

8

Connecticut

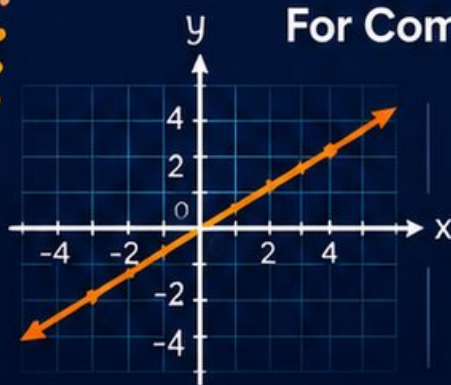
Smarter Balanced

GRADE 8

MATH

PRACTICE TESTS

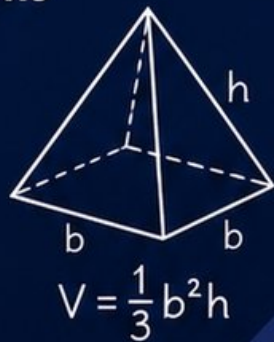
Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$

$$C = 2\pi r$$

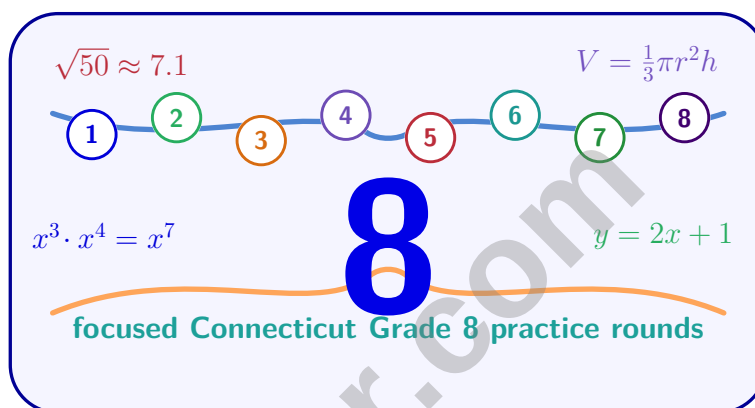
$$V = \frac{1}{3}\pi r^2 h$$

**8** PRINTED TESTS**2** ONLINE TESTS

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

8 Connecticut Smarter Balanced Grade 8 Math Practice Tests

Standards-Aligned Connecticut Practice for Functions, Geometry, and Statistics



Eight 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!

Eight focused rounds for sharper Smarter Balanced math thinking

This book gives you eight 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

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.

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?

Eight Smarter Balanced 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.

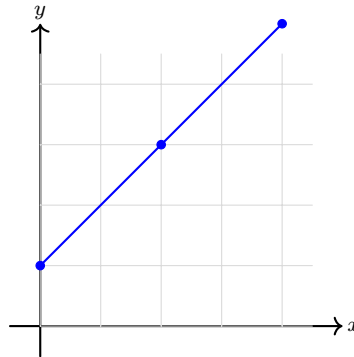
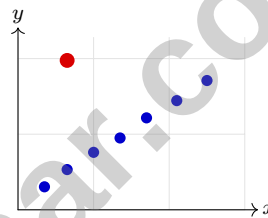


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1) The graph shows function g . What is $g(2)$?

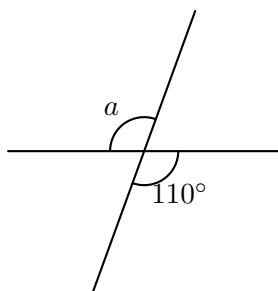
☐ A. 2☐ C. 1☐ B. 3☐ D. 4

2)

A scatter plot shows gas mileage (mpg) versus vehicle weight (pounds). The plot contains one point at (2500 lbs, 45 mpg) while all other points fall between (3000 lbs, 18 mpg) and (4500 lbs, 22 mpg). Which point is an outlier?

☐ A. The point at (3000, 18)☐ C. The point at (4500, 22)☐ B. The point at (2500, 45)☐ D. All points are equally spaced

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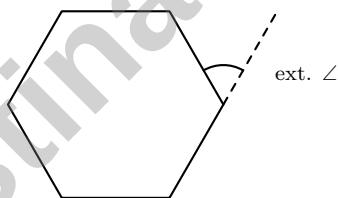


3)

Two lines intersect. One angle is 110° . What is a , the measure of the vertical angle?

