

6 Virginia SOL

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



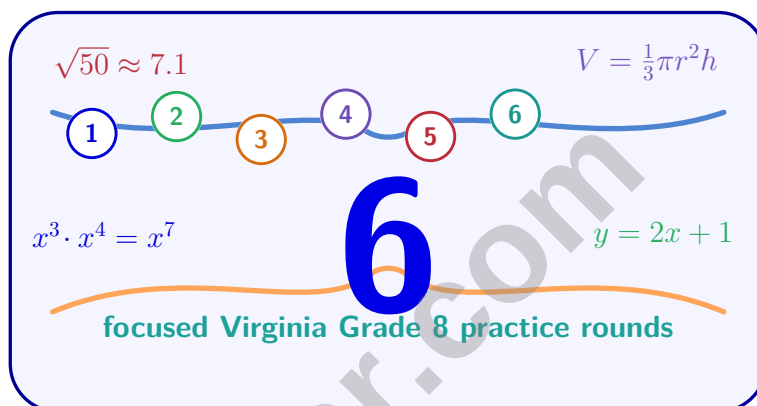
2 ONLINE
TESTS



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

6 Virginia SOL Grade 8 Math Practice Tests

Grade 8 Math Rounds for Algebra, Geometry, Data, and Confident Review



Six 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!

Six focused rounds for sharper SOL math thinking

This book gives you six 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 six-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?

Six SOL tests, 240 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 4–6	Functions, systems, transformations, geometry, data analysis, and multi-step problem solving.
Answer Pages	Compact keys and explanations that show why each answer works.

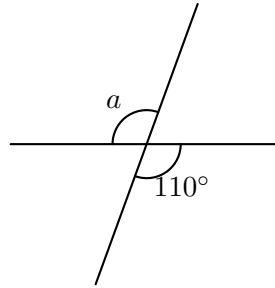
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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For more practice
& answers

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1)

Two lines intersect. One angle is 110° . What is a , the measure of the vertical angle?

☐ A. 70° ☐ C. 140° ☐ B. 110° ☐ D. 155°

2) Which of the following numbers is irrational?

☐ A. $\frac{3}{5}$ ☐ C. $\sqrt{7}$ ☐ B. $0.\overline{6}$ ☐ D. $\sqrt{25}$

3) Which product is irrational?

☐ A. $\sqrt{9} \times \sqrt{4}$ ☐ C. $2 \times \sqrt{3}$ ☐ B. $\sqrt{2} \times \sqrt{8}$ ☐ D. $\sqrt{16} \times \sqrt{25}$ 4) Which is the best estimate of $\pi - \sqrt{2}$?☐ A. 0.8☐ C. 1.7☐ B. 1.2☐ D. 2.4

5) A bonus of \$2,500 is invested at 6% compound interest for 3 years. What is the approximate final amount?

☐ A. \$2,500☐ C. \$3,000☐ B. \$3,500☐ D. \$2,975

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6) Simplify $\frac{m^8}{m^5} \cdot m^2$.

☐ A. m^{15}

☐ B. m^1

☐ C. m^{13}

☐ D. m^5

7) Two trend-line slopes are 1.2 and 1.1. What is their difference?

8) Which of the following is a perfect cube?

☐ A. 200

☐ B. 150

☐ C. 180

☐ D. 125

9) A strand of DNA has width 2.0×10^{-9} m. Convert to standard form.

☐ A. 2,000,000,000 m

☐ B. 0.00000002 m

☐ C. 0.0000002 m

☐ D. 0.000000002 m

10) An online music streaming service charges per song. A listener downloads 8 songs for \$9.60. What is the cost per song?

☐ A. \$1.00

☐ B. \$1.10

☐ C. \$1.20

☐ D. \$1.30

11) A card is randomly selected from a standard deck of 52 cards. What is the probability of drawing a spade? Express your answer as a fraction in simplest form.



12) Multiply: $(4x - 3)(x + 2)$

☐ A. $4x^2 + 5x - 6$

☐ C. $4x^2 + 2x - 6$

☐ B. $4x^2 + 8x - 3x - 6$

☐ D. $4x^2 - 6x + 2$

13) A restaurant menu has 6 appetizers, 8 main courses, and 4 desserts. If a customer orders one item from each category, how many different complete meals are possible?

14) Convert $0.\overline{3}$ to a fraction.

