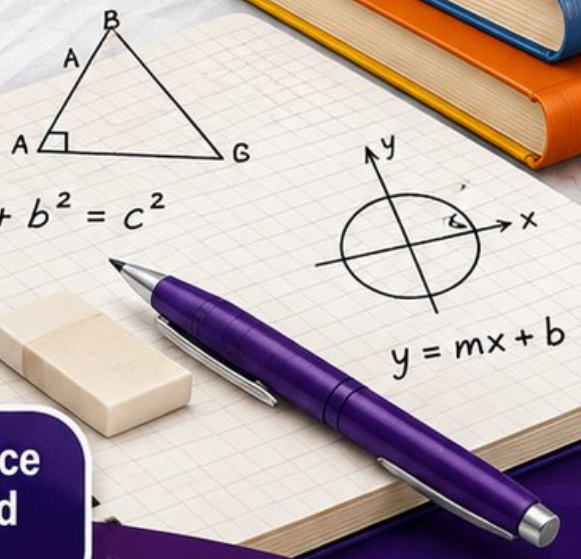
DELAWARE

Smarter Balanced

GRADE 8 MATH PRACTICE TESTS

5 PRINTED TESTS

2 ONLINE TESTS

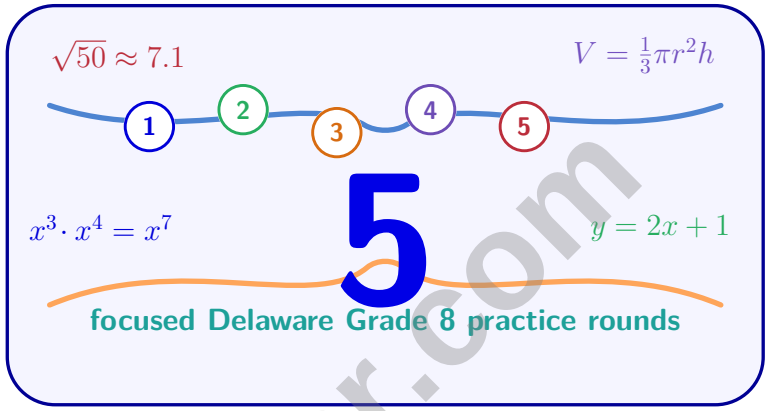


Standards Aligned Problem Solving For Comprehensive Assessment Programs

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

5 Delaware Smarter Balanced Grade 8 Math Practice Tests

Five Smarter Balanced Tests for Algebra, Geometry, and Data Skills



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, Delaware 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 Delaware 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 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.

Delaware 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.

Table of Contents

1) Which ordered pair, if added to $\{(1,2),(2,4),(3,6)\}$, would make it NOT a function?

☐ A. $(4,8)$
☐ B. $(3,8)$
☐ C. $(2,4)$
☐ D. $(5,10)$

2) Between which two consecutive integers does $\sqrt{77}$ lie?

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

3) A stock price drops from \$45 to \$30 over 10 days. What is the slope (rate of change per day)?

☐ A. $-\$1.50$ per day
☐ B. $-\$3$ per day
☐ C. \$1.50 per day
☐ D. \$0.50 per day

4) Two internet providers offer: Provider A costs \$60 per month (no setup). Provider B costs \$40 per month plus a \$100 installation fee. At how many months are the total costs equal?

☐ A. 3 months
☐ B. 4 months
☐ C. 5 months
☐ D. 6 months

5) Solve the system $\begin{cases} 3x - 2y = 4 \\ x + 2y = 8 \end{cases}$ by elimination.

6) Evaluate $(x + 4)(x + 8)$ when $x = 1$.

7) If $g(x) = x + 7$, what is $g(2)$?