☐ A. 70° ☐ C. 140° ☐ B. 110° ☐ D. 155°

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. $7.7 \times 10^6 \text{ m}^3$ 

5)

For a regular hexagon, what is the measure of each exterior angle?

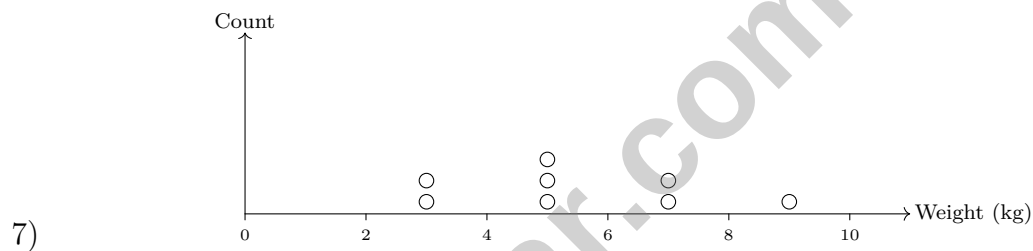
☐ A. 30° ☐ C. 60° ☐ B. 45° ☐ D. 72° 

6) A two-way table of 250 survey respondents:

	Coffee	Tea	Total
Morning	100	50	150
Afternoon	60	40	100
Total	160	90	250

Among tea drinkers, what is the relative frequency of afternoon consumers, as a decimal?

- ☐ A. ≈ 0.44
☐ C. ≈ 0.36
☐ B. ≈ 0.40
☐ D. ≈ 0.32



Pet weights: $\{3, 3, 5, 5, 5, 7, 7, 9\}$ kg with mean = 5.5 kg. Find MAD.

- ☐ A. 1.5
 ☐ C. 2
☐ B. 1.63
 ☐ D. 2.25
- 8) When the correlation between two variables is weak, the trend line:
- ☐ A. Has a slope of zero
 ☐ D. Will be very accurate for predictions
☐ B. Should not be used at all
☐ C. Will have large residuals and less reliable predictions



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1)

Which value belongs at the red mark on the number line?

☐ A. $\sqrt{9}$

☐ C. $\sqrt{16}$

☐ B. $\sqrt{20}$

☐ D. $\sqrt{12}$

2) What is the range of $\{(-1, 4), (-3, -2), (0, 4), (2, 7), (3, -2)\}$?

☐ A. $\{-3, -1, 0, 2, 3\}$

☐ C. $\{-2, 4\}$

☐ B. $\{-2, 4, 7\}$

☐ D. $\{-1, 0, 2, 3\}$

3) Two hikers start from the same point, walking in opposite directions. One walks at 4 mph, the other at 5 mph. After how many hours are they 27 miles apart?

4) A table shows that when $x = 1$, $y = 7$ and when $x = 5$, $y = 23$. What is the slope?

x	1	5
y	7	23

☐ A. 4

☐ C. $\frac{1}{4}$

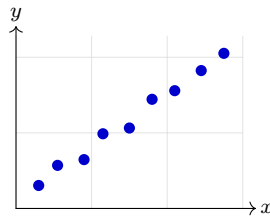
☐ B. 8

☐ D. 16



5) A student finds the hypotenuse of a 7-24-? right triangle. They calculate $c^2 = 7 + 24 = 31$. Is this method correct?

- ☐ A. Yes; $c = \sqrt{31}$ units ☐ C. Yes; the hypotenuse is 31 units
☐ B. No; they should add the squares: $c^2 = 49 + 576 = 625$, so $c = 25$ ☐ D. No; they forgot to multiply by 2



6)

In a scatter plot of height versus shoe size, the relationship is best described as:

- ☐ A. Negative correlation (taller people wear smaller shoes) ☐ C. Weak positive correlation with many outliers
☐ B. No correlation between height and shoe size ☐ D. Strong positive correlation showing a clear trend