15) Which of the following CORRECTLY pairs an equation with its type?

☐ A. $y = x + 2$ is nonlinear

☐ C. $y = \frac{1}{2}x$ is linear

☐ B. $y = x^2 + 2$ is linear

☐ D. $y = \sqrt{x - 1}$ is linear

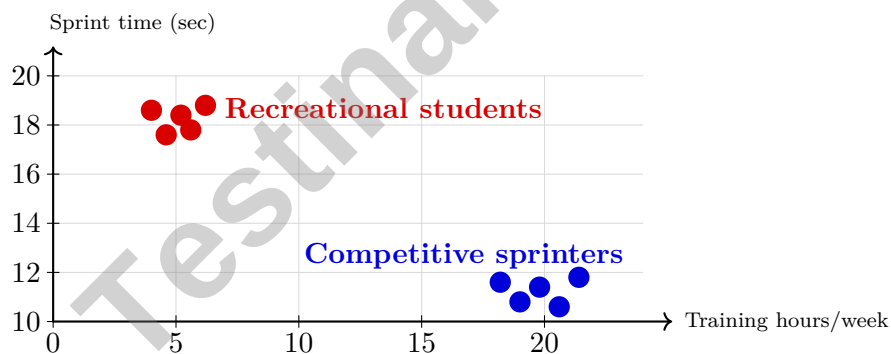


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- 1) Function $f(x) = \frac{3}{4}x + 2$ and g shown in table: (0, 3), (4, 5), (8, 7). Which has steeper slope?

x	0	4	8
$g(x)$	3	5	7

- ☐ A. $f(x)$ is steeper
☐ B. $g(x)$ is steeper
☐ C. Equal slopes
☐ D. Cannot compare
- 2) Trapezoid $PQRS$ is similar to Trapezoid $TUVW$ with scale factor $\frac{3}{2}$. If $PQ = 8$ cm in trapezoid $PQRS$, what is the length of TU in trapezoid $TUVW$?
- ☐ A. 12 cm
☐ B. 5.33 cm
☐ C. 8 cm
☐ D. 10.67 cm
- 3) A scatter plot compares weekly training time and sprint time for two groups. Red points represent recreational students, and blue points represent competitive sprinters. Which statement best describes the graph?



- ☐ A. All points form one cluster
☐ B. The points are randomly scattered
☐ C. Both groups follow the same pattern
☐ D. The groups form two separate clusters



4) In a survey of 200 people on movie preferences, 120 prefer comedy. Of those who prefer comedy, 84 are female. What is the relative frequency of females among comedy-lovers?

☐ A. 0.42

☐ C. 0.70

☐ B. 0.60

☐ D. 0.84

5) If a data set has mean = 50 and MAD = 0, which statement is true?

☐ A. All values equal 50

☐ C. There are no values equal to 50

☐ B. The data is very spread out

☐ D. The smallest value is 50

6) The probability of rain tomorrow is $\frac{2}{5}$. What is the probability that it will NOT rain?

☐ A. $\frac{3}{5}$
☐ C. $\frac{1}{5}$
☐ B. $\frac{5}{2}$
☐ D. $\frac{2}{5}$

7) A student can wear a shirt, pants, and shoes. There are 3 shirt colors, 2 pant types, and 4 shoe styles. How many different outfits are possible?

Shirts	Pants	Shoes
3 colors	2 types	4 styles

☐ A. $3 + 2 + 4 = 9$
☐ C. $3^2 \times 4 = 36$
☐ B. $3 \times 2 \times 4 = 24$
☐ D. $24 + 3 = 27$


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- 1) In a survey of 250 voters, 120 voted yes on a proposition and 130 voted no. If 75 of the yes-voters are women, what is the relative frequency of men among yes-voters as a percent?

- ☐ A. 37.5% ☐ C. 62.5%
☐ B. 30% ☐ D. 48%

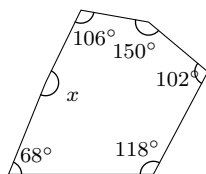
- 2) Calculate $(8.5 \times 10^4) - (3.7 \times 10^4)$ in scientific notation.

- 3) 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. $\{(4, 1), (4, 2), (4, 3)\}$

- 4) A right triangle has legs of $\sqrt{24}$ and 1. What is the hypotenuse in simplified form?

