

Connecticut

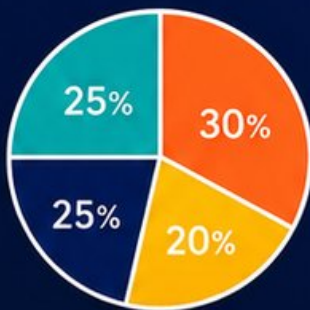
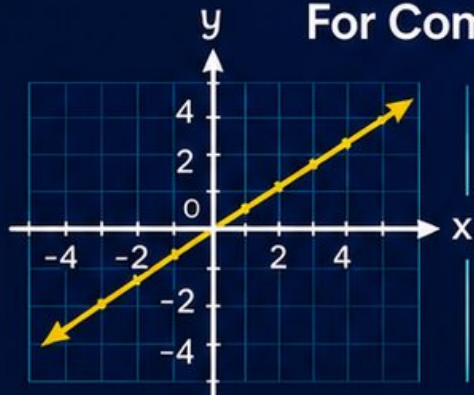
Smarter Balanced

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

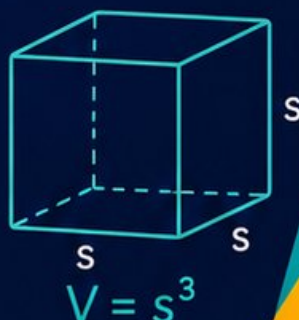


$$y = mx + b$$

$$2x - 3y = 6$$

$$\sqrt{x^2 + y^2}$$

$$A = bh$$



4 PRINTED TESTS



2 ONLINE TESTS

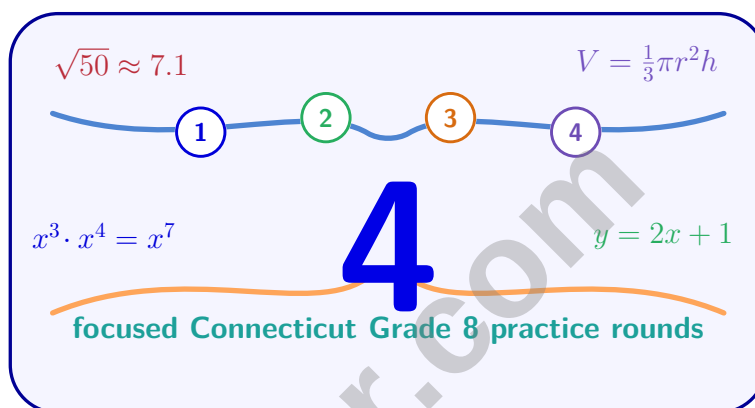


Use these **two additional online practice tests** for extra review after the printed tests in this book.



4 Connecticut Smarter Balanced Grade 8 Math Practice Tests

Compact Smarter Balanced Prep for Functions, Transformations, Geometry, and Data



Four 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!

Four focused rounds for sharper Smarter Balanced math thinking

This book gives you four 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 four-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?

Four Smarter Balanced tests, 160 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–4	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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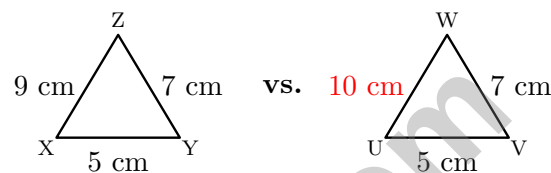
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- 1) To find the number of \$0.50 postage stamps and \$0.37 postage stamps that total \$3.74 with 10 stamps, which approach is best?

- ☐ A. Guess and check
 ☐ C. Solving a system of equations
☐ B. Proportional reasoning
 ☐ D. Trial by tables

- 2) Triangle XYZ is congruent to triangle UVW. The sides of triangle XYZ are 5 cm, 7 cm, and 9 cm. A student claims triangle UVW must have sides 5 cm, 7 cm, and 10 cm. Why is the student incorrect?



- ☐ A. Congruent triangles have equal corresponding sides
 ☐ C. The side lengths don't need to match
☐ B. UVW must have sides 7, 5, 9 in a different order
 ☐ D. The student counted incorrectly
- 3) A two-way table of 480 products tracks quality and price point:

	Premium	Standard	Total
High Quality	240	80	320
Low Quality	48	112	160
Total	288	192	480

What joint relative frequency represents high-quality premium products?

- ☐ A. $\frac{240}{320} = 0.75$
☐ C. $\frac{240}{480} = 0.50$
☐ B. $\frac{240}{288} \approx 0.83$
☐ D. $\frac{240}{480} \approx 0.67$



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4) A student finds that their homework scores have a mean of 85 and MAD of 4. Which interval is one MAD from the mean?

☐ A. 81 to 89

☐ C. 80 to 90

☐ B. 75 to 95

☐ D. 70 to 100

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?

