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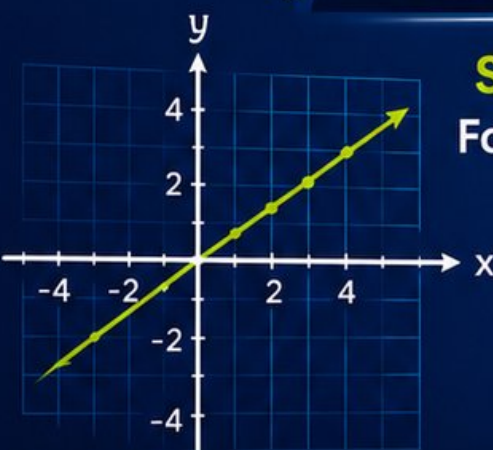
Virginia SOL

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$V = s^3$$



$$y = mx + b$$
$$2x + 5 = 13$$
$$x = 4$$



3 PRINTED
TESTS



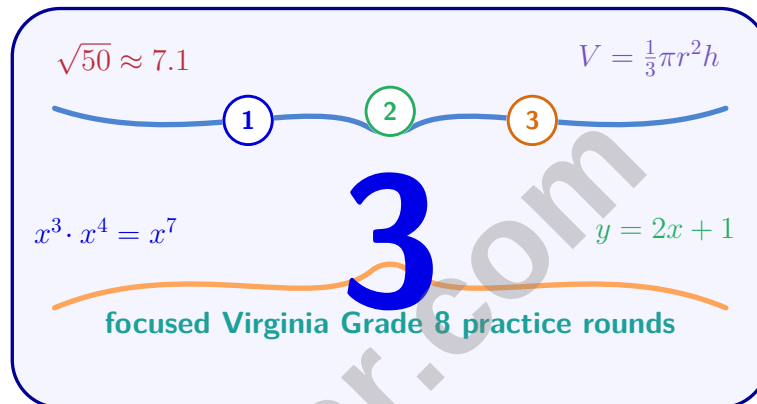
2 ONLINE
TESTS



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

3 Virginia SOL Grade 8 Math Practice Tests

Standards-Based SOL Practice with Answer Explanations



Three 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!

Three focused rounds for sharper SOL math thinking

This book gives you three 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

A three-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?

Three SOL tests, 120 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Test 3	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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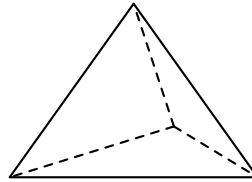
Table of Contents



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1) A function has the first differences: 4, 4, 4, 4. Is the function linear?

- ☐ A. No, because differences are all the same ☐ C. No, because only x -values can be constant
- ☐ B. Yes, constant first differences mean linear ☐ D. Yes, only if the starting value is positive



Triangular pyramid

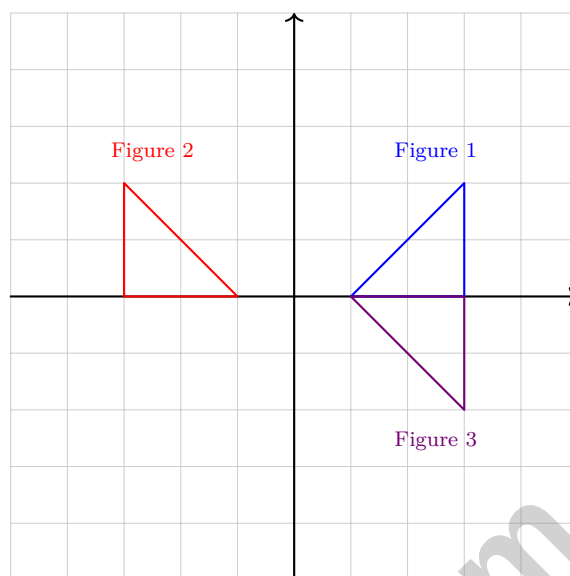
2)

A triangular pyramid (tetrahedron) has four triangular faces, each with area 10 cm^2 . What is the total surface area?

