

West Virginia

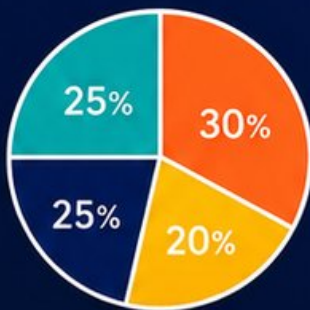
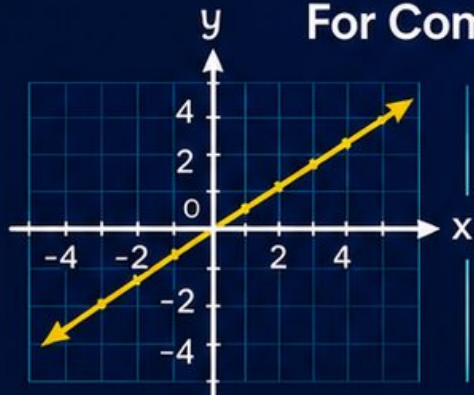
WVGSA

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

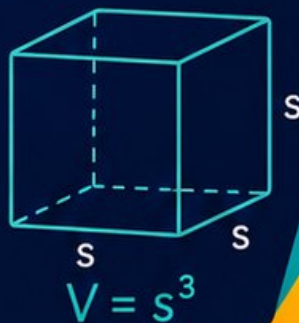


$$y = mx + b$$

$$2x - 3y = 6$$

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

$$A = bh$$



4 PRINTED TESTS



2 ONLINE TESTS



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



4 West Virginia WVGSA Grade 8 Math Practice Tests

Four WVGSA Practice Rounds for Clear Grade 8 Math Growth



Four complete 40-question Grade 8 WVGSA 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, West Virginia Grade 8 Problem Solver!

Four focused rounds for sharper WVGSA math thinking

This book gives you four full Grade 8 WVGSA 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 West Virginia 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.

West Virginia 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 WVGSA 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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1) A point P is at $(5, 3)$. After a translation of $(-2, 4)$, the point moves to P' . What is the distance from P to P' ?

☐ A. $\sqrt{5}$ units

☐ C. 6 units

☐ B. $\sqrt{20}$ units

☐ D. $\sqrt{45}$ units

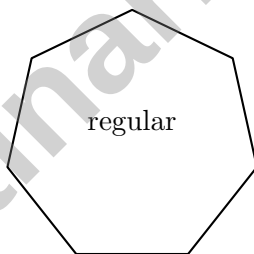
2) A student solves: "A jar has pennies and quarters totaling \$5.00 with 40 coins. How many quarters are there?" The student correctly sets up $p + q = 40$ (coins) and $0.01p + 0.25q = 5.00$ (dollars) and solves to get $q \approx 19.17$. Which statement best describes the issue?

☐ A. The student should have used cents: $p + 25q = 500$ instead.

☐ C. The answer must be a whole number, so the problem statement likely has a typo.

☐ B. The student should use elimination instead of substitution.

☐ D. The system is correct, and 19.17 quarters is a valid final answer.



3)

A regular heptagon is shown. What is the measure of each interior angle (to nearest whole degree)?

☐ A. $\approx 129^\circ$

☐ C. $\approx 148^\circ$

☐ B. $\approx 138^\circ$

☐ D. $\approx 158^\circ$



4)

Value	7	9	11	13
Deviation	?	1	1	?

The table shows values and their deviations from the mean. What is the MAD?

