

8

West Virginia

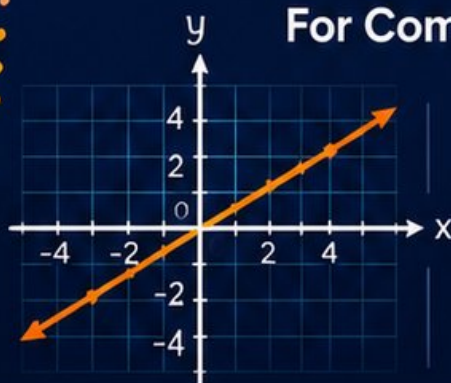
WVGSA

GRADE 8

MATH

PRACTICE TESTS

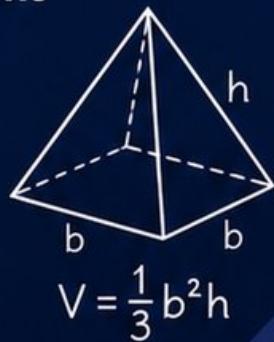
Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$

$$C = 2\pi r$$

$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}b^2 h$$



8 PRINTED TESTS



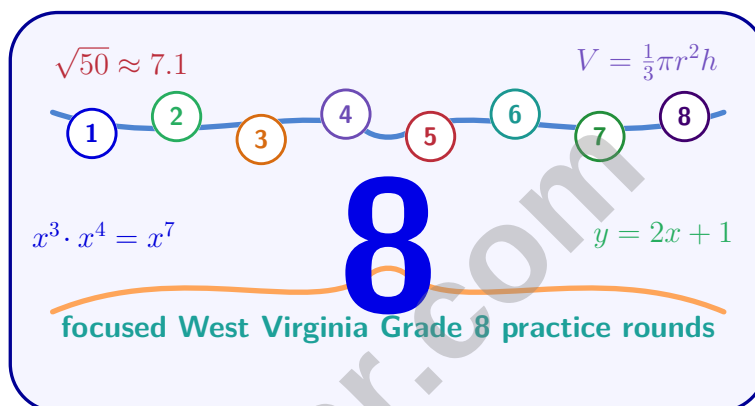
2 ONLINE TESTS



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

8 West Virginia WVGSA Grade 8 Math Practice Tests

West Virginia Grade 8 Review for Functions, Geometry, and Data



Eight 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!

Eight focused rounds for sharper WVGSA math thinking

This book gives you eight 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

An eight-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?

Eight WVGSA tests, 320 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real and irrational numbers, integer exponents, scientific notation, equations, and careful reading.
Tests 4–6	Slope, systems of equations, functions, inequalities, transformations, congruence, and similarity.
Tests 7–8	Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina.
Answer Pages	Compact keys and explanations that show why each answer works.

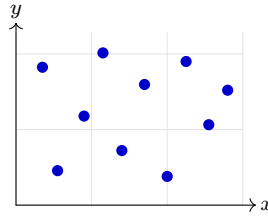
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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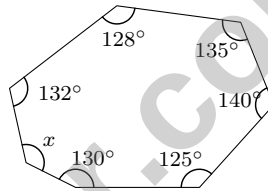
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1)

A scatter plot shows no clear pattern or trend. Which line is the best fit?

- ☐ A. A line with the steepest possible slope ☐ C. A vertical line
☐ B. A line that bounces between all the points randomly ☐ D. A horizontal line near the mean of the y -values



2)

A heptagon has six interior angles: 130° , 125° , 140° , 135° , 128° , 132° . Find the seventh angle.

- ☐ A. 100° ☐ C. 110°
☐ B. 105° ☐ D. 115°

3) A team has 10 players. The coach assigns a captain, a co-captain, and a goalkeeper. How many different leadership combinations are possible?

- ☐ A. $10 + 9 + 8 = 27$ ☐ C. $\binom{10}{3} = 120$
☐ B. $10 \times 9 \times 8 = 720$ ☐ D. $10^3 = 1,000$



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4) An angle is 25° more than its complement. Find the measure of the complement.

☐ A. 25°

☐ C. 57.5°

☐ B. 32.5°

☐ D. 90°

5) Pyramid A has a square base with side 4 cm and height 9 cm. Pyramid B has a square base with side 8 cm and height 18 cm (all linear dimensions doubled). How many times larger is Pyramid B's volume than Pyramid A's?

☐ A. 2 times

☐ C. 8 times

☐ B. 4 times

☐ D. 16 times

6) Find the Mean Absolute Deviation (MAD) of the data set $\{2, 4, 6, 8, 10\}$.

