

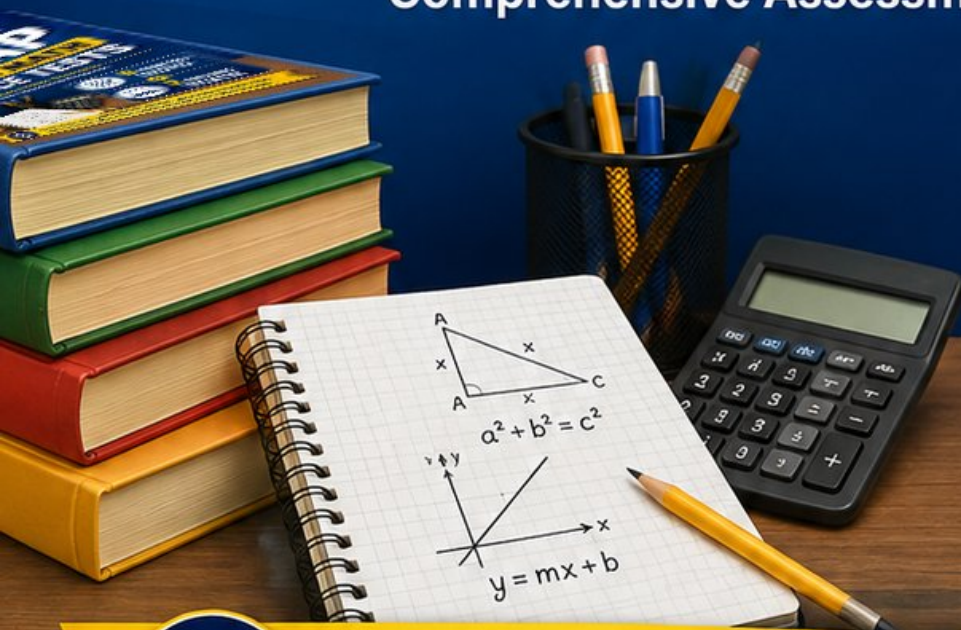
6

Connecticut

Smarter Balanced

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



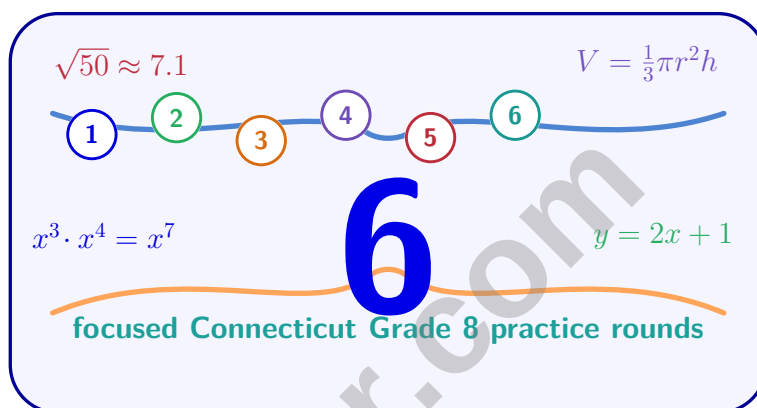
2 ONLINE
TESTS



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

6 Connecticut Smarter Balanced Grade 8 Math Practice Tests

Grade 8 Math Practice Built for Skills, Stamina, and Confident Review



Six complete 40-question Grade 8 Smarter Balanced 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, Connecticut Grade 8 Problem Solver!

Six focused rounds for sharper Smarter Balanced math thinking

This book gives you six full Grade 8 Smarter Balanced 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 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 six-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.

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?

Six Smarter Balanced tests, 240 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 4–6	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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For more practice
& answers

Table of Contents

★ Practice Test 1	_____	15
★ Practice Test 2	_____	30
★ Practice Test 3	_____	47
★ Practice Test 4	_____	62
★ Practice Test 5	_____	79
★ Practice Test 6	_____	95
Practice Test Answer Keys	_____	110
Practice Test Answers and Explanations	_____	114

1) Solve for y : $\frac{y-3}{2} = 5$

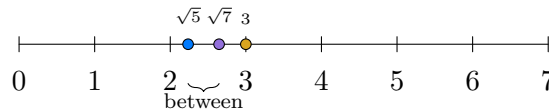
☐ A. $y = 13$

☐ C. $y = 4$

☐ B. $y = 7$

☐ D. $y = 10$

2)



Based on the number line, which statement is correct?

