

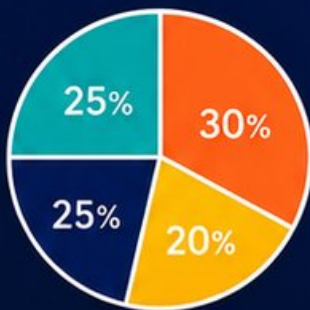
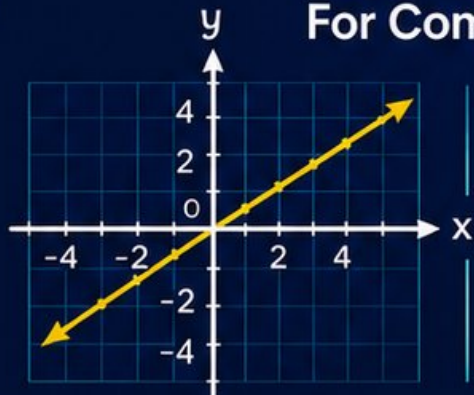
# Virginia SOL

## GRADE 8

# MATH

## PRACTICE TESTS

**Standards Aligned Problem Solving**  
For Comprehensive Assessment Programs

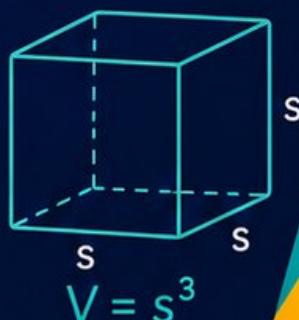


$$y = mx + b$$

$$2x - 3y = 6$$

$$\sqrt{x^2 + y^2}$$

$$A = bh$$



**4 PRINTED TESTS**



**2 ONLINE TESTS**



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



# 4 Virginia SOL Grade 8 Math Practice Tests

*Four Standards-Aligned SOL Tests with Review and Explanations*



Four 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!

Four focused rounds for sharper SOL math thinking

This book gives you four 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 four-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?

Four SOL tests, 160 questions, and a focused review path

| Part         | What You Will Practice                                                                        |
|--------------|-----------------------------------------------------------------------------------------------|
| Tests 1–2    | Real numbers, exponents, scientific notation, equations, and careful reading.                 |
| Tests 3–4    | 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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& answers

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- 1) Two classes have the same mean test score of 75. Class A has  $MAD = 3$ , and Class B has  $MAD = 8$ . What does this tell us?
- ☐ A. Class B has higher individual scores    ☐ C. Class A has more consistent scores  
☐ B. Class A has more students    ☐ D. Class B performed better overall
- 2) A father is currently 32 years older than his son. In 8 years, the father will be twice as old as the son. What is the son's current age?
- ☐ A. 16    ☐ C. 24  
☐ B. 20    ☐ D. 28
- 3) A pyramid has a rectangular base of 7 m by 9 m and a height of 15 m. What is its volume?
- ☐ A.  $315 \text{ m}^3$     ☐ C.  $630 \text{ m}^3$   
☐ B.  $420 \text{ m}^3$     ☐ D.  $945 \text{ m}^3$
- 4) A teacher plots the relationship between attendance and test scores. The trend line shows a positive slope. What does this tell you?
- ☐ A. Attendance directly causes higher test scores    ☐ C. Test scores determine how often students attend  
☐ B. All students with perfect attendance pass the test    ☐ D. As attendance increases, test scores tend to increase on average
- 5) Rectangle  $PQRS$  has length 10 m and width 6 m. Rectangle  $TUVW$  has length 5 m and width 3 m. What is the scale factor from  $PQRS$  to  $TUVW$ ?
- ☐ A. 2    ☐ C. 3  
☐ B.  $\frac{1}{2}$     ☐ D.  $\frac{1}{3}$



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6) If  $f(x) = \frac{2x+5}{3}$ , what is  $f(4)$ ?

☐ A. 3

☐ B. 4

☐ C.  $\frac{26}{3}$

☐ D.  $\frac{13}{3}$

7) Which of the following is irrational?

