

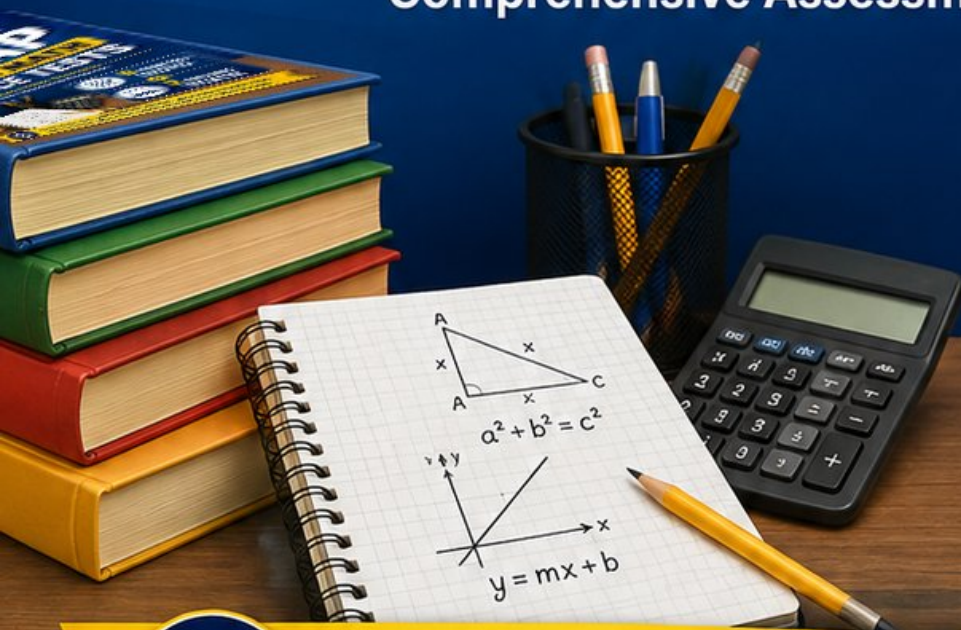
# 6

# Washington

## Smarter Balanced

# GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For  
Comprehensive Assessment Programs



**6** PRINTED  
TESTS

**+**



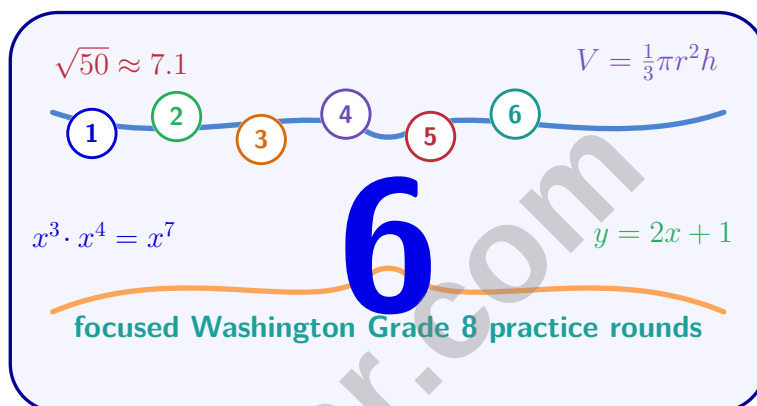
**2** ONLINE  
TESTS



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

# 6 Washington Smarter Balanced Grade 8 Math Practice Tests

*State-Aligned Grade 8 Practice with Mixed Review and Answer Support*



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**



# Copyright ©

## Testinar Inc



Published by Testinar Inc

[Testinar.com](http://Testinar.com)

All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the author, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law, including Section 107 or 108 of the 1976 United States Copyright Act.

This publication is independently produced and has no official connection to any state, district, or national testing program.

Test names and organizational names used herein are the property of their respective trademark holders.



*Copyright ©*

# Welcome, Washington 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 Washington 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 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.

**Washington 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.



Scan me!  
For more practice  
& answers

# Table of Contents

|                                        |       |     |
|----------------------------------------|-------|-----|
| ★ Practice Test 1                      | _____ | 15  |
| ★ Practice Test 2                      | _____ | 32  |
| ★ Practice Test 3                      | _____ | 48  |
| ★ Practice Test 4                      | _____ | 63  |
| ★ Practice Test 5                      | _____ | 78  |
| ★ Practice Test 6                      | _____ | 95  |
| Practice Test Answer Keys              | _____ | 111 |
| Practice Test Answers and Explanations | _____ | 115 |

1) Which of the following is rational?