☐ A. $\sqrt{5}$ and $\sqrt{7}$ are both less than 1

☐ C. 3 is irrational

☐ B. $\sqrt{7} > 3$

☐ D. $2 < \sqrt{5} < \sqrt{7} < 3$

3) A student claims that $0.\overline{3}$ is less than $\frac{1}{3}$. Which is true?

☐ A. The student is correct; $0.\overline{3} < \frac{1}{3}$.

☐ C. The student is incorrect; $0.\overline{3} > \frac{1}{3}$.

☐ B. We cannot compare them without a calculator.

☐ D. The student is incorrect; $0.\overline{3} = \frac{1}{3}$.

4) Is π^2 greater than or less than $(3.1)^2$?

☐ A. Cannot be determined

☐ C. Exactly equal to $(3.1)^2$

☐ B. Less than $(3.1)^2$

☐ D. Greater than $(3.1)^2$



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5) Using the quotient rule, explain why $x^0 = 1$ (for $x \neq 0$).

Step 1	Step 2	Step 3
$\frac{x^5}{x^5}$	$= x^{5-5}$	$= x^0 = ?$

Since $\frac{x^5}{x^5} = 1$, what must x^0 equal?

- ☐ A. Because the exponent is 0, so the result is 0.
 ☐ C. Because when exponents are equal, the quotient is 0.
 ☐ B. Because the quotient rule says so.
 ☐ D. 1 (any nonzero number divided by itself equals 1)

6) What is $\sqrt{289}$?

- ☐ A. 16
 ☐ C. 18
 ☐ B. 19
 ☐ D. 17

7) How many times smaller is 1.5×10^{-6} than 1.5×10^{-3} ?

- ☐ A. 3 times
 ☐ C. 300 times
 ☐ B. 30 times
 ☐ D. 1,000 times

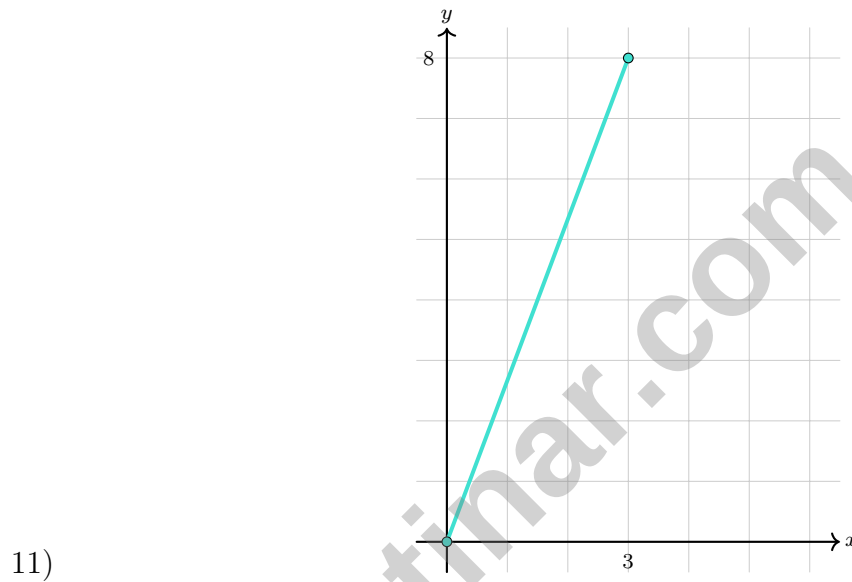
8) $(3 \times 10^8) + (5 \times 10^6) = ?$

- ☐ A. 8×10^{14}
☐ C. 8×10^6
☐ B. 30.5×10^6
☐ D. 3.05×10^8

9) A residual plot has residuals 1, -2, 1, 2, -1, 0. What is the greatest absolute residual?



