolute Deviation** (8.G.B.8): Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. It also prepares you for **Solving Linear Inequalities** (8.EE.C.8b): Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.

Your Connecticut 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 ten-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 a proportion, equation, diagram, number line, 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.

Grade 8 standards focus: Keep the routine connected to **Rational and Irrational Numbers** (8.NS.A.1): Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats.... Another recurring target is **Volume of Pyramids** (8.G.C.9): Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Connecticut 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?

Ten Connecticut Smarter Balanced tests, 400 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Linear relationships, integer exponents, scientific notation, real-number reasoning, and careful reading.
Tests 4–6	Expressions, equations, inequalities, transformations, geometry, and multi-step problem solving.
Tests 7–9	Data analysis, probability, mixed review, stamina, and choosing efficient strategies.
Test 10	A final Connecticut round to show growth across the whole book.
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.

Grade 8 standards focus: Use these habits while practicing **Estimating Expressions with Irrational Numbers** (8.NS.A.2): Estimate the value of expressions involving irrational numbers (e.g., π^2). The same routine helps with **Counting Principle and Permutations** (8.EE.C.7b): Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

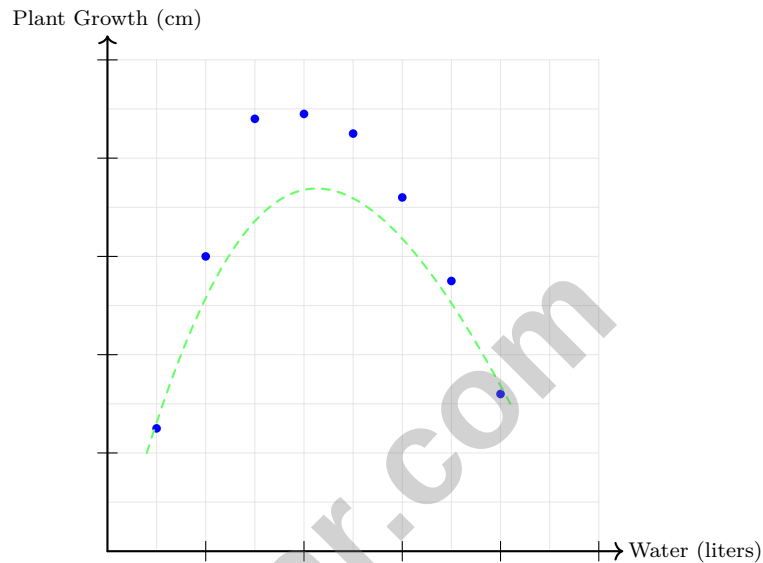


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Table of Contents

★ Practice Test 1	_____	15
★ Practice Test 2	_____	32
★ Practice Test 3	_____	49
★ Practice Test 4	_____	64
★ Practice Test 5	_____	80
★ Practice Test 6	_____	95
★ Practice Test 7	_____	110
★ Practice Test 8	_____	126
★ Practice Test 9	_____	140
★ Practice Test 10	_____	157
Practice Test Answer Keys	_____	173
Practice Test Answers and Explanations	_____	179

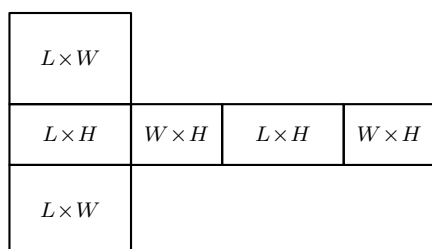
- 1) A scatter plot shows plant growth (cm) versus amount of water given (liters) over 8 weeks. The first 3 liters produce rapid growth; beyond 3 liters, additional water causes little additional growth, then declining growth past 5 liters (from overwatering). This pattern is best described as:



- ☐ A. Negative linear correlation
- ☐ B. Perfect positive correlation
- ☐ C. Nonlinear: increasing then decreasing (inverted parabola)
- ☐ D. No correlation



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2) Net of a rectangular prism

A rectangular prism has dimensions 4 cm (L) $\times$ 3 cm (W) $\times$ 2 cm (H). If we unfold it into a net, how many faces does the net show?

