

HAWAII

Smarter Balanced

GRADE 8 MATH

PRACTICE TESTS

5

PRINTED
TESTS

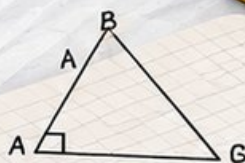


2 ONLINE
TESTS

**Standards Aligned
Problem Solving For**
Comprehensive Assessment Programs



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

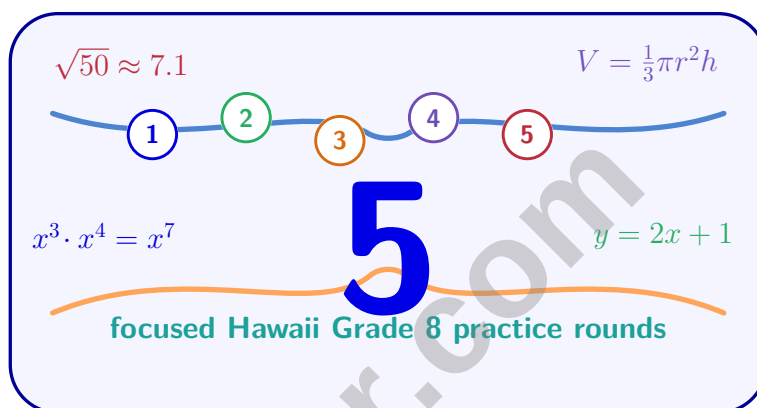


$$a^2 + b^2 = c^2$$



5 Hawaii Smarter Balanced Grade 8 Math Practice Tests

Practical Smarter Balanced Prep for Functions, Geometry, and Data



Five 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, Hawaii Grade 8 Problem Solver!

Five focused rounds for sharper Smarter Balanced math thinking

This book gives you five 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 Hawaii 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 five-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.

Hawaii 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?

Five Smarter Balanced tests, 200 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–5	Functions, systems, transformations, geometry, data analysis, and multi-step problem solving.
Answer Pages	Compact keys and explanations that show why each answer works.

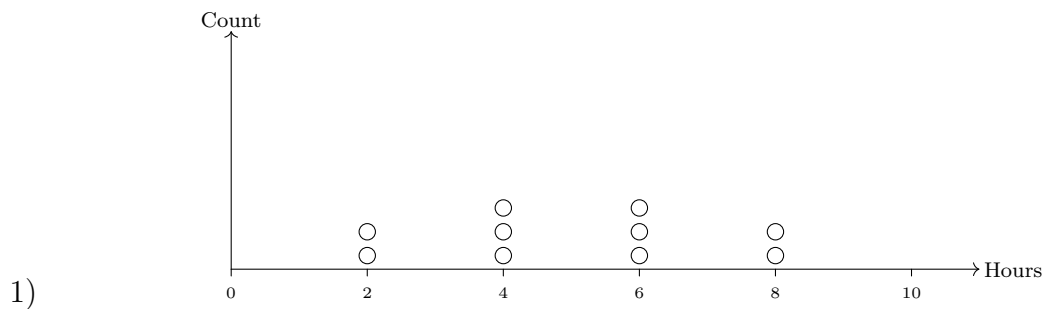
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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For more practice
& answers

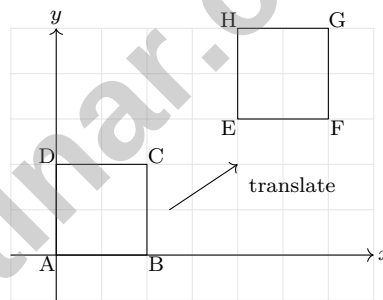
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Study hours: 2, 2, 4, 4, 4, 6, 6, 6, 8, 8 (mean = 5.2). Calculate MAD.

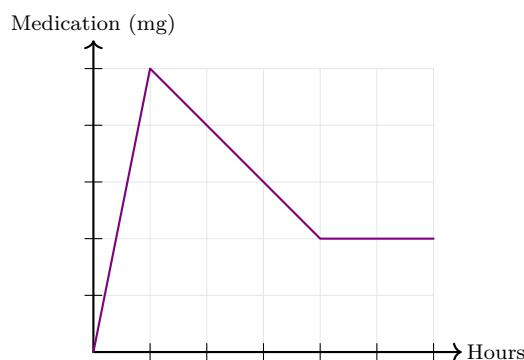
- ☐ A. 1.76
☐ B. 2.0 (used range $\div 5$ instead of sum of deviations $\div n$)
☐ C. 2.6 (divided sum of deviations by 8 instead of 10)
☐ D. 3.2 (used largest deviation only)
- 2) Which sequence of rigid motions would map square ABCD onto square EFGH positioned elsewhere on the coordinate plane?