☐ A.  $\sqrt{2}$

☐ B.  $\pi + 1$

☐ C.  $\sqrt{\pi}$

☐ D.  $\sqrt{64}$

2) Is  $\sqrt{22}$  closer to 4.6 or 4.7?

☐ A. 4.6

☐ B. Cannot determine

☐ C. Equally close

☐ D. 4.7

3) Which statement is true?

☐ A.  $\sqrt{36}$  is irrational

☐ B.  $\pi$  is rational

☐ C.  $\sqrt{11}$  is irrational

☐ D.  $0.333\ldots$  is irrational

4) A vehicle loan of \$25,000 at 6% simple interest for 5 years. What is the total amount to repay?

☐ A. \$25,750

☐ B. \$27,500

☐ C. \$30,000

☐ D. \$32,500

5) Visual: Expanded form.  $2^5$  means:

$$\underbrace{2 \times 2 \times 2 \times 2 \times 2}_{5 \text{ factors}}$$

If we multiply  $2^3 \times 2^4$ , how many total factors of 2 do we have?

☐ A. 2

☐ B. 12

☐ C. 24

☐ D. 7



Scan me!

For more practice  
& answers

6) A student claims that  $\sqrt{49} + \sqrt{64} = \sqrt{113}$ . Is this correct?

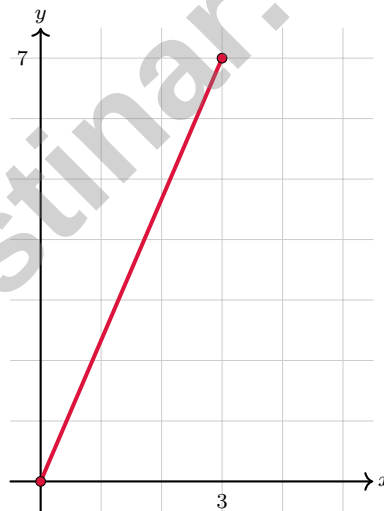
- ☐ A. Yes, because  $49 + 64 = 113$       ☐ C. No, because square roots cannot be added
- ☐ B. Yes, but only if we simplify the radicals first      ☐ D. No, because  $\sqrt{49} + \sqrt{64} = 15$

7) The wavelength of visible light is about  $5 \times 10^{-7}$  m, while the wavelength of a radio wave is about  $3 \times 10^3$  m. How many times larger is the radio wavelength?

- ☐ A.  $1.67 \times 10^9$  times      ☐ C.  $6 \times 10^{-4}$  times
- ☐ B.  $1.5 \times 10^4$  times      ☐ D.  $6 \times 10^9$  times

8)  $(5.2 \times 10^6) - (1.5 \times 10^6) = ?$

- ☐ A.  $0.37 \times 10^6$       ☐ C.  $3.7 \times 10^0$
- ☐ B.  $6.7 \times 10^6$       ☐ D.  $3.7 \times 10^6$



9)

At  $x = 6$ , what is the value of  $y$ ?

- ☐ A. 12      ☐ C. 14
- ☐ B. 13      ☐ D. 15



10) Factor  $4x^2 - 9$ .

☐ A.  $(2x - 3)(2x + 3)$

☐ C.  $(2x - 3)^2$

☐ B.  $(4x - 9)(x + 1)$

☐ D.  $(x - 3)(4x + 3)$

11) A scatter plot shows the number of hours a student studies versus their test score. The trend line has equation  $y = 5x + 60$ . If a student studies for 6 hours, what is the predicted test score?

12) Which equation is NONLINEAR?

☐ A.  $y = 100 - 5x$

☐ C.  $y = \frac{1}{x^2}$

☐ B.  $y = \frac{1}{4}x$

☐ D.  $y = 8x$

13) A card is randomly selected from a standard deck of 52 cards. What is the probability of drawing a spade? Express your answer as a fraction in simplest form.

14) Which two points give a slope of  $-\frac{3}{2}$ ?

