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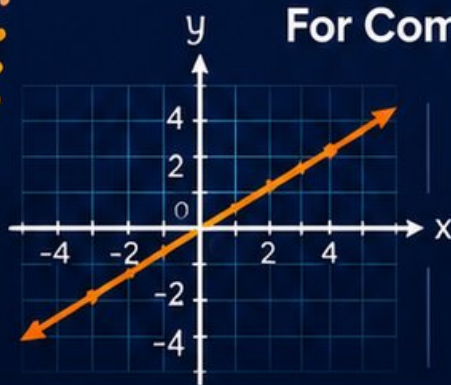
Ohio OST

GRADE 8

MATH

PRACTICE TESTS

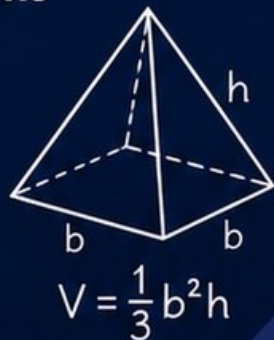
Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$

$$C = 2\pi r$$

$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}b^2 h$$



8

 PRINTED
TESTS

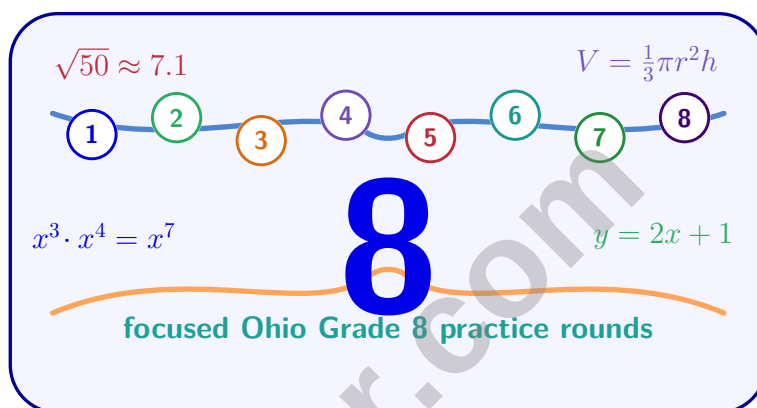
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 ONLINE
TESTS

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

8 Ohio OST Grade 8 Math Practice Tests

Ohio Grade 8 Practice for Equations, Functions, Geometry, and Statistics



Eight 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!

Eight focused rounds for sharper OST math thinking

This book gives you eight 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

An eight-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?

Eight OST tests, 320 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 7–8	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) 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

2) A scientist collected data on plant height (cm) versus days of growth. Which scatter plot shows a trend line that is a POOR fit?

☐ A. Points spread far from the line with large vertical distances

☐ C. Line passes through the center of the data cloud

☐ B. Half the points are above the line and half are below

☐ D. Points clustered tightly around the line with minimal scatter

3) Data set: $\{100, 102, 104, 106, 108\}$ (mean = 104). Calculate MAD.

☐ A. 1.6

☐ C. 3

☐ B. 2

☐ D. 2.4

4) A gift box in the shape of a triangular pyramid has a right-triangular base with legs 5 in and 12 in. The pyramid is 4 in tall. What is the volume?

☐ A. 20 in^3

☐ C. 40 in^3

☐ B. 30 in^3

☐ D. 60 in^3

5) A circular pool with radius 4 m has a rectangular platform (length 8 m, width 3 m) removed from its center. Find the remaining area. Use $\pi \approx 3.14$.

☐ A. 26.24 m^2

☐ C. 41.44 m^2

☐ B. 40.56 m^2

☐ D. 74.12 m^2



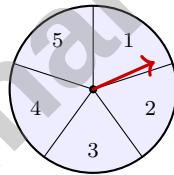
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- 6) In a survey of 80 coffee drinkers, 50 add cream and 30 do not. Of those who add cream, 35 are office workers. What is the relative frequency of office workers among cream-adders, rounded to the nearest whole percent?

☐ A. 44% ☐ C. 62%
☐ B. 70% ☐ D. 56%

- 7) A balloon starts at 300 meters and descends at 2 meters per second. What is the slope of the height model?

- 8) A spinner has 5 equal sections labeled 1, 2, 3, 4, 5. You spin it twice. What is the probability of spinning a 3 on the first spin AND a 2 on the second spin?