- ☐ A. $\sqrt{24}$ ☐ C. $\sqrt{23}$
☐ B. 5 ☐ D. 25



5)

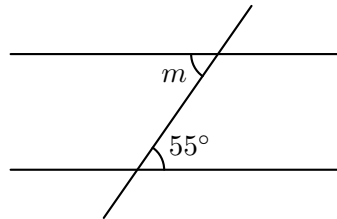
A hexagon has five interior angles: $68^\circ, 118^\circ, 102^\circ, 150^\circ, 106^\circ$. What is the sixth angle?

- ☐ A. 172° ☐ C. 180°
☐ B. 176° ☐ D. 184°



- 6) Pentagons $ABCDE$ and $FGHIJ$ are similar. Side $AB = 7$ cm and the corresponding side $FG = 14$ cm. If $BC = 9$ cm, what is the length of GH ?

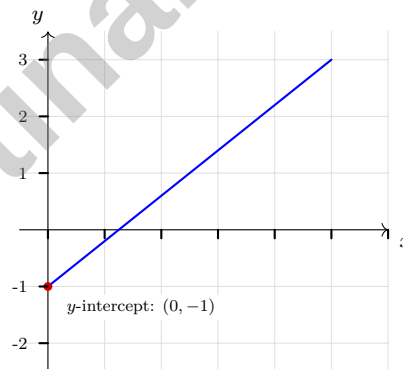
- ☐ A. 4.5 cm ☐ C. 9 cm
☐ B. 18 cm ☐ D. 11.5 cm



7)

Two parallel lines are cut by a transversal. If the lower angle is 55° , what is m , the alternate interior angle?

- ☐ A. 35° ☐ C. 125°
☐ B. 55° ☐ D. 145°



8)

The best-fit line for a dataset is $y = 0.8x - 1$. Which statement best describes what the intercept represents?

- ☐ A. For every 1-unit increase in x , y increases by 0.8 ☐ C. The x -value when $y = 0$
☐ B. The predicted value of y when $x = 0$ ☐ D. The maximum value of y