☐ A.  $(0, 3)$  and  $(2, 0)$

☐ C.  $(2, 4)$  and  $(4, 4)$

☐ B.  $(1, 2)$  and  $(3, 4)$

☐ D.  $(0, 0)$  and  $(3, 2)$



Scan me!

For more practice  
& answers

+ -

.....

19

.....

× ÷

Testinar.com

1) A store advertises: “Pay \$250 down and \$150/month for 12 months.” If the item costs \$1,500 cash, what is the finance charge?

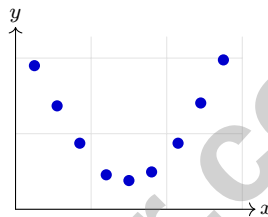
☐ A. \$0

☐ C. \$100

☐ B. \$50

☐ D. \$550

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

☐ A.  $16 \text{ cm}^2$ 
☐ C.  $36 \text{ cm}^2$ 
☐ B.  $24 \text{ cm}^2$ 
☐ D.  $54 \text{ cm}^2$ 


3)

A scatter plot of outdoor temperature ( $^{\circ}\text{C}$ ) versus energy consumption (kWh) for a city shows a U-shaped curve: energy use is high on very cold days, lower on mild days, and high again on very hot days. This pattern violates the assumption of:

☐ A. Random data collection

☐ C. Positive correlation always

☐ B. Linear (straight-line) relationship

☐ D. No outliers in the data

4) A researcher measures the marginal relative frequency of a category as  $\frac{\text{cell}}{\text{row total}}$  instead of  $\frac{\text{row total}}{\text{grand total}}$ . What type of frequency did the researcher calculate?

☐ A. Marginal relative frequency (correct).

☐ C. Row-conditional relative frequency.

☐ B. Joint relative frequency.

☐ D. Column-conditional relative frequency.


5) A manufacturing plant tracks widget defects per day:  $\{0, 1, 1, 2, 6\}$ . Mean = 2. What does the MAD tell us?

- ☐ A. The mode number of defects      ☐ C. That 6 defects is an outlier  
☐ B. The typical deviation from the average number of defects      ☐ D. The maximum possible defects

6) A box contains 6 pencils: 2 red, 3 blue, and 1 green. If you draw a pencil, replace it, then draw again, what is the probability of drawing blue both times?

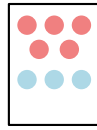
- ☐ A.  $\frac{9}{36}$       ☐ C.  $\frac{3}{18}$   
☐ B.  $\frac{1}{3}$       ☐ D.  $\frac{3}{6}$

7) A right triangle has a hypotenuse of 13 units and one leg of 5 units. Find the length of the other leg.

8) An angle is  $12^\circ$  less than three times its supplement. Write and solve an equation to find the angle's measure.



Scan me!  
For more practice  
& answers



5 red, 3 blue

1)

A bag contains 5 red and 3 blue marbles. A marble is drawn, its color noted, replaced, then another marble is drawn. What is the probability both marbles are red?

☐ A.  $\frac{10}{64}$

☐ C.  $\frac{10}{16}$

☐ B.  $\frac{25}{64}$

☐ D.  $\frac{5}{8}$

2) A student's test score shows: starts at 60, increases to 90 by question 5, then stays at 90 for questions 6-10, where 90 is the maximum possible score. Which is true?

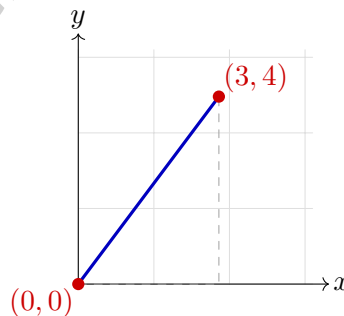
☐ A. The student answered 30 consecutive questions correctly

☐ C. The student's score increased from question 5 to 10

☐ B. The rate of improvement was constant throughout

☐ D. The student improved in the first half but was already at the ceiling in the second half