- 10) A student's quiz scores over 6 weeks are $\{72, 78, 75, 81, 84, 90\}$. The mean is 80. Calculate the Mean Absolute Deviation.

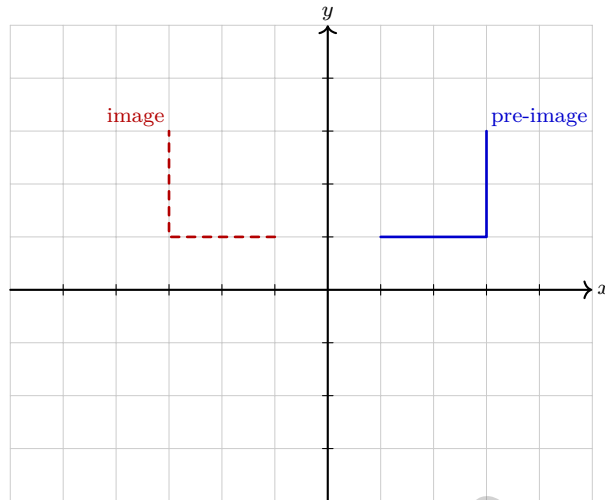


What is y when $x = 6$?

- ☐ A. 12 ☐ C. 16
☐ B. 14 ☐ D. 18
- 12) Function r passes through $(1, 3)$ and $(3, 7)$. Function $s(x) = x + 3$. Which increases faster?
- ☐ A. Function r ☐ C. Both increase equally.
☐ B. Function s ☐ D. Cannot be determined.



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1)

The segment (blue pre-image) is transformed to the red image. Which transformation is applied?

- ☐ A. Reflection across the y -axis ☐ C. Translation left 2
☐ B. Rotation 180° ☐ D. Reflection across $y = x$

2) A triangle has a perimeter of 15 inches. If the triangle is dilated by a scale factor of $\frac{1}{2}$, what is the perimeter of the dilated triangle?

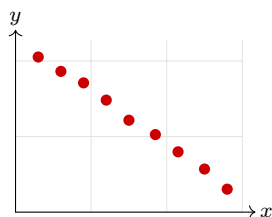
- ☐ A. 30 inches ☐ C. 15 inches
☐ B. 7.5 inches ☐ D. 10 inches

3) What is the relationship between an interior angle and its adjacent exterior angle of a polygon?

- ☐ A. They are equal. ☐ C. They sum to 360° .
☐ B. They sum to 180° . ☐ D. The interior angle is always larger.



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4)

A scatter plot of battery life (hours) versus daily phone usage (hours) shows points forming a tight downward trend from upper left to lower right. What does this pattern tell you?

- ☐ A. Battery life improves with more usage ☐ C. Weak relationship between usage and battery
☐ B. Phone usage does not affect battery life ☐ D. Increased usage is associated with shorter battery life

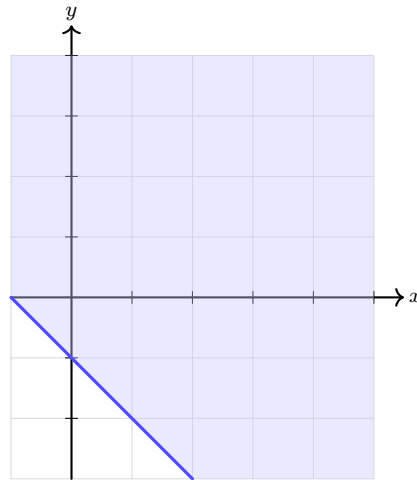
5) A survey of 240 shoppers by age group and purchase type:

	Apparel	Electronics	Total
Teen	48	32	80
Adult	72	88	160
Total	120	120	240

What is the joint relative frequency of teens buying electronics, as a percentage?

- ☐ A. $\approx 13\%$ ☐ C. $\approx 33\%$
☐ B. $\approx 27\%$ ☐ D. $\approx 40\%$
- 6) Two points are at $(-3, 4)$ and $(5, -2)$. Calculate the distance between them. Round to the nearest tenth if necessary.





