

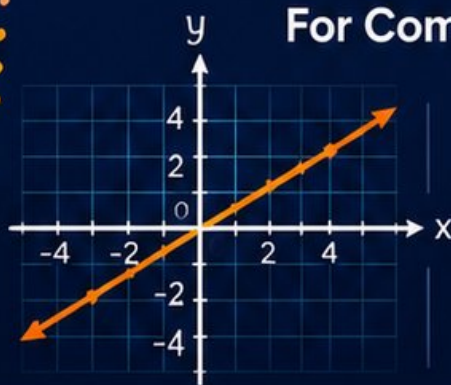
8

Virginia
SOL

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

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

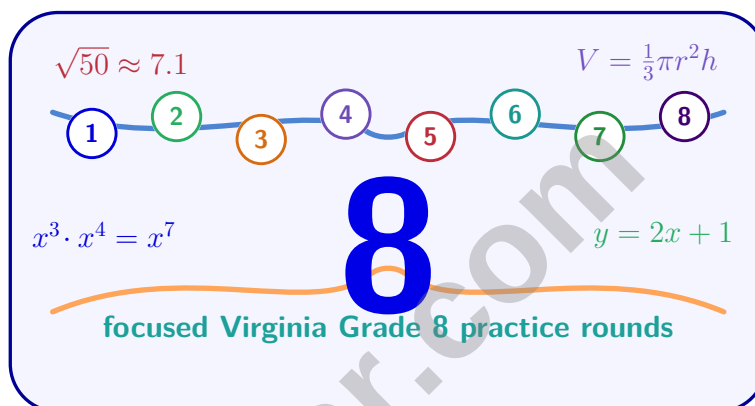


$$V = \frac{1}{3}b^2 h$$

8 PRINTED
TESTS2 ONLINE
TESTSUse these **two additional** online practice tests
for extra review after the printed tests in this book.

8 Virginia SOL Grade 8 Math Practice Tests

Virginia Grade 8 Practice for Functions, Geometry, and Quantitative Reasoning



Eight complete 40-question Grade 8 SOL 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, Virginia Grade 8 Problem Solver!

Eight focused rounds for sharper SOL math thinking

This book gives you eight full Grade 8 SOL 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 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.

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 SOL 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.

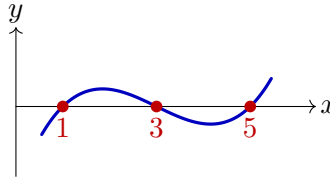


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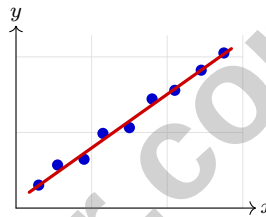
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- 1) A function has zeros at $x = 1$, $x = 3$, and $x = 5$. What does a zero represent on the graph?



- ☐ A. Where the graph crosses the y -axis ☐ C. Where the function is undefined
☐ B. Where the graph reaches its maximum ☐ D. Where the function value is zero (the x -intercept)



2)

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

- ☐ A. A line that passes through every data point ☐ C. A line that generally shows the overall trend of the data
☐ B. A line that passes through no data points ☐ D. A line that only passes through the outliers
- 3) A pyramid has a triangular base with area 18 cm^2 . If its height is doubled and the base area stays the same, the volume becomes 240 cm^3 . What was the original height?

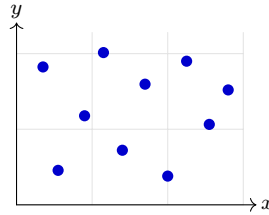
- ☐ A. 10 cm ☐ C. 20 cm
☐ B. 15 cm ☐ D. 30 cm



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- 4) A hexagonal garden can be decomposed into a rectangle (12 ft by 6 ft) and two congruent isosceles right triangles (legs 6 ft each) on opposite ends. What is the total area?

- ☐ A. 72 ft^2 ☐ C. 144 ft^2
☐ B. 108 ft^2 ☐ D. 180 ft^2



5)

A scatter plot shows two variables with points scattered randomly in all directions with absolutely no visible trend or pattern. What does this indicate about the relationship between the variables?

- ☐ A. No correlation ☐ C. Strong negative correlation
☐ B. Strong positive correlation ☐ D. Perfect linear relationship

- 6) Which interpretation of MAD is correct?

