

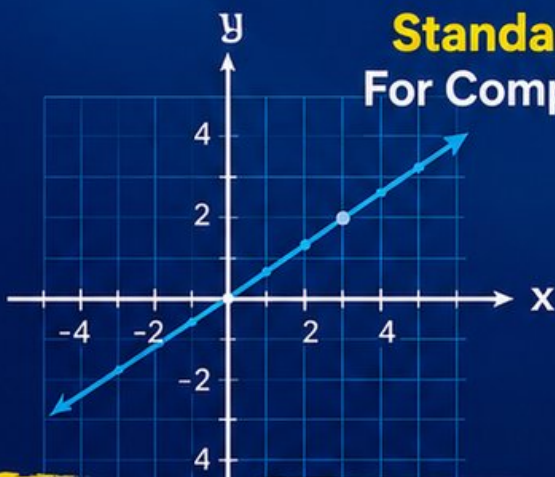
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Ohio
OST

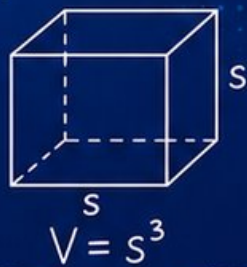
Grade 8

MATH

PRACTICE TESTS

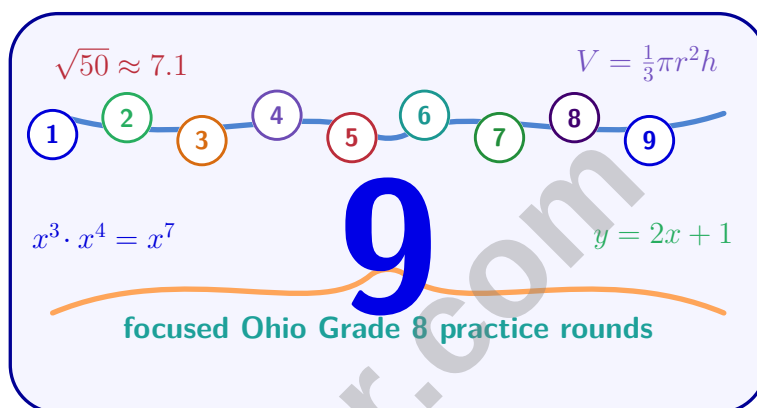
Standards Aligned Problem Solving
For Comprehensive Assessment Programs

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

9 PRINTED
TESTS2 ONLINE
TESTSUse these **two additional online practice tests** for extra review after the printed tests in this book.

9 Ohio OST Grade 8 Math Practice Tests

Standards-Based Ohio Practice with Review, Answer Keys, and Explanations



Nine complete 40-question Grade 8 OST 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, Ohio Grade 8 Problem Solver!

Nine focused rounds for sharper OST math thinking

This book gives you nine full Grade 8 OST 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 Ohio 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.

Ohio 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 OST 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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$$0.\overline{789}$$

Non-repeating digits: 1

Repeating-block digits: 2

Denominator form: $\frac{?}{990}$

1)

What goes in the numerator when converting $0.\overline{789}$?

☐ A. $7 + 89 = 96$

☐ C. 89

☐ B. 789

☐ D. $789 - 7 = 782$

2) Solve for x : $\frac{x+5}{3} = 4$

☐ A. $x = 7$

☐ C. $x = 17$

☐ B. $x = 12$

☐ D. $x = 2$

3) Which of the following satisfies $2x - 3 < 5$?

☐ A. $x = 5$

☐ C. $x = 3$

☐ B. $x = 10$

☐ D. $x = 8$

4) For the inequality $2x + y > 6$, rearrange to slope-intercept form, identify the boundary line type, and determine the shading region.

☐ A. $y > -2x + 6$; solid line; shade above

☐ C. $y > -2x + 6$; dashed line; shade above

☐ B. $y < -2x + 6$; dashed line; shade below

☐ D. $y > 2x - 6$; dashed line; shade below



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5) A parallelogram has a base of 8 inches and a slant side of 6 inches. After a reflection, what are the dimensions of the reflected parallelogram?

☐ A. 4 inches and 3 inches

☐ B. 8 inches and 6 inches

☐ C. 12 inches and 9 inches

☐ D. 16 inches and 12 inches

6) Simplify $n^6 \cdot n^{-4} \cdot n^3$.

☐ A. n^1

☐ B. n^{13}

☐ C. n^{-5}

☐ D. n^5

7) What is $\sqrt[3]{64}$?