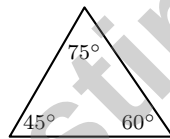
☐ A. One student made a calculation error

☐ C. Only one line can ever be correct

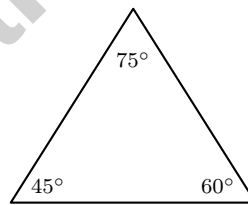
☐ B. The students used different data sets

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

6) Two triangles both have angles measuring 45° , 60° , and 75° . Are these triangles necessarily similar?



Triangle 1



Triangle 2

☐ A. No, the sides must also be proportional

☐ C. Yes, angles alone determine similarity (AAA)

☐ B. No, only two angles are given

☐ D. Only if the triangles are congruent



7) The table shows a linear function $m(x)$:

x	0	2	4	6
$m(x)$	5	11	?	23

What is $m(4)$?

☐ A. 15

☐ C. 17

☐ B. 16

☐ D. 18

8) The number $\sqrt[3]{8}$ (cube root of 8) is:

☐ A. Irrational

☐ C. 2.67

☐ B. Between 8 and 16

☐ D. 2, which is rational

9) $\sqrt{68}$ is closest to which integer?

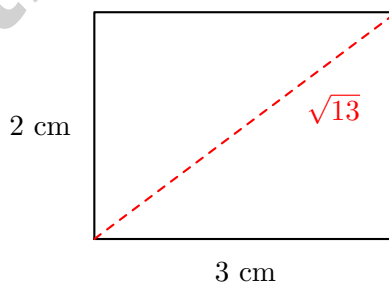
☐ A. 7

☐ C. 9

☐ B. 6

☐ D. 8

10) A rectangle has dimensions 2 cm by 3 cm. The diagonal is $\sqrt{13}$ cm. What is the best estimate of the diagonal?



☐ A. 3.0 cm

☐ C. 4.2 cm

☐ B. 6.5 cm

☐ D. 3.6 cm

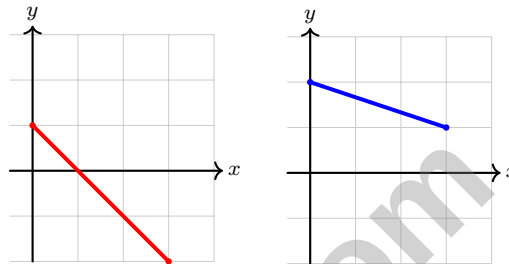


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1) Quadrilateral ABCD is mapped onto quadrilateral A'B'C'D' by a translation 3 units right and 2 units up. Which statement must be true?

- ☐ A. The perimeters are different ☐ C. Angle A is greater than angle A'
- ☐ B. The quadrilaterals are congruent ☐ D. Side AB is longer than side A'B'

2) Which graph best represents a line with slope $-\frac{1}{3}$?



☐ A. Red line (left) ☐ C. Both have slope $-\frac{1}{3}$

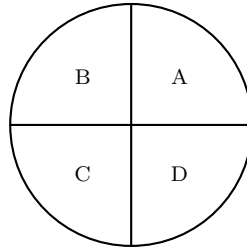
☐ B. Neither has slope $-\frac{1}{3}$ ☐ D. Blue line (right)

3) A car traveling at 60 mph leaves 1 hour before a car traveling at 75 mph. How long does the faster car take to catch the slower car?

- ☐ A. 2 hours ☐ C. 4 hours
- ☐ B. 3 hours ☐ D. 5 hours



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4)

The spinner above is divided into 4 equal sections labeled A, B, C, and D. What is the probability of landing on section A?

- ☐ A. $\frac{1}{4}$
☐ B. $\frac{1}{8}$

- ☐ C. $\frac{3}{4}$
☐ D. $\frac{1}{2}$

5) A game involves picking a number (1, 2, or 3) and a letter (A or B). The table lists some outcomes. How many total outcomes should the complete table show?

Number	A	B
1	(1,A)	(1,B)
2	(2,A)	(2,B)
3	(3,A)	(3,B)

- ☐ A. $3 + 2 = 5$
☐ B. $3 \times 2 = 6$

- ☐ C. $2^3 = 8$
☐ D. $3^2 = 9$

6) Comparison of graphs: Line A passes through origin with slope 2. Line B crosses y -axis at -3 with slope 1. At $x = 4$, which is higher?