- ☐ A. MAD tells you the largest value in the data ☐ C. MAD is always equal to the mean
☐ B. MAD measures the typical distance of data points from the mean ☐ D. MAD is usually negative

- 7) If two dice are rolled, what is the probability of getting at least one 4?

- ☐ A. $\frac{1}{6}$ ☐ C. $\frac{6}{36}$
☐ B. $\frac{11}{36}$ ☐ D. $\frac{25}{36}$



8) A student has 6 different books and wants to arrange all of them on a shelf. How many arrangements are possible?

☐ A. $6 + 5 + 4 + 3 + 2 + 1 = 21$

☐ C. $6! = 720$

☐ B. $6^6 = 46,656$

☐ D. $\binom{6}{6} = 1$

9) What is $0.\overline{3}$ as a fraction?

☐ A. $\frac{1}{10}$

☐ C. $\frac{3}{99}$

☐ B. $\frac{3}{10}$

☐ D. $\frac{3}{9} = \frac{1}{3}$

10) Which radicand gives a square root closest to 5.5?

☐ A. 25

☐ C. 33

☐ B. 28

☐ D. 30

11) Which of the following is rational?

☐ A. π

☐ C. 0.101001000... (non-repeating)

☐ B. $\sqrt{15}$

☐ D. $\sqrt{36}$

12) A point on a coordinate grid is at distance $\sqrt{50}$ from the origin. If one coordinate is 5, what is the other coordinate?

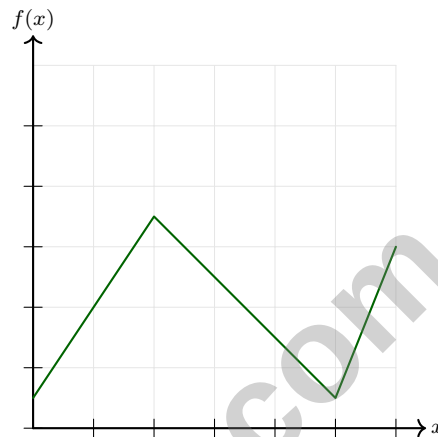


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- 1) A store sells apples at \$2 per pound. The proportional relationship is $y = 2x$, where x is pounds and y is cost in dollars. How much do 7 pounds cost?

☐ A. \$9
☐ B. \$12

☐ C. \$14
☐ D. \$16



2)

At which x -value does the graph reach its maximum?

☐ A. $x = 0$
☐ B. $x = 2$

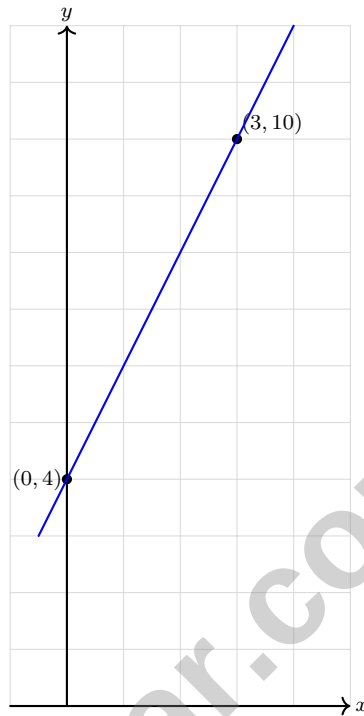
☐ C. $x = 5$
☐ D. $x = 6$

- 3) A car travels 180 miles in 3 hours. What is the slope (speed in miles per hour)?



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- 4) The graph shows a line passing through $(0, 4)$ and $(3, 10)$.



What is the equation of the line?

☐ A. $y = 2x + 4$

☐ C. $y = 2x + 3$

☐ B. $y = 3x + 4$

☐ D. $y = 4x + 3$

- 5) A rectangle's length is 4 cm more than its width. If the perimeter is 32 cm, what is the length?