- ☐ A. 10 cm^2 ☐ C. 30 cm^2
- ☐ B. 20 cm^2 ☐ D. 40 cm^2



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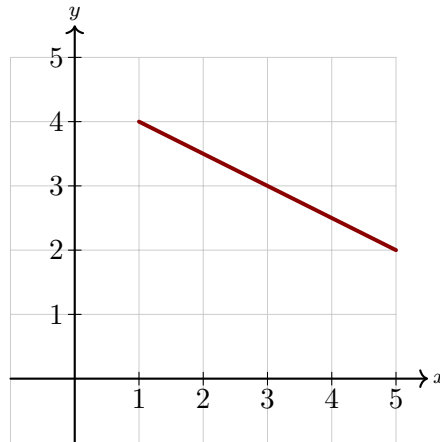


3)

If Figure 1 is the original, identify the transformation from Figure 1 to Figure 2 and from Figure 1 to Figure 3.

- ☐ A. Both are rotations ☐ C. Both are translations
☐ B. 1→2 is reflection across y -axis; 1→3 is reflection across x -axis ☐ D. 1→2 is translation; 1→3 is rotation





4)

What is the equation of the line shown?

☐ A. $y = -\frac{1}{2}x + \frac{9}{2}$

☐ C. $y = -2x + 6$

☐ B. $y = 2x + 2$

☐ D. $y = \frac{1}{2}x + 3$

5) A rectangle has a length that is 3 meters more than its width. If the perimeter is 26 meters, which equation represents this, where w is the width?

☐ A. $w + (w + 3) = 26$

☐ C. $w(w + 3) = 26$

☐ B. $3w = 26$

☐ D. $2w + 2(w + 3) = 26$

6) A student earns \$8 per hour. How many hours must they work to earn more than \$96?

☐ A. $h > 12$

☐ C. $h < 12$

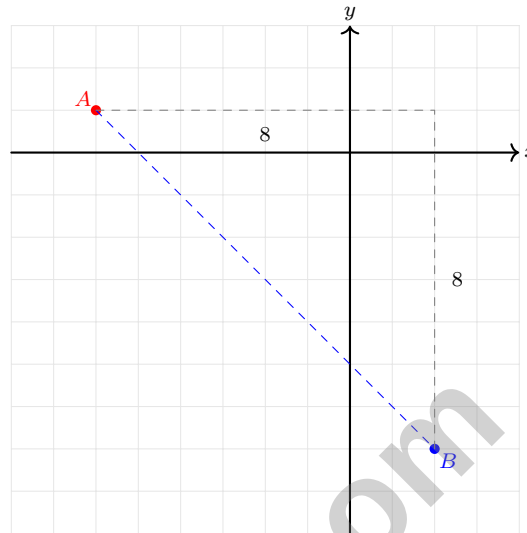
☐ B. $h \geq 12$

☐ D. $h \leq 12$



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- 1) On a map, two landmarks are at $(-6, 1)$ and $(2, -7)$. What is the distance between them?



- ☐ A. $8\sqrt{2}$ units
☐ B. 16 units
☐ C. $\sqrt{130}$ units
☐ D. 10 units
- 2) Convert $0.\overline{45}$ to a fraction in simplest form.
- ☐ A. $\frac{9}{20}$
☐ B. $\frac{45}{100}$
☐ C. $\frac{45}{90} = \frac{1}{2}$
☐ D. $\frac{45}{99} = \frac{5}{11}$
- 3) Which statement about $\sqrt{2} + 1$ is correct?
- ☐ A. It is rational
☐ B. It is between 0 and 1
☐ C. It equals $\sqrt{3}$
☐ D. It is irrational