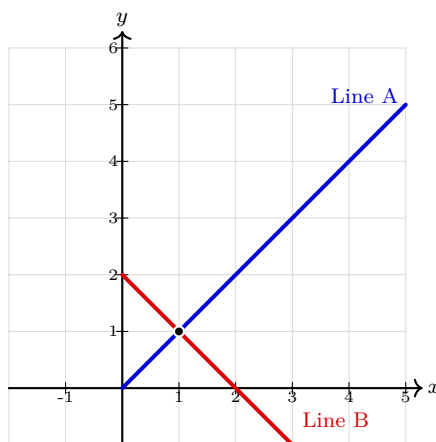
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- 1) A garden uses 3 gallons of water per crimson plant. After planting 12 crimson plants, how many gallons are needed?
- ☐ A. 24 gallons ☐ C. 36 gallons
☐ B. 30 gallons ☐ D. 40 gallons
- 2) A point P is translated by the vector $(5, -2)$ to get point P' . If you want to undo this translation and return to P , which translation vector should you apply to P' ?
- ☐ A. $(5, -2)$ ☐ C. $(5, 2)$
☐ B. $(-5, 2)$ ☐ D. $(-5, -2)$
- 3) A gardener's budget is $B = 50x + 75y$, where x is the number of seed packets and y is the number of tools. The gardener can spend at most \$300. Which inequality represents this constraint?
- ☐ A. $50x + 75y \leq 300$ ☐ C. $50x + 75y < 300$
☐ B. $50x + 75y \geq 300$ ☐ D. $50x + 75y > 300$
- 4) What is $\sqrt{361}$?
- ☐ A. 18 ☐ C. 20
☐ B. 21 ☐ D. 19
- 5) A horizontal line passes through the point $(2, 5)$. What is the equation of this line?
- ☐ A. $x = 2$ ☐ C. $y = 2x + 5$
☐ B. $x = y$ ☐ D. $y = 5$



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6) Use the graph below to solve the system.



☐ A. $(0, 0)$

☐ C. $(1, 1)$

☐ B. $(2, 2)$

☐ D. $(3, 3)$

7) Using $\sqrt{2} \approx 1.41$, estimate $3 + \sqrt{2}$ to the nearest hundredth.

8) Multiply: $(2x + 5)(3x - 1)$

☐ A. $6x^2 + 13x - 5$

☐ C. $6x^2 - 2x + 15x - 5$

☐ B. $5x^2 + 15x - 1$

☐ D. $6x^2 + 10x - 5$

9) Which of the following graphs represents a function?

☐ A. A vertical line.☐ C. A point.☐ B. A circle.☐ D. An ellipse centered at the origin.

