

Virginia SOL

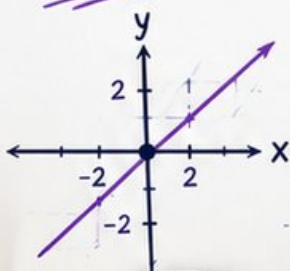
GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

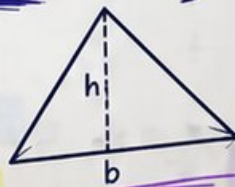
$$y = mx + b$$



**BUILD
CONFIDENCE.
SHARPEN SKILLS.
ACE YOUR
EXAM!**

Practice
Today
Succeed
Tomorrow!

$$A = \frac{1}{2}bh$$



7 PRINTED
TESTS



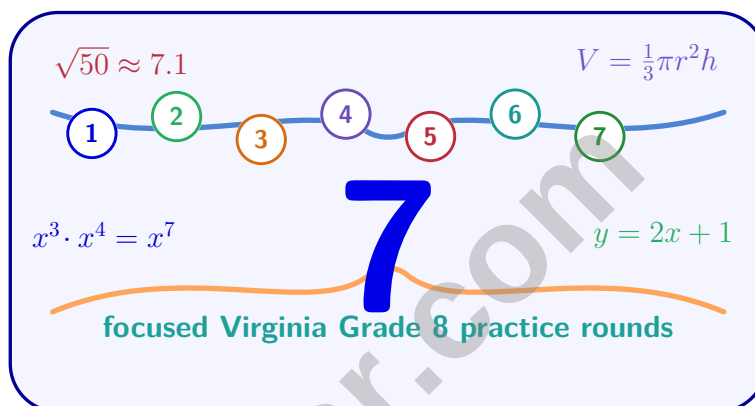
2 ONLINE
TESTS



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

7 Virginia SOL Grade 8 Math Practice Tests

Seven SOL Math Tests for Skill Building and Standards Practice



Seven 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!

Seven focused rounds for sharper SOL math thinking

This book gives you seven 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 seven-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?

Seven SOL tests, 280 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.
Test 7	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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1) Which number is equivalent to 6.5×10^{-3} ?

☐ A. 6,500

☐ C. 0.065

☐ B. 65,000

☐ D. 0.0065

2) $(7.8 \times 10^7) - (2.3 \times 10^6) = ?$

☐ A. 5.5×10^7

☐ C. 5.5×10^6

☐ B. 5.5×10^1

☐ D. 7.57×10^7

3) Which set of ordered pairs represents a function?

☐ A. $\{(0, 1), (0, 2), (1, 3)\}$

☐ C. $\{(1, 1), (1, 2), (2, 2)\}$

☐ B. $\{(2, 4), (3, 5), (4, 6)\}$

☐ D. $\{(5, 3), (5, 4), (6, 5)\}$

4) A television screen is advertised as having a diagonal of 50 inches. If the width is 40 inches, what is the height?

☐ A. 10 inches

☐ C. 45 inches

☐ B. 30 inches

☐ D. 90 inches

5) What is the sum of the interior angles of a triangle?

☐ A. 180°

☐ C. 270°

☐ B. 90°

☐ D. 360°

6) Which pair of figures is NOT similar?

☐ A. Two circles with radii 3 and 6

☐ C. A rectangle 2×4 and a rectangle

☐ B. A 3–4–5 triangle and a 6–8–10 triangle

3×6

☐ D. A square 5×5 and a rectangle 5×10



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7) Gym X : $\text{Cost}(m) = 30m$. Gym Y at month 1: \$50, month 3: \$115. Higher monthly fee?

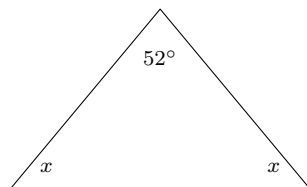
☐ A. Gym X

☐ B. Gym Y

☐ C. Both same.

☐ D. Cannot be determined.

8) In an isosceles triangle, the vertex angle is 52° . What is each base angle?



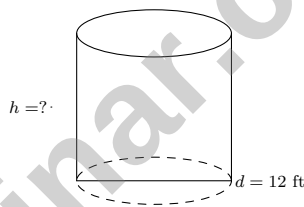
☐ A. 52°

☐ B. 64°

☐ C. 76°

☐ D. 90°

9)



A cylinder has a diameter of 12 ft and volume of 1130.4 ft^3 . What is its height? (Use $\pi \approx 3.14$.)