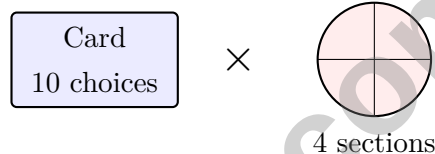
☐ A.  $\sqrt{49}$

☐ B.  $\frac{7}{8}$

☐ C.  $\sqrt{50}$

☐ D. 2.5

8) A game requires picking a card from a deck of 10 cards and then spinning a spinner with 4 sections. How many possible results are there?



☐ A.  $10 + 4 = 14$

☐ B.  $10 \times 4 = 40$

☐ C.  $10 - 4 = 6$

☐ D.  $4^{10}$

Algorithm for  $0.2\bar{5}$

Step 1:  $x = 0.2\bar{5}$

Step 2:  $10x = 2.\bar{5}$ ,  $100x = 25.\bar{5}$

Step 3: subtract the aligned equations

Step 4: solve for  $x$

9)

What is  $0.2\bar{5}$  as a fraction?

☐ A.  $\frac{25}{100}$

☐ B.  $\frac{25}{90}$

☐ C.  $\frac{2}{10}$

☐ D.  $\frac{23}{90}$



10) Which best approximates  $\sqrt[3]{50}$ ?

☐ A. 3.5

☐ C. 4.2

☐ B. 2.9

☐ D. 3.7

11) Which is the smallest number?

☐ A.  $1.5 \times 10^{-2}$

☐ C.  $1.5 \times 10^{-4}$

☐ B.  $1.5 \times 10^0$

☐ D.  $1.5 \times 10^2$

12) Which statement is true?

☐ A.  $\sqrt{36}$  is irrational

☐ C.  $\sqrt{11}$  is irrational

☐ B.  $\pi$  is rational

☐ D.  $0.333\ldots$  is irrational

13) A student calculates the surface area of a rectangular prism with dimensions 4 m  $\times$  3 m  $\times$  2 m as  $SA = 4 \times 3 + 4 \times 2 + 3 \times 2 = 12 + 8 + 6 = 26 \text{ m}^2$ . What is the student's error?

☐ A. Forgot to multiply by 2

☐ D. Added instead of multiplied all terms

☐ B. Calculated volume instead

☐ C. Used the wrong formula

14) Which property is preserved under all three rigid transformations (translation, reflection, and rotation)?

☐ A. Position on the coordinate plane

☐ C. Length of sides

☐ B. Orientation (clockwise vs. counterclockwise)

☐ D. Size relative to other figures



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- 1) A cone has radius 9 cm and height 14 cm. Approximately, what is its volume? (Use  $\pi \approx 3.14$ .)

☐ A.  $594.12 \text{ cm}^3$

☐ C.  $2373.84 \text{ cm}^3$

☐ B.  $1186.92 \text{ cm}^3$

☐ D.  $1782.36 \text{ cm}^3$

- 2) Factor  $x^2 + 5x - 36$ .

☐ A.  $(x + 9)(x - 4)$

☐ C.  $(x + 12)(x - 3)$

☐ B.  $(x - 9)(x + 4)$

☐ D.  $(x + 6)(x - 6)$

- 3) A table of values for a linear relationship is partially filled:

|     |   |   |    |
|-----|---|---|----|
| $x$ | 2 | 5 | 8  |
| $y$ | 3 | ? | 15 |

What is the missing  $y$ -value?

☐ A. 8

☐ C. 10

☐ B. 12

☐ D. 9

- 4) A water tank contains saltwater at 2% concentration. To reduce the concentration to 1%, how much pure water must be added to 100 liters of the 2% solution?

☐ A. 50 L

☐ C. 100 L

☐ B. 75 L

☐ D. 150 L

- 5) Using the model  $y = -2x + 15$ , what is the predicted  $y$ -value when  $x = 5.5$ ?