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 B is correct.** (8.F.A.1) Locate $x = 2$ on the horizontal axis and read the corresponding y -coordinate from the graph: $y = 3$.
- 2) **Choice B is correct.** (8.SP.A.1) The point at (2500, 45) lies far from the main cluster of data, making it an outlier. The other points are grouped in a much lower mpg range, so this one point stands apart.
- 3) **Choice B is correct.** (8.G.B.7) Vertical angles are congruent. When two lines intersect, opposite angles are equal, so $a = 110^\circ$.
- 4) **Choice B is correct.** (8.G.C.9) $B = 230^2 = 52900 \text{ m}^2$. $V = \frac{1}{3} \times 52900 \times 147 \approx \frac{7776300}{3} \approx 2.6 \times 10^6 \text{ m}^3$.
- 5) **Choice C is correct.** (8.G.A.5) Each exterior angle of a regular hexagon: $\frac{360}{6} = 60^\circ$.
- 6) **Choice A is correct.** (8.SP.A.4) This is a column-conditional frequency. Among tea drinkers (90 total), afternoon drinkers are 40. Relative frequency: $\frac{40}{90} \approx 0.44$.
- 7) **Choice B is correct.** (8.G.B.8) Deviations: $|3 - 5.5| = 2.5$ (twice), $|5 - 5.5| = 0.5$ (three times), $|7 - 5.5| = 1.5$ (twice), $|9 - 5.5| = 3.5$. Sum = $5 + 1.5 + 3 + 3.5 = 13$. MAD = $13/8 = 1.625 \approx 1.63$.
- 8) **Choice C is correct.** (8.SP.A.2) Weak correlation means data is scattered, with large residuals and less certainty in predictions made from the line.
- 9) **Choice D is correct.** (8.NS.A.1) Let $x = 0.4\overline{5} = 0.4555\dots$. Then $10x = 4.\overline{5}$ and $100x = 45.\overline{5}$. Subtracting: $90x = 41$, so $x = \frac{41}{90}$.
- 10) **Choice D is correct.** (8.NS.A.2) $4^2 = 16$ and $5^2 = 25$. Since 21 is between them and closer to the midpoint, $\sqrt{21} \approx 4.58 \approx 4.5$.
- 11) **Choice D is correct.** (8.NS.A.2) $\sqrt{5} \approx 2.24$ and $\sqrt{6} \approx 2.45$, so $\sqrt{5} + \sqrt{6} \approx 4.69 < 4.8$.
- 12) **Choice D is correct.** (8.G.B.7) Interest: $I = 4000 \times 0.03 \times 3 = \360 . Final: $4000 + 360 = \$4,360$.
- 13) **The correct answer is 14.** (8.G.A.2) Since the trapezoids are congruent and $QR = 8 \text{ cm}$ corresponds to one of the parallel sides of MNOP, the other parallel side of QRST must also be 14 cm.
- 14) **Choice D is correct.** (8.EE.A.3) Move the decimal 1 place right: $2.9 \times 10^1 = 29$.
- 15) **Choice D is correct.** (8.EE.C.7) After distributing $2(3x + 1) = 6x + 2$, you have $6x + 2 = 20$. The next step is to isolate the variable term by subtracting 2: $6x = 18$, then divide by 6 to get $x = 3$.
- 16) **Choice A is correct.** (8.EE.C.8b) "Product of a number and -2 " is $-2x$; "greater than 8" is > 8 .
- 17) **Choice D is correct.** (8.NS.A.1) $\frac{5}{8} = 0.625$, a terminating decimal. This is rational. The others are irrational: $\sqrt{5}$ is a non-perfect-square root, $\sqrt{e}$ is irrational, and $1 + \pi$ is an irrational sum.
- 18) **Choice D is correct.** (8.EE.B.6) Substitute (3, 5): $5 = \frac{1}{3}(3) + k$, so $5 = 1 + k$, thus $k = 4$.
- 19) **The correct answer is B,E.** (8.F.B.4) Option B is correct because the constant term 35 is the fixed monthly cost. Option E is correct because at $t = 0$, $C = 0.10(0) + 35 = 35$. The slope is 0.10, so the cost per text is \$0.10, not \$0.35.
- 20) **Choice D is correct.** (8.EE.C.8a) Check (2, 3): $5(2) - 2(3) = 10 - 6 = 4$ and $2(2) + 3 = 7$. So the solution is (2, 3).
- 21) **Choice A is correct.** (8.EE.C.7) Find two numbers that multiply to 15 and add to -8 : -3 and -5 . So $x^2 - 8x + 15 = (x - 3)(x - 5)$.
- 22) **Choice C is correct.** (8.EE.A.1) New side is s^2 , so new area is $(s^2)^2 = s^{2 \cdot 2} = s^4$.
- 23) **Choice D is correct.** (8.EE.A.2) $125 = 5^3$. The other options are not perfect cubes.
- 24) **Choice D is correct.** (8.EE.A.4) Divide coefficients: $1.2 \div 4 = 0.3 = 3 \times 10^{-1}$. Subtract exponents: $10^{4-6} = 10^{-2}$. Combine: $3 \times 10^{-1} \times 10^{-2} = 3 \times 10^{-3}$.
- 25) **Choice D is correct.** (8.EE.B.5) Runner B has a larger constant of proportionality ($8 > 6$), so Runner B travels farther in the same time.
- 26) **Choice A is correct.** (8.F.A.2) Slope of f : $\frac{3}{4} = 0.75$. Slope of g : $(5 - 3)/4 = 2/4 = 0.5$. Since $0.75 > 0.5$, f is steeper.
- 27) **Choice B is correct.** (8.F.A.3) A function is linear if and only if its first differences are constant. Since all differences equal 4, this function is linear.



Hi, Math Hero!

◇ This wide-ranging book gave you eight serious Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. You showed up for Grade 8 practice again and again. That is what real growth looks like: steady effort, honest review, and a willingness to try. ◇

★ **Remember this:** A math hero is not someone who never misses a question. A math hero learns from the miss and comes back stronger. ★

Hero Habits

- **Courage:** You try problems that are not automatic.
- **Honesty:** You review what needs work.
- **Patience:** You let skills grow over time.
- **Pride:** You recognize the effort you gave.

Grade 8 test-day tip: Save one solved problem you are proud of. Looking back at progress helps motivation stay strong.

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

Jay Daie

Your Math Hero Guide

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!



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Better Results.