☐ A. 3

☐ B. 6

☐ C. 5

☐ D. 4

8) $\frac{\frac{8 \times 10^9}{2 \times 10^3}}{4 \times 10^2} = ?$

☐ A. 10^5

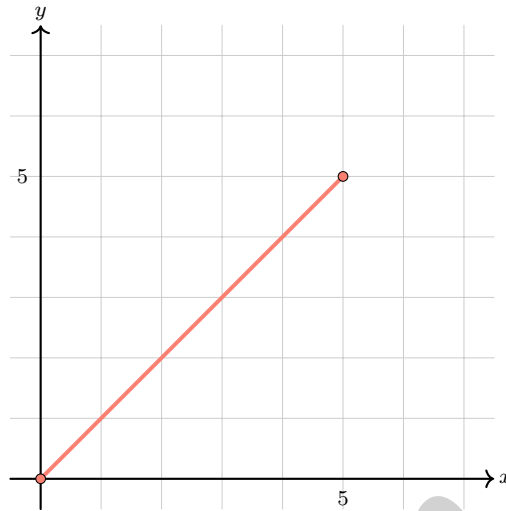
☐ B. 1×10^6

☐ C. 4×10^4

☐ D. 1×10^4

9) A square pyramid has a base side length of 5 cm and slant height of 9 cm. Find its total surface area.





10)

The equation is:

☐ A. $y = \frac{1}{5}x$

☐ B. $y = 5x$

☐ C. $y = x$

☐ D. $y = x + 5$

11) The line $y = mx + b$ has slope $\frac{2}{3}$ and passes through $(3, 6)$. What is b ?

☐ A. 4

☐ B. 2

☐ C. 6

☐ D. $\frac{2}{3}$

12) Expand $(x - 7)^2$.

☐ A. $x^2 - 49$

☐ B. $x^2 + 14x + 49$

☐ C. $x^2 - 14x + 49$

☐ D. $x^2 - 7x + 49$

13) Distance traveled: Function $d_1(t) = 55t$ miles (constant speed). Function d_2 at hours $(0, 0)$, $(3, 180)$. After 6 hours, which distance greater?

☐ A. d_1

☐ B. d_2

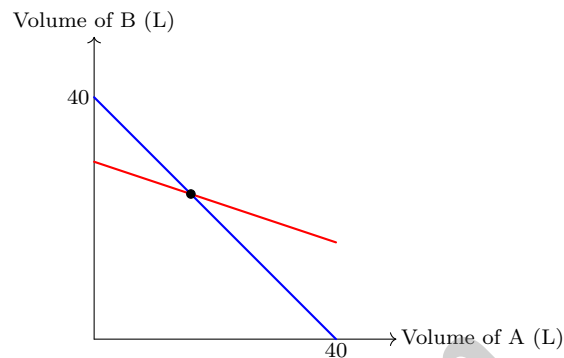
☐ C. Same distance

☐ D. Cannot determine



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- 1) A juice bar mixes two juices. Juice A is 25% apple. Juice B is 75% apple. The shop wants 40 liters of a 55% apple blend. The graph below shows the relationship between volumes of A and B.



Which point represents the solution?

- ☐ A. (10, 30) ☐ C. (16, 24)
☐ B. (20, 20) ☐ D. (30, 10)
- 2) A rectangular prism has length 8 m, width 5 m, and height 3 m. What is its surface area?
- ☐ A. 120 m² ☐ C. 238 m²
☐ B. 158 m² ☐ D. 280 m²
- 3) Use the table to find the value of x if $f(x) = 7$.

x	0	1	2	3
$f(x)$	1	3	5	7



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4) A two-way table of 120 people shows:

	Owens Car	No Car	Total
Urban	24	36	60
Rural	45	15	60
Total	69	51	120

What is the joint frequency of rural people who own a car?

☐ A. $\frac{60}{120}$

☐ B. $\frac{45}{60}$

☐ C. $\frac{45}{120}$

☐ D. $\frac{45}{69}$

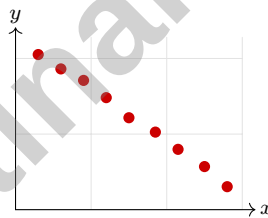
5) A patio is shaped like a hexagon decomposed into a rectangle (12 ft by 8 ft) and two congruent right triangles (legs 6 ft and 4 ft each). What is the total area?

☐ A. 72 ft^2

☐ B. 84 ft^2

☐ C. 96 ft^2

☐ D. 120 ft^2



6)

A scatter plot of price versus quantity sold shows a downward trend that is clearly linear. A line of best fit passes through most of the points with only small deviations. Which term best describes the strength of this association?

☐ A. Weak negative correlation

☐ B. Moderate negative correlation

☐ C. Strong negative correlation

☐ D. No correlation



1) Three angles are formed on a straight line. Their measures are x , $2x$, and $3x$. Find x .