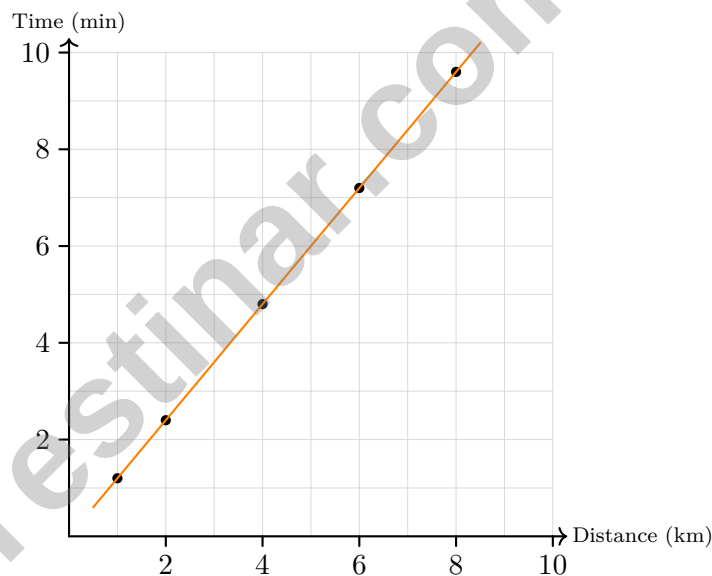
☐ A. 1.5

☐ C. 2.5

☐ B. 2

☐ D. 3

5) A login code uses 3 distinct digits from the set $\{0, 1, 2, 3, 4, 5\}$. How many codes are possible?

☐ A. $6 + 5 + 4 = 15$
☐ C. $6^3 = 216$
☐ B. $6 \times 5 \times 4 = 120$
☐ D. $\binom{6}{3} = 20$


6)

A delivery company tracks distance versus delivery time. The trend line shows an almost perfect fit with points nearly aligned. What can you conclude?

☐ A. Distance and time are unrelated

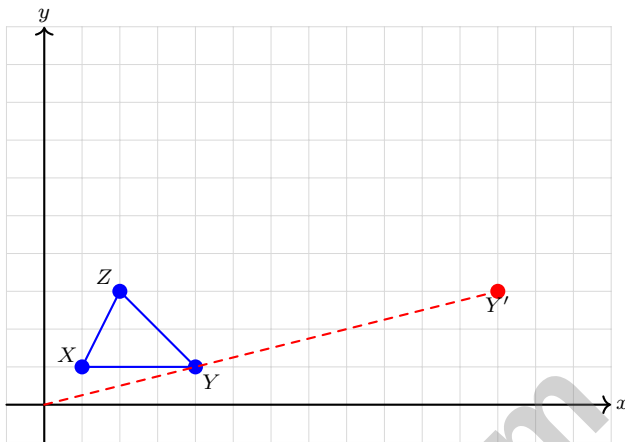
☐ C. The trend line should not be trusted

☐ B. There is a strong linear relationship with very small residuals

☐ D. The data contains measurement errors


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- 7) Triangle XYZ has vertices at $X(1, 1)$, $Y(4, 1)$, and $Z(2, 3)$. If dilated by scale factor 3 from the origin, where is the vertex that corresponds to Y ?



- ☐ A. $(12, 3)$
☐ C. $(7, 4)$
☐ B. $(4, 1)$
☐ D. $(3, 3)$

Number Sorting

π , $\sqrt{4}$, $0.\bar{5}$, -2.5 , $\sqrt{11}$

How many are rational?

8)

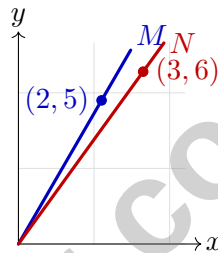
- ☐ A. One ($\sqrt{4}$ only)
 ☐ C. Three ($\sqrt{4}$, $0.\bar{5}$, and -2.5)
☐ B. Two ($\sqrt{4}$ and $0.\bar{5}$)
 ☐ D. Four (all but π or $\sqrt{11}$)



1) A student graphs $x \leq -1$ but draws a DASHED line instead of solid. What is the consequence?

- ☐ A. The boundary point $x = -1$ is excluded from the solution
- ☐ B. The boundary point $x = -1$ is still included
- ☐ C. The shading direction is flipped
- ☐ D. The inequality changes to $x > -1$

2) Two lines are shown on the same graph. Line M passes through $(0, 0)$ and $(2, 5)$. Line N passes through $(0, 0)$ and $(3, 6)$. Which statement is true?