☐ A. $\frac{1}{25}$ ☐ C. $\frac{2}{25}$
☐ B. $\frac{1}{5}$ ☐ D. $\frac{2}{5}$

- 9) A point $P(3, 7)$ moves to $P'(-2, 4)$. What is the translation vector?



10) A login code uses 3 distinct digits from the set $\{0, 1, 2, 3, 4, 5\}$. How many codes are possible?

☐ A. $6 + 5 + 4 = 15$

☐ C. $6^3 = 216$

☐ B. $6 \times 5 \times 4 = 120$

☐ D. $\binom{6}{3} = 20$

11) Which statement is true?

☐ A. $\sqrt{36}$ is irrational

☐ C. $\sqrt{11}$ is irrational

☐ B. π is rational

☐ D. $0.333\ldots$ is irrational

Numbers	
Rational	Irrational
$\frac{1}{2}, 0.5$	$\sqrt{2}, \pi$

12)

Which number should be placed in the Rational section?

☐ A. $\sqrt{13}$

☐ C. $-\frac{9}{2}$

☐ B. $2 + \sqrt{5}$

☐ D. $\sqrt{\pi}$

13) What denominator appears when a repeating decimal has a 4-digit repeating block?

☐ A. 10

☐ C. 999

☐ B. 100

☐ D. 9999

14) If \$3,000 earns \$450 in simple interest over 3 years, what is the annual interest rate?

☐ A. 3%

☐ C. 10%

☐ B. 15%

☐ D. 5%



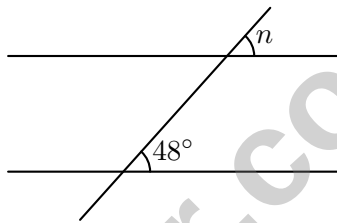
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1) A student expands $(x - 4)^2$ and gets $x^2 - 16$. What is the error?

- ☐ A. Missing the middle term. ☐ C. Used subtraction instead of FOIL.
☐ B. Forgot to square the coefficient of x . ☐ D. The answer is correct; there is no error.

2) A student finds that their homework scores have a mean of 85 and MAD of 4. Which interval is one MAD from the mean?

- ☐ A. 81 to 89 ☐ C. 80 to 90
☐ B. 75 to 95 ☐ D. 70 to 100



3)

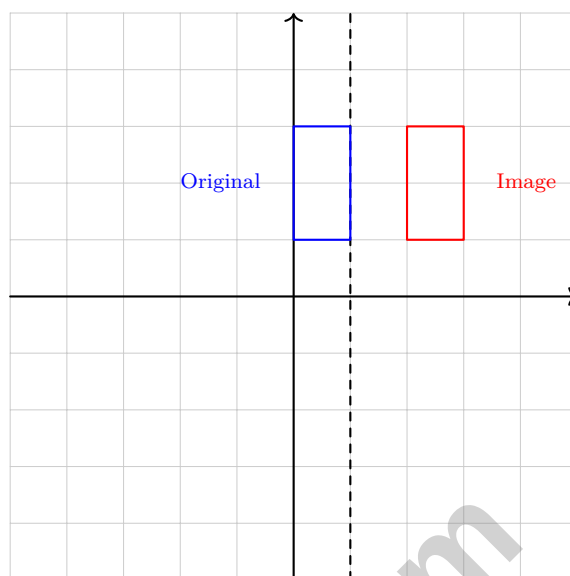
Two parallel lines are cut by a transversal. One angle below the transversal measures 48° . What is n , the corresponding angle above the line?

- ☐ A. 42° ☐ C. 132°
☐ B. 48° ☐ D. 138°

4) Which of the following is the BEST description of what a small residual means?

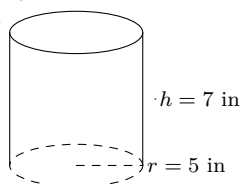
- ☐ A. The data point is far from the trend line ☐ C. The slope of the line is steep
☐ B. The data point is very close to the trend line ☐ D. There is no correlation in the data





5)

The figure shows a reflection across the dashed line $x = 1$. If a point on the original was at $(0, 2)$, where is it in the image?

☐ A. $(1, 2)$
☐ C. $(0, 2)$
☐ B. $(2, 2)$
☐ D. $(3, 2)$


6)

A cylinder with radius 5 in and height 7 in is shown. What is its volume? (Use $\pi \approx 3.14$.)