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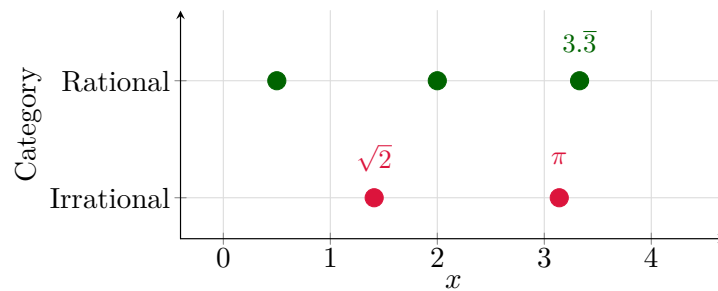
- 4) How many times smaller is 1.5×10^{-6} than 1.5×10^{-3} ?
- ☐ A. 3 times ☐ C. 300 times
☐ B. 30 times ☐ D. 1,000 times
- 5) Which is the best estimate of $\frac{\sqrt{10}}{\sqrt{2}}$?
- ☐ A. 1.4 ☐ C. 2.8
☐ B. 5.0 ☐ D. 2.2
- 6) A cube has a total surface area of 96 cm^2 . What is the length of one edge?
- ☐ A. 2 cm ☐ C. 6 cm
☐ B. 4 cm ☐ D. 8 cm
- 7) Triangle PQR is congruent to triangle STU. If PQR is transformed to STU by a single reflection, which of the following is different between the two triangles?
- ☐ A. Side lengths ☐ C. Orientation (clockwise vs. counterclockwise labeling)
☐ B. Angle measures ☐ D. Perimeter
- 8) Which pair of equations represents perpendicular lines?
- ☐ A. $y = 3x + 1$ and $y = 3x - 5$ ☐ C. $y = 4x - 2$ and $y = 4x + 6$
☐ B. $y = -\frac{3}{5}x + 2$ and $y = \frac{3}{5}x - 1$ ☐ D. $y = 2x + 4$ and $y = -\frac{1}{2}x + 1$
- 9) If an equation simplifies to $0 = 5$ after subtracting variables and constants from both sides, what does this tell you?
- ☐ A. The equation has exactly one solution ☐ C. The equation has infinitely many solutions
☐ B. The solution is $x = 0$ ☐ D. The equation has no solution



- 1) Juan borrows \$1,200 at 8% simple interest. If he repays the loan in 2 years, what is the total amount he owes?
- ☐ A. \$1,200 ☐ C. \$1,392
- ☐ B. \$1,292 ☐ D. \$1,512
- 2) A data analyst fits two different trend lines to a scatter plot. Line A has MAD (mean absolute deviation of residuals) = 0.3, while Line B has MAD = 0.8. Which conclusion is justified?
- ☐ A. Line B is better because it has a higher MAD ☐ C. Both lines are equally good
- ☐ B. Line A is better because residuals are closer to zero ☐ D. We cannot compare lines using MAD alone
- 3) A parallelogram has base 6 in and height 4 in. It is dilated by a scale factor of 2.5. What is the new height?
- ☐ A. 4 in ☐ C. 15 in
- ☐ B. 10 in ☐ D. 6.5 in
- 4) If $f(x) = x^2 - 4x + 3$, what is $f(2)$?
- ☐ A. -1 ☐ C. 3
- ☐ B. 0 ☐ D. 7



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& answers



5)

Which number should be plotted as irrational (height 0)?

☐ A. 0.5

☐ C. $3.\bar{3}$
☐ B. 2

☐ D. $\sqrt{5}$

6) What denominator appears when a repeating decimal has a 4-digit repeating block?

☐ A. 10

☐ C. 999

☐ B. 100

☐ D. 9999

7) Which set contains only irrational numbers?

☐ A. $\{1, 2, 3\}$
☐ C. $\{\sqrt{2}, 3, \sqrt{5}\}$
☐ B. $\{\sqrt{4}, \sqrt{9}, \sqrt{16}\}$
☐ D. $\{\sqrt{2}, \sqrt{3}, \sqrt{5}\}$

8) Which is arranged from smallest to largest?

