

Connecticut

Smarter Balanced

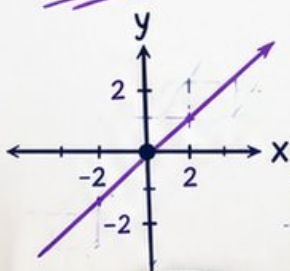
GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

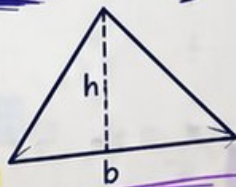
$$y = mx + b$$



**BUILD
CONFIDENCE.
SHARPEN SKILLS.
ACE YOUR
EXAM!**

Practice
Today
Succeed
Tomorrow!

$$A = \frac{1}{2}bh$$



7 PRINTED
TESTS



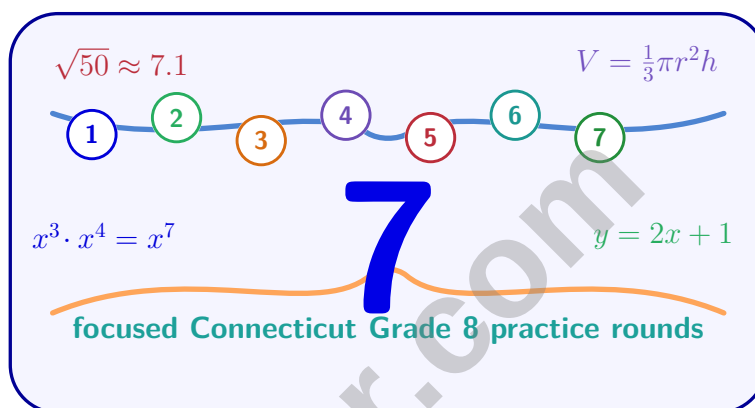
2 ONLINE
TESTS



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

7 Connecticut Smarter Balanced Grade 8 Math Practice Tests

Seven Grade 8 Smarter Balanced Rounds for Confident Math Review



Seven 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!

Seven focused rounds for sharper Smarter Balanced math thinking

This book gives you seven 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 seven-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?

Seven Smarter Balanced tests, 280 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.
Test 7	Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina.
Answer Pages	Compact keys and explanations that show why each answer works.

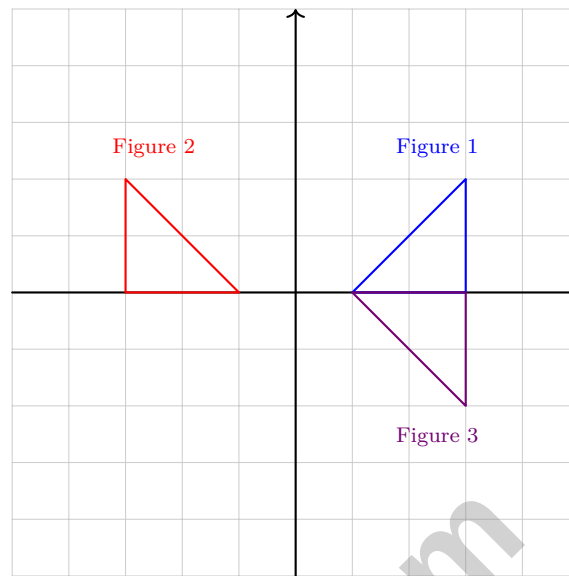
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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& answers

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1)

If Figure 1 is the original, identify the transformation from Figure 1 to Figure 2 and from Figure 1 to Figure 3.

- ☐ A. Both are rotations ☐ C. Both are translations
☐ B. 1→2 is reflection across y -axis; 1→3 is reflection across x -axis ☐ D. 1→2 is translation; 1→3 is rotation

2) Factor $x^2 - x - 20$.

- ☐ A. $(x - 5)(x + 4)$ ☐ C. $(x - 10)(x + 2)$
☐ B. $(x + 5)(x - 4)$ ☐ D. $(x - 20)(x + 1)$

3) A side job pays a bonus of \$800, invested at 5% simple interest. How long until the account grows to \$880?

- ☐ A. 1 year ☐ C. 3 years
☐ B. 4 years ☐ D. 2 years



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4) Use elimination to solve:
$$\begin{cases} 3x + 4y = 10 \\ 3x - 2y = 4 \end{cases}$$

☐ A. $(1, \frac{7}{4})$

☐ C. $(0, \frac{5}{2})$

☐ B. $(3, \frac{1}{4})$

☐ D. $(2, 1)$

5) A right triangle has sides a , b , and c where c is the hypotenuse. If $a = 10$ and $c = 26$, which value of b is correct?