☐ A. 5
☐ B. 9
☐ C. 10
☐ D. 14

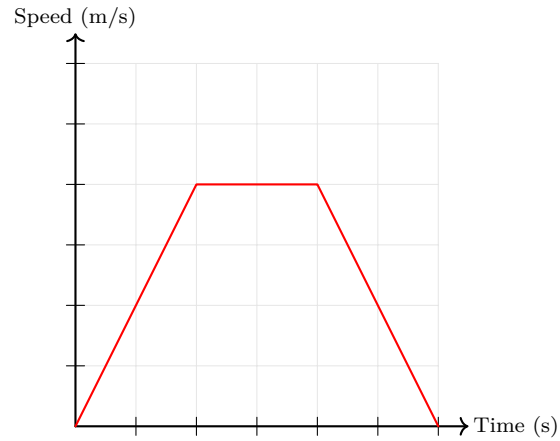
8) A spring stretches when weights are attached. The table shows the length L (in cm) for a spring with w weights attached.

Number of Weights (w)	0	2	4	6
Length (L, cm)	10	14	18	22

Which equation describes the relationship?

☐ A. $L = 2w + 10$
☐ B. $L = 10w + 2$
☐ C. $L = 4w + 10$
☐ D. $L = w + 10$

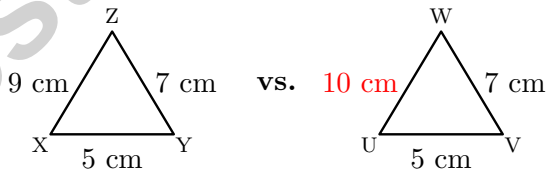
9)



A car accelerates, maintains constant speed, then brakes. Which intervals match?

☐ A. Accelerate [0,2], constant [2,4], brake [4,6]
☐ B. Constant [0,2], accelerate [2,4], brake [4,6]
☐ C. Brake [0,2], constant [2,4], accelerate [4,6]
☐ D. Accelerate [0,4], brake [4,6], constant after

10) Triangle XYZ is congruent to triangle UVW. The sides of triangle XYZ are 5 cm, 7 cm, and 9 cm. A student claims triangle UVW must have sides 5 cm, 7 cm, and 10 cm. Why is the student incorrect?



☐ A. Congruent triangles have equal corresponding sides
☐ B. UVW must have sides 7, 5, 9 in a different order
☐ C. The side lengths don't need to match
☐ D. The student counted incorrectly

1) What is $\sqrt{361}$?

☐ A. 18
☐ B. 21
☐ C. 20
☐ D. 19

2) Does the relation $\{(5, 10), (5, 15), (6, 12)\}$ represent a function?

☐ A. Yes, because all y-values are positive.
☐ B. No, because 5 is paired with two different outputs.
☐ C. Yes, because there are three ordered pairs.
☐ D. No, because 10 and 15 are both outputs.

3) Which equation represents a NONLINEAR function?

☐ A. $y = 2x + 3$
☐ B. $y = -x + 5$
☐ C. $y = x^2 + 1$
☐ D. $y = \frac{1}{2}x - 7$

4) A video streaming service charges a flat fee plus a per-minute rate. The relationship is shown:

Minutes watched	10	20	30
Cost ($)	2.50	4.50	6.50

What is the slope?

☐ A. $0.20 per minute
☐ B. $2.50 per minute
☐ C. $0.10 per minute
☐ D. $0.05 per minute

5) 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
☐ B. 1 hour
☐ C. 1.5 hours
☐ D. 2 hours

6) If $f(x) = 10 - x$, which is greater: $f(2)$ or $f(5)$?

☐ A. $f(2)$ is greater
☐ B. $f(5)$ is greater
☐ C. They are equal
☐ D. Cannot be determined

7) Identify the system with no solution.

☐ A. $y = \frac{1}{2}x + 1$ and $y = \frac{1}{2}x - 3$
☐ B. $y = \frac{1}{2}x + 1$ and $y = -2x + 1$
☐ C. $y = \frac{1}{2}x + 1$ and $x - 2y = -2$
☐ D. $y = \frac{1}{2}x + 1$ and $2y = x + 2$

8) Factor $4x + 12$ completely.

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

9) Temperature functions: Oven $T_{\text{oven}}(m) = 15m + 70$ (degrees, starting at 70). Freezer T_{freeze} shown in table: $(0, -5)$, $(2, -15)$, $(4, -25)$. At 10 minutes, which is warmer?

m	0	2	4
T_{freeze}	-5	-15	-25

☐ A. Oven is warmer
☐ B. Freezer is warmer
☐ C. Same temperature
☐ D. Cannot be determined

1) Using the model $y = 2x - 3$, suppose the actual data point is $(5, 7)$, but the model predicts $y = 7$ at $x = 5$. What is the residual (error)?