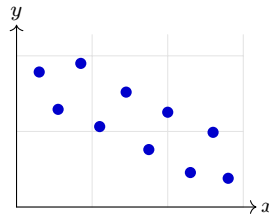
- ☐ A. Line M is steeper
- ☐ B. Line N is steeper
- ☐ C. Both lines have the same steepness
- ☐ D. Cannot be determined from the information
- 3) To find the number of \$0.50 postage stamps and \$0.37 postage stamps that total \$3.74 with 10 stamps, which approach is best?
- ☐ A. Guess and check
- ☐ B. Proportional reasoning
- ☐ C. Solving a system of equations
- ☐ D. Trial by tables
- 4) If $f(x) = \frac{x+4}{2}$ and $f(x) = 5$, what is x ?

- ☐ A. 2
- ☐ B. 4
- ☐ C. 6
- ☐ D. 10



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- 5) A pyramid has a rectangular base of 7 m by 9 m and a height of 15 m. What is its volume?

☐ A. 315 m^3
☐ C. 630 m^3
☐ B. 420 m^3
☐ D. 945 m^3


6)

A researcher studies the relationship between screen time (hours/day) and grade point average (GPA 0–4.0) for high school students. The scatter plot shows weak negative correlation ($r = -0.35$) with substantial scatter. The researcher writes: **“The data show that screen time weakly causes lower GPAs.”** Which phrase in this statement is incorrect?

☐ A. *screen time*
☐ C. *weakly*
☐ B. *lower GPAs*
☐ D. *causes*

- 7) A retail store analyzes 500 transactions. 350 included a sale item and 150 did not. Of those with a sale item, 245 were from returning customers. What relative frequency (as a percent) of transactions with sale items are from returning customers?

☐ A. 49%

☐ C. 70%

☐ B. 56%

☐ D. 84%


1) In a regular hexagon, each interior angle measures:

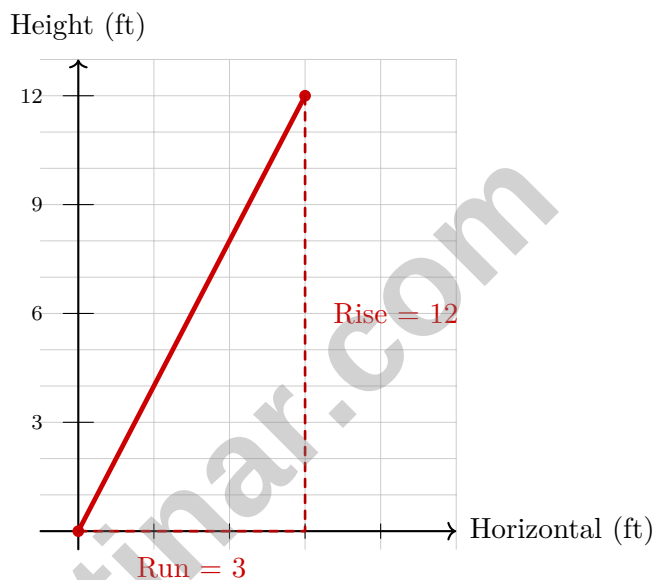
☐ A. 144°

☐ C. 90°

☐ B. 120°

☐ D. 108°

2) A ladder against a building creates a line from $(0, 0)$ on the ground to $(3, 12)$ where coordinates are (horizontal distance in ft, height in ft). What is the slope?



☐ A. 4 feet per foot

☐ C. 3 feet per foot

☐ B. $\frac{1}{4}$ feet per foot

☐ D. 12 feet per foot

3) 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



4) A segment from $(2, 1)$ to $(4, 3)$ is dilated by scale factor 2 from the point $(2, 1)$. Where does $(4, 3)$ map to?