☐ A. 2

☐ C. 3

☐ B. 2.4

☐ D. 6

7)

	M	F
Soccer	8	6
Tennis	5	7

The table shows the number of boys (M) and girls (F) who play soccer and tennis. If one student is selected at random, what is the probability that they play tennis?

☐ A. $\frac{6}{26}$

☐ C. $\frac{14}{26}$

☐ B. $\frac{5}{26}$

☐ D. $\frac{12}{26}$

8) Which value is irrational?

☐ A. $0.5 + 0.25$

☐ C. $\sqrt{10} + 1$

☐ B. $\frac{1}{2} + \frac{1}{3}$

☐ D. 2^2



9) Which equals $0.\overline{27}$?

☐ A. $\frac{27}{100}$

☐ B. $\frac{1}{27}$

☐ C. $\frac{27}{90}$

☐ D. $\frac{27}{99} = \frac{3}{11}$

10) Which is the best estimate of $\sqrt{99}$?

☐ A. 9.0

☐ B. 49.5

☐ C. 10.0

☐ D. 9.5

11) The table below shows preferences for sports among 100 students.

	Football	Basketball	Total
Boys	35	20	55
Girls	15	30	45
Total	50	50	100

How many boys prefer basketball?

☐ A. 15

☐ B. 20

☐ C. 35

☐ D. 50

12) A bank offers two savings accounts: Account M at 4% simple interest, and Account N at 2% compound interest annually. After 3 years on an initial deposit of \$1,000, which is better?

☐ A. Cannot determine

☐ B. Account N (compound)

☐ C. They are equal

☐ D. Account M (simple)



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1) A line has equation $y = \frac{3}{2}x + 5$. Which statement is true?

- ☐ A. The line has slope 5 and passes through $(0, \frac{3}{2})$
- ☐ B. The line is perpendicular to $y = \frac{2}{3}x + 1$
- ☐ C. The line has y -intercept $\frac{3}{2}$
- ☐ D. The line passes through $(2, 8)$

2) A line passes through $(2, 9)$ and $(5, 18)$. Which equation represents this line?

- ☐ A. $y = 3x + 3$
- ☐ B. $y = 3x + 9$
- ☐ C. $y = 2x + 5$
- ☐ D. $y = x + 7$

3) Which equation is LINEAR?

- ☐ A. $y = 5 - 3x^2$
- ☐ B. $y = \sqrt{x + 4}$
- ☐ C. $y = 7 + 2x$
- ☐ D. $y = \frac{10}{x}$

4) The distance from $(0, 0)$ to a point on the coordinate plane is $\sqrt{50}$ units. Which coordinates could this point have?

- ☐ A. $(5, 5)$
- ☐ B. $(7, 2)$
- ☐ C. $(5, 2)$
- ☐ D. $(3, 4)$

5) If each interior angle of a regular polygon is 120° , what polygon is it?

- ☐ A. Octagon
- ☐ B. Pentagon
- ☐ C. Heptagon
- ☐ D. Hexagon

6) A chemist combines a 25% salt solution with an 80% salt solution to make 100 mL of a 50% solution. How many mL of the 25% solution are used?



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7) There are 5 ways to get from building A to building B, and 3 ways to get from B to C. A student writes: “Total routes = $5 + 3 = 8$.” Which statement best describes the error?

- ☐ A. The student is correct; addition is the right operation.
 ☐ C. The student should use factorials: $5! + 3! = 126$.
- ☐ B. The student should multiply because each A-to-B route can be followed by any B-to-C route.
 ☐ D. The student should use combinations: $\binom{5}{3} = 10$.

8) A student calculates the surface area of a rectangular prism with dimensions $3 \text{ m} \times 4 \text{ m} \times 5 \text{ m}$ as: $SA = 2(3 \times 4) + 2(3 \times 5) + 2(4 \times 5) = 24 + 30 + 40 = 94 \text{ m}^2$. What is the error?

- ☐ A. The calculation is correct
 ☐ C. The student missed the bottom face
- ☐ B. The student forgot to add the second base
 ☐ D. The student mixed up length and width

9) Which property is preserved under all three rigid transformations (translation, reflection, and rotation)?

- ☐ A. Position on the coordinate plane
 ☐ C. Length of sides
- ☐ B. Orientation (clockwise vs. counterclockwise)
 ☐ D. Size relative to other figures



1) In a triangle, two angles measure 45° and 75° . What is the measure of the third angle?