- ☐ A. 3 faces ☐ C. 6 faces
☐ B. 4 faces ☐ D. 8 faces

3) Using the model $y = -2x + 15$, what is the predicted y -value when $x = 5.5$?

- ☐ A. 4 ☐ C. 10
☐ B. 5 ☐ D. 26

4) Express $\left(\frac{1}{3}\right)^{-2}$ as a positive exponent.

- ☐ A. $\frac{1}{9}$ ☐ C. $\frac{2}{3}$
☐ B. -9 ☐ D. 9

5) A computer downloads files at 15 MB per second. How many MB are downloaded in 2.5 seconds?

- ☐ A. 30 MB ☐ C. 37.5 MB
☐ B. 35 MB ☐ D. 40 MB



6) Which system below can be solved by the elimination shown: adding the two equations to eliminate y ?

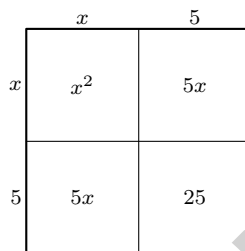
☐ A. $3x + y = 10$ and $2x + y = 7$

☐ C. $x - 2y = 3$ and $2x + y = 5$

☐ B. $4x + 3y = 12$ and $2x - 3y = 6$

☐ D. $5x + 2y = 11$ and $3x + y = 6$

7) The area model represents $(x + 5)^2$:



What is the sum of all areas?

☐ A. $x^2 + 10x + 25$

☐ C. $x^2 + 5x + 5$

☐ B. $x^2 + 25$

☐ D. $2x^2 + 10x$

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

☐ A. No, because y never changes.

☐ C. Yes, each x produces exactly one

☐ B. No, because there is no variable x .

output ($y = 7$).

☐ D. Yes, only if x is positive.

9) Which of the following CORRECTLY pairs an equation with its type?

☐ A. $y = x + 2$ is nonlinear

☐ C. $y = \frac{1}{2}x$ is linear

☐ B. $y = x^2 + 2$ is linear

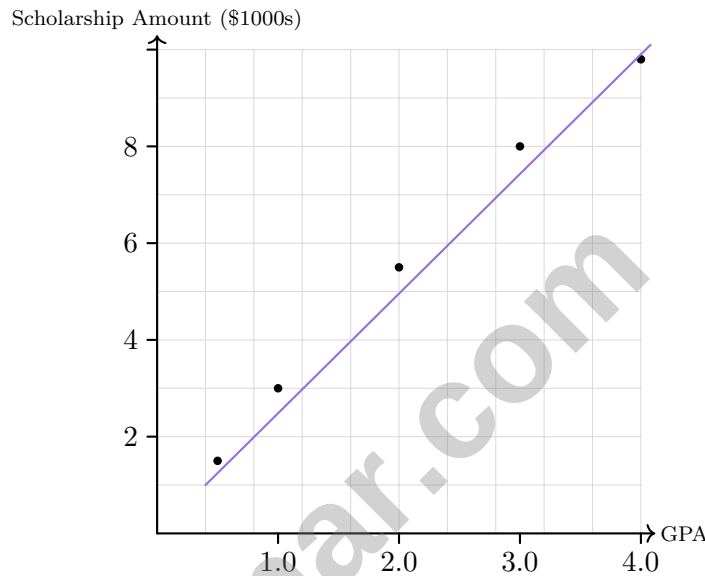
☐ D. $y = \sqrt{x - 1}$ is linear



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- 1) The equation $C = 25t + 80$ represents the total cost of a phone plan, where t is the number of months. What does the 80 represent?

- ☐ A. Monthly cost of \$25 ☐ C. Number of months
☐ B. Equipment fee of \$80 ☐ D. Total cost after 1 month



2)

A university studies the relationship between student GPA and scholarship amount. Based on the trend line, what is the approximate slope?