☐ A. 30°

☐ C. 60°

☐ B. 45°

☐ D. 90°

2) A square pyramid-shaped roof covers a building with a square base of side length 10 m. The slant height is 13 m. What is the lateral surface area (the four triangular sides)?

☐ A. 130 m^2

☐ C. 360 m^2

☐ B. 260 m^2

☐ D. 520 m^2

3) A student found that a cone and a cylinder with the same radius r and height h have volumes differing by 600 cm^3 . If $V_{\text{cyl}} = 900 \text{ cm}^3$, what is V_{cone} ?

☐ A. 100 cm^3

☐ C. 600 cm^3

☐ B. 300 cm^3

☐ D. 1500 cm^3

4) Factor completely: $5x^2 + 35x + 50$.

☐ A. $5(x^2 + 7x + 10)$

☐ C. $5(x + 2)(x + 5)$

☐ B. $(5x + 5)(x + 10)$

☐ D. $5(x + 10)(x + 1)$

5) A pizza restaurant charges \$12 for a large pizza and \$1.50 per topping. Is the total cost a function of the number of toppings?

☐ A. No, because the base price is fixed.

☐ D. Yes, only if the customer is satisfied with the pizza.

☐ B. No, because toppings are not free.

☐ C. Yes, each number of toppings gives exactly one total cost.



6) Missing value problem: Function through $(2, 9)$ and $(5, 24)$ has what equation?

☐ A. $y = 5x - 1$

☐ C. $y = 3x + 3$

☐ B. $y = 5x + 1$

☐ D. $y = 6x - 3$

7) A table shows that when $x = 1$, $y = 7$ and when $x = 5$, $y = 23$. What is the slope?

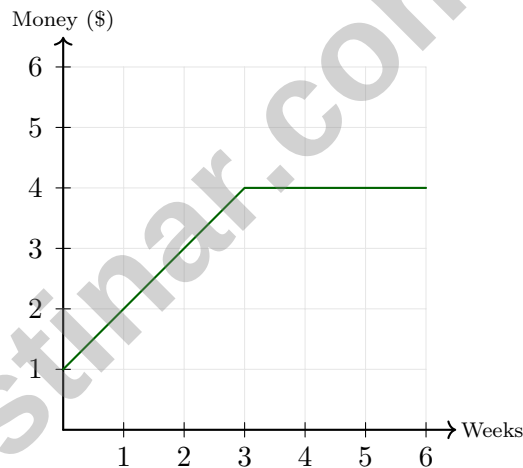
x	1	5
y	7	23

☐ A. 4

☐ C. $\frac{1}{4}$

☐ B. 8

☐ D. 16



8)

A student saves money over time. The graph shows: increases for 3 weeks, then constant for 3 weeks. The y -intercept is 1. Which is true?

