

VIRGINIA SOL

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.



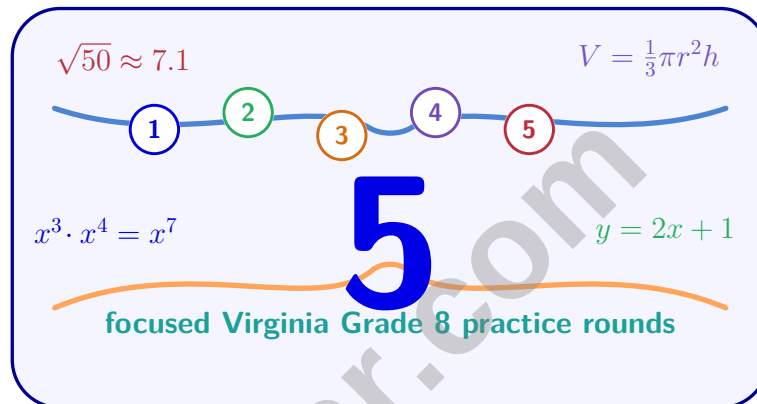
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

5 Virginia SOL Grade 8 Math Practice Tests

Five SOL Tests for Standards-Aligned Math Practice



Five 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.

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Welcome, Virginia Grade 8 Problem Solver!

Five focused rounds for sharper SOL math thinking

This book gives you five 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 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.

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?

Five SOL 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.



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For more practice
& answers

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1) Which is the best estimate of $\sqrt{18}$?

☐ A. 3.0

☐ C. 4.2

☐ B. 4.0

☐ D. 9.0

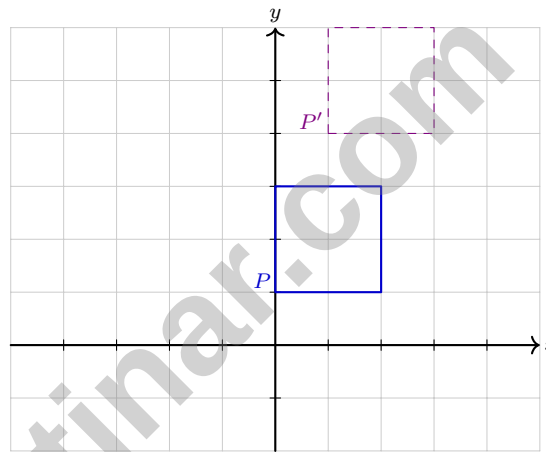
2) A student expands $(x - 4)^2$ and gets $x^2 - 16$. What is the error?

☐ A. Missing the middle term.

☐ C. Used subtraction instead of FOIL.

☐ B. Forgot to square the coefficient of x .

☐ D. The answer is correct; there is no error.



3)

The blue square is the pre-image $PQRS$ with P at $(0, 1)$. The purple square is the image $P'Q'R'S'$. What is the translation rule?

☐ A. $(x, y) \rightarrow (x + 1, y + 3)$

☐ C. $(x, y) \rightarrow (x + 2, y + 2)$

☐ B. $(x, y) \rightarrow (x - 1, y - 3)$

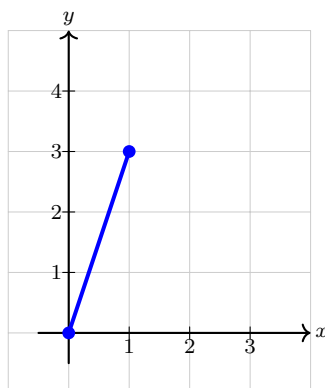
☐ D. $(x, y) \rightarrow (x + 3, y + 1)$



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4) What is the slope of the line shown?

☐ A. 2☐ C. 3☐ B. $\frac{1}{3}$ ☐ D. $\frac{3}{2}$

5) How much of a 100% alcohol solution must be mixed with 500 mL of 20% alcohol solution to create a 50% solution?