☐ A. 5 ft

☐ B. 8 ft

☐ C. 10 ft

☐ D. 15 ft

10) Three angles at a point on a straight line measure 38° , 71° , and z . Find the value of z .

☐ A. 71°

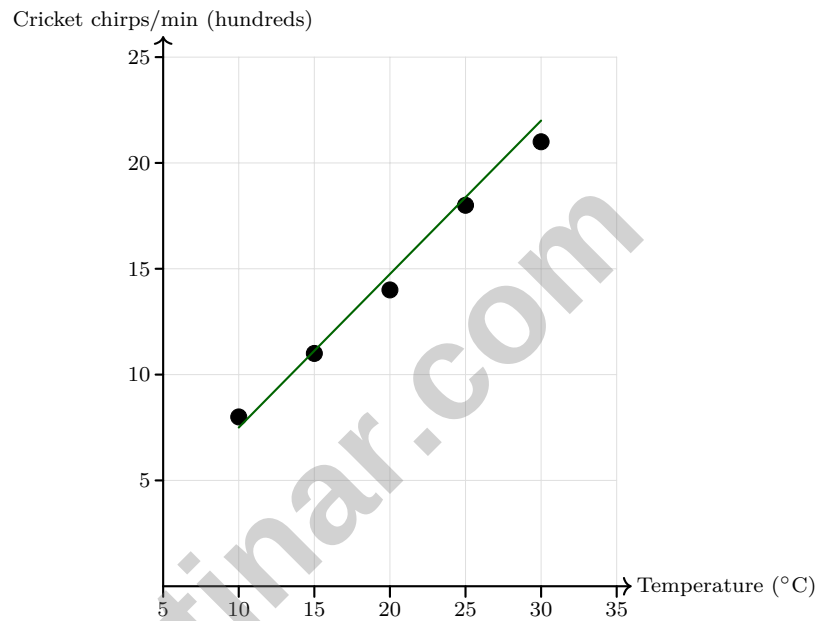
☐ B. 109°

☐ C. 119°

☐ D. 142°



11) Solve for m : $\frac{m}{5} - 2 = 3$. Show all work and verify your solution.



12)

Based on the scatter plot, as temperature increases by 5°C , cricket chirps increase by approximately how many (in hundreds)?

☐ A. 0.5 hundreds

☐ C. 1.5 hundreds

☐ B. 1 hundred

☐ D. 3 hundreds



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1) Convert $0.9\overline{3}$ to a fraction in simplest form.

☐ A. $\frac{93}{100}$

☐ B. $\frac{9}{30}$

☐ C. $\frac{93}{99}$

☐ D. $\frac{84}{90} = \frac{14}{15}$

2) What is the slope of the line $y = -2x + 5$?

☐ A. -2

☐ B. 2

☐ C. $-\frac{1}{2}$

☐ D. 5

3) Solve for y : $-4y + 7 = 15$

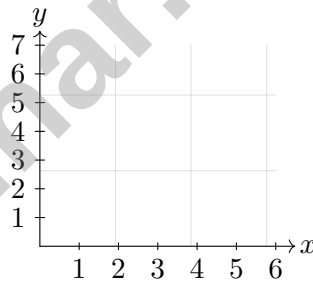
☐ A. $y = -8$

☐ B. $y = 8$

☐ C. $y = 2$

☐ D. $y = -2$

4) Graph the proportional relationship $y = \frac{3}{2}x$ by finding three points and identifying the slope. What is the slope?



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5) $\frac{5 \times 10^{-2}}{2.5 \times 10^{-5}} = ?$

☐ A. 0.2×10^3

☐ B. 2.5×10^{-7}

☐ C. 2×10^3

☐ D. 7.5×10^{-7}

6) Solve by substitution:
$$\begin{cases} y = -x + 7 \\ 2x + y = 10 \end{cases}$$

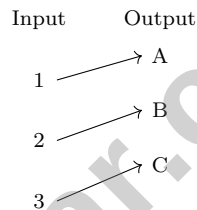
☐ A. (2, 5)

☐ B. (5, 2)

☐ C. (4, 3)

☐ D. (3, 4)

7) Analyze this mapping and determine if it is a function:

☐ A. Yes, this is a function.☐ B. No, because inputs are numbers and outputs are letters.☐ C. No, because there are three inputs and three outputs.☐ D. Yes, but only if each input is positive.

8) A right triangle has a hypotenuse of 10 and one leg of 6. What is the other leg?

☐ A. 4

☐ B. 8

☐ C. 16

☐ D. 100



- 1) A triangle is reflected across a horizontal line, then rotated 180 degrees. If the original triangle has an area of 35 square cm, what is the area of the final triangle?

