

Washington

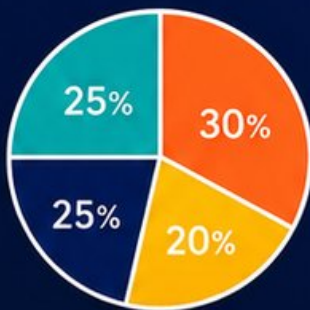
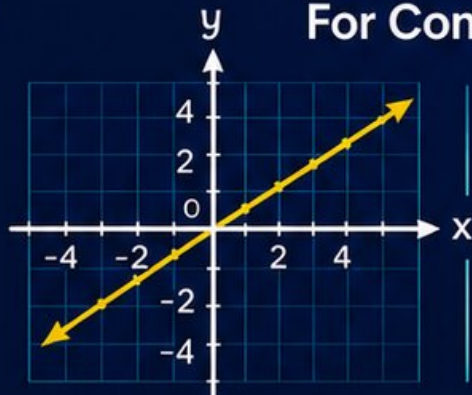
Smarter Balanced

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

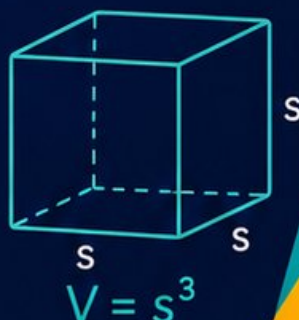


$$y = mx + b$$

$$2x - 3y = 6$$

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

$$A = bh$$



4 PRINTED TESTS



2 ONLINE TESTS



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



4 Washington Smarter Balanced Grade 8 Math Practice Tests

Targeted Smarter Balanced Review for Algebra, Geometry, and Data Confidence



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, Washington 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 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 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.

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?

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.

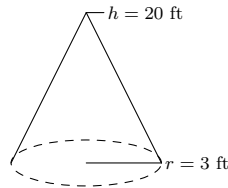
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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& answers

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1)

A cone has radius 3 ft and height 20 ft. What is its approximate volume? (Use $\pi \approx 3.14$.)

☐ A. 188.4 ft^3
☐ C. 226.08 ft^3
☐ B. 56.52 ft^3
☐ D. 339.12 ft^3

2) 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

3) The area model below represents $(x + 2)(x + 4)$:

	x	2
x	x^2	$2x$
4	$4x$	8

What is the total area?

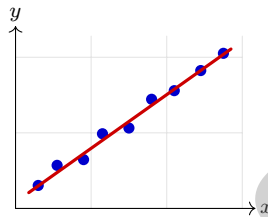
☐ A. $x^2 + 6x + 8$
☐ C. $x^2 + 4x + 2$
☐ B. $x^2 + 8$
☐ D. $2x^2 + 6x + 8$


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- 4) In a game, you spin a spinner with 3 colors (red, yellow, green) and flip a coin (heads, tails). The table shows all outcomes. How many outcomes are there?

	Red	Yellow	Green
Heads	(H,R)	(H,Y)	(H,G)
Tails	(T,R)	(T,Y)	(T,G)

- ☐ A. $3 + 2 = 5$
☐ C. $2^3 = 8$
☐ B. $3 \times 2 = 6$
☐ D. $3^2 = 9$



5)

Which is the BEST description of a “line of best fit” on a scatter plot?

- ☐ A. A line that passes through every data point
☐ B. A line that passes through no data points
☐ C. A line that generally shows the overall trend of the data
☐ D. A line that only passes through the outliers
- 6) Two similar trapezoids have parallel sides. In trapezoid T_1 , the bases are 10 cm and 6 cm. In trapezoid T_2 , the longer base is 15 cm. What is the length of the shorter base of T_2 ?

- ☐ A. 8 cm
 ☐ C. 10 cm
☐ B. 9 cm
 ☐ D. 12 cm



7) The table shows $f(x)$. If $f(x) = 8$, what is x ?

x	1	2	3	4
$f(x)$	4	6	8	10

☐ A. 1

☐ C. 3

☐ B. 2

☐ D. 4

Decimal Classification	
Terminating	Repeating
0.25	0.33
0.5	0.142857

8)

Both categories shown contain rational numbers. Which is irrational?

