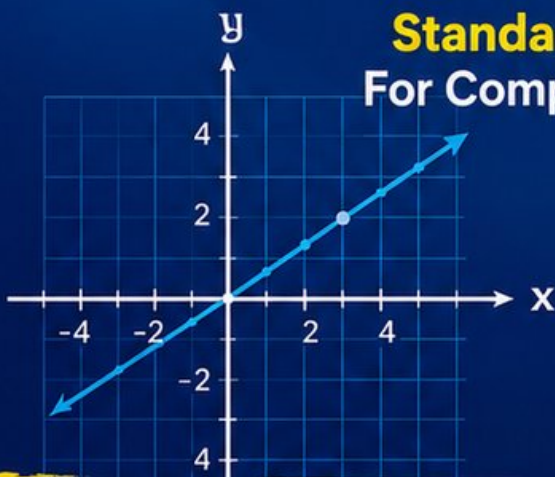
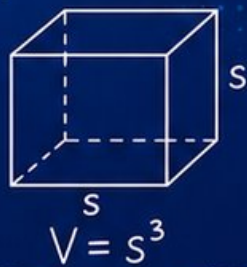


9 Virginia SOL Grade 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$2x + 3y = 12$$
$$y = mx + b$$



**9 PRINTED
TESTS**

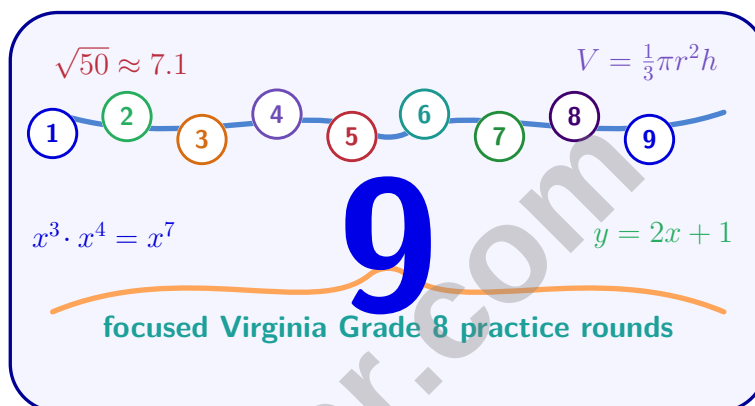


**2 ONLINE
TESTS**

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

9 Virginia SOL Grade 8 Math Practice Tests

Standards-Aligned Virginia Practice for Functions, Geometry, Data, and Equations



Nine 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!

Nine focused rounds for sharper SOL math thinking

This book gives you nine 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 nine-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?

Nine SOL tests, 360 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.
Tests 7–9	Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina.
Answer Pages	Compact keys and explanations that show why each answer works.

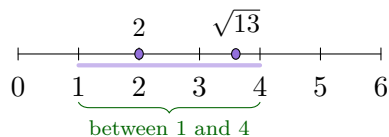
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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1)

The highlighted interval contains many irrational numbers between 1 and 4. Should 2 be classified as irrational?

- ☐ A. Yes, because 2 is plotted between 1 and 4 ☐ C. Yes, because $2 = \sqrt{4}$
☐ B. It cannot be determined ☐ D. No, because 2 is rational, not irrational

2) Which type of transformation maps a figure to a congruent image without changing its position relative to orientation?

- ☐ A. Reflection ☐ C. Translation
☐ B. Rotation ☐ D. Dilation

3) A line has equation $y = \frac{3}{2}x + 5$. Which statement is true?

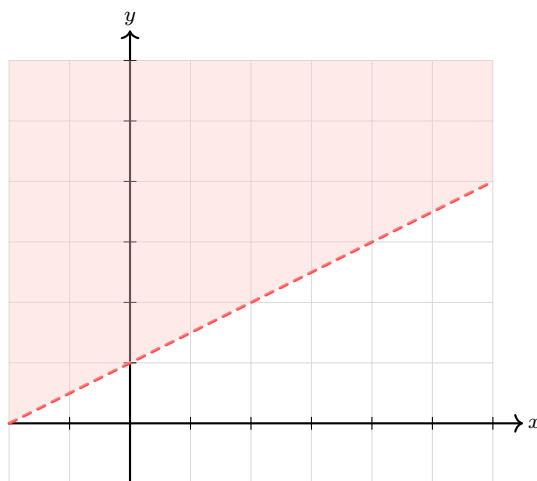
- ☐ A. The line has slope 5 and passes through $(0, \frac{3}{2})$ ☐ C. The line has y -intercept $\frac{3}{2}$
☐ B. The line is perpendicular to $y = \frac{2}{3}x + 1$ ☐ D. The line passes through $(2, 8)$

4) Solve: $5x + 2 > -8$

- ☐ A. $x > -2$ ☐ C. $x > 2$
☐ B. $x < -2$ ☐ D. $x < 2$



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5)

Based on the dashed line and shading above, the inequality is:

☐ A. $y > \frac{1}{2}x + 1$

☐ B. $y \geq \frac{1}{2}x + 1$

☐ C. $y < \frac{1}{2}x + 1$

☐ D. $y \leq \frac{1}{2}x + 1$

6) What is $\sqrt{225}$?