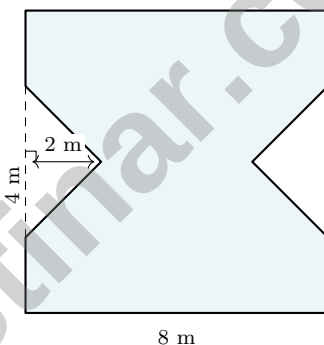
☐ A. $b = 24$

☐ C. $b = 20$

☐ B. $b = 16$

☐ D. $b = 36$

6) A composite figure has a square (8 m by 8 m) with two opposite triangular notches cut out (each 4 m base, 2 m height). What is the remaining area?



☐ A. 56 m^2

☐ C. 64 m^2

☐ B. 60 m^2

☐ D. 72 m^2

7) Triangle A has sides 5, 12, 13. Triangle B has sides 7.5, 18, 19.5. Triangle C has sides 10, 24, 26. Which triangles are similar to Triangle A ?

☐ A. Only Triangle B

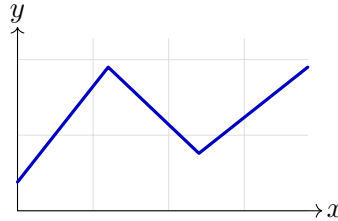
☐ C. Both Triangle B and C

☐ B. Only Triangle C

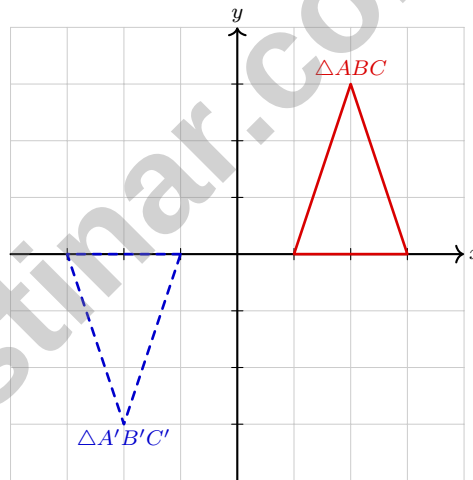
☐ D. Neither Triangle B nor C



- 8) A function exhibits error: a student says “The graph increases at all points.” But the actual graph increases, then decreases, then increases again. Which statement correctly identifies the student’s error?



- ☐ A. The student only looked at one part of the graph
☐ B. The graph is increasing everywhere
☐ C. The graph is decreasing everywhere
☐ D. The graph is constant everywhere



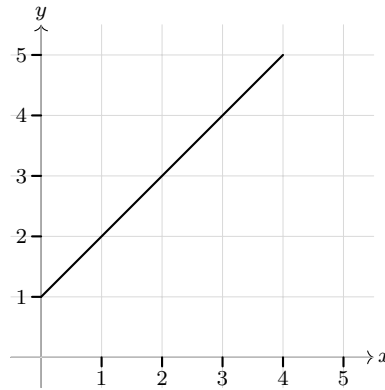
9)

Triangle ABC (red) is transformed to $\triangle A'B'C'$ (dark blue). Which transformation is shown?

- ☐ A. Reflection across the y -axis
☐ B. Rotation 90° counterclockwise
☐ C. Rotation 180°
☐ D. Translation left 2, down 3



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1)

What is the slope of the line shown in the graph?

☐ A. $\frac{1}{2}$

☐ B. 2

☐ C. 1

☐ D. 4.5

2) What is the y -intercept of the line $y = 3x - 7$?

☐ A. -7

☐ B. 3

☐ C. 7

☐ D. -3

3) Factor $x^2 - 25$.

☐ A. $(x - 5)^2$

☐ B. $(x + 5)^2$

☐ C. $(x + 5)(x - 5)$

☐ D. $(x - 25)(x + 1)$

4) A payday loan charges \$15 for every \$100 borrowed for 2 weeks. What is the APR equivalent?

☐ A. 15%

☐ B. 30%

☐ C. 390%

☐ D. 780%



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5) Which ordered pair is a solution to both equations?

- $y = -2x + 5$
- $3x + y = 6$

☐ A. (1, 3)

☐ C. (0, 4)

☐ B. (2, 1)

☐ D. (-1, 7)

6) Does a triangle with sides 6, 8, 9 form a right triangle?

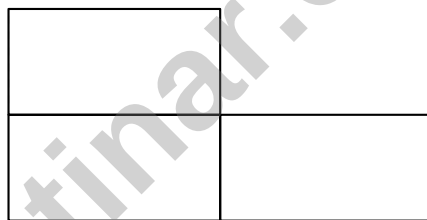
☐ A. Yes, because $6 + 8 > 9$

☐ D. No, because the sides are different lengths

☐ B. No, because $6^2 + 8^2 \neq 9^2$

☐ C. Yes, because it is a Pythagorean triple

7) A composite figure consists of three congruent rectangles (4 m by 2 m each) arranged in an L-shape. What is the total area?