☐ A. $2 \times 10^1, 2 \times 10^{-3}, 2 \times 10^{-1}$
☐ C. $2 \times 10^{-1}, 2 \times 10^{-3}, 2 \times 10^1$
☐ B. $2 \times 10^1, 2 \times 10^{-1}, 2 \times 10^{-3}$
☐ D. $2 \times 10^{-3}, 2 \times 10^{-1}, 2 \times 10^1$

9) Which is the best estimate of $\sqrt{48}$?

☐ A. 6.5

☐ C. 6.9

☐ B. 7.0

☐ D. 8.2


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 B is correct.** **(8.PFA.3)** A function is linear if and only if its first differences are constant. Since all differences equal 4, this function is linear.
- 2) **Choice D is correct.** **(8.MG.2)** A triangular pyramid has 4 triangular faces (one base, three lateral). If each has area 10 cm^2 , total surface area $= 4 \times 10 = 40 \text{ cm}^2$.
- 3) **Choice B is correct.** **(8.MG.3)** Figure 2 is the mirror image of Figure 1 across the y -axis. Figure 3 is the mirror image of Figure 1 across the x -axis. The asymmetric triangle shape helps show the reflections clearly.
- 4) **Choice A is correct.** **(8.PFA.3)** Using $(1, 4)$ and $(5, 2)$: slope $= \frac{2-4}{5-1} = -\frac{1}{2}$. Substituting: $4 = -\frac{1}{2}(1) + b$ gives $b = \frac{9}{2}$.
- 5) **Choice D is correct.** **(8.PFA.4)** Perimeter $= 2(\text{length}) + 2(\text{width}) = 2(w + 3) + 2w = 26$.
- 6) **Choice A is correct.** **(8.PFA.5)** Set up: $8h > 96$. Divide by 8: $h > 12$ hours.
- 7) **Choice B is correct.** **(8.PFA.5)** Substitute: $4(3) - 3(3) = 12 - 9 = 3$. Test: $3 \geq 3$ TRUE. The point is on the boundary and included in the solution because of $\geq$.
- 8) **Choice D is correct.** **(8.PFA.1)** $(k^2)^3 = k^6$; then $k^6 \cdot k^{-1} = k^5$; then $\frac{k^5}{k^5} = k^0 = 1$.
- 9) **Choice C is correct.** **(8.NS.1)** $20 \times 20 = 400$, so $\sqrt{400} = 20$.
- 10) **Choice C is correct.** **(8.NS.1)** Divide coefficients: $7.5 \div 2.5 = 3$. Subtract exponents: $10^{9-5} = 10^4$. Result: 3×10^4 .
- 11) **Choice D is correct.** **(8.PFA.3)** Slope $= \frac{8}{2} = 4$. The line passes through $(0, 0)$ and $(2, 8)$.
- 12) **Choice A is correct.** **(8.PFA.4)** Substitute $y = 2x - 5$ into $4x - y = 7$: $4x - (2x - 5) = 7$, so $2x + 5 = 7$ and $x = 1$. Then $y = 2(1) - 5 = -3$, so the solution is $(1, -3)$.
- 13) **The correct answer is -2 .** **(8.NS.1)** With the same coefficient, the smallest power has the smallest exponent: -2 .
- 14) **Choice A is correct.** **(8.PFA.2)** Each vertical line at $x = a$ represents all points with that x -coordinate. If the line intersects the graph more than once, the input a has multiple outputs, violating the function definition.
- 15) **Choice B is correct.** **(8.PFA.2)** Slope of p : -1 . Slope of q : -1.5 . Since $-1.5 < -1$, function q is more negative.
- 16) **The correct answer is $\frac{37}{900}$.** **(8.NS.2)** Set $x = 0.12\bar{3} = 0.12333\dots$. Then $100x = 12.\bar{3}$ and $1000x = 123.\bar{3}$. Subtracting: $900x = 111$, so $x = \frac{111}{900} = \frac{37}{300}$.
- 17) **Choice A is correct.** **(8.PFA.3)** Using $y = mx + b$ with $m = -2$ and $b = 5$: equation is $y = -2x + 5$.
- 18) **Choice B is correct.** **(8.PFA.3)** A flat section means the function is constant, so the temperature does not change. This occurs from noon to 6pm.