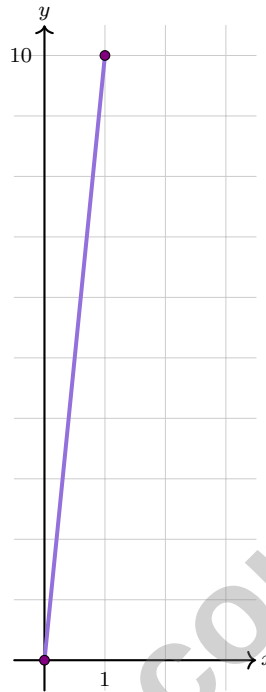
☐ A. 13

☐ B. 14

☐ C. 15

☐ D. 16





7)

The constant of proportionality is:

☐ A. 1☐ C. 10☐ B. 5☐ D. 208) What is the solution to $6(x + 2) = 30$?☐ A. $x = 3$ ☐ C. $x = 8$ ☐ B. $x = 5$ ☐ D. $x = -2$

9) A function machine applies the rule: "Divide the input by 2 and subtract 1." What is the output when the input is 10?

☐ A. 5☐ C. 3☐ B. 9☐ D. 4

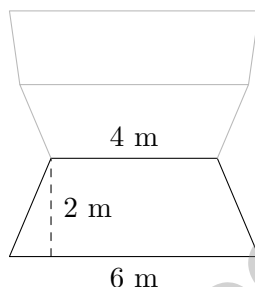
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- 1) A die is rolled. What is the probability of rolling a number that is either even OR less than 3?

☐ A. $\frac{2}{6}$
☐ B. $\frac{5}{6}$

☐ C. $\frac{3}{6}$
☐ D. $\frac{4}{6}$

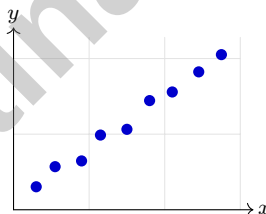
- 2) A composite figure is made of three trapezoids stacked vertically. The first trapezoid has bases 4 m and 6 m with height 2 m. What is just this trapezoid's area?



☐ A. 8 m^2
☐ B. 10 m^2

☐ C. 12 m^2
☐ D. 16 m^2

3)

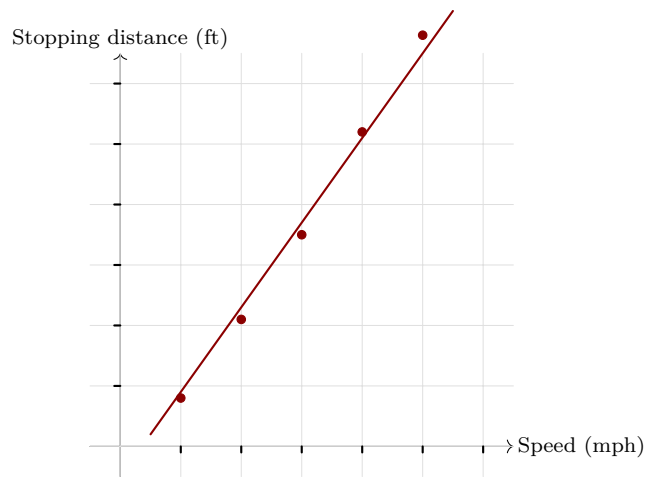


A scatter plot displays the relationship between temperature (in degrees Celsius) and ice cream sales (in dollars) for 12 weeks. The points show a clear upward trend from left to right. Which statement correctly describes the correlation?

- ☐ A. Negative correlation
☐ B. Positive correlation

- ☐ C. No correlation
☐ D. Random scatter with no pattern





4)

The best-fit line for stopping distance is $d = 1.1s + 0.2$, where d is distance in ft and s is speed in mph. Using this model, the stopping distance at 60 mph would be about 66.2 ft. Why is this estimate unreliable?

- ☐ A. The formula has an error in computation
☐ B. We are extrapolating far beyond the observed data range
☐ C. The y -intercept is too small
☐ D. Linear models always fail for large values

5) Of 200 high school students surveyed, 120 play sports and 80 do not. Among those who play sports, 72 are boys. What fraction of sports players are girls?