- ☐ A. Rotation only
☐ B. Translation only
☐ C. Reflection and translation
☐ D. Dilation and rotation



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3)

A patient receives a medication injection. The dosage spikes immediately, then decreases as the body metabolizes it, and stabilizes at a baseline. Which interval shows the body absorbing the drug most rapidly?

- ☐ A. From 0 to 1 hour (absorption/rise) ☐ D. The rise and decay are equally rapid
☐ B. From 1 to 4 hours (decay)
☐ C. From 4 to 6 hours (plateau)

4) A proportional relationship passes through $(0,0)$ and $(3,12)$. What is the constant of proportionality k ? (Give your answer as a simplified fraction or decimal.)

5) A cell phone plan costs \$20 per month plus \$0.10 per text message. If cost is graphed against number of texts sent (x-axis texts, y-axis cost in \$), what is the slope?

- ☐ A. \$20 per text ☐ C. 20 texts per dollar
☐ B. \$20.10 per text ☐ D. \$0.10 per text



- 6) Two hikers start from the same trailhead and walk in the same direction. One walks at 3 mph and the other at 4 mph. If they walk for the same amount of time, after how many hours will the faster hiker be 2 miles ahead?

☐ A. 0.5 hours ☐ C. 1.5 hours
☐ B. 1 hour ☐ D. 2 hours

- 7) If $f(x) = \frac{x+4}{2}$ and $f(x) = 5$, what is x ?

☐ A. 2 ☐ C. 6
☐ B. 4 ☐ D. 10

- 8) Plan A costs \$15 per month: $A(m) = 15 + 0.10m$. Plan B shown in table: (0, \$20), (100, \$25), (200, \$30), (300, \$35). Which plan has the higher base cost?

m	0	100	200	300
Plan B	\$20	\$25	\$30	\$35

☐ A. Plan A ☐ C. Both cost the same.
☐ B. Plan B ☐ D. Cannot be determined.

- 9) Which equation represents a LINEAR function?

☐ A. $y = 2^x$ ☐ C. $y = |x| + 1$
☐ B. $y = \frac{5}{x-2}$ ☐ D. $y = -3x + 4$

- 10) A bicycle rental costs \$20 per day plus a \$15 deposit. Which equation gives total cost C for d days?

☐ A. $C = 20d + 15$ ☐ C. $C = 35d$
☐ B. $C = 15d + 20$ ☐ D. $C = 20d - 15$



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1) A trend line has equation $y = 2.5x - 5$. What would be the predicted value of y when $x = 10$?

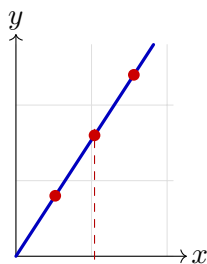
☐ A. 30

☐ C. 20

☐ B. 25

☐ D. 15

2) Is the graph of a straight line passing through $(1, 2)$ and $(3, 6)$ a function?



☐ A. No, it is not steep enough.

☐ C. Yes, it passes the vertical line test.

☐ B. Yes, because it is a straight line.

☐ D. No, because the slope is positive.

3) Pentagon JKLMN is congruent to pentagon PQRST. In pentagon JKLMN, all sides have equal length and each interior angle measures 108° . What can you conclude about pentagon PQRST?

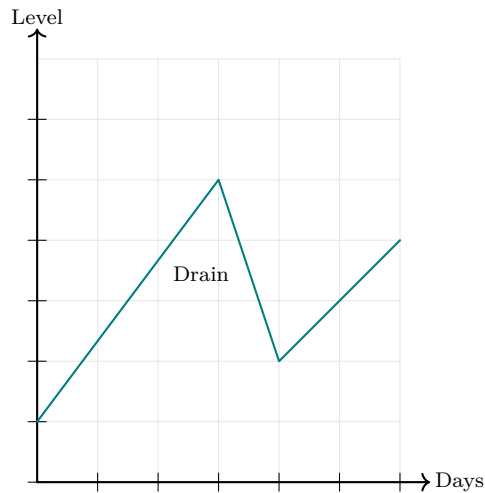
☐ A. It is a regular pentagon

☐ C. Its interior angles are not 108°

☐ B. Its sides have different lengths

☐ D. It is smaller than JKLMN





4)

A water tank fills, then drains, then fills again. Based on the graph:

- ☐ A. The tank drains from day 1 to day 3
☐ B. The tank drains from day 3 to day 3
☐ C. The tank drains from day 3 to day 4
☐ D. The tank never fills again after day 3

5) A table of values for a linear relationship is partially filled:

x	2	5	8
y	3	?	15

What is the missing y -value?