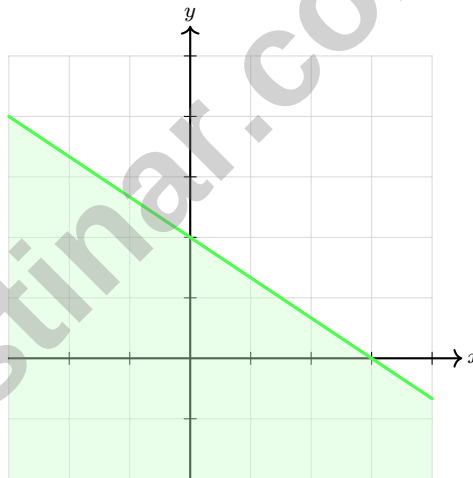


1) Which scatter plot pattern would suggest there is **no correlation** between two variables?

- ☐ A. Points scattered randomly with no visible pattern
- ☐ B. Points forming a clear upward trend
- ☐ C. Points forming a clear downward trend
- ☐ D. Points concentrated along a single line

2) A figure in Quadrant I is reflected across the line $y = -x$. Which quadrant will the image be in?

- ☐ A. Quadrant I
- ☐ B. Quadrant II
- ☐ C. Quadrant IV
- ☐ D. Quadrant III



3)

What is the inequality?

- ☐ A. $y > -\frac{2}{3}x + 2$
- ☐ B. $y < -\frac{2}{3}x + 2$
- ☐ C. $y \geq -\frac{2}{3}x + 2$
- ☐ D. $y \leq -\frac{2}{3}x + 2$



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4) Which list is in order from smallest to largest?

- ☐ A. 3.2×10^{-5} , 3.2×10^1 , 3.2×10^{-3} ☐ C. 3.2×10^{-3} , 3.2×10^{-5} , 3.2×10^1
☐ B. 3.2×10^1 , 3.2×10^{-3} , 3.2×10^{-5} ☐ D. 3.2×10^{-5} , 3.2×10^{-3} , 3.2×10^1

5) Which equation represents a proportional relationship?

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

6) Solve for x : $\frac{2x}{3} = 8$

- ☐ A. $x = 12$ ☐ C. $x = 24$
☐ B. $x = 16$ ☐ D. $x = 6$

7) Which relation is a function?

- ☐ A. A student and the clubs they joined (a student may join more than one club).
☐ B. A book title and its author (a book has multiple authors).
☐ C. A person and the phone numbers they use (a person may use more than one phone number).
☐ D. A country and its capital (one country, one capital).

8) A cube-shaped storage container has a volume of 512 cubic feet. What is the side length of the cube?