☐ A. 100 mL☐ C. 300 mL☐ B. 200 mL☐ D. 400 mL

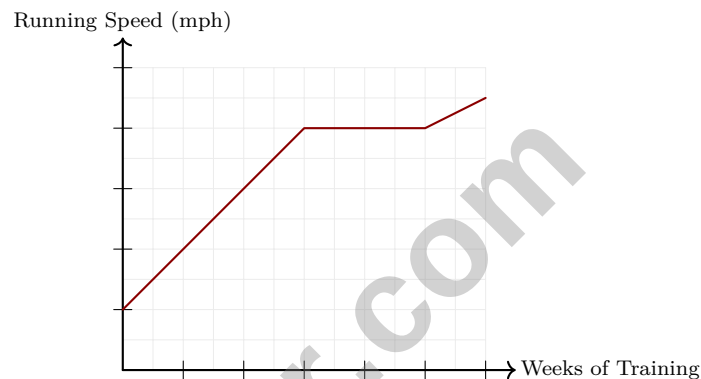
6) If $f(x) = \frac{x+4}{2}$ and $f(x) = 5$, what is x ?

☐ A. 2☐ C. 6☐ B. 4☐ D. 10

7) The relationship between Celsius (C) and Fahrenheit (F) is linear. When $C = 0$, $F = 32$; when $C = 100$, $F = 212$. What is the slope of the line?

☐ A. 1.8☐ C. 0.56☐ B. $\frac{5}{9}$ ☐ D. $\frac{100}{180}$ 

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



9)

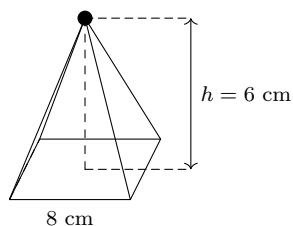
A runner trains for 6 weeks. Speed increases for the first 3 weeks, stays constant for 2 weeks (maintenance phase), then improves slightly. During weeks 3–5, what is the runner's speed trend?

- | | |
|---|---|
| ☐ A. Speed continues to increase | ☐ C. Speed decreases |
| ☐ B. Speed remains constant | ☐ D. Speed fluctuates randomly |
- 10) Pentagon PQRST is congruent to pentagon UVWXY. If side $PQ = 8$ cm, what is the length of the corresponding side in the second pentagon?
- | | |
|----------------------------------|--|
| ☐ A. 4 cm | ☐ C. 16 cm |
| ☐ B. 8 cm | ☐ D. Cannot be determined |



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- 1) The square pyramid below has a base edge of 8 cm and a height of 6 cm.



What is the volume of the pyramid?

- ☐ A. 64 cm^3
☐ C. 256 cm^3
☐ B. 128 cm^3
☐ D. 384 cm^3

- 2) The area model below represents $(x + 2)(x + 4)$:

	x	2
x	x^2	$2x$
4	$4x$	8

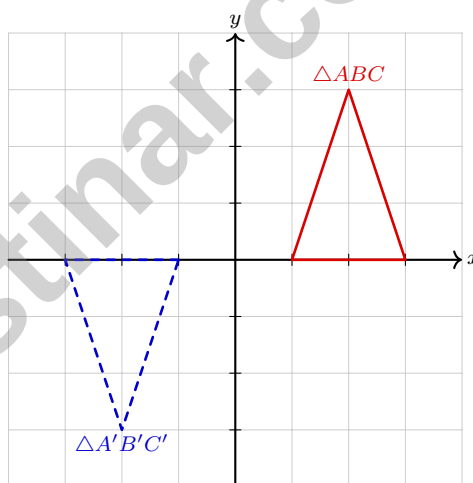
What is the total area?

- ☐ A. $x^2 + 6x + 8$
☐ C. $x^2 + 4x + 2$
☐ B. $x^2 + 8$
☐ D. $2x^2 + 6x + 8$
- 3) The equation $y = |x - 2|$ is:
- ☐ A. Linear, because it is an equation
 ☐ C. Nonlinear, because absolute value creates a V-shape
☐ B. Linear, because the absolute value of a linear expression is linear
 ☐ D. Linear, because it can be written as $y = mx + b$



- 4) Simplify $\frac{x^{10} \cdot x^{-3}}{x^4}$. What is the exponent on x in the final answer?