☐ A. 0
☐ B. 2
☐ C. -2
☐ D. 7

2) What is the value of 8^0?

☐ A. 0
☐ B. Undefined
☐ C. 8
☐ D. 1

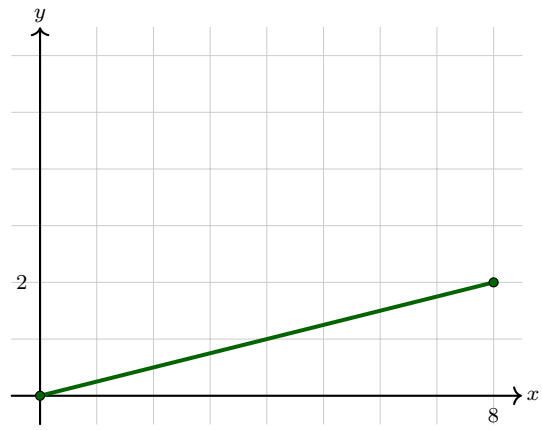
3) Sarah invests \$2,000 at 5% simple interest for 3 years. At the end of 3 years, she decides whether to withdraw all her money or let it grow another 3 years at the same rate. Which statement correctly predicts the impact of waiting another 3 years?

☐ A. No additional interest accrues after 3 years
☐ B. She will earn another \$600 in interest (total after 6 years: \$2,900)
☐ C. Interest compounds, so she earns more than \$300
☐ D. She will earn another \$300 in interest (total after 6 years: \$2,600)

4) If $x^3 = 125$, what is x?

☐ A. 4
☐ B. 7
☐ C. 6
☐ D. 5

5)



The constant of proportionality is:

☐ A. 4
☐ B. 2
☐ C. 0.25
☐ D. 8

6) Which set of ordered pairs represents a function?

☐ A. $\{(0,1),(0,2),(1,3)\}$
☐ B. $\{(2,4),(3,5),(4,6)\}$
☐ C. $\{(1,1),(1,2),(2,2)\}$
☐ D. $\{(5,3),(5,4),(6,5)\}$

7) For the equation $y = 3x - \frac{1}{5}$, identify the slope and y-intercept. Is it linear?

☐ A. Slope 3, intercept $\frac{1}{5}$; nonlinear
☐ B. Slope 3, intercept $-\frac{1}{5}$; linear
☐ C. Slope $-\frac{1}{5}$, intercept 3; linear
☐ D. Cannot determine without more data

8) A table shows values for x and y. What is the rate of change?

x	0	2	4	6
y	-2	2	6	10

☐ A. 2
☐ B. $\frac{1}{2}$
☐ C. 4
☐ D. -2

Delaware 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 Delaware Smarter Balanced practice test.

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

1) **Choice B is correct.** 8.F.A.1 Input 3 already maps to 6. Adding $(3, 8)$ would make input 3 map to two different outputs (6 and 8), violating the function definition.

2) **Choice D is correct.** 8.EE.A.2 $8^2 = 64$ and $9^2 = 81$. Since $64 < 77 < 81$, we have $8 < \sqrt{77} < 9$.

3) **Choice A is correct.** 8.EE.B.5 Slope $= \dfrac{30-45}{10-0} = \dfrac{-15}{10} = -\$1.50$ per day.

4) **Choice C is correct.** 8.EE.C.8c Let m = months. Provider A total cost: $60m$. Provider B total cost: $100 + 40m$. Setting them equal: $60m = 100 + 40m$, so $20m = 100$, giving $m = 5$ months.

5) **The correct answer is** $(3, \frac{5}{2})$ **.** 8.EE.C.8a Add the equations to eliminate y: $(3x - 2y) + (x + 2y) = 4 + 8$, so $4x = 12$, giving $x = 3$. Substitute: $3 + 2y = 8$, so $2y = 5$ and $y = \frac{5}{2}$.

6) **The correct answer is** 45 **.** 8.EE.C.7 Substitute $x = 1$: $(1 + 4)(1 + 8) = 5 \cdot 9 = 45$.