☐ A. 0.1234567 (terminating)

☐ C. $\frac{22}{7}$
☐ B. 0.999... (repeating 9's)

☐ D. 0.3030030003... (non-repeating)

9) A table shows:

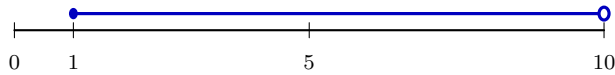
x	0	3	6
y	5	2	-1

What is the rate of change (slope)?



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Coefficient range for scientific notation

Valid interval: $1 \leq a < 10$ 

1)

Which number is NOT in correct scientific notation form?

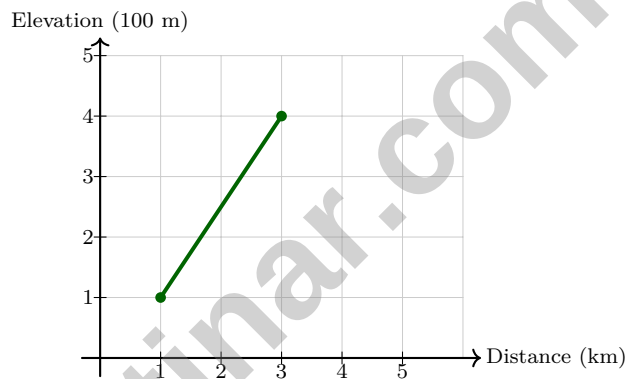
☐ A. 9.99×10^2

☐ C. 0.9×10^5

☐ B. 1.0×10^0

☐ D. 5.05×10^{-4}

2) The graph shows elevation change during a hike.



What is the slope of the line?

☐ A. $\frac{3}{4}$

☐ C. $\frac{3}{2}$

☐ B. $\frac{2}{3}$

☐ D. 2

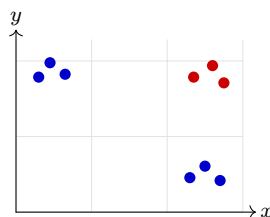
3) A father is currently 32 years older than his son. In 8 years, the father will be twice as old as the son. What is the son's current age?

☐ A. 16

☐ C. 24

☐ B. 20

☐ D. 28



4)

A scatter plot of rainfall (inches) versus plant height (cm) shows several clusters of points. One cluster has points at low rainfall and low plant height. Another cluster shows points at high rainfall and high plant height. A third small cluster is at high rainfall but very low plant height. Which cluster represents an unexpected or unusual situation?

- ☐ A. Low rainfall, low plant height (expected) ☐ C. High rainfall, low plant height (unexpected)
☐ B. High rainfall, high plant height (expected) ☐ D. Cannot determine what is unusual from a scatter plot

5) A two-way table of 480 products tracks quality and price point:

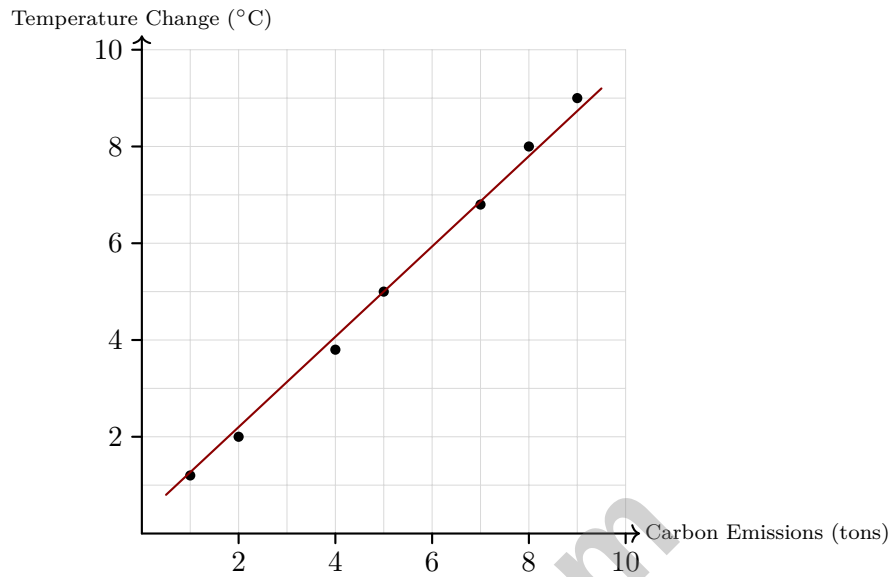
	Premium	Standard	Total
High Quality	240	80	320
Low Quality	48	112	160
Total	288	192	480