☐ A. 17.5 sq cm ☐ C. 70 sq cm
☐ B. 35 sq cm ☐ D. Cannot be determined

- 2) A triangular pyramid has a right-triangular base with legs 9 in and 12 in, and a pyramid height of 20 in. Calculate the volume in cubic inches.



- 3) A coach recorded sprint times (in seconds): {8, 8, 8, 9, 10}. Mean = 8.6 seconds. What is the MAD?

☐ A. 0.4 ☐ C. 0.6
☐ B. 0.72 ☐ D. 1.2

- 4) A deck of cards has 4 aces out of 52 cards. If you draw a card, replace it, and draw again, what is the probability that both draws are aces?

☐ A. $\frac{4}{52}$ ☐ C. $\frac{1}{152}$
☐ B. $\frac{16}{2704}$ ☐ D. $\frac{8}{52}$

- 5) Which scenario requires permutation (order matters)?

☐ A. Selecting 2 students from a group of 10 to form a study pair. ☐ C. Picking 2 toppings from a pizza menu.
☐ B. Arranging 2 students from a group of 10 in a line (first and second position). ☐ D. Choosing 2 books to bring home from a library shelf.



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6) What is $0.3\overline{45}$ as a fraction?

☐ A. $\frac{345}{1000}$

☐ B. $\frac{3}{45}$

☐ C. $\frac{345}{999}$

☐ D. $\frac{342}{990} = \frac{19}{55}$

n	4	9	16	25
$\sqrt{n}$	2	3	4	5

7)

Using the table, between which integers does $\sqrt{11}$ lie?

☐ A. 2 and 3

☐ B. 5 and 6

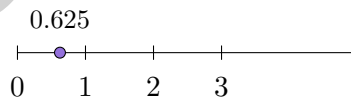
☐ C. 4 and 5

☐ D. 3 and 4

8) A patio is 15 ft by 10 ft. A semicircular decorative edge (diameter 10 ft) is added along one side. What is the total area? (Use $\pi \approx 3.14$.)



9)



Which number can be written as a terminating decimal?

☐ A. $\sqrt{5}$

☐ B. $1 + \pi$

☐ C. $\sqrt{e}$ (where $e \approx 2.718$)