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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 B is correct.** **(8.MG.1)** Vertical angles are congruent. When two lines intersect, opposite angles are equal, so $a = 110^\circ$.
- 2) **Choice C is correct.** **(8.NS.1)** $\sqrt{7}$ is irrational because 7 is not a perfect square; its decimal expansion is non-terminating and non-repeating. $\frac{3}{5} = 0.6$ and $0.\overline{6} = \frac{2}{3}$ are rational. $\sqrt{25} = 5$ is rational.
- 3) **Choice C is correct.** **(8.NS.1)** A: $3 \times 2 = 6$ (rational). B: $\sqrt{16} = 4$ (rational). C: $2\sqrt{3}$ is irrational. D: $4 \times 5 = 20$ (rational).
- 4) **Choice C is correct.** **(8.NS.1)** $\pi \approx 3.14$ and $\sqrt{2} \approx 1.41$, so $3.14 - 1.41 \approx 1.73$.
- 5) **Choice D is correct.** **(8.CE.1)** $A = 2500(1.06)^3 \approx \$2,977.54$. Among the choices, \$2,975 is the closest estimate.
- 6) **Choice D is correct.** **(8.PFA.1)** First apply quotient rule: $\frac{m^8}{m^5} = m^3$. Then multiply: $m^3 \cdot m^2 = m^{3+2} = m^5$.
- 7) **The correct answer is 0.1.** **(8.PS.3)** Compute $1.2 - 1.1 = 0.1$.
- 8) **Choice D is correct.** **(8.NS.1)** $125 = 5^3$. The other options are not perfect cubes.
- 9) **Choice D is correct.** **(8.NS.1)** Move the decimal 9 places left: $2.0 \times 10^{-9} = 0.000000002$ m.
- 10) **Choice C is correct.** **(8.PFA.3)** Unit price $k = \frac{9.60}{8} = 1.20$ dollars per song.
- 11) **The correct answer is $\frac{1}{4}$.** **(8.PS.1)** There are 13 spades in a standard deck. $P(\text{spade}) = \frac{13}{52} = \frac{1}{4}$.
- 12) **Choice A is correct.** **(8.PFA.4)** FOIL: $(4x - 3)(x + 2) = 4x^2 + 8x - 3x - 6 = 4x^2 + 5x - 6$.
- 13) **The correct answer is 192.** **(8.NS.2)** Multiply the number of choices: $6 \times 8 \times 4 = 192$ different complete meals.
- 14) **The correct answer is $\frac{1}{3}$.** **(8.NS.2)** Let $x = 0.\overline{3}$. Then $10x = 3.\overline{3}$, so $9x = 3$ and $x = \frac{1}{3}$.
- 15) **Choice C is correct.** **(8.PFA.3)** $y = \frac{1}{2}x$ is in the form $y = mx + b$ with $m = \frac{1}{2}$ and $b = 0$. The others are incorrectly classified.
- 16) **Choice A is correct.** **(8.MG.3)** The points $(0, 2) \rightarrow (0, -2)$ and $(2, 4) \rightarrow (2, -4)$. This is the reflection rule $(x, y) \rightarrow (x, -y)$.
- 17) **Choice A is correct.** **(8.PFA.3)** The red line goes up as x increases (positive slope). The blue line goes down as x increases (negative slope).
- 18) **Choice C is correct.** **(8.PFA.4)** Let n = nickels, d = dimes. Then $n + d = 25$ and $0.05n + 0.10d = 1.70$. From the first equation, $d = 25 - n$. Substituting: $0.05n + 0.10(25 - n) = 1.70$, so $0.05n + 2.5 - 0.10n = 1.70$, giving $-0.05n = -0.8$, so $n = 12$.
- 19) **Choice A is correct.** **(8.PFA.2)** Substitute $x = 5$: $f(5) = |5 - 2| = |3| = 3$.
- 20) **The correct answer is A, C.** **(8.MG.3)** Correct: (A) Corresponding angles are congruent — definition of similarity. (C) Corresponding sides are proportional — they scale by a constant factor k . Incorrect: (B) Equal length is congruence, not similarity. (D) Congruence requires equality; similarity allows scaling. (E) Scale factor can be any positive number; $k < 1$ is a reduction, still similarity.
- 21) **Choice B is correct.** **(8.MG.2)** Let side length = s . Then $SA = 2(s^2 + s \cdot s + s \cdot s) = 2(s^2 + 2s^2) = 2(3s^2) = 6s^2 = 150$. So $s^2 = 25$, giving $s = 5$ cm.
- 22) **Choice A is correct.** **(8.MG.3)** Figure E and Figure F have the same size and orientation. Each point moves 5 units left and 1 unit up (translation), not a rotation which would change orientation.
- 23) **Choice D is correct.** **(8.PFA.3)** Using any two points: $\frac{7-3}{2-0} = \frac{4}{2} = 2$. Same slope for all pairs confirms collinearity.
- 24) **Choice D is correct.** **(8.PFA.4)** Subtract $-2x$ (add $2x$) and subtract 12: $-3x = -18$. Divide by -3 : $x = 6$.
- 25) **Choice D is correct.** **(8.PFA.5)** Set up: $150 + 25w > 500$. Subtract 150: $25w > 350$. Divide by 25: $w > 14$ weeks.
- 26) **Choice B is correct.** **(8.PFA.5)** SOLID line means the boundary is INCLUDED ($\leq$ or $\geq$). Shading to the LEFT means x values are at most 4, so $x \leq 4$.
- 27) **Choice A is correct.** **(8.MG.2)** $V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times 3.14 \times 9 \times 20 = \frac{1}{3} \times 565.2 = 188.4$ ft³.
- 28) **Choice B is correct.** **(8.PS.3)** The data covers 5 to 20 minutes; predicting at 25 minutes is beyond the observed range, making it extrapolation.



Hi, Strategy Solver!

◇ Grade 8 math rewards students who think before they calculate. You practiced choosing strategies, not just hunting for answers. This deep and steady book gave you six full Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. ◇

★ **Remember this:** That matters because stronger math students do not use one method for every question. They notice the structure and choose the tool that fits. ★

Strategy Moves

- **Estimate:** Know the neighborhood of the answer.
- **Simplify:** Rewrite numbers in friendlier forms.
- **Model:** Draw what the words describe.
- **Verify:** Put the answer back into the problem.

Grade 8 test-day tip: Pause for ten seconds before hard questions. A short plan can save several minutes.

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

Jay Daie

Your Strategy Guide

PRACTICE TODAY. ACHIEVE TOMORROW.

6

Give your child the confidence and skills they need with **6 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 |
| | ✓ And More! |



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