

3

Connecticut

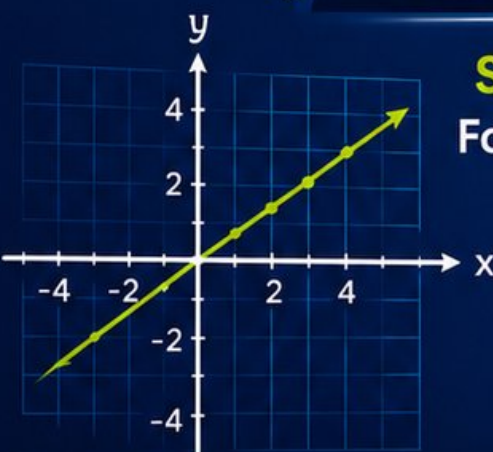
Smarter Balanced

GRADE 8

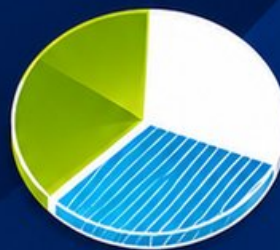
MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$V = s^3$$



$$y = mx + b$$
$$2x + 5 = 13$$
$$x = 4$$



3 PRINTED TESTS



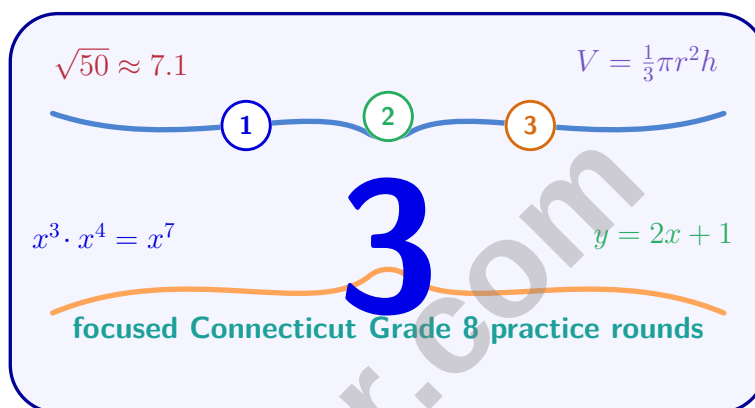
2 ONLINE TESTS



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

3 Connecticut Smarter Balanced Grade 8 Math Practice Tests

Grade 8 Smarter Balanced Practice for Stronger Reasoning and Accuracy



Three 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!

Three focused rounds for sharper Smarter Balanced math thinking

This book gives you three 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 three-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?

Three Smarter Balanced tests, 120 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Test 3	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

Table of Contents



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1) What is $0.3\overline{2}$ as a fraction?

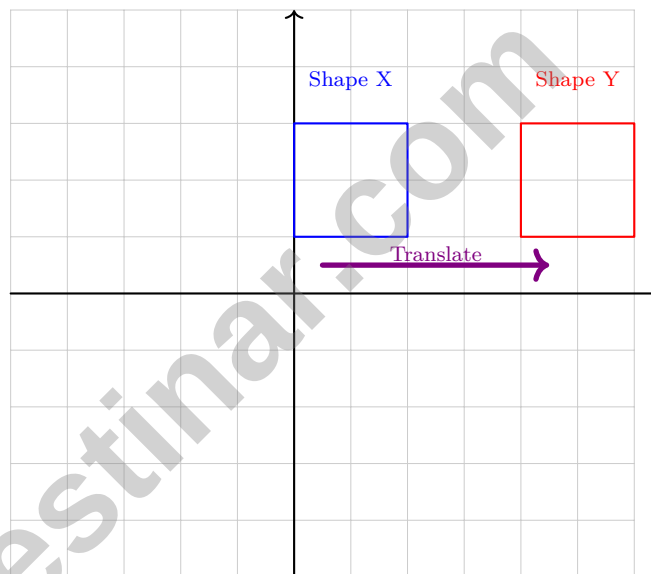
- ☐ A. $\frac{3}{20}$
☐ B. $\frac{32}{100}$

- ☐ C. $\frac{32}{99}$
☐ D. $\frac{29}{90}$

2) A cylinder has radius 1.5 inches and height 8 inches. What is the surface area? (Use $\pi \approx 3.14$.)

