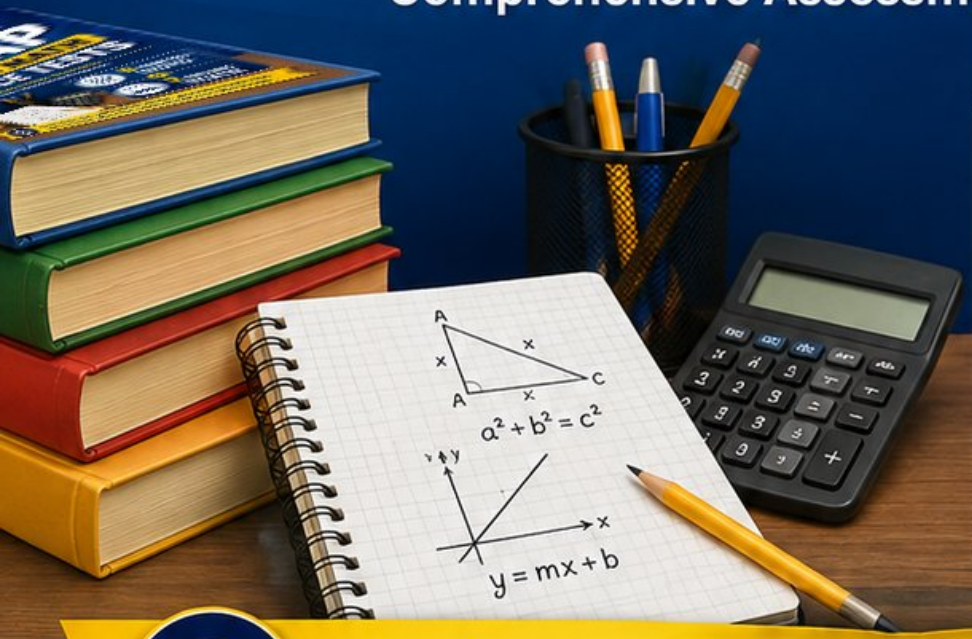
6 Hawaii Smarter Balanced

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For Comprehensive Assessment Programs



6 PRINTED TESTS

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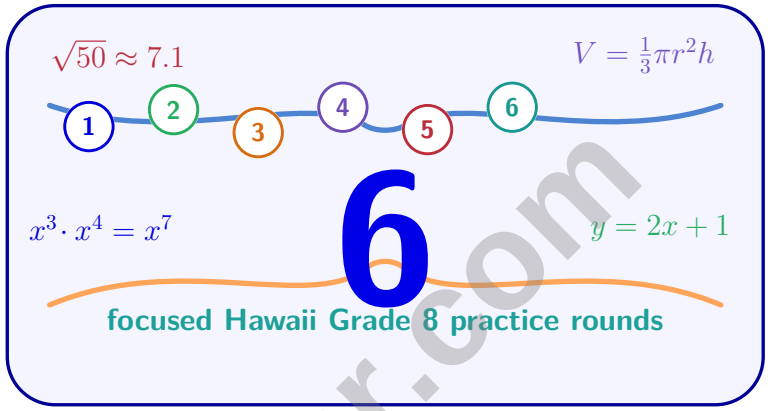
2 ONLINE TESTS

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

6 Hawaii Smarter Balanced Grade 8 Math Practice Tests

Complete Grade 8 Practice for Functions, Equations, Geometry, and Data



Six 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!

Six focused rounds for sharper Smarter Balanced math thinking

This book gives you six 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.

How to Use This Book

A six-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?

Six Smarter Balanced tests, 240 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 4–6	Functions, systems, transformations, geometry, data analysis, and multi-step problem solving.
Answer Pages	Compact keys and explanations that show why each answer works.

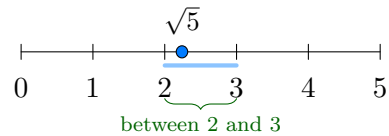
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.

Table of Contents

1) Between which integers does $\sqrt{99}$ lie?

☐ A. 8 and 9
☐ B. 7 and 8
☐ C. 10 and 11
☐ D. 9 and 10

2)



Based on the number line, which statement is true?