- ☐ A. Line A
☐ B. Line B

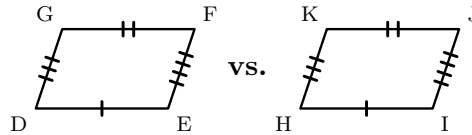
- ☐ C. Both equal
☐ D. Cannot determine



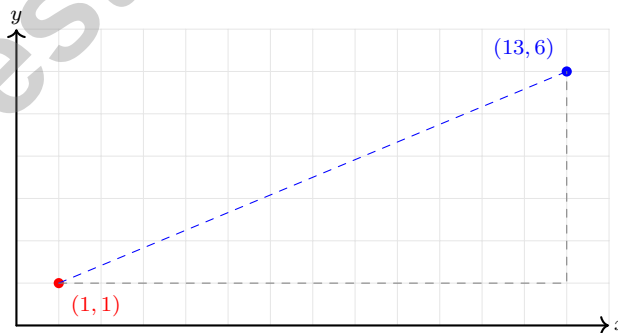
- 1) What is the product $(3 \times 10^4) \times (2 \times 10^5)$ in scientific notation?
- ☐ A. 5×10^9 ☐ C. 6×10^{20}
☐ B. 6×10^{10} ☐ D. 6×10^9
- 2) Company A: $A(d) = 40 + 0.15d$. Company B through $(100, 55)$ and $(200, 80)$. Which has higher rate?
- ☐ A. Company A ☐ C. Both same.
☐ B. Company B ☐ D. Cannot be determined.
- 3) A swimming pool is being drained. The water level drops $\frac{1}{2}$ foot every $\frac{1}{4}$ hour. What is the slope?
- ☐ A. -2 feet per hour ☐ C. $-\frac{1}{8}$ feet per hour
☐ B. 2 feet per hour ☐ D. $\frac{1}{8}$ feet per hour
- 4) A coffee shop has fixed costs of \$400 per day and variable costs of \$2 per cup sold. If cups sell for \$5 each, about how many cups must be sold to break even?
- ☐ A. 100 cups ☐ C. 134 cups
☐ B. 120 cups ☐ D. 160 cups
- 5) Given $f(x) = x^2$ and $g(x) = 2x + 1$, which statement is true?
- ☐ A. $f(3) = g(3)$ ☐ C. $f(3) < g(3)$
☐ B. $f(3) > g(3)$ ☐ D. Cannot be determined



- 6) Quadrilateral DEFG is congruent to quadrilateral HIJK. A student wrote $DEFG \cong IJKH$. Which error did the student make?



- ☐ A. $DEFG \cong HIJK$ (correct order) ☐ C. $DEFG \cong KJHI$ (wrong order)
☐ B. $DEFG \cong IJKH$ (wrong vertex order) ☐ D. $DEFG \cong IHKJ$ (completely wrong order)
- 7) Two angles in a triangle measure 29° and 71° . Find the third angle.
- ☐ A. 42° ☐ C. 80°
☐ B. 70° ☐ D. 100°
- 8) A right triangle has legs of $\sqrt{18}$ and $\sqrt{7}$. What is the hypotenuse?
- ☐ A. 5 ☐ C. $\sqrt{11}$
☐ B. $\sqrt{25}$ ☐ D. 25
- 9) What is the distance between (1, 1) and (13, 6)?