☐ D. $\frac{5}{8}$



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.NS.1)** A negative exponent shifts the decimal to the left. Move the decimal 3 places left: $6.5 \times 10^{-3} = 0.0065$.
- 2) **Choice D is correct.** **(8.NS.1)** Rewrite with common exponent: $7.8 \times 10^7 - 0.23 \times 10^7 = (7.8 - 0.23) \times 10^7 = 7.57 \times 10^7$.
- 3) **Choice B is correct.** **(8.PFA.2)** Each input (2, 3, 4) maps to exactly one output (4, 5, 6). The other sets have repeated inputs.
- 4) **Choice B is correct.** **(8.MG.4)** The 3-4-5 triple scaled by 10 is 30-40-50. From $40^2 + h^2 = 50^2$: $1600 + h^2 = 2500$, so $h = 30$ inches.
- 5) **Choice A is correct.** **(8.MG.1)** For a triangle ($n = 3$): $(3 - 2) \times 180 = 1 \times 180 = 180^\circ$.
- 6) **Choice D is correct.** **(8.MG.3)** The square has aspect ratio 1 : 1 while the rectangle has aspect ratio 1 : 2. Different aspect ratios mean they are not similar.
- 7) **Choice B is correct.** **(8.PFA.2)** X fee: \$30/mo. Y fee: $(115 - 50)/(3 - 1) = 65/2 = 32.5/\text{mo}$. Since $32.5 > 30$, Y is higher.
- 8) **Choice B is correct.** **(8.MG.1)** Base angles are equal: $52 + 2x = 180$, so $2x = 128$ and $x = 64^\circ$.
- 9) **Choice C is correct.** **(8.MG.2)** Radius $r = 6$ ft. From $V = \pi r^2 h$: $1130.4 = 3.14 \times 36 \times h \Rightarrow h = \frac{1130.4}{113.04} = 10$ ft.
- 10) **Choice A is correct.** **(8.MG.1)** Angles on a straight line sum to 180° . So $z = 180 - 38 - 71 = 71^\circ$.
- 11) **The correct answer is $m = 25$.** **(8.PFA.4)** Add 2 to both sides: $\frac{m}{5} = 5$. Multiply both sides by 5: $m = 25$. Verify: $\frac{25}{5} - 2 = 5 - 2 = 3 \checkmark$.
- 12) **Choice D is correct.** **(8.PS.3)** From 10°C to 15°C (an increase of 5°), chirps go from about 8 to 11 hundreds, an increase of about 3 hundreds.
- 13) **The correct answer is -4 .** **(8.PFA.5)** Solving gives $x > -4$, so the boundary value is -4 .
- 14) **Choice D is correct.** **(8.PS.3)** Relative frequency among dine-in orders: $\frac{108}{180} = 0.60$. This is a row-conditional frequency.
- 15) **Choice B is correct.** **(8.PFA.4)** In option B, the y coefficients are $+3$ and -3 . Adding these equations eliminates y : $(4x + 3y) + (2x - 3y) = 12 + 6 \Rightarrow 6x = 18$.
- 16) **Choice B is correct.** **(8.PFA.3)** Linear functions have constant slope. Option B: slope from 1 to 2 is $\frac{8-5}{1} = 3$; from 2 to 3 is $\frac{11-8}{1} = 3$. Constant, so linear.
- 17) **Choice B is correct.** **(8.PFA.3)** From $x = 2$ to $x = 4$: change is from 3 to 1, a drop of 2 over 2 units (slope $= -1$). From 0 to 2: rise of 3. From 4 to 6: rise of 3. The only decreasing segment is 2 to 4.
- 18) **The correct answer is B,E.** **(8.PFA.3)** The equation has slope $-\frac{2}{3}$ and y -intercept 5, so B and E are correct. The point (5, 0) is not on the line because $-\frac{2}{3}(5) + 5 = \frac{5}{3}$, not 0. A perpendicular line would have slope $\frac{3}{2}$, not $-\frac{3}{2}$.
- 19) **Choice B is correct.** **(8.MG.3)** Dilation by scale factor 2 enlarges all side lengths by a factor of 2, but angles remain unchanged. The dilated pentagon is SIMILAR to the original, not congruent (unless the scale factor is 1).
- 20) **Choice A is correct.** **(8.MG.4)** Using the Pythagorean Theorem: $c = \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10$ units.
- 21) **Choice B is correct.** **(8.MG.2)** For a right triangle, base area is $\frac{1}{2} \times 6 \times 8 = 24 \text{ cm}^2$ (not 48 cm^2). Correct volume: $V = \frac{1}{3} \times 24 \times 10 = 80 \text{ cm}^3$.
- 22) **The correct answer is 2.** **(8.PFA.5)** Slope $= \frac{1 - (-3)}{2 - 0} = 2$.
- 23) **Choice B is correct.** **(8.MG.5)** Trapezoid area $= \frac{1}{2}(b_1 + b_2) \times h = \frac{1}{2}(8 + 12) \times 6 = \frac{1}{2} \times 20 \times 6 = 60 \text{ cm}^2$.
- 24) **Choice C is correct.** **(8.PS.3)** A clear upward trend with most points close to the line indicates strong positive correlation. If most points stayed far from the trend, the correlation would be weak.
- 25) **Choice D is correct.** **(8.PS.3)** Data A: Deviations are $\{2, 1, 0, 1, 2\}$, MAD $= (2 + 1 + 0 + 1 + 2)/5 = 1.2$. Data B: Deviations are $\{5, 2, 0, 2, 5\}$, MAD $= (5 + 2 + 0 + 2 + 5)/5 = 2.8$. Data B has larger MAD, indicating greater spread from the mean.
- 26) **Choice A is correct.** **(8.PS.1)** $P(A \text{ then } B) = \frac{1}{3} \times \frac{2}{3} = \frac{2}{9}$.



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Hi, Number Sense Builder!

◇ Grade 8 mathematics connects numbers, algebra, geometry, and data. It helps you model linear change, compare functions, estimate irrational values, measure distance, and explain patterns. ◇

★ **Remember this:** You practiced listening to that story. When the answer makes sense in the situation, your math becomes much stronger. This version gave you 7 opportunities to rehearse test-day habits. ★

Number Sense Checks

- **Too Big?:** Compare with an estimate.
- **Too Small?:** Use the context to judge.
- **Right Sign?:** Positive and negative values matter.
- **Right Unit?:** A number needs meaning.

Grade 8 test-day tip: Before choosing an answer, ask whether it fits the story of the problem.

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

Jay Daie

Your Number-Sense Friend

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Give your child the confidence and skills they need with **7 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!

GRADE 8

Practice
Today
Succeed
Tomorrow!

Algebra

Geometry

Statistics

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 | ✓ 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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