☐ A. $\sqrt{5}$ is rational
☐ B. $\sqrt{5}$ is between 1 and 2
☐ C. $\sqrt{5} = 2.5$
☐ D. $\sqrt{5} \approx 2.24$

3) Between which two consecutive integers does $\sqrt{24}$ fall?

n	n^2	Compare to 24
3	9	Too small
4	16	Too small
5	25	Too large

☐ A. Between 3 and 4
☐ B. Between 6 and 7
☐ C. Between 5 and 6
☐ D. Between 4 and 5

4) A scientist measures a particle with mass $m = 10^{-6}$ kilograms. Rewrite this as a fraction.

☐ A. $\frac{1}{6}$ kg
☐ B. -10^6 kg
☐ C. 10^6 kg
☐ D. $\frac{1}{10^6}$ kg

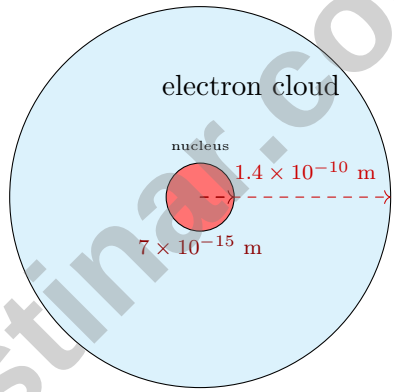
5) A square has a side length of 11 cm. What is its area?

☐ A. 99 cm^2
☐ B. 110 cm^2
☐ C. 121 cm^2
☐ D. 132 cm^2

6) Which is the correct scientific notation for the standard form 0.0031?

☐ A. 3.1×10^{3}
☐ B. 3.1×10^{-2}
☐ C. 31×10^{-4}
☐ D. 3.1×10^{-3}

7) A gold nucleus has a radius of about 7×10^{-15} meters. The electron cloud of a gold atom extends to about 1.4×10^{-10} meters. The atomic radius is how many times the nuclear radius?

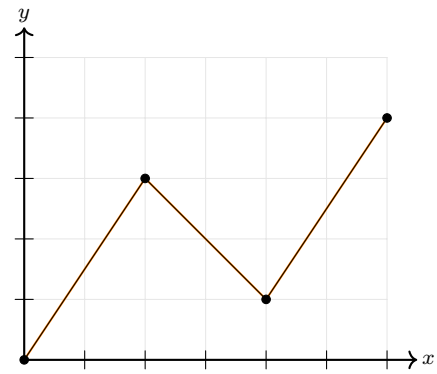


☐ A. 0.5×10^{5}
☐ B. 5×10^{4}
☐ C. 2×10^{4}
☐ D. 2×10^{5}

8) Is the equation $y = 7$ (a horizontal line) a function?

☐ A. No, because y never changes.
☐ B. No, because there is no variable x.
☐ C. Yes, each x produces exactly one output ($y = 7$).
☐ D. Yes, only if x is positive.

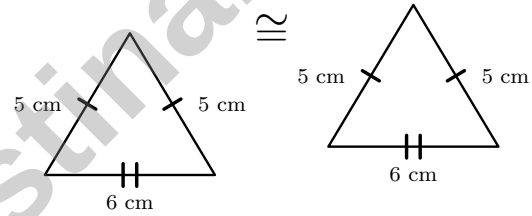
9)



Over which interval is the function decreasing most rapidly?

☐ A. From $x = 0$ to $x = 2$
☐ B. From $x = 2$ to $x = 4$
☐ C. From $x = 4$ to $x = 6$
☐ D. The function never decreases

10) Two congruent isosceles triangles are shown with tick marks indicating equal sides. Triangle 1 has a base of 6 cm and equal sides of 5 cm each. What is the perimeter of Triangle 2?

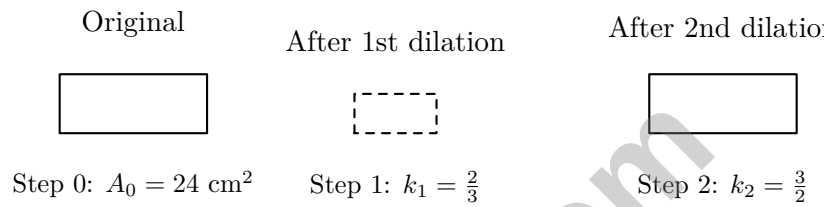


☐ A. 11 cm
☐ B. 16 cm
☐ C. 22 cm
☐ D. 30 cm

1) A regular pentagon has all sides equal and all angles equal. What is the measure of each interior angle?