☐ A. 30°

☐ C. 90°

☐ B. 60°

☐ D. 120°

2) Which transformation does **NOT** preserve both distance and angle measure?

☐ A. Translation

☐ C. Rotation

☐ B. Reflection

☐ D. Dilation

3) Solve: $-4x > 12$

☐ A. $x > -3$

☐ C. $x < -3$

☐ B. $x > 3$

☐ D. $x < 3$

4) Factor completely: $3x^2 + 6x + 3$.

☐ A. $3(x^2 + 2x + 1)$

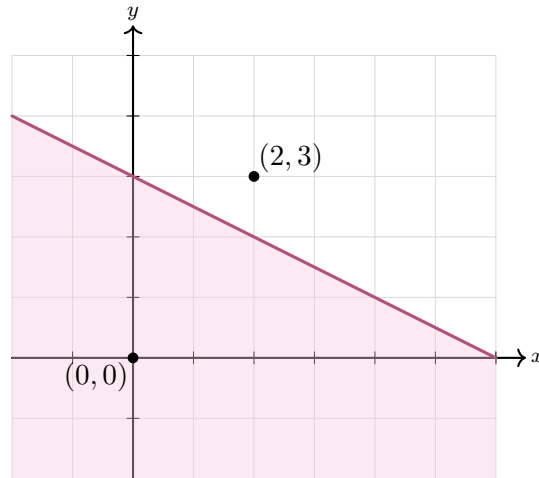
☐ C. $3(x + 1)^2$

☐ B. $(3x + 3)(x + 1)$

☐ D. $3(x + 2)^2$



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5)

The graph has a solid line with shading below. Two points are marked: $(0, 0)$ (in shaded region) and $(2, 3)$ (above the line). Which inequality is graphed?

- ☐ A. $y < -\frac{1}{2}x + 3$ (forgot to flip when dividing by $-\frac{1}{2}$)
 ☐ C. $y \leq -\frac{1}{2}x + 3$ (correct)
- ☐ B. $y \geq -\frac{1}{2}x + 3$ (reversed shading AND boundary inclusion)
 ☐ D. $y > -\frac{1}{2}x + 3$ (solid line with shading above)

6) Which of the following relations is a function?

- ☐ A. $\{(1, 2), (1, 3), (2, 4)\}$
 ☐ C. $\{(2, 5), (2, 6), (3, 7)\}$
- ☐ B. $\{(1, 2), (2, 3), (3, 4)\}$
 ☐ D. $\{(4, 1), (4, 2), (4, 3)\}$

7) Function with slope 2 and y -intercept -5 is?