- ☐ A. 8
☐ B. 12
☐ C. 10
☐ D. 9



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1) Simplify $\frac{a^{-3}}{a^2}$.

☐ A. a^6

☐ B. a^{-1}

☐ C. a^1

☐ D. a^{-5}

2) Find the y -intercept of the line $3x + y = 12$.

3) What is $\sqrt{400}$?

☐ A. 18

☐ B. 19

☐ C. 20

☐ D. 21

4) How many of $\sqrt{5}$, $\sqrt{6}$, and $\sqrt{7}$ are between 2 and 3?

5) A scientist measures a cell with diameter 5.3×10^{-6} mm. Convert this to standard form.

☐ A. 5,300 mm

☐ B. 0.0053 mm

☐ C. 5.3 mm

☐ D. 0.0000053 mm



6) A student claims $(4 \times 10^3) \times (5 \times 10^2) = 20 \times 10^5$. The arithmetic steps are correct, but is the final answer in proper scientific notation?

- ☐ A. Yes, it is in proper form.
 ☐ C. No; the exponent should be 10^6 instead.
- ☐ B. No; both coefficient and exponent are wrong.
 ☐ D. No; the coefficient 20 is too large. Should be 2×10^6 .

7) Which table represents a function where the output is always greater than the input?

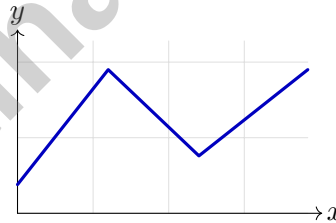
Table A:

x	1	2	3	4
y	3	5	7	9

Table B:

x	0	1	2	3
y	0	2	4	6

- ☐ A. Neither table.
 ☐ C. Table B only.
- ☐ B. Table A only.
 ☐ D. Both tables.
- 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
 ☐ C. The graph is decreasing everywhere
- ☐ B. The graph is increasing everywhere
 ☐ D. The graph is constant everywhere