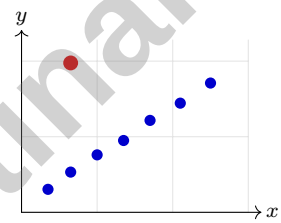
☐ A. 120°
☐ B. 100°
☐ C. 72°
☐ D. 108°

2) A rectangle undergoes two successive dilations: first by scale factor $\frac{2}{3}$, then by scale factor $\frac{3}{2}$. If the original rectangle has area 24 cm^2, what is the final area?



☐ A. 24 cm^2
☐ B. 16 cm^2
☐ C. 32 cm^2
☐ D. 54 cm^2

3)



A medical study plots patient age (years) versus cholesterol level (mg/dL). The scatter plot shows a moderate positive correlation with most points clustered near a trend line. However, one 35-year-old has a cholesterol level of 280 mg/dL, while most 35-year-olds in the study have levels near 200 mg/dL. A doctor should:

☐ A. Investigate this outlier for potential health risks or data errors
☐ B. Ignore it because the overall trend is clear
☐ C. Remove it to improve the correlation coefficient
☐ D. Use it to predict all 35-year-olds' cholesterol levels

4) Two-way table of 200 employees and training completion:

	Completed	Incomplete	Total
Salaried	96	24	120
Hourly	56	24	80
Total	152	48	200

What is the relative frequency of incomplete training among all employees?

☐ A. $\frac{24}{120} = 0.20$
☐ B. $\frac{48}{200} = 0.24$
☐ C. $\frac{24}{80} = 0.30$
☐ D. $\frac{48}{120} = 0.40$

5) A sports analyst compares two players' scoring consistency. Player A averaged 15 points with MAD = 1.5. Player B averaged 15 points with MAD = 4. Who is the more reliable scorer?

☐ A. Player A (more consistent)
☐ B. Player B (higher variability makes them adaptable)
☐ C. They are equally reliable
☐ D. Cannot determine from MAD alone

6) Two parallel lines are cut by a transversal. One angle measures 73°. Write and solve an equation to find the measure of its co-interior angle.

1) Solve for x: $6x - 3(x + 2) = 3$

☐ A. $x = 3$
☐ B. $x = 2$
☐ C. $x = 1$
☐ D. $x = 9$

2) Which statement is true about the exterior angles of any convex polygon?

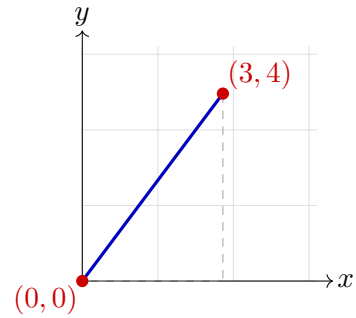
☐ A. Each exterior angle measures less than 90°.
☐ B. The sum of all exterior angles is always 360°.
☐ C. Exterior angles are always equal in any polygon.
☐ D. The sum depends on the number of sides.

3) The table shows the distance traveled over time. Is this a linear relationship?

Time (h)	1	2	3	4
Distance (mi)	60	120	180	240

☐ A. No, time goes up to 4
☐ B. Yes, the first differences are constant (60 mi)
☐ C. No, the distances double
☐ D. Yes, the ratio of distance to time is not constant

4) Two points on a coordinate plane are located at $(0, 0)$ and $(3, 4)$. What is the distance between these two points?



☐ A. 5
☐ B. 7
☐ C. 12
☐ D. 25

5) A triangle has area 36 cm^2. If the triangle is dilated by a scale factor of $\frac{2}{3}$, what is the area of the dilated triangle?

☐ A. 16 cm^2
☐ B. 24 cm^2
☐ C. 36 cm^2
☐ D. 54 cm^2

6) Factor $4x + 12$ completely.