☐ A. The student had \$0 at the start

☐ C. The student spends money after week 3

☐ B. The student had \$1 initially and saves \$1 per week, then stops

☐ D. The function is linear over all 6 weeks


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Ohio OST 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 Ohio OST 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) Let $x = 0.7\overline{89}$. Then $10x = 7.\overline{89}$ and $1000x = 789.\overline{89}$. Subtracting gives $990x = 789 - 7 = 782$, so the numerator is 782.
- 2) **Choice A is correct.** (8.EE.7b) Multiply both sides by 3: $x + 5 = 12$. Subtract 5: $x = 7$.
- 3) **Choice C is correct.** (8.EE.8b) Solving $2x - 3 < 5$ gives $2x < 8$, so $x < 4$. Of the listed choices, only $x = 3$ satisfies the inequality.
- 4) **Choice C is correct.** (8.EE.8c) Rearrange: $y > -2x + 6$. Strict inequality ($>$) $\rightarrow$ DASHED boundary. Since y is GREATER than the expression, shade ABOVE. Distractor A mistakes dashed for solid; B flips both inequality and shading; D has wrong slope.
- 5) **Choice B is correct.** (8.G.1) Reflections are rigid transformations that preserve all side lengths and angle measures. The reflected parallelogram has the same dimensions as the original.
- 6) **Choice D is correct.** (8.EE.1) Add exponents: $n^6 \cdot n^{-4} \cdot n^3 = n^{6-4+3} = n^5$.
- 7) **Choice D is correct.** (8.EE.2) $4 \times 4 \times 4 = 64$, so $\sqrt[3]{64} = 4$.
- 8) **Choice D is correct.** (8.EE.4) First divide: $\frac{8 \times 10^9}{2 \times 10^3} = 4 \times 10^6$. Then divide again: $\frac{4 \times 10^6}{4 \times 10^2} = 1 \times 10^4$.
- 9) **The correct answer is 115.** (8.G.9) Base area = 25 cm^2 . Lateral area = $4 \times \frac{1}{2}(5)(9) = 4 \times 22.5 = 90 \text{ cm}^2$. Total = $25 + 90 = 115 \text{ cm}^2$.
- 10) **Choice C is correct.** (8.EE.5) Slope $k = \frac{5}{5} = 1$. The line has a 45-degree angle, so $y = x$.
- 11) **Choice A is correct.** (8.EE.6) Substitute: $6 = \frac{2}{3}(3) + b$, so $6 = 2 + b$, thus $b = 4$.
- 12) **Choice C is correct.** (8.EE.8c) $(x - 7)^2 = (x - 7)(x - 7) = x^2 - 7x - 7x + 49 = x^2 - 14x + 49$.
- 13) **Choice B is correct.** (8.F.2) $d_1(6) = 55(6) = 330$ miles. Slope of d_2 : $180/3 = 60$ mph, so $d_2(6) = 0 + 60(6) = 360$ miles. Since $360 > 330$, d_2 is greater.
- 14) **Choice B is correct.** (8.G.2) Equal perimeters do NOT guarantee congruence. Rectangle 1 is $18 \times 12 \text{ cm}$, while Rectangle 2 is $20 \times 10 \text{ cm}$. Congruence requires equal corresponding sides, not just equal perimeters.
- 15) **The correct answer is 66.67.** (8.EE.3) Divide: $\frac{8 \times 10^{-6}}{1.2 \times 10^{-7}} = \frac{8}{1.2} \times 10^1 = 6.67 \times 10^1 \approx 66.67$.
- 16) **Choice C is correct.** (8.G.8) Removing an outlier far from the mean removes a large deviation, lowering the overall average deviation (MAD).
- 17) **Choice A is correct.** (8.EE.8) Check $(3, 6)$ in both equations: $6 = 2(3) = 6$ ✓ and $6 = 3 + 3 = 6$ ✓. The solution is correct.
- 18) **Choice B is correct.** (8.F.1) For each hour parked, the cost is uniquely determined: $c = 0.50h$. This satisfies the definition of a function.
- 19) **Choice B is correct.** (8.F.3) The first differences are 3, 5, 7, which are not constant. When first differences vary, the function is nonlinear.
- 20) **The correct answer is A, D.** (8.NS.2) A is true: $3^2 = 9$ and $4^2 = 16$, so $9 < 12 < 16$ means $3 < \sqrt{12} < 4$. B is false: $6^2 = 36$ and $7^2 = 49$, so $\sqrt{48}$ is between 6 and 7, not 5 and 6. C is false: $\sqrt{100} = 10$, so it is not between 10 and 11. D is true: $6^2 = 36$ and $7^2 = 49$, so $36 < 37 < 49$ means $6 < \sqrt{37} < 7$. E is false: $8^2 = 64$ and $9^2 = 81$, so $\sqrt{75}$ is between 8 and 9, not 9 and 10.
- 21) **Choice A is correct.** (8.F.4) Daily rate is \$20 per day (slope). Deposit \$15 is the fixed cost (intercept). Equation: $C = 20d + 15$.
- 22) **Choice A is correct.** (8.F.5) The instant pump-dry event is shown with a dashed vertical jump from 4 to 0 at $t = 2$. This marks a discontinuity, not a gradual change over time.
- 23) **The correct answer is 5.7.** (8.NS.2) $\sqrt{32} = 4\sqrt{2} \approx 4 \times 1.41 = 5.66 \approx 5.7$ meters.
- 24) **Choice B is correct.** (8.G.3) The pre-image $(1, 2)$ maps to image $(-1, 2)$, confirming reflection across the y -axis: $(x, y) \rightarrow (-x, y)$.
- 25) **Choice B is correct.** (8.G.8) Distance = $\sqrt{(3-0)^2 + (4-0)^2} = \sqrt{9+16} = \sqrt{25} = 5$ miles. (This is a 3-4-5 Pythagorean triple.)
- 26) **Choice B is correct.** (8.G.7) Let the smaller angle be x . Then $x + (x + 18) = 90$, so $2x + 18 = 90$, giving $x = 36^\circ$.



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Hi, Strategy Solver!

◇ Grade 8 math rewards students who think before they calculate. You practiced choosing strategies, not just hunting for answers. This high-stamina book gave you nine substantial 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

CONFIDENCE TODAY, SUCCESS TOMORROW!

GRADE

8

Help your child excel in math with **9 full-length Grade 8 practice tests** designed to reflect real test formats and cover all key math standards.

With a wide variety of questions and real-world applications, this book builds the skills and confidence students need to achieve their best!



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 |
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