- ☐ A. 28.3 in^2
☐ B. 47.1 in^2

- ☐ C. 75.4 in^2
☐ D. 89.5 in^2



3)

Based on the arrow shown, what is the translation vector from Shape X to Shape Y?

- ☐ A. $(2, 0)$
☐ B. $(4, 0)$

- ☐ C. $(4, 2)$
☐ D. $(2, 2)$



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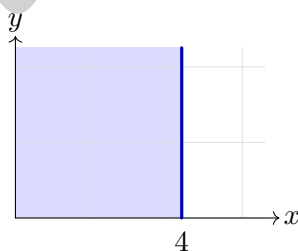
4)

x	y
1	6
2	9
3	12

What is the slope represented by the table?

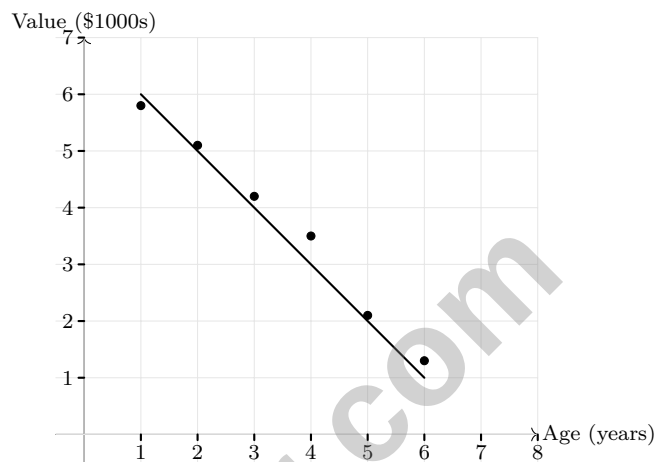
☐ A. 1☐ C. 3☐ B. 2☐ D. 65) Solve for x : $\frac{3x-2}{5} = 2$ ☐ A. $x = 4$ ☐ C. $x = 10$ ☐ B. $x = 2$ ☐ D. $x = 6$ 6) Solve: $3x + 2 \geq -4$ ☐ A. $x \geq -2$ ☐ C. $x \geq 2$ ☐ B. $x \leq -2$ ☐ D. $x \leq 2$

7) A student sees a graph with a SOLID vertical line at $x = 4$. The left side is shaded. What does this represent?

☐ A. $x < 4$ ☐ C. $x > 4$ ☐ B. $x \leq 4$ ☐ D. $x \geq 4$ 

8) A cone has radius r and height h . If the radius is doubled and the height stays the same, how does the new volume compare to the original?

- ☐ A. New volume = Original ☐ C. New volume = $4 \times$ Original
☐ B. New volume = $2 \times$ Original ☐ D. New volume = $8 \times$ Original



9)

A scatter plot shows vehicle age vs. value. Which best describes the relationship?

- ☐ A. Positive linear relationship ☐ C. No relationship
☐ B. Negative linear relationship ☐ D. Exponential growth

10) A student writes: $\frac{x^8}{x^2} = x^4$. What mistake did the student make?

- ☐ A. Added the exponents instead of subtracting. ☐ C. Divided the exponents instead of subtracting.
☐ B. Multiplied the exponents instead of subtracting. ☐ D. The student is correct.



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1) What is the sum of the interior angles of a hexagon?

☐ A. 900°

☐ C. 360°

☐ B. 540°

☐ D. 720°

2) Which best approximates $\sqrt{50}$?

☐ A. 6.5

☐ C. 5.0

☐ B. 7.5

☐ D. 7.1

3) Which is the best estimate of $\sqrt{30}$?