☐ A. $(6, 5)$

☐ C. $(8, 6)$

☐ B. $(4, 3)$

☐ D. $(2, 1)$

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

☐ A. $f(2)$ is greater

☐ C. They are equal

☐ B. $f(5)$ is greater

☐ D. Cannot be determined

6) The table has points $(0, -3)$, $(2, -1)$, and $(4, 1)$. What is its rate of change?

x	0	2	4
y	-3	-1	1

7) Hexagon ABCDEF is congruent to hexagon GHIJKL. The perimeter of ABCDEF is 48 cm. What is the perimeter of GHIJKL?

☐ A. 24 cm

☐ C. 96 cm

☐ B. 48 cm

☐ D. Cannot be determined

8) Point $Z(6, 8)$ is rotated 90° counterclockwise about the origin. What is the image Z' ?

☐ A. $(8, 6)$

☐ C. $(-6, -8)$

☐ B. $(-8, 6)$

☐ D. $(6, -8)$



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West Virginia WVGSA 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 West Virginia WVGSA practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice B is correct.** (M.8.19) The translation vector is $(-2, 4)$, so the distance moved is the magnitude: $\sqrt{(-2)^2 + 4^2} = \sqrt{4 + 16} = \sqrt{20} = 2\sqrt{5}$ units.
- 2) **Choice C is correct.** (M.8.9) Setting up correctly: $p + q = 40$ and $0.01p + 0.25q = 5.00$. From the first: $p = 40 - q$. Substituting: $0.01(40 - q) + 0.25q = 5.00$, so $0.40 - 0.01q + 0.25q = 5.00$, giving $0.24q = 4.60$ and $q \approx 19.17$. Since the number of coins must be an integer, the problem's numbers are inconsistent.
- 3) **Choice A is correct.** (M.8.23) Sum for heptagon: $(7 - 2) \times 180 = 900^\circ$. Each angle: $\frac{900}{7} \approx 128.6^\circ \approx 129^\circ$.
- 4) **Choice B is correct.** (M.8.26) Mean = 10. Deviations: $|7 - 10| = 3$, $|9 - 10| = 1$, $|11 - 10| = 1$, $|13 - 10| = 3$. Sum = 8. MAD = $8/4 = 2$.
- 5) **Choice B is correct.** (M.8.26) First digit: 6 choices. Second digit: 5 remaining (no repetition). Third: 4 remaining. Total: $6 \times 5 \times 4 = 120$.
- 6) **Choice B is correct.** (M.8.29) Points nearly aligned on the line indicates high correlation, small residuals, and a strong linear model.
- 7) **Choice A is correct.** (M.8.22) Apply dilation: $(x, y) \rightarrow (kx, ky)$ where $k = 3$. Point $Y(4, 1) \rightarrow Y'(4 \times 3, 1 \times 3) = (12, 3)$.
- 8) **Choice C is correct.** (M.8.1) $\sqrt{4} = 2$ (rational), $0.5 = \frac{5}{10}$ (rational), and $-2.5 = -\frac{5}{2}$ (rational). The irrational numbers are π and $\sqrt{11}$ (non-perfect square).
- 9) **Choice D is correct.** (M.8.25) Total: 360° . Section B: 180° . So $P(B) = \frac{180}{360} = \frac{1}{2}$.
- 10) **Choice D is correct.** (M.8.19) Let $x = 0.1\bar{6} = 0.1666\dots$. Then $10x = 1.\bar{6}$ and $100x = 16.\bar{6}$. Subtracting: $90x = 15$, so $x = \frac{15}{90} = \frac{1}{6}$.
- 11) **Choice D is correct.** (M.8.2) $5.9^2 = 34.81$ and $6^2 = 36$. Since 35 is closer to 34.81 than to 36, $\sqrt{35} \approx 5.9$.
- 12) **Choice D is correct.** (M.8.5) Divide: $\frac{1.5 \times 10^{12}}{1.5 \times 10^{10}} = 1 \times 10^2 = 100$ times larger.
- 13) **Choice C is correct.** (M.8.2) $\sqrt{36} = 6$ (rational), π is irrational, and $0.333\dots = \frac{1}{3}$ (rational). $\sqrt{11}$ cannot be expressed as a ratio of integers.