- ☐ A. 7 ☐ C. 13
☐ B. 17 ☐ D. $\sqrt{119}$



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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 C is correct.** **(8.EE.C.8c)** With two unknowns (number of each stamp) and two constraints (total count and total value), a system of linear equations is the systematic approach. Guess and check works but is inefficient.
- 2) **Choice A is correct.** **(8.G.A.2)** Since triangle XYZ is congruent to triangle UVW, triangle UVW must have sides 5 cm, 7 cm, and 9 cm, not 10 cm. The student made an error by changing one of the side lengths.
- 3) **Choice C is correct.** **(8.SP.A.4)** Joint relative frequency divides the cell count (240) by the grand total (480) = 0.50. Options A and B are conditional frequencies; D is a marginal.
- 4) **Choice A is correct.** **(8.G.B.8)** One MAD from the mean means subtract and add the MAD: $85 - 4 = 81$ and $85 + 4 = 89$, so the interval is 81 to 89.
- 5) **Choice D is correct.** **(8.SP.A.2)** When sketching trend lines by hand, slight differences in slope are natural and acceptable, as long as both lines reasonably balance data on both sides and follow the overall trend.
- 6) **Choice C is correct.** **(8.G.A.4)** If two triangles have all three corresponding angles congruent, they are similar by AAA (Angle-Angle-Angle). Here, both triangles have the same three angles, so they must be similar regardless of side lengths.
- 7) **Choice C is correct.** **(8.F.A.1)** The pattern shows the function increases by 3 for each unit increase in x (or by 6 for each 2-unit increase). So $m(4) = 11 + 6 = 17$.
- 8) **Choice D is correct.** **(8.NS.A.1)** $\sqrt[3]{8} = 2$ because $2 \times 2 \times 2 = 8$. Since 2 is an integer, it is rational.
- 9) **Choice D is correct.** **(8.NS.A.2)** $8^2 = 64$ and $9^2 = 81$. Since 68 is closer to 64 than to 81 (distance 4 vs. 13), $\sqrt{68} \approx 8.25$ is closest to 8.
- 10) **Choice D is correct.** **(8.NS.A.2)** By the Pythagorean theorem, diagonal = $\sqrt{2^2 + 3^2} = \sqrt{4 + 9} = \sqrt{13} \approx 3.606 \approx 3.6$ cm.
- 11) **Choice C is correct.** **(8.EE.A.3)** Divide: $\frac{6 \times 10^8}{3 \times 10^6} = \frac{6}{3} \times 10^{8-6} = 2 \times 10^2 = 200$.
- 12) **Choice D is correct.** **(8.G.B.7)** At 0% APR during the promo period, no interest accrues. Balance after 18 months is still \$1,200.
- 13) **Choice D is correct.** **(8.G.C.9)** The net shows all 6 faces of a cube. Each face has area $3^2 = 9 \text{ cm}^2$. Total surface area = $6 \times 9 = 54 \text{ cm}^2$.
- 14) **Choice D is correct.** **(8.G.A.1)** Reflecting across $y = -x$ uses $(x, y) \rightarrow (-y, -x)$. A point like (1, 2) maps to (-2, -1) in Quadrant III (both coordinates negative).
- 15) **Choice D is correct.** **(8.EE.B.6)** Slope = $\frac{1-7}{3-0} = \frac{-6}{3} = -2$.
- 16) **Choice D is correct.** **(8.EE.C.7)** Eq. 1: Expand $2x + 6 = 2x + 6$ (identity, infinitely many). Eq. 2: Expand $2x + 6 = 2x + 5 \Rightarrow 6 = 5$ (false, no solution).
- 17) **Choice A is correct.** **(8.EE.C.8b)** Add 3: $x > -4$. Open circle at -4 with right ray confirms this.
- 18) **Choice C is correct.** **(8.EE.C.8b)** Test: $4 \leq 2 + 1 \Rightarrow 4 \leq 3$ FALSE. So (2, 4) is NOT in the solution region.
- 19) **The correct answer is $\frac{1}{4}$.** **(8.EE.B.5)** Slope = $\frac{500}{2000} = \frac{1}{4} = 0.25$.
- 20) **Choice C is correct.** **(8.G.C.9)** $V = \pi r^2 h = 3.14 \times 9 \times 8 = 3.14 \times 72 = 226.08 \text{ yd}^3$.
- 21) **The correct answer is B, E.** **(8.EE.A.4)** The product is $(4 \times 5) \times 10^{3+4} = 20 \times 10^7 = 2 \times 10^8$, so choices B and E are equivalent to the original expression. Choice A uses an exponent that is too large, and choices C and D have the wrong value.
- 22) **Choice D is correct.** **(8.SP.A.3)** Substitute $x = 4$: $y = 2.5(4) - 8 = 10 - 8 = 2$.
- 23) **Choice D is correct.** **(8.NS.A.1)** Let $x = 0.\overline{27}$. Then $100x = 27.\overline{27}$. Subtracting: $99x = 27$, so $x = \frac{27}{99} = \frac{3}{11}$.
- 24) **Choice C is correct.** **(8.EE.A.1)** Using the product rule, the missing exponent plus 4 must equal 9. So the missing exponent is $9 - 4 = 5$.
- 25) **Choice D is correct.** **(8.EE.A.2)** Volume of a cube = $e^3 = 4^3 = 64$ cubic units.
- 26) **Choice D is correct.** **(8.EE.B.5)** Slope = $\frac{\Delta y}{\Delta x} = \frac{6-0}{3-0} = \frac{6}{3} = 2$. The line passes through (0, 0) and (3, 6).
- 27) **Choice C is correct.** **(8.EE.C.8a)** Verify (2, 3): $y = 2 + 1 = 3$ ✓ and $y = -2 + 5 = 3$ ✓. The marked intersection point is (2, 3).



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Hi, Confident Learner!

◇ This carefully paced book gave you four steady Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. Grade 8 math can feel big because it connects real numbers and exponents with linear equations, systems, functions, transformations, geometry, and data. ◇

★ **Remember this:** But big topics become manageable when you practice one skill at a time. That is what you have been doing with every test in this book. ★

Confidence Builders

- **Know the Goal:** Identify what the question asks.
- **Use Vocabulary:** Math words point to math actions.
- **Show Work:** Give yourself something to check.
- **Celebrate Effort:** Practice is proof that you are moving.

Grade 8 test-day tip: When reviewing, do not only mark wrong answers. Write one sentence about what you learned from each one.

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

Jay Daie

Your Confidence Coach

PRACTICE TODAY, ACHIEVE TOMORROW!

Give your child the confidence and skills they need with **4 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!

4



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
- ✓ 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!



4 PRINTED TESTS



2 ONLINE TESTS



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