☐ A. $4(x + 3)$
☐ B. $2(2x + 6)$
☐ C. $12(x + 1)$
☐ D. $x + 12$

7) Plant X: $H(d) = 2d + 10$ cm. Plant Y at days $0, 5, 10$ has heights $15, 20, 25$ cm. Which started taller?

☐ A. Plant X
☐ B. Plant Y
☐ C. Both same.
☐ D. Cannot be determined.

8) Water drains from a tank at a rate of 3 gallons per minute. The tank starts with 120 gallons. Which equation gives the amount of water W (in gallons) after t minutes?

☐ A. $W = -3t + 120$
☐ B. $W = 3t + 120$
☐ C. $W = 120t - 3$
☐ D. $W = 120 - t$

9) A bakery produces 50 cookies per hour. After 4 hours, how many cookies have been produced?

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.

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

1) **Choice D is correct.** 8.NS.A.2 $9^2 = 81$ and $10^2 = 100$. Since $81 < 99 < 100$, we have $9 < \sqrt{99} < 10$.
2) **Choice D is correct.** 8.NS.A.1 The number line shows $\sqrt{5}$ positioned between 2 and 3, closer to 2.2. Since $2.2^2 = 4.84$ and $2.24^2 \approx 5.02$, we have $\sqrt{5} \approx 2.24$. Also, $\sqrt{5}$ is irrational.
3) **Choice D is correct.** 8.NS.A.2 $4^2 = 16$ and $5^2 = 25$. Since $16 < 24 < 25$, we have $4 < \sqrt{24} < 5$. More precisely, $\sqrt{24} \approx 4.90$.
4) **Choice D is correct.** 8.EE.A.1 Negative exponent rule: $10^{-6} = \frac{1}{10^6}$.
5) **Choice C is correct.** 8.EE.A.2 Area of a square $= s^2 = 11^2 = 121$ cm^2.
6) **Choice D is correct.** 8.EE.A.3 Move the decimal 3 places right from 0.0031 to get 3.1, giving 3.1×10^{-3}.
7) **Choice C is correct.** 8.EE.A.4 $\frac{1.4\times10^{-10}}{7\times10^{-15}} = \frac{1.4}{7} \times 10^5 = 0.2 \times 10^5 = 2 \times 10^4$.
8) **Choice C is correct.** 8.F.A.1 Constant functions are functions. For every x, the output is always 7, satisfying the one-input-one-output requirement.
9) **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.
10) **Choice B is correct.** 8.G.A.2 Perimeter of Triangle $1 = 5 + 5 + 6 = 16$ cm. Even though Triangle 2 is oriented differently (rotated or reflected), congruent figures have equal corresponding sides. Therefore, Triangle 2 also has sides of 5 cm, 5 cm, and 6 cm, giving a perimeter of 16 cm.
11) **Choice D is correct.** 8.EE.B.5 Choose two points from the table: $(2, 18)$ and $(4, 36)$. Slope $= \frac{36-18}{4-2} = \frac{18}{2} = 9$ dollars per hour.
12) **Choice A is correct.** 8.EE.C.8c "Sum" translates to $x + y = 20$. "Difference" translates to $x - y = 4$ (or $y - x = 4$, depending on order). Options B, C, and D do not match these descriptions.
13) **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 $m(4) = 11 + 6 = 17$.
14) **Choice D is correct.** 8.G.C.9 The net shows all 6 faces of a cube. Each face has area $3^2 = 9$ cm^2. Total surface area $= 6 \times 9 = 54$ cm^2.
15) **The correct answer is** 0.1 . 8.SP.A.2 Compute $1.2 - 1.1 = 0.1$.
16) **Choice C is correct.** 8.EE.B.6 As x increases by 1, y increases by 3. Slope $= \frac{\Delta y}{\Delta x} = \frac{3}{1} = 3$.
17) **Choice A is correct.** 8.G.A.1 The image is the mirror of the original across the y-axis. A point at $(2, 1)$ maps to $(-2, 1)$, confirming the reflection.
18) **Choice A is correct.** 8.EE.C.7 Total cost is adult tickets plus child tickets. If a adults, then $(6 - a)$ children. Equation: $12a + 8(6 - a) = 60$.
19) **Choice A is correct.** 8.EE.C.8b The open circle at 2 means 2 is not included. The ray points left to smaller values, so $x < 2$.
20) **Choice A is correct.** 8.EE.C.8b The line is $x - 2y = 6$. Test origin: $0 - 0 = 0 \leq 6$ TRUE. So the origin is in the solution region with $\leq$.
21) **Choice D is correct.** 8.G.C.9 Cylinder: $V = 3.14 \times 64 \times 6 = 1205.76$ m^3. Cone: $V = \frac{1}{3} \times 3.14 \times 64 \times 6 = 401.92$ m^3. Difference: $1205.76 - 401.92 = 803.84$ m^3.
22) **The correct answer is A,C.** 8.G.A.4 Correct: (A) Corresponding angles are congruent — definition of similarity. (C) Corresponding sides are proportional — they scale by a constant factor k. Incorrect: (B) Equal length is congruence, not similarity. (D) Congruence requires equality; similarity allows scaling. (E) Scale factor can be any positive number; $k < 1$ is a reduction, still similarity.
23) **Choice A is correct.** 8.SP.A.3 The slope is the rate of change. A slope of 1.5 means for every 1-unit increase in x, y increases by 1.5.
24) **Choice D is correct.** 8.G.B.7 Solve for r: $450 = 3000 \times r \times 3 \Rightarrow r = \frac{450}{9000} = 0.05 = 5\%$.