- 14) **Choice D is correct.** (M.8.27) Two triangular bases: $2 \times \frac{1}{2}(8)(6) = 48 \text{ cm}^2$. The hypotenuse is 10 cm, so the triangle's perimeter is $8 + 6 + 10 = 24$ cm. The lateral area is $4(24) = 96 \text{ cm}^2$. Total surface area = $48 + 96 = 144 \text{ cm}^2$.
- 15) **Choice D is correct.** (M.8.8) The slope is the rate of change: $\frac{\Delta y}{\Delta x} = \frac{3}{1} = 3$ (each increase of 1 in x gives 3 more in y).
- 16) **Choice C is correct.** (M.8.9) Check by substitution: A: $3(2) + 4 = 10 \neq 11$ ✗. B: $5(2) - 1 = 9 \neq 12$ ✗. C: $2(2) + 3 = 7$ ✓. D: $4(2) - 2 = 6 \neq 10$ ✗. Only C is satisfied.
- 17) **Choice B is correct.** (M.8.27) $V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times 3.14 \times 49 \times 12 = \frac{1}{3} \times 1846.32 = 615.44 \text{ cm}^3$.
- 18) **Choice C is correct.** (M.8.30) Substitute $x = 6$: $R = 20 + 3(6) = 20 + 18 = \38 .
- 19) **Choice D is correct.** (M.8.25) $A = 5000(1.07)^{10} \approx 5000 \times 1.967 = \$9,835$.
- 20) **Choice D is correct.** (M.8.3) Simplify coefficients: $\frac{20}{5} = 4$. Simplify variables: $\frac{x^9}{x^3} = x^6$. Result: $4x^6$.
- 21) **The correct answer is -1.** (M.8.2) Using $(0, 5)$ and $(3, 2)$: slope = $\frac{2 - 5}{3 - 0} = \frac{-3}{3} = -1$.
- 22) **The correct answer is A,B.** (M.8.19) Verify each value: $f(1) = 3$ and $f(3) = 7$, so A and B are correct. Also, $f(2) = 5$, $f(0) = 1$, and $f(4) = 9$, so C, D, and E are false.
- 23) **Choice D is correct.** (M.8.4) $\sqrt{40}$ is irrational because 40 is not a perfect square. The others equal 5, 10, and 12 respectively.
- 24) **Choice D is correct.** (M.8.6) Same exponents: $(5.2 - 1.5) \times 10^6 = 3.7 \times 10^6$.
- 25) **Choice D is correct.** (M.8.7) Check ratio: $(2, 6) \rightarrow 6/2 = 3$ and $(4, 12) \rightarrow 12/4 = 3$. Same ratio means proportional. Choice D has $k = 3$.
- 26) **Choice C is correct.** (M.8.10) Both equations have slope 2. If $c \neq 3$, the lines are parallel and have no solution. If $c = 3$, the equations are identical and there are infinitely many solutions.



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Hi, Thoughtful Reader!

◇ A strong Grade 8 test taker is also a strong reader. You practiced turning words, tables, graphs, and diagrams into math decisions. ◇

★ **Remember this:** That skill grows each time you slow down enough to ask what the problem is really telling you and what it is really asking for. This version gave you 4 opportunities to rehearse test-day habits. ★

Reader-to-Solver Skills

- **Circle the Ask:** Make the target visible.
- **Sort Information:** Separate useful facts from extra words.
- **Match Units:** Keep quantities connected.
- **Answer Fully:** Include the value and what it means.

Grade 8 test-day tip: After solving, reread only the final question. Make sure your answer matches it exactly.

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

Jay Daie

Your Reading-and-Math Helper

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



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