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



☐ A. 5

☐ C. 12

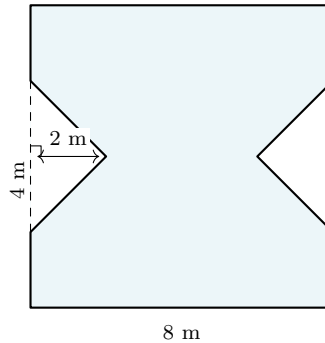
☐ B. 7

☐ D. 25



Scan me!  
For more practice  
& answers

- 4) 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.  $56 \text{ m}^2$  ☐ C.  $64 \text{ m}^2$   
☐ B.  $60 \text{ m}^2$  ☐ D.  $72 \text{ m}^2$
- 5) Rectangle  $X$  is similar to Rectangle  $Y$ . Rectangle  $X$  has perimeter 20 m. Rectangle  $Y$  has perimeter 50 m. What is the ratio of the side lengths ( $X$  to  $Y$ )?
- ☐ A. 2 : 5 ☐ C. 5 : 2  
☐ B. 4 : 25 ☐ D. 25 : 4
- 6) What is the sum of the interior angles of a hexagon?
- ☐ A.  $900^\circ$  ☐ C.  $360^\circ$   
☐ B.  $540^\circ$  ☐ D.  $720^\circ$