1)

The line shown has equation $y = -x - 1$. With shading above, the inequality is:

☐ A. $y > -x - 1$

☐ C. $y \geq -x - 1$

☐ B. $y < -x - 1$

☐ D. $y \leq -x - 1$

2) A right triangle has legs of 15 and 20. How much longer is the hypotenuse than the shorter leg?

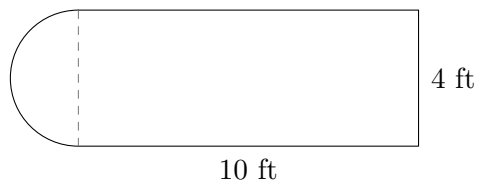
☐ A. 10

☐ C. 25

☐ B. 20

☐ D. 35

3) A composite figure is a rectangle (10 ft by 4 ft) with a semicircle attached on one end (diameter 4 ft). What is the total area? Use $\pi \approx 3.14$.



☐ A. 40 ft^2

☐ C. 52.56 ft^2

☐ B. 46.28 ft^2

☐ D. 58.84 ft^2



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& answers

4) Triangle P has sides 8, 15, 17. Triangle Q has sides 12, 22.5, 25.5. Are they similar?

- ☐ A. No, the sides are not equal
☐ B. No, the ratios are 1.5, 1.5, 1.5 which is not constant
☐ C. Yes, all sides have the same ratio 1.5 to Q 's sides
☐ D. Only if corresponding angles equal 90°

5) A regression model for test performance is $P = 5.2q + 12$, where P is percent score and q is the number of quiz attempts. A teacher observes data only for q values 1 through 5. Is predicting performance at $q = 8$ interpolation or extrapolation? Why?

- ☐ A. Interpolation; $q = 8$ is close to observed values
☐ B. Extrapolation; $q = 8$ is outside the observed range $[1, 5]$
☐ C. Neither; the model fails beyond $q = 5$
☐ D. Interpolation; the formula works for any positive number

6) A standard deck has 52 cards. What is the probability of drawing a card that is a 10 OR a heart? (Note: one card is both 10 and a heart.)

- ☐ A. $\frac{15}{52}$
☐ B. $\frac{16}{52}$
☐ C. $\frac{17}{52}$
☐ D. $\frac{13}{52}$