☐ A. 4.5

☐ C. 6.0

☐ B. 15.0

☐ D. 5.5

4) If $f(x) = \frac{x-1}{3}$ and $f(x) = 2$, find x .

5) Which error did the student make when converting 0.000891 to scientific notation?
Student wrote: 8.91×10^{-3} instead of 8.91×10^{-4} .

☐ A. Moved decimal the wrong direction

☐ C. Wrong sign on exponent

☐ B. Coefficient outside $[1, 10)$

☐ D. Counted decimal places incorrectly

6) A point at $(8, 6)$ is dilated by some scale factor from the origin and lands at $(2, 1.5)$.
What is the scale factor?



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- 7) A bank loan of \$10,000 at 5% simple interest is repaid in 5 equal annual installments. The total simple interest over the full term is \$2,500. How much principal and interest remains owed after making the first \$2,500 payment?

☐ A. \$8,000 ☐ C. \$10,000
☐ B. \$8,500 ☐ D. \$9,500

- 8) A student finds the surface area of a triangular prism with a right-triangle base (legs 3 cm and 4 cm, hypotenuse 5 cm) and prism height 10 cm. The student calculates: Base areas: $2 \times \frac{1}{2}(3)(4) = 12 \text{ cm}^2$. Lateral: $10 \times 3 + 10 \times 4 + 10 \times 5 = 120 \text{ cm}^2$. Total: $12 + 120 = 132 \text{ cm}^2$. Is this correct?

☐ A. Yes, the calculation is correct are only 12 cm^2 total, so the answer
☐ B. No, the lateral area should be is 132 cm^2 (correct)
 $12 + 120 = 132$ but the student forgot ☐ D. The student used the wrong
 the second base formula for the triangular base area
☐ C. No, the lateral area is calculated
 correctly but the two triangular bases

- 9) Which property is preserved under all three rigid transformations (translation, reflection, and rotation)?

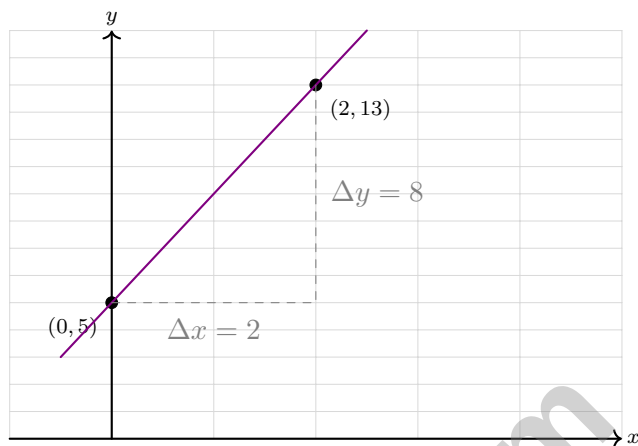
☐ A. Position on the coordinate plane ☐ C. Length of sides
☐ B. Orientation (clockwise vs. counterclockwise) ☐ D. Size relative to other figures

- 10) The line $x + 2y = 8$ has slope:

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

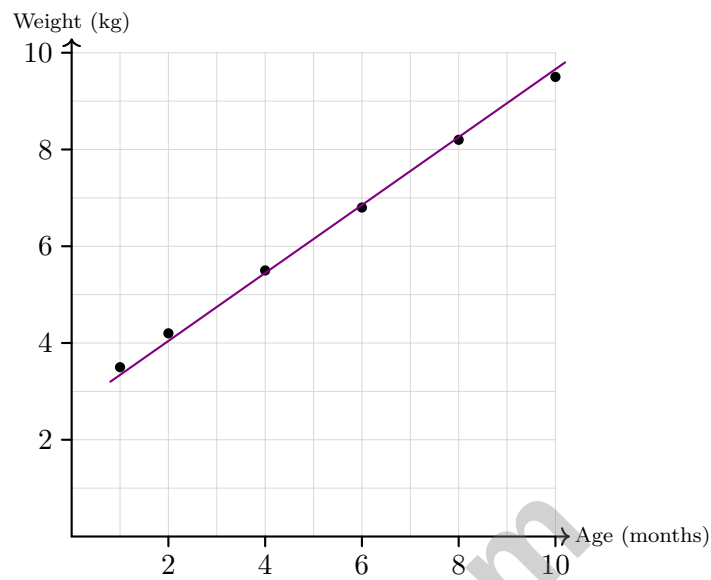


- 1) A graph shows a line passing through $(0, 5)$ and $(2, 13)$. What is the equation of the line?