☐ A. 4

☐ C. 10

☐ B. 5

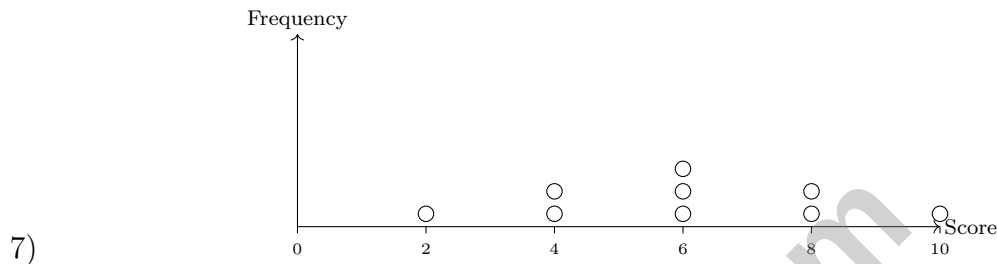
☐ D. 26



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- 6) A retail store analyzes 500 transactions. 350 included a sale item and 150 did not. Of those with a sale item, 245 were from returning customers. What relative frequency (as a percent) of transactions with sale items are from returning customers?

- ☐ A. 49% ☐ C. 70%  
☐ B. 56% ☐ D. 84%



Data from dot plot:  $\{2, 4, 4, 6, 6, 6, 6, 8, 8, 10\}$  with mean = 6. Find MAD.

- ☐ A. 1.5 ☐ C. 2  
☐ B. 1.78 ☐ D. 2.2
- 8) Two complementary angles have measures of  $x$  and  $2x + 6$ . Write and solve an equation to find both angle measures.



1) A recipe calls for 2 parts flour to 1 part sugar. If a baker uses 9 cups total of these two ingredients, how many cups of flour are needed?

- ☐ A. 3 cups                      ☐ C. 6 cups  
☐ B. 4.5 cups                  ☐ D. 7 cups

2) Factor  $x^2 + 2x - 8$ .

- ☐ A.  $(x + 4)(x - 2)$                       ☐ C.  $(x - 2)(x - 4)$   
☐ B.  $(x + 2)(x - 4)$                       ☐ D.  $(x + 1)(x + 8)$

3) A store's revenue is  $\$200 + \$15$  per item sold. What is the slope of revenue versus items sold?

- ☐ A. \$200                                      ☐ C. \$215  
☐ B. \$30                                        ☐ D. \$15

4) The table shows values of  $f(x) = 3x - 2$ . What is  $f(5)$ ?

|        |   |   |   |   |
|--------|---|---|---|---|
| $x$    | 1 | 2 | 3 | 5 |
| $f(x)$ | 1 | 4 | 7 | ? |

- ☐ A. 13                                          ☐ C. 12  
☐ B. 15                                          ☐ D. 17

5) Two parallel lines cut by a transversal have alternate exterior angles measuring  $(7k - 3)^\circ$  and  $(5k + 17)^\circ$ . Find  $k$ .

- ☐ A. 8                                              ☐ C. 12  
☐ B. 10                                            ☐ D. 14



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6) A right triangle has legs of  $\sqrt{32}$  and  $\sqrt{4}$ . What is the hypotenuse in simplified radical form?

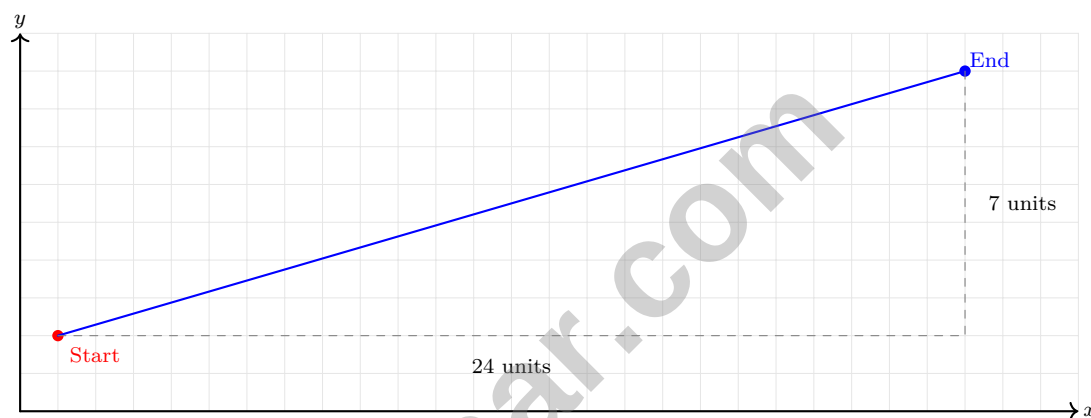
☐ A.  $\sqrt{36}$  (which is 6)