- 19) **The correct answer is $\sqrt{10}$.** **(8.NS.1)** Since square root is an increasing function, compare the radicands: $10 < 19 < 35$. Therefore $\sqrt{10} < \sqrt{19} < \sqrt{35}$.
- 20) **Choice B is correct.** **(8.MG.3)** Comparing the two squares: ABCD (lower left on the grid) and EFGH (upper right) have identical side lengths and the same orientation. The vertices align: A is at $(0, 0)$ and E is at $(4, 3)$, indicating a translation 4 units right and 3 units up. Translation is a rigid motion that preserves all distances and angles, so no rotation or reflection is needed.
- 21) **The correct answer is A, C.** **(8.NS.1)** $\sqrt{169} = 13$ is rational (perfect square). The repeating decimal $0.777\dots = \frac{7}{9}$ is rational. The other values are irrational: $\sqrt{170}$ (non-perfect square), 2π (irrational multiple of π), and $\sqrt{2} + 1$ (irrational plus rational is irrational).
- 22) **Choice A is correct.** **(8.MG.3)** Under dilation by scale factor k , length is multiplied by k . So $15 \times \frac{2}{3} = 10$.
- 23) **Choice D is correct.** **(8.MG.1)** Exterior angle equals the sum of remote interior angles: $55 + 64 = 119^\circ$.
- 24) **Choice A is correct.** **(8.MG.4)** From $(\sqrt{2})^2 + (\sqrt{2})^2 = c^2$, we get $2 + 2 = 4$, so $c = 2$.
- 25) **Choice B is correct.** **(8.MG.2)** $V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times 3.14 \times 216 = 904.32 \text{ mm}^3$.
- 26) **Choice B is correct.** **(8.MG.1)** Vertical angles are congruent. Adjacent angles are supplementary: $180 - 72 = 108^\circ$. The four angles are $72^\circ, 108^\circ, 72^\circ, 108^\circ$.
- 27) **Choice C is correct.** **(8.MG.5)** Rectangle area $= 7 \times 5 = 35 \text{ in}^2$. Triangle area $= \frac{1}{2} \times 7 \times 3 = 10.5 \text{ in}^2$. Total $= 35 + 10.5 = 45.5 \text{ in}^2$.



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Hi, Grade 8 Math Star!

◇ You finished this practice set with real effort. Grade 8 math asks you to connect ideas, explain your thinking, and stay steady through multi-step problems. ◇

★ **Remember this:** Every page you completed helped build stronger habits: reading carefully, choosing a method, showing work, and checking whether the answer makes sense. You practiced across 3 full Grade 8 practice tests, and that repeated effort matters. ★

What You Built

- **Focus:** You stayed with challenging questions.
- **Accuracy:** You learned to slow down when details matter.
- **Reasoning:** You practiced explaining why a method works.
- **Readiness:** You are more prepared than when you started.

Grade 8 test-day tip: Before test day, review the questions that made you pause. Those are the best teachers.

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

Jay Daie

Your Grade 8 Math Friend

PRACTICE TODAY, ACHIEVE TOMORROW!

GRADE
8

Give your child the edge they need with **3 full-length** Grade 8 Math practice tests that reflect real test formats and cover all key math standards. Perfect for building skills, boosting confidence, and preparing for 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!



2 Extra Online Practice Tests Included!

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PRACTICE. PREPARE. SUCCEED.



Testinar

More Practice. More Confidence.
Better **Results**.