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& answers

Hawaii 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 Hawaii 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.G.B.8) Deviations from 5.2 are 3.2, 3.2, 1.2, 1.2, 1.2, 0.8, 0.8, 0.8, 2.8, 2.8. Their sum is 17.6, so the MAD is $17.6 \div 10 = 1.76$.
- 2) **Choice B is correct.** (8.G.A.2) Comparing the two squares: ABCD (lower left on the grid) and EFGH (upper right) have identical side lengths and the same orientation. The vertices align: A is at (0,0) and E is at (4,3), indicating a translation 4 units right and 3 units up. Translation is a rigid motion that preserves all distances and angles, so no rotation or reflection is needed.
- 3) **Choice A is correct.** (8.F.B.5) The graph shows a spike from 0 to 5 mg in 1 hour, then a gradual decrease from 5 to 2 mg over 3 hours. The steepest positive slope is in the first hour.
- 4) **The correct answer is 4.** (8.EE.B.5) The constant is $k = 12 \div 3 = 4$.
- 5) **Choice D is correct.** (8.EE.B.5) The slope is the rate of change of cost per additional text, which is \$0.10 per text. The \$20 is the y-intercept (fixed cost).
- 6) **Choice D is correct.** (8.EE.C.8c) Let t be the number of hours. The faster hiker gains $4t - 3t = t$ miles on the slower hiker. Set $t = 2$, so the faster hiker is 2 miles ahead after 2 hours.
- 7) **Choice C is correct.** (8.F.A.1) Solve $\frac{x+4}{2} = 5$: multiply both sides by 2 to get $x + 4 = 10$, so $x = 6$.
- 8) **Choice B is correct.** (8.F.A.2) Plan A base cost: \$15. Plan B at $m = 0$: \$20. Since $20 > 15$, Plan B is higher.
- 9) **Choice D is correct.** (8.F.A.3) Only $y = -3x + 4$ fits the linear form $y = mx + b$. Options A (exponential), B (reciprocal), and C (absolute value) are all nonlinear.
- 10) **Choice A is correct.** (8.F.B.4) Daily rate is \$20 per day (slope). Deposit \$15 is the fixed cost (intercept). Equation: $C = 20d + 15$.
- 11) **Choice B is correct.** (8.G.A.3) Left means subtract from x ; up means add to y . The rule is $(x, y) \rightarrow (x - 5, y + 8)$.
- 12) **Choice A is correct.** (8.G.A.5) By the exterior angle theorem, an exterior angle of a triangle equals the sum of the two remote interior angles. If those two angles have a sum greater than 90° , the exterior angle is obtuse.
- 13) **Choice B is correct.** (8.G.B.6, 8.G.B.7) Check: $6^2 + 8^2 = 36 + 64 = 100 = 10^2$. This is a scaled 3-4-5 triple (all multiplied by 2).
- 14) **Choice B is correct.** (8.G.B.8) Distance = $\sqrt{(5-0)^2 + (12-0)^2} = \sqrt{25 + 144} = \sqrt{169} = 13.0$. (This is a 5-12-13 Pythagorean triple.)
- 15) **Choice A is correct.** (8.G.B.7) A linear pair sums to 180° : $5y + (2y + 54) = 180 \Rightarrow 7y + 54 = 180 \Rightarrow 7y = 126 \Rightarrow y = 18^\circ$.
- 16) **Choice B is correct.** (8.G.C.9) $V_X = \frac{1}{3} \times 9 \times 10 = 30 \text{ cm}^3$. $V_Y = \frac{1}{3} \times 36 \times 10 = 120 \text{ cm}^3$. Ratio: $\frac{30}{120} = 1 : 4$.
- 17) **Choice C is correct.** (8.G.B.7) Each rectangle area = $4 \times 2 = 8 \text{ m}^2$. Three rectangles = $3 \times 8 = 24 \text{ m}^2$.
- 18) **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.
- 19) **The correct answer is (3, 6).** (8.EE.C.8a) Substitute $y = 2x$ into $x + y = 9$: $x + 2x = 9$, so $3x = 9$, giving $x = 3$. Then $y = 2(3) = 6$.
- 20) **Choice D is correct.** (8.G.A.5) The sum of exterior angles is always 360° . If each exterior angle is 24° , then $n = \frac{360}{24} = 15$.
- 21) **Choice C is correct.** (8.SP.A.1) Even a strong correlation ($r = 0.88$) only shows association. The mattress company confuses correlation with causation. Better test scores might result from healthier habits, nutrition, or academic motivation—not specifically the mattress.
- 22) **Choice A is correct.** (8.SP.A.4) Joint frequency is the intersection count divided by the grand total: $\frac{63}{150} = \frac{21}{50} = 0.42$.
- 23) **The correct answer is 45.** (8.EE.C.7) Substitute $x = 1$: $(1 + 4)(1 + 8) = 5 \cdot 9 = 45$.
- 24) **Choice A is correct.** (8.G.B.7) $3 \times 4 \times 2 = 24$ different combinations.
- 25) **Choice B is correct.** (8.EE.C.7b) First digit: 10 choices. Second digit: 9 remaining choices. Third: 8 remaining. Total: $10 \times 9 \times 8 = 720$.
- 26) **Choice B is correct.** (8.SP.A.2) At $x = 5$ on the trend line, the corresponding y -value is approximately 6.



Hi, Persistent Problem Solver!

◇ Some Grade 8 questions ask you to hold several ideas in your mind at once. That can feel hard, and that is exactly why practice matters. ◇

★ **Remember this:** You showed persistence by continuing through the set. That habit is powerful because difficult problems often open after one more good attempt. You practiced across 5 full Grade 8 practice tests, and that repeated effort matters. ★

Persistence Tools

- **Try a Smaller Case:** Use an easier number to see the pattern.
- **Draw It:** Make the situation visible.
- **Restate It:** Say the question in your own words.
- **Check One Step:** Fix the first unclear place.

Grade 8 test-day tip: When stuck, do not restart everything. Find the first step you trust, then rebuild from there.

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

Jay Daie

Your Persistence Coach

Practice Today. Succeed Tomorrow!

Give your child the confidence and skills they need with **5 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 |
| ✓ Measurement & Data | ✓ And More! |

5
PRINTED
TESTS



2 ONLINE
TESTS



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