- ☐ A. $y = 2x - 5$
 ☐ C. $y = 2x + 5$
- ☐ B. $y = -5x + 2$
 ☐ D. $y = -2x - 5$



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 D is correct.** (M.8.29) When there is no clear trend (no correlation), data appears randomly scattered. The best fit is a horizontal line at the average y -value, since no slope can be meaningfully determined.
- 2) **Choice C is correct.** (M.8.23) A heptagon's interior angles add to $(7 - 2) \times 180 = 900^\circ$. The known angles add to $130 + 125 + 140 + 135 + 128 + 132 = 790^\circ$, so the seventh angle is $900 - 790 = 110^\circ$.
- 3) **Choice B is correct.** (M.8.26) Captain: 10 choices. Co-captain: 9 remaining. Goalkeeper: 8 remaining. Total: $10 \times 9 \times 8 = 720$.
- 4) **Choice B is correct.** (M.8.25) Let the complement be x . Then $(x+25)+x=90 \Rightarrow 2x+25=90 \Rightarrow 2x=65 \Rightarrow x=32.5^\circ$.
- 5) **Choice C is correct.** (M.8.27) $V_A = \frac{1}{3} \times 16 \times 9 = 48 \text{ cm}^3$. $V_B = \frac{1}{3} \times 64 \times 18 = 384 \text{ cm}^3$. Ratio: $\frac{384}{48} = 8$. When linear scale is $2\times$, volume scales by $2^3 = 8\times$.
- 6) **Choice B is correct.** (M.8.26) Mean = 6. Absolute deviations: $|2-6|=4$, $|4-6|=2$, $|6-6|=0$, $|8-6|=2$, $|10-6|=4$. Sum = 12. MAD = $12/5 = 2.4$.
- 7) **Choice D is correct.** (M.8.25) Total: $8 + 6 + 5 + 7 = 26$. Tennis: $5 + 7 = 12$. $P(\text{tennis}) = \frac{12}{26}$.
- 8) **Choice C is correct.** (M.8.1) The sum of an irrational number ($\sqrt{10}$) and a rational number (1) is always irrational. So $\sqrt{10} + 1$ is irrational. The others are rational: $0.5 + 0.25 = 0.75$, $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$, and $2^2 = 4$.
- 9) **Choice D is correct.** (M.8.19) Let $x = 0.\overline{27}$. Then $100x = 27.\overline{27}$. Subtracting: $99x = 27$, so $x = \frac{27}{99} = \frac{3}{11}$.
- 10) **Choice D is correct.** (M.8.2) $\sqrt{99} \approx 9.95$ (very close to 10). Since $9.9^2 = 98.01$ and $10^2 = 100$, estimate is $9.95 \approx 9.5$ when rounded to tenths. Tests proximity to perfect square 100.
- 11) **Choice B is correct.** (M.8.31) This is a joint frequency (read directly from the cell). Row label **Boys**, column **Basketball**: entry is 20.
- 12) **Choice D is correct.** (M.8.25) M: $I = 1000 \times 0.04 \times 3 = \120 . N: $1000(1.02)^3 \approx 1061.21$, so interest $\approx \$61.21$. Account M is better.
- 13) **Choice A is correct.** (M.8.8) In slope-intercept form $y = mx + b$, the y -intercept is b . Here $b = -7$.
- 14) **Choice A is correct.** (M.8.9) Subtract $4x$ and add 12: $4x = 20$. Divide by 4: $x = 5$.
- 15) **Choice A is correct.** (M.8.10) Two lines with different slopes always intersect at exactly one point. The lines $y = mx + 3$ and $y = -2x + 6$ have different slopes unless $m = -2$. If $m = -2$, the lines have the same slope but different y -intercepts, so they do not intersect.
- 16) **Choice A is correct.** (M.8.12) Subtract 7: $x < 3$. The open circle and left ray match this solution.
- 17) **Choice C is correct.** (M.8.14) The vertical line test is the definition test for functions. If no vertical line intersects the graph more than once, it is a function.
- 18) **Choice A is correct.** (M.8.2) Slope: $(5-3)/(2-1) = 2$. From $(1, 3)$: $3 = 2(1) + b \Rightarrow b = 1$. So $y = 2x + 1$.
- 19) **The correct answer is 2.** (M.8.14) Slope = $\frac{1-(-3)}{2-0} = 2$.
- 20) **The correct answer is A,B.** (M.8.26) Using the Pythagorean Theorem, $9^2 + 40^2 = 81 + 1600 = 1681$, so the hypotenuse is $\sqrt{1681} = 41$ units. C is false because $9 + 40 = 49$, not 41. D is false because the squares of the legs are needed. E is false because $41 > 40$.
- 21) **Choice D is correct.** (M.8.2) A is all integers (rational). B contains perfect square roots (rational). C is mixed. D contains $\sqrt{2}, \sqrt{3}, \sqrt{5}$, all irrational.
- 22) **Choice C is correct.** (M.8.3) When dividing powers with the same base, subtract exponents: $\frac{x^7}{x^3} = x^{7-3} = x^4$.
- 23) **Choice D is correct.** (M.8.4) Volume = $s^3 = 343$, so $s = \sqrt[3]{343} = 7$ cm. One face is a square with side 7 cm, so area = $7^2 = 49 \text{ cm}^2$.
- 24) **Choice D is correct.** (M.8.5) Multiply coefficients and add exponents: $2 \times 3 = 6$ and $10^3 \times 10^2 = 10^5$, giving 6×10^5 .
- 25) **Choice C is correct.** (M.8.6) Volume = $(\text{side})^3 = (1.5 \times 10^{-2})^3 = (1.5)^3 \times (10^{-2})^3 = 3.375 \times 10^{-6} \text{ m}^3$.
- 26) **Choice D is correct.** (M.8.7) Unit rate $k = \frac{45}{3} = 15$ dollars per hour.
- 27) **The correct answer is 6.** (M.8.27) From $V = \frac{4}{3}\pi r^3$: $904.32 = \frac{4}{3} \times 3.14 \times r^3 \Rightarrow r^3 = 216 \Rightarrow r = 6$ cm.



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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 8 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, SUCCEED TOMORROW!

Give your child the confidence and skills they need with **8 full-length Grade 8** Math practice tests that mirror 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.



BUILD SKILLS & BOOST CONFIDENCE

Strengthen understanding and feel prepared for test day.



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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Better Results.