## Washington 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 Washington Smarter Balanced practice test.**



Scan me!  
For more practice  
& answers

## Practice Test Answers and Explanations

### Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** (8.NS.A.1)  $\sqrt{64} = 8$ , a whole number and therefore rational. The other values involve irrational numbers:  $\sqrt{2}$  is irrational,  $\pi + 1$  is the sum of an irrational and a rational,  $\sqrt{\pi}$  is the square root of an irrational number.
- 2) **Choice D is correct.** (8.NS.A.2)  $(4.6)^2 = 21.16$  and  $(4.7)^2 = 22.09$ . Since 22 is closer to 22.09,  $\sqrt{22}$  is closer to 4.7.
- 3) **Choice C is correct.** (8.NS.A.2)  $\sqrt{36} = 6$  (rational),  $\pi$  is irrational, and  $0.333\ldots = \frac{1}{3}$  (rational).  $\sqrt{11}$  cannot be expressed as a ratio of integers.
- 4) **Choice D is correct.** (8.G.B.7) Interest:  $I = 25000 \times 0.06 \times 5 = \$7,500$ . Total:  $25000 + 7500 = \$32,500$ .
- 5) **Choice D is correct.** (8.EE.A.1)  $2^3$  has 3 factors,  $2^4$  has 4 factors. Total:  $3 + 4 = 7$  factors. This illustrates the product rule:  $2^3 \times 2^4 = 2^7$ .
- 6) **Choice D is correct.** (8.EE.A.2)  $\sqrt{49} = 7$  and  $\sqrt{64} = 8$ , so  $7 + 8 = 15 \neq \sqrt{113} \approx 10.63$ . You cannot add the radicands before taking the root.
- 7) **Choice D is correct.** (8.EE.A.3) Divide:  $\frac{3 \times 10^3}{5 \times 10^{-7}} = \frac{3}{5} \times 10^{3-(-7)} = 0.6 \times 10^{10} = 6 \times 10^9$ .
- 8) **Choice D is correct.** (8.EE.A.4) Same exponents:  $(5.2 - 1.5) \times 10^6 = 3.7 \times 10^6$ .
- 9) **Choice C is correct.** (8.EE.B.5) Slope  $k = \frac{7}{3}$ . Equation:  $y = \frac{7}{3}x$ . At  $x = 6$ :  $y = \frac{7}{3}(6) = 14$ .
- 10) **Choice A is correct.** (8.EE.C.7) Difference of squares:  $4x^2 - 9 = (2x)^2 - 3^2 = (2x - 3)(2x + 3)$ .
- 11) **The correct answer is 90.** (8.SP.A.2) Substitute  $x = 6$ :  $y = 5(6) + 60 = 30 + 60 = 90$ .
- 12) **Choice C is correct.** (8.F.A.3)  $y = \frac{1}{x^2}$  is a reciprocal function with  $x$  in the denominator, making it nonlinear. All others are linear.
- 13) **The correct answer is  $\frac{1}{4}$ .** (8.G.B.7) There are 13 spades in a standard deck.  $P(\text{spade}) = \frac{13}{52} = \frac{1}{4}$ .
- 14) **Choice A is correct.** (8.EE.B.5) Option A: slope  $= \frac{0-3}{2-0} = \frac{-3}{2} = -\frac{3}{2}$ .
- 15) **Choice C is correct.** (8.EE.C.8c) Boat A's effective upstream speed is  $10 - 2 = 8$  mph. Boat B's effective downstream speed is  $14 + 2 = 16$  mph. Their separation increases at  $8 + 16 = 24$  mph, so  $24t = 36$  and  $t = 1.5$  hours.
- 16) **Choice B is correct.** (8.F.A.1) Find where the graph crosses the horizontal line  $y = 2$ . This occurs at the point  $(2, 2)$ , so  $x = 2$ .
- 17) **Choice D is correct.** (8.G.C.9) A triangular pyramid has 4 triangular faces (one base, three lateral). If each has area  $10 \text{ cm}^2$ , total surface area  $= 4 \times 10 = 40 \text{ cm}^2$ .
- 18) **The correct answer is A,C.** (8.G.A.4) Correct: (A) All linear measurements (sides, perimeter) are multiplied by 2.5. (C) Area is multiplied by  $(2.5)^2 = 6.25$ . Incorrect: (B) Angles are congruent in dilation, not scaled. (D) Perimeter is multiplied, not divided, by 2.5. (E) Dilation preserves shape; polygon type does not change.
- 19) **Choice C is correct.** (8.G.A.1) A  $90^\circ$  counterclockwise rotation sends the rectangle to a vertical position. Translating that rotated image 5 units down matches the orange image.
- 20) **Choice A is correct.** (8.EE.B.6) Slope  $= \frac{3-0}{0-(-1)} = 3$ . When  $x = 0$ ,  $y = 3$ , so  $b = 3$ . Thus  $y = 3x + 3$ .
- 21) **Choice D is correct.** (8.EE.C.7) Subtract  $2x$  and add 3:  $3x = 12$ . Divide by 3:  $x = 4$ . (Distractor A: result of dividing 12 by 3 incorrectly; C: forgetting to distribute constant; D: result of incorrect arithmetic.)
- 22) **Choice D is correct.** (8.EE.C.8a) The first two systems are lines with different equations but the same form (both are  $x = 2$  or  $y = 4$ , not two distinct lines). Option C has parallel lines (same slope, different intercepts). Option D has different slopes, so the lines intersect at exactly one point.
- 23) **Choice C is correct.** (8.EE.C.8b) The inequality  $x \geq -1$  includes  $-1$  (closed circle) and all values greater (ray points right).
- 24) **The correct answer is 192.** (8.EE.C.7b) Multiply the number of choices:  $6 \times 8 \times 4 = 192$  different complete meals.
- 25) **Choice C is correct.** (8.EE.C.8b) Strict inequality ( $<$ ) means a DASHED boundary line. Because  $y$  is LESS than the expression, shade BELOW the line.
- 26) **Choice A is correct.** (8.G.C.9) Since height is constant, volume depends on  $r^2$ .  $r_1^2 = 4 < r_2^2 = 9 < r_3^2 = 16$ . Order: smallest to largest is  $r_1, r_2, r_3$ .



Scan me!  
For more practice  
& answers

## Hi, Number Sense Builder!

◇ Grade 8 mathematics connects numbers, algebra, geometry, and data. It helps you model linear change, compare functions, estimate irrational values, measure distance, and explain patterns. ◇

★ **Remember this:** You practiced listening to that story. When the answer makes sense in the situation, your math becomes much stronger. This version gave you 6 opportunities to rehearse test-day habits. ★

### Number Sense Checks

- **Too Big?:** Compare with an estimate.
- **Too Small?:** Use the context to judge.
- **Right Sign?:** Positive and negative values matter.
- **Right Unit?:** A number needs meaning.

**Grade 8 test-day tip:** Before choosing an answer, ask whether it fits the story of the problem.

If you want to share something or ask a question, please email me at [jay@testinar.com](mailto:jay@testinar.com).

**Jay Daie**

Your Number-Sense Friend

# PRACTICE TODAY. ACHIEVE TOMORROW.

# 6

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



**6 PRINTED TESTS**



**2 ONLINE TESTS**



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