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. $\frac{320}{480} \approx 0.67$



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1)

A scientist studies the relationship between carbon emissions and temperature change. The trend line shows a strong positive relationship. Which is the best interpretation?

- ☐ A. As carbon emissions increase, temperature tends to increase on average
☐ B. Temperature change has no relationship to emissions
☐ C. Higher temperatures cause carbon emissions
☐ D. The relationship is random

2) Simplify $\frac{(k^2)^3 \cdot k^{-1}}{k^5}$.

- ☐ A. k^{-5}
☐ B. k^2
☐ C. k^{10}
☐ D. $k^0 = 1$



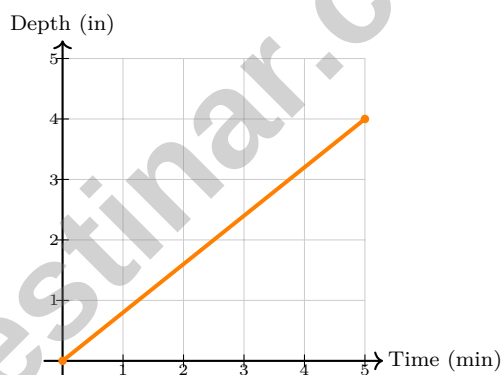
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- 3) A balloon starts at 300 meters and descends at 2 meters per second. What is the slope of the height model?

- 4) A student expands $(x - 4)^2$ and gets $x^2 - 16$. What is the error?

- ☐ A. Missing the middle term. ☐ C. Used subtraction instead of FOIL.
☐ B. Forgot to square the coefficient of x . ☐ D. The answer is correct; there is no error.

- 5) A graph shows depth of water versus time as a pool is filled.



What is the filling rate (slope)?

- ☐ A. $\frac{4}{5}$ inches per minute ☐ C. 4 inches per minute
☐ B. $\frac{5}{4}$ inches per minute ☐ D. 5 inches per minute



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.