☐ C.  $\sqrt{28}$

☐ B. 6

☐ D.  $\sqrt{68}$

7) A hiker's GPS shows the horizontal distance traveled is 24 units and the vertical distance is 7 units. Using the Pythagorean Theorem, what is the total straight-line distance?



☐ A. 31 units

☐ C. 25 units

☐ B.  $\sqrt{625}$  units

☐ D.  $\sqrt{500}$  units



**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.PS.3)** A smaller MAD (Class A = 3) indicates less variability and more consistency. Class B's larger MAD (8) shows greater spread in scores.
- 2) **Choice C is correct.** **(8.PFA.4)** Let  $s$  = son's current age. Then father's age =  $s + 32$ . In 8 years:  $s + 32 + 8 = 2(s + 8)$ , so  $s + 40 = 2s + 16$ , giving  $s = 24$  years.
- 3) **Choice A is correct.** **(8.MG.2)**  $B = 7 \times 9 = 63 \text{ m}^2$ .  $V = \frac{1}{3} \times 63 \times 15 = \frac{945}{3} = 315 \text{ m}^3$ .
- 4) **Choice D is correct.** **(8.PS.3)** A positive slope indicates a positive association: as  $x$  increases,  $y$  tends to increase. This is correlation, not necessarily causation.
- 5) **Choice B is correct.** **(8.MG.3)** Scale factor is the ratio of a side in  $TUVW$  to the corresponding side in  $PQRS$ :  $\frac{5}{10} = \frac{1}{2}$ .
- 6) **Choice D is correct.** **(8.PFA.2)** Substitute  $x = 4$ :  $f(4) = \frac{2(4)+5}{3} = \frac{8+5}{3} = \frac{13}{3}$ .
- 7) **Choice C is correct.** **(8.NS.1)**  $\sqrt{50}$  is irrational because 50 is not a perfect square. The other values are rational:  $\sqrt{49} = 7$ ,  $\frac{7}{8} = 0.875$  (terminating decimal), and 2.5 is a terminating decimal.
- 8) **Choice B is correct.** **(8.NS.2)** Card pick (10 choices) times spinner section (4 choices):  $10 \times 4 = 40$  possible results.
- 9) **Choice D is correct.** **(8.NS.2)** Following the algorithm:  $100x - 10x = 25.\bar{5} - 2.\bar{5} = 23$ , so  $90x = 23$  and  $x = \frac{23}{90}$ .
- 10) **Choice D is correct.** **(8.NS.1)**  $3^3 = 27$  and  $4^3 = 64$ . Since 50 is between 27 and 64,  $\sqrt[3]{50}$  is between 3 and 4. Testing:  $3.7^3 \approx 50.65$ , closest match.
- 11) **Choice C is correct.** **(8.NS.1)** The most negative exponent gives the smallest value.  $1.5 \times 10^{-4} = 0.00015$  is the smallest.
- 12) **Choice C is correct.** **(8.NS.1)**  $\sqrt{36} = 6$  (rational),  $\pi$  is irrational, and  $0.333\ldots = \frac{1}{3}$  (rational).  $\sqrt{11}$  cannot be expressed as a ratio of integers.
- 13) **Choice A is correct.** **(8.MG.2)** The student calculated the sum of the three different face areas but forgot to double each (since there are two of each face). The correct calculation is  $SA = 2(12 + 8 + 6) = 52 \text{ m}^2$ .
- 14) **Choice C is correct.** **(8.MG.3)** All rigid transformations preserve distance (side length) and angles. Position, orientation, and quadrant location may change during transformation.
- 15) **Choice A is correct.** **(8.PFA.3)** Using points (1, -1) and (5, 3): slope =  $\frac{3 - (-1)}{5 - 1} = \frac{4}{4} = 1$ .