7) **Choice B is correct.** 8.F.A.1 Substitute $x = 2$: $g(2) = 2 + 7 = 9$.

8) **Choice A is correct.** 8.F.B.4 Initial length is 10 cm (when $w = 0$). Change from 2 to 4 weights: length goes from 14 to 18 cm, a change of 4 cm for 2 weights, so slope is 2. Equation: $L = 2w + 10$.

9) **Choice A is correct.** 8.F.B.5 Rising segment = increasing speed (acceleration). Flat = constant speed. Falling = decreasing speed (braking).

10) **Choice A is correct.** 8.G.A.2 Since triangle XYZ is congruent to triangle UVW, triangle UVW must have sides 5 cm, 7 cm, and 9 cm, not 10 cm. The student made an error by changing one of the side lengths.

11) **Choice B is correct.** 8.G.A.3 Reflect across x-axis: $(1, 4) \to (1, -4)$. Then reflect across y-axis: $(1, -4) \to (-1, -4)$.

12) **Choice B is correct.** 8.G.A.5 Alternate interior angles are on opposite sides of the transversal and between the parallel lines.

13) **Choice A is correct.** 8.G.B.6, 8.G.B.7 From $15^2 + 20^2 = 225 + 400 = 625$, we get $c = 25$. The difference is $25 - 15 = 10$ (scaled 3-4-5 triple).

14) **Choice A is correct.** 8.G.B.8 $d = \sqrt{(9-1)^2 + (8-2)^2} = \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10$ units.

15) **Choice B is correct.** 8.G.B.7 Let the smaller angle be x. Then $x + (x + 18) = 90$, so $2x + 18 = 90$, giving $x = 36°$.

16) **Choice B is correct.** 8.G.C.9 Correct volume: $V = \frac{1}{3} \times (5^2) \times 12 = \frac{1}{3} \times 25 \times 12 = 100$ m^3. The student missed both the squaring and the $\frac{1}{3}$ factor.

17) **Choice B is correct.** 8.G.B.7 The square area is $20 \times 20 = 400$ m^2. Four corner triangles are removed, and each has area $\frac{1}{2} \times 3 \times 3 = 4.5$ m^2. The octagon area is $400 - 4(4.5) = 382$ m^2.

18) **Choice C is correct.** 8.G.A.5 Set $(n - 2) \times 180 = 900$. Then $n - 2 = 5$, so $n = 7$ (a heptagon).

19) **Choice D is correct.** 8.SP.A.1 Study method (alone vs. group) acts as a confounding variable, causing the data to split into two clusters at the same x-value but different y-values. This shows that the relationship is more complex than a single bivariate correlation.

20) **Choice C is correct.** 8.SP.A.4 Joint frequency: intersection cell (45) divided by grand total (120). This answers 'what fraction of all respondents are rural car-owners?' $= \dfrac{45}{120} \approx 0.375$.

21) **Choice B is correct.** 8.G.B.8 Set X clusters tightly around 20 (values 18–22). Set Y is spread widely (10–30). Larger spread implies larger MAD.

22) **The correct answer is A,D.** 8.EE.B.5 Line 1: $k = \frac{6}{4} = 1.5$, so $y = 1.5x$ (\$1.50/lb). Line 2: $k = \frac{12}{6} = 2$, so $y = 2x$ (\$2.00/lb). A is correct (Line 1 equation and price). D is correct (Line 2 has greater slope: $2 > 1.5$). C is wrong (Line 2 is steeper, not Line 1). B is correct but not a correct pair; E is subjective (worse deal, not better). Answer: A and D.

23) **The correct answer is** 1 **.** 8.F.A.2 The rate of change is $\frac{-1-(-3)}{2-0} = 1$.

24) **Choice B is correct.** 8.EE.C.7b Choose a main dish (5 options) and a side (3 options): $5 \times 3 = 15$ different meals.

25) **Choice D is correct.** 8.G.B.7 Numbers less than 4: 1, 2, 3. Rolling a 2 is already included in that set. So favorable outcomes: 1, 2, 3 = 3 outcomes. $P = \frac{3}{6} = \frac{1}{2}$.

Author's Note

A Page for Persistence

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
- 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!

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