☐ A. 12 m^2

☐ C. 24 m^2

☐ B. 16 m^2

☐ D. 32 m^2



1) Solve:
$$\begin{cases} 4x - 3y = 5 \\ x = 2 \end{cases}$$

☐ A. (2, 1)

☐ B. (2, -1)

☐ C. $(2, \frac{1}{3})$

☐ D. (2, 3)

2) A library tracks 420 patrons by age and material preference:

	Books	Digital	Total
Youth (< 18)	140	70	210
Adult (≥ 18)	140	70	210
Total	280	140	420

Is there an association between age group and material preference? Why or why not?

- ☐ A. Yes; youth prefer books at $\frac{140}{210} = \frac{2}{3}$ while adults also do at $\frac{140}{210} = \frac{2}{3}$.
- ☐ B. Yes; youth prefer books more than adults.
- ☐ C. No; both groups prefer books at identical relative frequencies.
- ☐ D. No; the total for books (280) exceeds digital (140).

3) Two lines intersect. One angle is 82° . What is the measure of an adjacent angle?

4)

Height (cm)	160	165	170	175
-------------	-----	-----	-----	-----

Four students have heights shown. The mean is 167.5 cm. What is the MAD?

☐ A. 3.75

☐ B. 5

☐ C. 6.25

☐ D. 7.5



5) A scientist collected data on plant height (cm) versus days of growth. Which scatter plot shows a trend line that is a POOR fit?

- | | |
|---|---|
| ☐ A. Points spread far from the line with large vertical distances | ☐ C. Line passes through the center of the data cloud |
| ☐ B. Half the points are above the line and half are below | ☐ D. Points clustered tightly around the line with minimal scatter |

6) Which equals $0.\overline{54}$?

- | | |
|--|--|
| ☐ A. $\frac{54}{100}$ | ☐ C. $\frac{54}{90}$ |
| ☐ B. $\frac{27}{50}$ | ☐ D. $\frac{54}{99} = \frac{6}{11}$ |

7) Which is a rational number?

- | | |
|---|---|
| ☐ A. $\sqrt{11}$ | ☐ C. $\sqrt{49}$ |
| ☐ B. $\sqrt{20}$ | ☐ D. $\sqrt{23}$ |

8) Which is the best estimate of $\sqrt{99}$?

- | | |
|----------------------------------|----------------------------------|
| ☐ A. 9.0 | ☐ C. 10.0 |
| ☐ B. 49.5 | ☐ D. 9.5 |

9) A bonus of \$2,500 is invested at 6% compound interest for 3 years. What is the approximate final amount?

- | | |
|-------------------------------------|-------------------------------------|
| ☐ A. \$2,500 | ☐ C. \$3,000 |
| ☐ B. \$3,500 | ☐ D. \$2,975 |



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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