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& answers

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** (8.G.C.9) $V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times 3.14 \times 9 \times 20 = \frac{1}{3} \times 565.2 = 188.4 \text{ ft}^3$.
- 2) **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.
- 3) **Choice A is correct.** (8.EE.C.7) Sum of areas: $x^2 + 2x + 4x + 8 = x^2 + 6x + 8$.
- 4) **Choice B is correct.** (8.EE.C.7b) From the table, count all cells: 3 colors times 2 coin outcomes = 6 total outcomes.
- 5) **Choice C is correct.** (8.SP.A.2) A line of best fit minimizes the overall distance between itself and the data points, capturing the general trend. It rarely passes through every point.
- 6) **Choice B is correct.** (8.G.A.4) Scale factor is $\frac{15}{10} = 1.5$. Shorter base is $6 \times 1.5 = 9 \text{ cm}$.
- 7) **Choice C is correct.** (8.F.A.1) Find the output value 8 in the table; it corresponds to $x = 3$.
- 8) **Choice D is correct.** (8.NS.A.1) A decimal that is non-terminating and non-repeating is irrational. The pattern of 0.303, 0.3003, 0.30003, ... never repeats, so this is irrational. $\frac{22}{7}$ is rational, and 0.999... repeats infinitely.
- 9) **The correct answer is -1.** (8.EE.B.5) Using (0, 5) and (3, 2): slope $= \frac{2-5}{3-0} = \frac{-3}{3} = -1$.
- 10) **The correct answer is Plot A.** (8.SP.A.1) Strength of correlation is judged by how closely points cluster around the trend line. Tight clustering (Plot A) indicates stronger correlation; wide scatter (Plot B) indicates weaker correlation.
- 11) **Choice B is correct.** (8.G.B.7) Not Y: X or Z. Total degrees: 360° . Not Y: $120 + 120 = 240$. $P = \frac{240}{360} = \frac{2}{3}$.
- 12) **Choice D is correct.** (8.NS.A.1) Let $x = 0.4\bar{5} = 0.4555\dots$. Then $10x = 4.\bar{5}$ and $100x = 45.\bar{5}$. Subtracting: $90x = 41$, so $x = \frac{41}{90}$.
- 13) **Choice D is correct.** (8.NS.A.2) The side length is $\sqrt{75}$. Since $8^2 = 64$ and $9^2 = 81$, and $64 < 75 < 81$, we have $8 < \sqrt{75} < 9$.
- 14) **Choice D is correct.** (8.G.B.7) Correct: $I = 400 \times (0.12/12) \times 1 = \4 . She incorrectly applied 12% for 1 month (should use the monthly rate of 1%), mistaking APR as a monthly rate.
- 15) **Choice D is correct.** (8.NS.A.2) $\frac{\sqrt{10}}{\sqrt{2}} = \sqrt{5} \approx 2.236$.
- 16) **Choice D is correct.** (8.EE.A.3) $9.9 \times 10^2 = 990$ and $1.0 \times 10^3 = 1,000$. The exponent dominates when coefficients are close.
- 17) **Choice C is correct.** (8.G.C.9) Radius $r = 5$ feet. Lateral (curved) surface area $= 2\pi rh = 2(3.14)(5)(20) = 628 \text{ sq. ft}$. Cost $= 628 \times \$2 = \$1,256$.
- 18) **Choice A is correct.** (8.G.A.1) Reflecting across $y = x$ swaps coordinates: $(x, y) \rightarrow (y, x)$. The vertex $(2, 1) \rightarrow (1, 2)$, which is part of the reflected rectangle shown.
- 19) **Choice D is correct.** (8.EE.B.6) The correct slope is $\frac{9-3}{4-1} = \frac{6}{3} = 2$. The student computed $\frac{4-1}{9-3} = \frac{3}{6} = \frac{1}{2}$, reversing the roles of Δx and Δy .
- 20) **Choice A is correct.** (8.EE.C.7) Expand: $5x - 10 = 3x + 6$. Subtract $3x$ and add 10: $2x = 16$, so $x = 8$.
- 21) **Choice A is correct.** (8.EE.C.8b) Subtract $2x$: $2x + 1 > 9$. Subtract 1: $2x > 8$. Divide by 2: $x > 4$.
- 22) **The correct answer is A, E.** (8.EE.A.1) A is true because $(m^5)^2 = m^{10}$. E is true because $(m^2)^5 = m^{10}$. B simplifies to m^9 , C is a sum, and D simplifies to m^8 .
- 23) **Choice A is correct.** (8.EE.C.8b) At most \$300 means the budget is less than or equal to 300. The solid boundary line includes the exact limit of \$300.
- 24) **Choice B is correct.** (8.SP.A.3) Negative slope means as one variable increases, the other decreases. More training leads to fewer errors.
- 25) **Choice D is correct.** (8.EE.A.2) Solve $x^3 = 512$ by taking the cube root: $x = \sqrt[3]{512} = 8$.
- 26) **Choice D is correct.** (8.EE.A.4) Divide coefficients: $2.8 \div 7 = 0.4$. Subtract exponents: $10^{7-4} = 10^3$. Rewrite: $0.4 \times 10^3 = 4 \times 10^2$.
- 27) **Choice C is correct.** (8.EE.B.5) Unit rate $k = \frac{48}{2} = 24$ bacteria per hour.



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.