- ☐ A. $y = 4x + 5$ ☐ C. $y = 8x + 5$
☐ B. $y = 2x + 5$ ☐ D. $y = 4x + 13$





2)

An infant growth chart plots age in months versus weight in kg. If the trend line is $y = 0.65x + 2.5$, how much weight gain is predicted per month?

- | | |
|---|---|
| ☐ A. 0.65 kg per month | ☐ C. 2.5 kg per month |
| ☐ B. 0.50 kg per month | ☐ D. 3.15 kg per month |



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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 D is correct.** (8.NS.A.1) Let $x = 0.3\overline{2} = 0.3222\dots$. Then $10x = 3.\overline{2}$ and $100x = 32.\overline{2}$. Subtracting: $90x = 29$, so $x = \frac{29}{90}$.
- 2) **Choice D is correct.** (8.G.C.9) $SA = 2\pi r^2 + 2\pi rh = 2(3.14)(1.5)^2 + 2(3.14)(1.5)(8) = 14.13 + 75.36 = 89.49 \approx 89.5$ in².
- 3) **Choice B is correct.** (8.G.A.1) The shape moves 4 units to the right and 0 units vertically. Shape X spans $x = 0-2$; Shape Y spans $x = 4-6$, confirming a 4-unit horizontal shift.
- 4) **Choice C is correct.** (8.EE.B.6) As x increases by 1, y increases by 3. Slope $= \frac{\Delta y}{\Delta x} = \frac{3}{1} = 3$.
- 5) **Choice A is correct.** (8.EE.C.7) Multiply both sides by 5: $3x - 2 = 10$. Add 2: $3x = 12$. Divide by 3: $x = 4$.
- 6) **Choice A is correct.** (8.EE.C.8b) Subtract 2: $3x \geq -6$. Divide by 3: $x \geq -2$.
- 7) **Choice B is correct.** (8.EE.C.8b) SOLID line means the boundary is INCLUDED ($\leq$ or $\geq$). Shading to the LEFT means x values are at most 4, so $x \leq 4$.
- 8) **Choice C is correct.** (8.G.C.9) Original: $V = \frac{1}{3}\pi r^2 h$. New: $V' = \frac{1}{3}\pi(2r)^2 h = \frac{1}{3}\pi \times 4r^2 h = 4V$.
- 9) **Choice B is correct.** (8.SP.A.3) As age increases, value decreases in a roughly linear pattern, indicating a negative relationship.
- 10) **Choice C is correct.** (8.EE.A.1) Correct answer: $\frac{x^8}{x^2} = x^{8-2} = x^6$, not x^4 . The student likely divided: $8 \div 2 = 4$.
- 11) **Choice D is correct.** (8.EE.A.2) $\sqrt{64} = 8$. The other numbers are not perfect squares.
- 12) **The correct answer is 3.33×10^5 .** (8.EE.A.3) Divide: $\frac{2 \times 10^{30}}{6 \times 10^{24}} = \frac{2}{6} \times 10^6 = \frac{1}{3} \times 10^6 \approx 3.33 \times 10^5$.
- 13) **Choice D is correct.** (8.EE.B.5) Unit price $k = \frac{30}{6} = 5$ dollars per pound.
- 14) **Choice C is correct.** (8.EE.C.8a) Both equations have slope 2. If $c \neq 3$, the lines are parallel and have no solution. If $c = 3$, the equations are identical and there are infinitely many solutions.
- 15) **Choice B is correct.** (8.EE.C.7) FOIL: $(x-8)(x+3) = x^2 + 3x - 8x - 24 = x^2 - 5x - 24$.
- 16) **Choice B is correct.** (8.F.A.1) For each hour parked, the cost is uniquely determined: $c = 0.50h$. This satisfies the definition of a function.
- 17) **Choice C is correct.** (8.F.A.3) By definition, a line represents a linear function. Since the graph is a line, the relationship is linear.
- 18) **Choice B is correct.** (8.F.B.5) From $x = 2$ to $x = 4$: change is from 3 to 1, a drop of 2 over 2 units (slope $= -1$). From 0 to 2: rise of 3. From 4 to 6: rise of 3. The only decreasing segment is 2 to 4.