- ☐ A. $\frac{48}{200}$
☐ B. $\frac{48}{120}$
☐ C. $\frac{72}{120}$
☐ D. $\frac{48}{80}$



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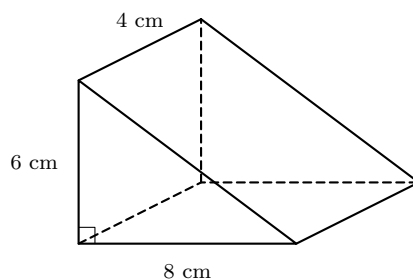
1) To simplify $\frac{(w^4)^3}{w^6}$, which law should be applied first?

☐ A. Quotient rule

☐ C. Product rule

☐ B. Zero exponent rule

☐ D. Power of a power rule



2)

A triangular prism has a right triangular base with legs 8 cm and 6 cm. The prism extends 4 cm in depth. What is the total surface area?

☐ A. 48 cm²

☐ C. 128 cm²

☐ B. 116 cm²

☐ D. 144 cm²

3) Multiply: $(6 \times 10^2) \times (3 \times 10^4)$

☐ A. 18×10^5

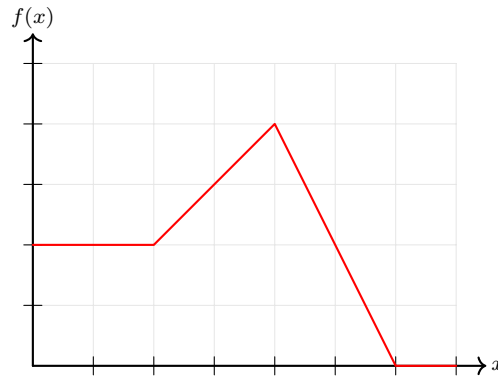
☐ C. 9×10^6

☐ B. 18×10^8

☐ D. 1.8×10^7

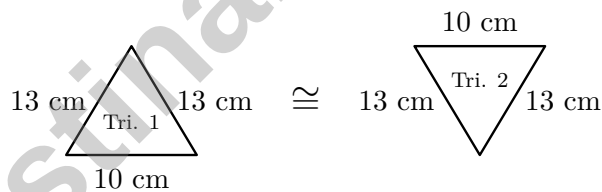


4)



Identify the intervals where the function is increasing.

- ☐ A. From $x = 1$ to $x = 3$ only ☐ C. From $x = 1$ to $x = 3$ and from $x = 3$ to $x = 5$
☐ B. From $x = -1$ to $x = 1$ ☐ D. From $x = -1$ to $x = 3$
- 5) Two congruent isosceles triangles have equal bases but different orientations. Triangle 1 has base 10 cm and equal sides of 13 cm. What is the perimeter of Triangle 2?



- ☐ A. 26 cm ☐ C. 36 cm
☐ B. 20 cm ☐ D. 52 cm
- 6) Triangle PQR has vertices $P(1, 2)$, $Q(4, 2)$, and $R(2, 5)$. A translation moves P to $P'(4, 5)$. What is the image of Q after this translation?
- ☐ A. (7, 3) ☐ C. (5, 7)
☐ B. (7, 5) ☐ D. (6, 4)