- 16) **Choice A is correct.** **(8.PFA.4)** Substitution is the definitive test:  $2(3) + 5 = 11$  ✓ and  $2(4) + 5 = 13 \neq 11$  ✗. Student A is correct.
- 17) **Choice C is correct.** **(8.PFA.5)** Distribute:  $-3x + 6 \leq 9$ . Subtract 6:  $-3x \leq 3$ . Divide by  $-3$  and flip the inequality:  $x \geq -1$ .
- 18) **Choice C is correct.** **(8.PFA.5)** At (2, 4):  $4 \geq 2$  is TRUE. The SOLID line shows  $\geq$ . Shading ABOVE the line confirms  $y \geq x$ .
- 19) **Choice D is correct.** **(8.CE.1)** Remaining =  $\$3,000 - (\$900 + \$400 + \$300 + \$200) = \$3,000 - \$1,800 = \$1,200$ .
- 20) **Choice C is correct.** **(8.PFA.1)** Using the product rule, the missing exponent plus 4 must equal 9. So the missing exponent is  $9 - 4 = 5$ .
- 21) **The correct answer is B,C.** **(8.PFA.4)**  $(x + 6)^2 = (x + 6)(x + 6) = x^2 + 12x + 36$ . Choice B is the expanded form, and choice C is the factored form. Choice A ignores the middle term. Choice D has an error. Choice E is a different factorization that does not equal  $(x + 6)^2$ .
- 22) **The correct answer is -1.** **(8.PFA.3)** Using (0, 5) and (3, 2): slope =  $\frac{2 - 5}{3 - 0} = \frac{-3}{3} = -1$ .
- 23) **Choice C is correct.** **(8.NS.1)** Area of a square =  $s^2 = 11^2 = 121 \text{ cm}^2$ .
- 24) **The correct answer is 55.** **(8.PS.3)** Substitute  $n = 500$ :  $C = 0.08(500) + 15 = 40 + 15 = \$55$ .
- 25) **The correct answer is 0.45.** **(8.PS.3)** Joint relative frequency:  $\frac{144}{320} = 0.45$ .
- 26) **The correct answer is  $\frac{1}{6}$ .** **(8.PS.1)** Favorable outcomes: (1,6), (2,5), (3,4), (4,3), (5,2), (6,1). That's 6 of 36.  $P = \frac{6}{36} = \frac{1}{6}$ .



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## Hi, Progress Maker!

◇ You have done more than complete a set of tests. You have rehearsed the habits that make Grade 8 math feel less surprising. ◇

★ **Remember this:** Progress is not always loud. Sometimes it looks like fewer careless errors, clearer work, better pacing, and more confidence when a problem is unfamiliar. You practiced across 4 full Grade 8 practice tests, and that repeated effort matters. ★

### Signs of Growth

- **Clear Work:** Your steps are easier to follow.
- **Better Pacing:** You know when to move on and return.
- **Stronger Checks:** You catch mistakes earlier.
- **Calmer Thinking:** You know what to try next.

**Grade 8 test-day tip:** Keep one short list of mistakes you often make, then check that list before each practice session.

If you want to share something or ask a question, please email me at [jay@testinar.com](mailto:jay@testinar.com).

**Jay Daie**

Your Growth Coach

# PRACTICE TODAY, ACHIEVE TOMORROW!

Give your child the confidence and skills they need with **4 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!

# 4



## 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
- ✓ 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!



# 4 PRINTED TESTS

# +



# 2 ONLINE TESTS



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