- 19) **The correct answer is A, C.** (8.NS.A.1) Statement A is true because rational numbers are closed under addition. Statement C is true because any terminating decimal, such as $0.75 = \frac{3}{4}$, is rational. Statement B is false because two irrational numbers can multiply to a rational number, for example $\sqrt{2} \times \sqrt{8} = 4$. Statement D is false because integers are rational. Statement E is false because perfect squares have rational square roots, not irrational ones.
- 20) **Choice D is correct.** (8.G.A.3) Reverse the translation: $(x, y) \rightarrow (x-3, y+5)$. So $(4, -2) \rightarrow (4-3, -2+5) = (1, 3)$.
- 21) **Choice B is correct.** (8.G.A.5) Corresponding angles are congruent: $9t - 15 = 4t + 10 \Rightarrow 5t = 25 \Rightarrow t = 5$.
- 22) **Choice A is correct.** (8.G.B.6, 8.G.B.7) Using $(\sqrt{8})^2 + (\sqrt{8})^2 = c^2$ gives $8 + 8 = 16$, so $c = \sqrt{16} = 4$.
- 23) **Choice B is correct.** (8.G.B.8) Distance in units: $\sqrt{(5-2)^2 + (6-2)^2} = \sqrt{9+16} = 5$ units. In kilometers: $5 \times 2 = 10$ km.
- 24) **Choice B is correct.** (8.G.B.7) Let the smaller angle be x . Then $x + (x+18) = 90$, so $2x + 18 = 90$, giving $x = 36^\circ$.
- 25) **The correct answer is $\sqrt{10}$.** (8.NS.A.2) Since square root is an increasing function, compare the radicands: $10 < 19 < 35$. Therefore $\sqrt{10} < \sqrt{19} < \sqrt{35}$.
- 26) **Choice A is correct.** (8.G.C.9) $V = \frac{1}{3} \times 25 \times 9 = 75$ cm³.
- 27) **Choice B is correct.** (8.G.B.7) Decompose: rectangle and trapezoid. Rectangle area $= 7 \times 4 = 28$ in². Trapezoid area $= \frac{1}{2}(7+3) \times 2 = 10$ in². Total $= 28 + 10 = 38$ in².



Hi, Grade 8 Math Star!

◇ You finished this practice set with real effort. Grade 8 math asks you to connect ideas, explain your thinking, and stay steady through multi-step problems. ◇

★ **Remember this:** Every page you completed helped build stronger habits: reading carefully, choosing a method, showing work, and checking whether the answer makes sense. You practiced across 3 full Grade 8 practice tests, and that repeated effort matters. ★

What You Built

- **Focus:** You stayed with challenging questions.
- **Accuracy:** You learned to slow down when details matter.
- **Reasoning:** You practiced explaining why a method works.
- **Readiness:** You are more prepared than when you started.

Grade 8 test-day tip: Before test day, review the questions that made you pause. Those are the best teachers.

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

Jay Daie

Your Grade 8 Math Friend

PRACTICE TODAY, ACHIEVE TOMORROW!

GRADE
8

Give your child the edge they need with **3 full-length** Grade 8 Math practice tests that reflect real test formats and cover all key math standards. Perfect for building skills, boosting confidence, and preparing for 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!

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

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PRACTICE. PREPARE. SUCCEED.



Testinar

More Practice. More Confidence.
Better **Results**.