Hi, Progress Maker!

◇ You have done more than complete a set of tests. You have rehearsed the habits that make Grade 8 math feel less surprising. ◇

⋆ **Remember this:** Progress is not always loud. Sometimes it looks like fewer careless errors, clearer work, better pacing, and more confidence when a problem is unfamiliar. You practiced across 6 full Grade 8 practice tests, and that repeated effort matters. ⋆

Signs of Growth

- **Clear Work:** Your steps are easier to follow.
- **Better Pacing:** You know when to move on and return.
- **Stronger Checks:** You catch mistakes earlier.
- **Calmer Thinking:** You know what to try next.

Grade 8 test-day tip: Keep one short list of mistakes you often make, then check that list before each practice session.

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

Jay Daie

Your Growth Coach

PRACTICE TODAY. ACHIEVE TOMORROW.

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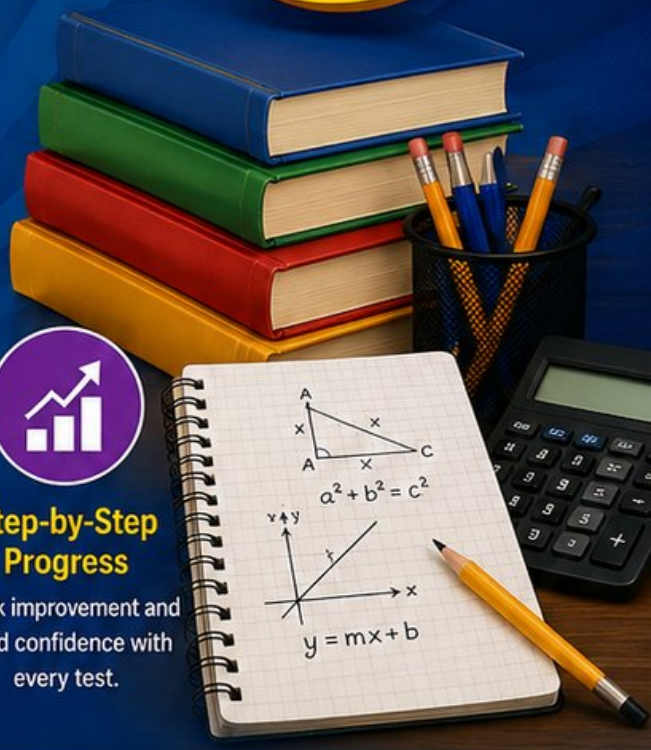
Give your child the confidence and skills they need with **6 full-length Grade 8** Math practice tests that reflect real test formats and cover all key math standards. Perfect for building skills, strengthening problem-solving abilities, and achieving success on test day!



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
- Expressions & Equations
- Ratios & Proportional Relationships
- Linear Equations
- Functions
- Geometry
- Statistics & Probability
- Pythagorean Theorem
- Volume & Surface Area
- Transformations
- Inequalities
- Data Analysis & Graphing
- And More!

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