- Choice B is correct.** (8.G.A.1) Figure 2 is the mirror image of Figure 1 across the y -axis. Figure 3 is the mirror image of Figure 1 across the x -axis. The asymmetric triangle shape helps show the reflections clearly.
- Choice A is correct.** (8.EE.C.7) Find two numbers that multiply to -20 and add to -1 : -5 and 4 . Check: $-5 \cdot 4 = -20$ and $-5 + 4 = -1$.
- Choice D is correct.** (8.G.B.7) Interest needed: \$80. Solve: $80 = 800 \times 0.05 \times t \Rightarrow t = 2$ years.
- Choice D is correct.** (8.EE.C.8a) Subtract the second from the first: $(3x + 4y) - (3x - 2y) = 10 - 4$, so $6y = 6$, giving $y = 1$. Substitute: $3x + 4(1) = 10$, so $x = 2$. Solution: $(2, 1)$.
- Choice A is correct.** (8.G.B.6, 8.G.B.7) From $10^2 + b^2 = 26^2$, we get $100 + b^2 = 676$, so $b^2 = 576$ and $b = 24$ (scaled 5-12-13 triple).
- Choice A is correct.** (8.G.B.7) Square area $= 8 \times 8 = 64 \text{ m}^2$. Each triangle area $= \frac{1}{2} \times 4 \times 2 = 4 \text{ m}^2$. Two triangles $= 8 \text{ m}^2$. Remaining $= 64 - 8 = 56 \text{ m}^2$.
- Choice C is correct.** (8.G.A.4) For B : $\frac{7.5}{5} = \frac{18}{12} = \frac{19.5}{13} = 1.5$ (proportional). For C : $\frac{10}{5} = \frac{24}{12} = \frac{26}{13} = 2$ (proportional). Both are similar.
- Choice A is correct.** (8.F.B.5) The actual graph increases, then decreases, then increases again. The student's error is describing only part of the graph instead of the full interval.
- Choice C is correct.** (8.G.A.3) Under 180° rotation, $(x, y) \rightarrow (-x, -y)$: $(1, 0) \rightarrow (-1, 0)$, $(3, 0) \rightarrow (-3, 0)$, $(2, 3) \rightarrow (-2, -3)$.
- The correct answer is -4 .** (8.EE.C.8b) Solving gives $x \geq -4$, so the boundary value is -4 .
- The correct answer is 0 .** (8.EE.C.8b) Substitute $(0, 0)$: $0 + 3(0) = 0$.
- Choice C is correct.** (8.SP.A.3) The y -intercept (15) is the cost when $u = 0$, representing fixed storage costs.
- Choice A is correct.** (8.G.B.7) $P(\text{not rain}) = 1 - P(\text{rain}) = 1 - \frac{2}{5} = \frac{3}{5}$.
- Choice D is correct.** (8.F.A.1) If all students have different heights, the number of inputs (students) equals the number of outputs (distinct heights). If multiple students share the same height, there are more inputs than outputs.
- Choice C is correct.** (8.F.B.4) Line 1 slope: $\frac{5-1}{4-0} = 1$. Line 2 slope: $\frac{6-2}{4-0} = 1$. Same slope; different intercepts.
- Choice B is correct.** (8.G.A.2) Congruent figures have equal corresponding sides. Kite 2 has the same side lengths as Kite 1: 4 cm , 4 cm , 6 cm , 6 cm .
- Choice A is correct.** (8.G.B.8) Using the Pythagorean Theorem: $c = \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10$ units.
- Choice B is correct.** (8.G.B.7) If the angles are equal and supplementary, then $x + x = 180$, so $2x = 180$ and $x = 90^\circ$.
- Choice C is correct.** (8.G.C.9) When linear scale is $k = \frac{3}{2}$, volume scales by $k^3 = \left(\frac{3}{2}\right)^3 = \frac{27}{8}$.
- The correct answer is 10 .** (8.G.A.5) Co-interior angles are supplementary: $(7a + 5) + (2a + 85) = 180$. Thus $9a + 90 = 180$, so $9a = 90$ and $a = 10$.
- Choice B is correct.** (8.G.A.5) A hexagon's interior angles add to 720° . The known angles add to $88 + 112 + 95 + 118 + 147 = 560^\circ$, so the sixth angle is $720 - 560 = 160^\circ$.
- The correct answer is A, B.** (8.EE.B.6) Options A and B both have slope 4 , making them parallel. Option C has slope -4 , option D has slope $\frac{1}{4}$, and option E has slope 2 , so none of these match.
- Choice B is correct.** (8.SP.A.1) A scattered plot with no linear trend only means there is no simple straight-line relationship. There could be a curved relationship, effects that appear only at high or low values, or time-delayed effects. Absence of linear correlation does not prove no relationship exists.
- Choice B is correct.** (8.SP.A.4) Marginal relative frequency for IT employees: row total divided by grand total $= \frac{180}{500} = 0.36$.
- Choice A is correct.** (8.G.B.8) Deviations: $|50 - 60| = 10$, $|60 - 60| = 0$, $|55 - 60| = 5$, $|65 - 60| = 5$, $|70 - 60| = 10$. Sum $= 30$. MAD $= 30/5 = 6$.
- Choice B is correct.** (8.EE.C.7b) For each of the 5 color choices, you can pair it with any of the 9 numbers. By the Counting Principle, multiply: $5 \times 9 = 45$ different passwords.



Hi, Future Algebra Thinker!

◇ Grade 8 practice builds a bridge to high school mathematics through exponents, linear systems, functions, transformations, geometry, and data models. This broad and demanding book gave you seven strong Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence.

◇

★ **Remember this:** Every time you solved for an unknown or explained a relationship, you were building skills that future math will use again. ★

Bridge Skills

- **Use Variables:** Let letters stand for unknown values.
- **Balance Equations:** Keep both sides fair.
- **Read Graphs:** Connect points to meaning.
- **Compare Rates:** Look for constant relationships.

Grade 8 test-day tip: When you see a variable, say what it represents. That keeps algebra connected to the problem.

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

Jay Daie

Your Algebra Bridge Coach

PRACTICE TODAY SUCCEED TOMORROW!

Give your child the confidence and skills they need with **7 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!

GRADE 8

Practice
Today
Succeed
Tomorrow!

Algebra

Geometry

Statistics

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 | ✓ Statistics & Probability |
| ✓ Expressions & Equations | ✓ Pythagorean Theorem |
| ✓ Ratios & Proportional Relationships | ✓ Volume & Surface Area |
| ✓ Linear Equations | ✓ Transformations |
| ✓ Functions | ✓ Inequalities |
| ✓ Geometry | ✓ Data Analysis & Graphing |
| ✓ Measurement & Data | ✓ 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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BUILD CONFIDENCE. SHARPEN SKILLS. ACE YOUR EXAM!