- 5) A square park has an area of 169 square yards. What is the length of one side of the park?



6)

Triangle ABC (red) is transformed to $\triangle A'B'C'$ (dark blue). Which transformation is shown?

- ☐ A. Reflection across the y -axis ☐ C. Rotation 180°
☐ B. Rotation 90° counterclockwise ☐ D. Translation left 2, down 3



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- 1) A triangular prism has an isosceles triangular base with base 8 cm and two equal sides of 5 cm each. The height of the triangle is 3 cm. The prism length is 6 cm. What is the total surface area?
- ☐ A. 96 cm^2 ☐ C. 132 cm^2
☐ B. 108 cm^2 ☐ D. 156 cm^2
- 2) A bank loan of \$10,000 at 5% simple interest is repaid in 5 equal annual installments. The total simple interest over the full term is \$2,500. How much principal and interest remains owed after making the first \$2,500 payment?
- ☐ A. \$8,000 ☐ C. \$10,000
☐ B. \$8,500 ☐ D. \$9,500
- 3) Rewrite 6^{-3} using only positive exponents.
- ☐ A. $\frac{6}{3}$ ☐ C. 6^3
☐ B. -6^3 ☐ D. $\frac{1}{6^3}$
- 4) A rectangle has vertices at $(0, 0)$, $(4, 0)$, $(4, 2)$, and $(0, 2)$. If this rectangle is reflected across the line $y = x$, what is the length of the side that corresponds to the bottom side of the original rectangle (from $(0, 0)$ to $(4, 0)$)?



- 5) Estimate $\sqrt{50}$ to the nearest tenth and explain how you found your estimate.

- 6) What is $\sqrt{289}$?

☐ A. 16

☐ C. 18

☐ B. 19

☐ D. 17

- 7) Write the two consecutive integers between which $\sqrt{45}$ lies.

- 8) The diameter of an atom is about 2×10^{-10} m. What is this in decimal form?