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

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



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 A is correct.** (8.EE.C.7) Multiply by 2: $y - 3 = 10$. Add 3: $y = 13$.
- 2) **Choice D is correct.** (8.NS.A.1) From the number line, $\sqrt{5} \approx 2.236$ and $\sqrt{7} \approx 2.646$, both between 2 and 3. So $2 < \sqrt{5} < \sqrt{7} < 3$. All three numbers are plotted, and only 3 is rational; $\sqrt{5}$ and $\sqrt{7}$ are irrational.
- 3) **Choice D is correct.** (8.NS.A.1) Let $x = 0.\bar{3}$. Then $10x = 3.\bar{3}$. Subtracting: $9x = 3$, so $x = \frac{1}{3}$. The student confused the notation with a terminating decimal.
- 4) **Choice D is correct.** (8.NS.A.2) $(3.1)^2 = 9.61$ and $\pi^2 \approx (3.14159)^2 \approx 9.87$. Since $9.87 > 9.61$, π^2 is greater.
- 5) **Choice D is correct.** (8.EE.A.1) The quotient rule shows: $\frac{x^5}{x^5} = x^{5-5} = x^0$. Since $\frac{x^5}{x^5} = 1$, we have $x^0 = 1$.
- 6) **Choice D is correct.** (8.EE.A.2) $17 \times 17 = 289$, so $\sqrt{289} = 17$.
- 7) **Choice D is correct.** (8.EE.A.3) Divide the larger value by the smaller value: $\frac{1.5 \times 10^{-3}}{1.5 \times 10^{-6}} = \frac{1.5}{1.5} \times 10^{-3-(-6)} = 1 \times 10^3 = 1,000$.
- 8) **Choice D is correct.** (8.EE.A.4) Rewrite: $3 \times 10^8 + 0.05 \times 10^8 = (3 + 0.05) \times 10^8 = 3.05 \times 10^8$.
- 9) **The correct answer is 2.** (8.SP.A.2) The largest absolute value among the residuals is 2.
- 10) **The correct answer is 5.** (8.G.B.8) Absolute deviations: $|72 - 80| = 8$, $|78 - 80| = 2$, $|75 - 80| = 5$, $|81 - 80| = 1$, $|84 - 80| = 4$, $|90 - 80| = 10$. Sum = 30. MAD = $30/6 = 5$.
- 11) **Choice C is correct.** (8.EE.B.5) Slope $k = \frac{8}{3}$. Equation: $y = \frac{8}{3}x$. At $x = 6$: $y = \frac{8}{3}(6) = 16$.
- 12) **Choice A is correct.** (8.F.A.2) Slope of r : $(7 - 3)/(3 - 1) = 4/2 = 2$. Slope of s : 1. Since $2 > 1$, r increases faster.
- 13) **Choice C is correct.** (8.F.A.3) Absolute value functions are nonlinear. They produce a V-shaped graph, not a straight line.
- 14) **Choice D is correct.** (8.EE.B.5) Change in altitude is -2000 feet over 5 minutes. Slope = $\frac{-2000}{5} = -400$ feet per minute.
- 15) **Choice C is correct.** (8.EE.C.8c) 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. ✓
- 16) **Choice A is correct.** (8.F.A.1) Solve $5x - 3 = 12$: add 3 to both sides to get $5x = 15$, so $x = 3$.
- 17) **Choice C is correct.** (8.G.C.9) Use $SA = 2(lw + lh + wh)$. Then $250 = 2(10 \times 5 + 10h + 5h) = 100 + 30h$, so $150 = 30h$ and $h = 5$ ft.
- 18) **Choice A is correct.** (8.G.A.1) Step 1: Rotate 90° CCW: $(x, y) \rightarrow (-y, x)$. Step 2: Translate 3 units right (add 3 to x-coordinate): $(-y, x) \rightarrow (-y + 3, x)$.
- 19) **Choice D is correct.** (8.EE.B.6) Using point-slope form, then converting: $5 = -3(2) + b$ gives $b = 11$, so $y = -3x + 11$.
- 20) **The correct answer is A, C.** (8.G.A.4) Correct: (A) All linear measurements (sides, perimeter) are multiplied by 2.5. (C) Area is multiplied by $(2.5)^2 = 6.25$. Incorrect: (B) Angles are congruent in dilation, not scaled. (D) Perimeter is multiplied, not divided, by 2.5. (E) Dilation preserves shape; polygon type does not change.
- 21) **Choice C is correct.** (8.EE.C.8b) Subtract 1: $2x \geq 8$. Divide by 2: $x \geq 4$.
- 22) **The correct answer is 132.** (8.EE.C.7b) Line leader: 12 choices. Helper: 11 remaining choices. Total: $12 \times 11 = 132$ ways.
- 23) **Choice A is correct.** (8.EE.C.8b) The $>$ symbol (strict) gives a DASHED line. Since y is GREATER than the expression, shade ABOVE.
- 24) **The correct answer is 8.2.** (8.NS.A.2) $8^2 = 64$ and $9^2 = 81$, so $\sqrt{68}$ is between 8 and 9. A closer estimate is about 8.246, which rounds to 8.2 to the nearest tenth.
- 25) **Choice A is correct.** (8.F.B.5) The y -values decrease from 1 at $x = 0$ to approximately 0.2 at $x = 2$. After $x = 2$, the curve increases.
- 26) **Choice B is correct.** (8.G.C.9) $V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times 3.14 \times 27 = \frac{4}{3} \times 84.78 = 113.04 \text{ in}^3$.
- 27) **Choice C is correct.** (8.SP.A.3) Predictions are most reliable within or near the observed data range (1–4 miles). Option (C) uses 2.5 miles, which is centered in this range; (D) is far extrapolation.



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 6 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. ACHIEVE TOMORROW.

6

Give your child the confidence and skills they need with **6 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 |
| | ✓ And More! |



6 PRINTED TESTS



2 ONLINE TESTS



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