Virginia SOL 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 Virginia SOL practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** (8.PFA.3) A zero of a function is a point where $f(x) = 0$, represented on a graph as an x -intercept (where the curve crosses the x -axis). Option A is a y -intercept, B is a maximum, C is undefined.
- 2) **Choice C is correct.** (8.PS.3) 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.
- 3) **Choice C is correct.** (8.MG.2) Let original height be h . After doubling, $V = \frac{1}{3} \times 18 \times 2h = 240 \Rightarrow 12h = 240 \Rightarrow h = 20$ cm.
- 4) **Choice B is correct.** (8.MG.5) Rectangle = $12 \times 6 = 72$ ft². Each isosceles right triangle = $\frac{1}{2} \times 6 \times 6 = 18$ ft². Two triangles = 36 ft². Total = $72 + 36 = 108$ ft².
- 5) **Choice A is correct.** (8.PS.3) Points scattered randomly with no visible trend or pattern indicate no correlation between the variables. There is no identifiable relationship.
- 6) **Choice B is correct.** (8.PS.3) MAD represents the average distance each value is from the mean, showing variability. It cannot be negative because it uses absolute values.
- 7) **Choice B is correct.** (8.PS.1) $P(\text{at least one } 4) = 1 - P(\text{no } 4) = 1 - \frac{25}{36} = \frac{11}{36}$.
- 8) **Choice C is correct.** (8.NS.2) Arranging all 6 books in order is a factorial: $6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$.
- 9) **Choice D is correct.** (8.NS.2) Let $x = 0.\bar{3}$. Then $10x = 3.\bar{3}$. Subtracting: $9x = 3$, so $x = \frac{3}{9} = \frac{1}{3}$.
- 10) **Choice D is correct.** (8.NS.1) $(5.5)^2 = 30.25$. Since $\sqrt{30} \approx 5.48$ is closest to 5.5, the answer is 30.
- 11) **Choice D is correct.** (8.NS.1) $\sqrt{36} = 6$, which is an integer and therefore rational. The others are irrational: π is transcendental, $\sqrt{15}$ is a square root of a non-perfect square, and $0.101001000\dots$ is non-terminating and non-repeating.
- 12) **The correct answer is ± 5 .** (8.MG.4) $\sqrt{5^2 + y^2} = \sqrt{50}$, so $25 + y^2 = 50$. Thus $y^2 = 25$ and $y = \pm 5$.
- 13) **Choice C is correct.** (8.NS.1) $\sqrt{45} = 3\sqrt{5} \approx 3 \times 2.24 = 6.71$.
- 14) **Choice D is correct.** (8.PFA.5) Dividing by -5 requires flipping $<$ to $>$. The correct step is $x - 1 > -2$, so the correct solution is $x > -1$, not $x < -1$.
- 15) **Choice C is correct.** (8.NS.1) Area of a square = $s^2 = 9^2 = 81$ cm².
- 16) **Choice D is correct.** (8.NS.1) Move the decimal 7 places right: $7.14 \times 10^7 = 71,400,000$ m.
- 17) **Choice B is correct.** (8.PFA.3) The slope is the coefficient of x . Only option B has a negative coefficient: -3 .
- 18) **Choice C is correct.** (8.PFA.4) Both sides are identical ($2x + 3 = 2x + 3$), so the equation is true for all values of x . This is an identity, not "no solution."
- 19) **The correct answer is 8.** (8.PS.3) Substitute $x = 10$: $y = \frac{1}{2}(10) + 3 = 5 + 3 = 8$.
- 20) **Choice A is correct.** (8.MG.3) Under 90° counterclockwise rotation, $(x, y) \rightarrow (-y, x)$. So $(2, 1) \rightarrow (-1, 2)$.
- 21) **Choice C is correct.** (8.MG.4) Using the Pythagorean Theorem: $7^2 + 24^2 = 49 + 576 = 625$, so $c = 25$ (the 7-24-25 triple).
- 22) **The correct answer is B,E.** (8.PFA.3) Option B is correct because the constant term 35 is the fixed monthly cost. Option E is correct because at $t = 0$, $C = 0.10(0) + 35 = 35$. The slope is 0.10, so the cost per text is \$0.10, not \$0.35.
- 23) **Choice D is correct.** (8.PFA.1) $c^0 = 1$; so $c^0 \cdot c^5 = 1 \cdot c^5 = c^5$.
- 24) **Choice D is correct.** (8.NS.1) Rewrite: $4.0 \times 10^5 + 0.6 \times 10^5 = (4.0 + 0.6) \times 10^5 = 4.6 \times 10^5$.
- 25) **The correct answer is 0.45.** (8.PS.3) Joint relative frequency: $\frac{216}{480} = 0.45$.
- 26) **Choice D is correct.** (8.PFA.3) A proportional equation is $y = kx$ (no constant term). Choice D has $+1$, so it's linear but not proportional.
- 27) **Choice C is correct.** (8.PFA.4) The marked point where the two lines meet is $(2, -2)$, so that ordered pair is the solution.
- 28) **Choice C is correct.** (8.PFA.4) Difference of squares: $x^2 - 25 = x^2 - 5^2 = (x + 5)(x - 5)$.
- 29) **Choice B is correct.** (8.PFA.2) The parabola opens upward and any vertical line intersects it at most once (or once in the visible region shown). This confirms it is a function.



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Hi, Detail Champion!

◇ In Grade 8, small details can change an entire answer: a negative sign, a decimal place, a unit, an exponent, or an inequality symbol. ◇

★ **Remember this:** You practiced noticing those details. That is a serious test skill, and it gets better with every careful review. This version gave you 8 opportunities to rehearse test-day habits. ★

Detail Checks

- **Signs:** Circle negatives before simplifying.
- **Symbols:** Read inequality signs carefully.
- **Decimals:** Line up place values.
- **Units:** Match the unit the question asks for.

Grade 8 test-day tip: Use the final minute on each section for a detail scan, not a full redo.

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

Jay Daie

Your Detail-Check 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!

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Questions designed to cover essential Grade 8 math standards.



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Multiple-choice, short answer, and more to build well-rounded skills.



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Engaging problems that connect math to everyday life.



STEP-BY-STEP PROGRESS

Track improvement and build confidence with every test.



BUILD SKILLS & BOOST CONFIDENCE

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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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