☐ A. 0.0000002 m

☐ C. 0.000000002 m

☐ B. 0.00000002 m

☐ D. 0.0000000002 m



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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 C is correct.** **(8.NS.1)** $\sqrt{18} = 3\sqrt{2} \approx 3 \times 1.41 = 4.23$.
- 2) **Choice A is correct.** **(8.PFA.4)** $(x-4)^2 = x^2 - 8x + 16$, not $x^2 - 16$. The student missed the middle term $-8x$ that comes from $2(x)(-4)$.
- 3) **Choice A is correct.** **(8.MG.3)** $P(0,1) \rightarrow P'(1,4)$ means the translation is right 1 and up 3: $(x,y) \rightarrow (x+1, y+3)$.
- 4) **Choice C is correct.** **(8.PFA.3)** The line passes through $(0,0)$ and $(1,3)$. Rise is 3 for every 1 unit right. The slope is $\frac{\text{rise}}{\text{run}} = \frac{3}{1} = 3$.
- 5) **Choice C is correct.** **(8.PFA.4)** Let x = mL of 100% alcohol solution. The 500 mL of 20% solution contains 100 mL of alcohol. Set up $\frac{x+100}{x+500} = 0.50$. Then $x+100 = 0.5x+250$, so $0.5x = 150$ and $x = 300$.
- 6) **Choice C is correct.** **(8.PFA.2)** Solve $\frac{x+4}{2} = 5$: multiply both sides by 2 to get $x+4 = 10$, so $x = 6$.
- 7) **Choice A is correct.** **(8.PFA.3)** Slope is $m = \frac{212-32}{100-0} = \frac{180}{100} = 1.8$. Be careful to use change in F over change in C .
- 8) **The correct answer is (5,3).** **(8.PFA.4)** Add the two equations to eliminate y : $(x+y) + (x-y) = 8+2$, so $2x = 10$, giving $x = 5$. Substitute into the first equation: $5+y = 8$, so $y = 3$.
- 9) **Choice B is correct.** **(8.PFA.3)** The graph shows a flat horizontal line from week 3 to week 5 at 4 mph, indicating no change in speed. This is the maintenance phase after rapid early gains.
- 10) **Choice B is correct.** **(8.MG.3)** Congruent figures have equal corresponding sides. The side corresponding to PQ in pentagon $UVWXY$ is UV , and it must equal 8 cm.
- 11) **Choice B is correct.** **(8.MG.1)** The two acute angles in a right triangle sum to 90° . So $p + (2p+18) = 90$, which gives $3p = 72$ and $p = 24^\circ$.
- 12) **Choice B is correct.** **(8.MG.4)** The 3-4-5 Pythagorean triple is among the most common. $3^2 + 4^2 = 9 + 16 = 25$, so $c = 5$.
- 13) **Choice A is correct.** **(8.MG.4)** Check: $15^2 + 20^2 = 225 + 400 = 625 = 25^2$. Yes, it's a Pythagorean triple (a multiple of 3-4-5).
- 14) **Choice C is correct.** **(8.MG.1)** Let the angle be x . Its supplement is $180 - x$. So $x = (180 - x) + 8 \Rightarrow x = 188 - x \Rightarrow 2x = 188 \Rightarrow x = 94^\circ$.
- 15) **Choice D is correct.** **(8.MG.5)** Rectangle = $14 \times 9 = 126 \text{ ft}^2$. Trapezoid = $\frac{1}{2}(14+10) \times 3 = 36 \text{ ft}^2$. Total = $126 + 36 = 162 \text{ ft}^2$.
- 16) **The correct answer is 1.** **(8.PFA.2)** A nonvertical line has exactly one y -value for each x -value.
- 17) **Choice C is correct.** **(8.MG.1)** Each interior angle of a regular hexagon is $\frac{(6-2) \times 180}{6} = \frac{720}{6} = 120^\circ$.
- 18) **Choice A is correct.** **(8.PS.3)** Random scatter with no visible trend or pattern indicates no correlation between the two variables.
- 19) **Choice B is correct.** **(8.PS.3)** The line goes from $(0,3.0)$ to $(4,4.2)$ on the graph (representing \$30,000 to \$42,000). Slope = $\frac{4.2-3.0}{4-0} = \frac{1.2}{4} = 0.3$ (in units of \$10,000), or \$3000/year.
- 20) **Choice C is correct.** **(8.PS.3)** Column-conditional frequency: among Science club (column total 216), Math-lovers are 84. Divide by column total, not row or grand total.
- 21) **The correct answer is A,D.** **(8.PFA.3)** The line goes through $(0,0)$ and $(8,4)$, so the slope and constant of proportionality are $\frac{4}{8} = 0.5$. A point on the line must have $y = 0.5x$; when $x = 6$, $y = 3$, so $(6,3)$ is on the line.
- 22) **Choice D is correct.** **(8.PS.3)** If MAD = 0, every value must equal the mean exactly, which happens only when all values are the same.
- 23) **Choice D is correct.** **(8.PS.1)** Rolling exactly a 3 has only 1 favorable outcome out of 6. So $P(3) = \frac{1}{6}$, not $\frac{1}{3}$.
- 24) **Choice C is correct.** **(8.NS.2)** Choose 1st (5 choices), then 2nd (4 remaining), then 3rd (3 remaining): $5 \times 4 \times 3 = 60$.
- 25) **The correct answer is 10.** **(8.PFA.2)** Car A travels 60 mph and Car B travels 50 mph, so the difference is 10 mph.
- 26) **Choice A is correct.** **(8.MG.2)** $V = \frac{1}{3} \times 25 \times 9 = 75 \text{ cm}^3$.
- 27) **Choice C is correct.** **(8.PS.3)** Reading from the trend line at $x = 7$, the corresponding y -value is just under 7, so the best estimate is approximately 7.



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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 | ✓ Statistics & Probability |
| ✓ Expressions & Equations | ✓ Pythagorean Theorem |
| ✓ Ratios & Proportional Relationships | ✓ Volume & Surface Area |
| ✓ Linear Equations | ✓ Transformations |
| ✓ Functions | ✓ Inequalities |
| ✓ Geometry | ✓ Data Analysis & Graphing |
| ✓ Measurement & Data | ✓ And More! |

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