- ☐ A. \$2,000 per GPA point ☐ C. \$3,000 per GPA point
☐ B. \$2,500 per GPA point ☐ D. \$4,000 per GPA point

- 3) A student dilates a triangle with scale factor 2 and claims the new triangle's perimeter is twice the original. Is this correct?

- ☐ A. No, the perimeter is multiplied by 4 ☐ C. No, the area is multiplied by 2
☐ B. Yes, linear measurements scale by 2 ☐ D. Only if the triangle is equilateral



4) 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

5) Why can the repeating decimal $0.\overline{142857}$ be written as a fraction?

- ☐ A. Because it has a finite number of digits ☐ C. Because it is between 0 and 1
☐ B. Because its digits form a perfect square ☐ D. Because the decimal pattern repeats

n	4	9	16	25
$\sqrt{n}$	2	3	4	5

6)

Using the table, between which integers does $\sqrt{11}$ lie?

- ☐ A. 2 and 3 ☐ C. 4 and 5
☐ B. 5 and 6 ☐ D. 3 and 4

7) A chemist combines a 25% salt solution with an 80% salt solution to make 100 mL of a 50% solution. How many mL of the 25% solution are used?



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

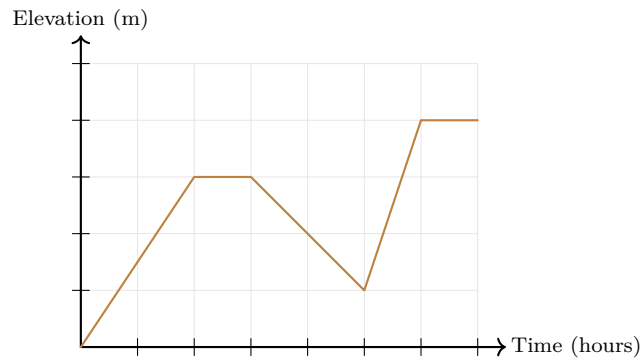
	Dine-In	Takeout	Total
Vegetarian	75	125	200
Meat	100	200	300
Total	175	325	500

What is the marginal relative frequency for takeout orders?

- ☐ A. 0.35 ☐ C. 0.60
☐ B. 0.50 ☐ D. 0.65
- 2) Which quotient is the largest?
- ☐ A. $\frac{8 \times 10^6}{4 \times 10^2}$ ☐ C. $\frac{9 \times 10^4}{3 \times 10^{-2}}$
☐ B. $\frac{6 \times 10^5}{2 \times 10^1}$ ☐ D. $\frac{4 \times 10^7}{2 \times 10^3}$
- 3) Video streaming Plan A: \$2.99 base, \$0.50 per movie. Plan B through (0, 1) and (10, 6) on a cost-movie plane. Which plan costs more at 20 movies?
- ☐ A. Plan A ☐ C. Both equal
☐ B. Plan B ☐ D. Cannot be determined
- 4) A cyclist travels at a constant speed. After 1.5 hours, they have traveled 22.5 miles. After 3 hours, they have traveled 45 miles. What is the slope (speed in mph)?
- ☐ A. 15 mph ☐ C. 30 mph
☐ B. 22.5 mph ☐ D. 45 mph
- 5) Tickets cost \$4 for children and \$7 for adults. The theater sold 200 tickets for a total of \$1,100. How many children's tickets were sold?
- ☐ A. 100 ☐ C. 50
☐ B. 150 ☐ D. 120



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6)

A hiker starts at sea level. Which part of the journey involves going downhill?