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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 D is correct.** **(8.NS.1)** Although 2 is between 1 and 4, it is an integer and therefore rational. It should not be classified as irrational.
- 2) **Choice C is correct.** **(8.MG.3)** A translation slides a figure without changing its orientation, producing a congruent image. Reflections flip, rotations turn, and dilations resize.
- 3) **Choice D is correct.** **(8.PFA.3)** Check (2, 8): $\frac{3}{2}(2) + 5 = 8$, so the point lies on the line. The slope is $\frac{3}{2}$ and the y -intercept is 5; a perpendicular line would have slope $-\frac{2}{3}$, not $\frac{2}{3}$.
- 4) **Choice A is correct.** **(8.PFA.5)** Subtract 2: $5x > -10$. Divide by 5: $x > -2$.
- 5) **Choice A is correct.** **(8.PFA.5)** DASHED line (strict inequality) and shading ABOVE (greater than) indicate $y > \frac{1}{2}x + 1$.
- 6) **Choice C is correct.** **(8.NS.1)** $15 \times 15 = 225$, so $\sqrt{225} = 15$.
- 7) **Choice C is correct.** **(8.PFA.3)** $k = \frac{10}{1} = 10$. The line is very steep, passing through (0, 0) and (1, 10).
- 8) **Choice A is correct.** **(8.PFA.4)** Distribute: $6x + 12 = 30$. Subtract 12: $6x = 18$. Divide by 6: $x = 3$.
- 9) **Choice D is correct.** **(8.PFA.2)** Divide 10 by 2: $10 \div 2 = 5$. Subtract 1: $5 - 1 = 4$.
- 10) **Choice A is correct.** **(8.PFA.2)** Rate for Table 1: $(5 - 1)/(2 - 0) = 2$. Rate for Table 2: $(-1 - (-2))/(1 - 0) = 1$. Since $2 > 1$, Table 1 is steeper.
- 11) **Choice B is correct.** **(8.PFA.3)** The y -intercept (at $x = 0$) is 1, so the student has \$1 initially. From 0 to 3 weeks, the graph rises linearly from 1 to 4, a gain of \$1 per week. From week 3 to 6, the graph is flat at 4, so no additional savings.
- 12) **Choice D is correct.** **(8.MG.3)** Rotation is a rigid motion that preserves shape and size. Rectangle M'N'O'P' is congruent to MNOP (same dimensions, though the length and width labels may have switched visually).
- 13) **Choice C is correct.** **(8.MG.3)** Under 180° rotation, $(x, y) \rightarrow (-x, -y)$: $(1, 1) \rightarrow (-1, -1)$, $(3, 1) \rightarrow (-3, -1)$, $(2, 3) \rightarrow (-2, -3)$. This matches the red triangle.
- 14) **Choice A is correct.** **(8.MG.1)** Corresponding angles are equal: $6y + 12 = 3y + 51$, so $3y = 39$ and $y = 13$.
- 15) **Choice B is correct.** **(8.MG.4)** Check: $36 + 64 = 100$ but $81 \neq 100$. The converse of the Pythagorean Theorem confirms this is not a right triangle.
- 16) **Choice C is correct.** **(8.CE.1)** Housing allocation = 35% of \$4,000 = $0.35 \times 4000 = \$1,400$.
- 17) **Choice D is correct.** **(8.PFA.1)** Apply power to both factors: $(2a)^3 = 2^3 \cdot a^3 = 8a^3$.
- 18) **Choice D is correct.** **(8.NS.1)** Multiply coefficients: $2.1 \times 3 = 6.3$. Add exponents: $10^{4+2} = 10^6$. Result: 6.3×10^6 .
- 19) **Choice A is correct.** **(8.PFA.4)** Set the expressions equal: $\frac{1}{2}x + 3 = -x + 6$. Multiply by 2: $x + 6 = -2x + 12$, so $3x = 6$, giving $x = 2$. Then $y = \frac{1}{2}(2) + 3 = 4$. Solution: (2, 4).
- 20) **The correct answer is A, E.** **(8.MG.2)** A is true because $V = 3.14(4^2)(10) = 502.4 \text{ cm}^3$. E is true because a cone's volume is one-third the volume of a cylinder with the same base and height. B is false because the sphere's volume is about 267.95 cm^3 , not the cylinder volume. C is false because the cone's volume with height 10 cm is about 167.47 cm^3 . D is false because a cylinder with height 6 cm has volume 301.44 cm^3 , which is greater than the sphere volume.
- 21) **Choice A is correct.** **(8.PFA.4)** Area = $(2x + 1)(x + 3) = 2x^2 + 6x + x + 3 = 2x^2 + 7x + 3 \text{ m}^2$.
- 22) **Choice A is correct.** **(8.PFA.3)** $y = \frac{7}{2}x - 6$ is linear with slope $\frac{7}{2}$ and y -intercept -6 . Option B expands to $y = x^2 - x$ (nonlinear), and C and D are exponential and rational functions.
- 23) **Choice A is correct.** **(8.PFA.3)** For $x = 0$, $y = -5$. For $x = 2$, $y = 1$. For $x = 5$, $y = 10$. The sum is $-5 + 1 + 10 = 6$.
- 24) **Choice A is correct.** **(8.MG.4)** Map distance is $\sqrt{100} = 10$ units. Actual distance is $10 \times 5 = 50$ miles.
- 25) **Choice A is correct.** **(8.MG.1)** The sum of angles in a pentagon is 540° . So $\angle E = 540 - 100 - 120 - 110 - 130 = 80^\circ$.
- 26) **Choice D is correct.** **(8.PFA.3)** The rate of change is the profit increase per unit sold, which is \$500 per unit. The slope is 500.
- 27) **Choice B is correct.** **(8.PS.3)** Both have slope $m = -2$ but intercepts of 5 and -3 respectively. These are parallel lines.
- 28) **Choice A is correct.** **(8.MG.3)** $20 \times 0.4 = 8 \text{ cm}$. A scale factor between 0 and 1 creates a reduction.



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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 9 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

CONFIDENCE TODAY, SUCCESS TOMORROW!

GRADE

8

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