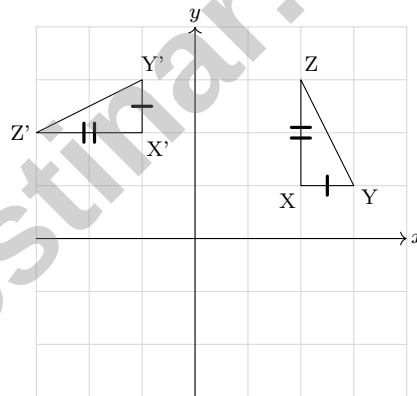
☐ A. From 0 to 2 hours

☐ C. From 3 to 5 hours

☐ B. From 2 to 3 hours

☐ D. From 5 to 7 hours

7) 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



Connecticut Smarter Balanced 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 Connecticut Smarter Balanced 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.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.
- 2) **Choice C is correct.** (8.G.C.9) A rectangular prism has 6 rectangular faces (3 pairs of congruent rectangles). A complete net shows all 6 faces.
- 3) **Choice A is correct.** (8.SP.A.3) Substitute $x = 5.5$: $y = -2(5.5) + 15 = -11 + 15 = 4$.
- 4) **Choice D is correct.** (8.EE.A.1) Negative exponent flips the fraction: $\left(\frac{1}{3}\right)^{-2} = \left(\frac{3}{1}\right)^2 = 3^2 = 9$.
- 5) **Choice C is correct.** (8.EE.B.5) Proportional: $y = 15x$. For $x = 2.5$: $y = 15(2.5) = 37.5$ MB.
- 6) **Choice B is correct.** (8.EE.C.8a) In option B, the y coefficients are $+3$ and -3 . Adding these equations eliminates y : $(4x + 3y) + (2x - 3y) = 12 + 6 \Rightarrow 6x = 18$.
- 7) **Choice A is correct.** (8.EE.C.7) Sum: $x^2 + 5x + 5x + 25 = x^2 + 10x + 25 = (x + 5)^2$.
- 8) **Choice C is correct.** (8.F.A.1) Constant functions are functions. For every x , the output is always 7, satisfying the one-input-one-output requirement.
- 9) **Choice C is correct.** (8.F.A.3) $y = \frac{1}{2}x$ is in the form $y = mx + b$ with $m = \frac{1}{2}$ and $b = 0$. The others are incorrectly classified.
- 10) **Choice A is correct.** (8.F.B.5) The graph shows a spike from 0 to 5 mg in 1 hour, then a gradual decrease from 5 to 2 mg over 3 hours. The steepest positive slope is in the first hour.
- 11) **Choice B is correct.** (8.G.A.3) Reflect across x -axis: $(1, 4) \rightarrow (1, -4)$. Then reflect across y -axis: $(1, -4) \rightarrow (-1, -4)$.
- 12) **Choice B is correct.** (8.G.A.5) When parallel lines are cut by a transversal, corresponding angles, alternate interior angles, and alternate exterior angles are all congruent.
- 13) **Choice A is correct.** (8.G.B.6, 8.G.B.7) Using $a^2 + b^2 = c^2$: $14^2 + 48^2 = 196 + 2304 = 2500$, so $c = 50$ (scaled 7-24-25 triple).
- 14) **Choice B is correct.** (8.G.B.7) Alternate interior angles are congruent: $4x = 2x + 30$. Solving: $2x = 30$, so $x = 15^\circ$.
- 15) **Choice A is correct.** (8.G.C.9) The triangular base area is $\frac{1}{2} \times 8 \times 6 = 24 \text{ cm}^2$. The pyramid volume is $\frac{1}{3} \times 24 \times 9 = 72 \text{ cm}^3$.
- 16) **The correct answer is 22.** (8.EE.A.2) $22 \times 22 = 484$, so $\sqrt{484} = 22$.
- 17) **Choice A is correct.** (8.G.B.7) Interest costs: A: \$240 (total \$2,240); B: \$320 (total \$2,320); C: \$360 (total \$2,360); D: \$320 (total \$2,320). Option A has the lowest total cost.
- 18) **The correct answer is A, C.** (8.G.B.7) A is correct: $P(\text{heads}) = \frac{1}{2}$. C is correct: $P(\text{heads and 4}) = \frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$. B is wrong: $P(4) = \frac{1}{6}$. D is wrong: total outcomes = 12. E is wrong: $P(\text{not heads}) = \frac{1}{2}$.
- 19) **Choice C is correct.** (8.EE.A.4) Divide: $\frac{9 \times 10^{-6}}{3 \times 10^{-8}} = \frac{9}{3} \times 10^{-6-(-8)} = 3 \times 10^2$.
- 20) **Choice B is correct.** (8.F.A.2) $I_X(12) = 0.8(12) = 9.60$ dollars. Slope of Y : $(10 - 0)/12 \approx 0.833$ per month, so $I_Y(12) = 10$ dollars. Since $10 > 9.60$, Account Y earns more.
- 21) **Choice A is correct.** (8.F.B.4) Using $y = mx + b$ with $m = 3$ and point $(1, 7)$: $7 = 3(1) + b \Rightarrow b = 4$. Equation: $y = 3x + 4$.
- 22) **Choice C is correct.** (8.G.A.2) Perimeter of PQRS = $10 + 14 + 5 + 7 = 36$ cm. Since TUVW is congruent to PQRS, its perimeter is also 36 cm.
- 23) **Choice A is correct.** (8.G.B.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.)
- 24) **Choice A is correct.** (8.G.A.5) The sum of angles in a pentagon is 540° . So $\angle E = 540 - 100 - 120 - 110 - 130 = 80^\circ$.
- 25) **Choice C is correct.** (8.SP.A.4) Joint relative frequency is the cell count divided by the grand total: $\frac{48}{360} = \frac{2}{15} \approx 0.133$.
- 26) **Choice A is correct.** (8.G.B.8) Original data: $\{1, 2, 3\}$, mean = 2. New point must equal 2 to keep mean at 2. New data: $\{1, 2, 2, 3\}$, deviations $\{1, 0, 0, 1\}$. MAD = $2/4 = 0.5$.



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Hi, Thoughtful Reader!

◇ A strong Grade 8 test taker is also a strong reader. You practiced turning words, tables, graphs, and diagrams into math decisions. ◇

★ **Remember this:** That skill grows each time you slow down enough to ask what the problem is really telling you and what it is really asking for. This version gave you 10 opportunities to rehearse test-day habits. ★

Reader-to-Solver Skills

- **Circle the Ask:** Make the target visible.
- **Sort Information:** Separate useful facts from extra words.
- **Match Units:** Keep quantities connected.
- **Answer Fully:** Include the value and what it means.

Grade 8 test-day tip: After solving, reread only the final question. Make sure your answer matches it exactly.

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

Jay Daie

Your Reading-and-Math Helper

PRACTICE TODAY. SUCCEED TOMORROW!

This book includes **10** full-length Math practice tests and **2** online tests to help Grade 8 students build confidence, strengthen skills, and excel on standardized assessments.

Each practice test is carefully crafted to reflect the latest standards and includes a variety of question types, realistic test conditions, and detailed answer explanations.

Perfect for classroom use, homework, test preparation, and extra practice at home.



THIS BOOK INCLUDES:

10

Full-Length
Printed Tests

2

Online
Practice Tests



Detailed Answers
& Explanations



MORE PRACTICE. GREATER RESULTS.

Give your child the tools to build strong math skills, confidence, and a positive attitude toward learning.

WHAT YOU'LL GAIN



Build Confidence

Practice regularly to feel prepared and test-ready.



Master Key Skills

Develop strong math skills and problem solving abilities.



Improve Understanding

Learn with clear explanations and step-by-step solutions.



Test Strategies

Learn proven strategies to approach every question with confidence.



Boost Performance

Apply your knowledge and achieve your best score!

TOPICS COVERED

- | | |
|---------------------------|----------------------------|
| ✓ The Number System | ✓ Statistics & Probability |
| ✓ Expressions & Equations | ✓ Data Analysis |
| ✓ Inequalities | ✓ Measurement |
| ✓ Functions | ✓ Pythagorean Theorem |
| ✓ Geometry | ✓ Surface Area & Volume |
| ✓ Ratios & Proportions | ✓ And More! |



2 ONLINE TESTS

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



2 EXTRA ONLINE TEST ACCESS CODE IS INSIDE THE BOOK!

Don't lose it—your extra practice and success start here!



PRACTICE
REGULARLY



STAY
FOCUSED



SOLVE
CONFIDENTLY



SUCCEED
BRIGHTLY