☐ A. 109.9 in^3
☐ C. 549.5 in^3
☐ B. 219.8 in^3
☐ D. 1099 in^3

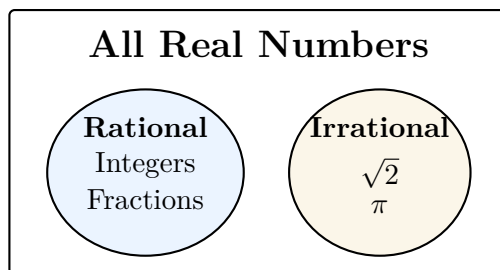

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1)

Which statement is true?

- ☐ A. All square roots are irrational
 ☐ D. Every irrational number can be written as a fraction
- ☐ B. All integers are rational
 ☐ C. Some repeating decimals are irrational
- 2) A company allows workers to earn \$12 per hour plus a \$50 bonus. How many hours must they work to earn at least \$170?
- ☐ A. $h < 10$
☐ C. $h \geq 10$
- ☐ B. $h > 10$
☐ D. $h \leq 10$
- 3) For the inequality $y \geq 2x - 4$, test the point $(1, -1)$. Is it in the solution region?
- ☐ A. Yes, because $-1 \geq -2$
☐ C. No, because $-1 < -2$
- ☐ B. Yes, because $-1 > -2$
☐ D. No, because $-1 = -2$
- 4) A point (p, q) is reflected across the y -axis, giving $(-p, q)$. Then it is reflected across the x -axis, giving $(-p, -q)$. What single transformation produces the same result?
- ☐ A. 90° rotation about the origin
 ☐ C. 270° rotation about the origin
- ☐ B. 180° rotation about the origin
 ☐ D. Reflection across the line $y = x$



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- 5) Evaluate $(2x^3)^2$ when $x = 1$.

- 6) A student claims that $\sqrt{49} + \sqrt{64} = \sqrt{113}$. Is this correct?

- ☐ A. Yes, because $49 + 64 = 113$ ☐ C. No, because square roots cannot be added
☐ B. Yes, but only if we simplify the radicals first ☐ D. No, because $\sqrt{49} + \sqrt{64} = 15$

- 7) $\frac{1.2 \times 10^4}{4 \times 10^6} = ?$

- ☐ A. 0.3×10^{-2} ☐ C. 3.2×10^{-2}
☐ B. 5×10^{-3} ☐ D. 3×10^{-3}

- 8) The cost of a gym membership is \$50 per month. If Sarah spends a total of \$200 after t months, write and solve an equation to find t . Verify your answer.

- 9) An athlete drinks 8 ounces of water for every 10 minutes of exercise. After 45 minutes of exercise, how many ounces has the athlete drunk?

- ☐ A. 30 ounces ☐ C. 40 ounces
☐ B. 45 ounces ☐ D. 36 ounces



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.EE.4)** Multiply: $6 \times 3 = 18 = 1.8 \times 10^1$. Add exponents: $10^{2+4} = 10^6$. Combine: $1.8 \times 10^1 \times 10^6 = 1.8 \times 10^7$.
- 2) **Choice A is correct.** **(8.NS.2)** A poor fit means the line fails to capture the pattern in the data. Large gaps (residuals) between points and the line indicate a weak relationship. A good fit minimizes these distances.
- 3) **Choice D is correct.** **(8.G.8)** Absolute deviations: $|100 - 104| = 4$, $|102 - 104| = 2$, $|104 - 104| = 0$, $|106 - 104| = 2$, $|108 - 104| = 4$. Sum = 12. MAD = $12/5 = 2.4$.
- 4) **Choice C is correct.** **(8.G.7)** Base: $B = \frac{1}{2} \times 5 \times 12 = 30 \text{ in}^2$. Volume: $V = \frac{1}{3} \times 30 \times 4 = 40 \text{ in}^3$.
- 5) **Choice A is correct.** **(8.G.7)** Decompose using subtraction: circle minus rectangle. Circle area = $\pi r^2 = 3.14 \times 4^2 = 50.24 \text{ m}^2$. Rectangle area = $8 \times 3 = 24 \text{ m}^2$. Remaining = $50.24 - 24 = 26.24 \text{ m}^2$.
- 6) **Choice B is correct.** **(8.SP.4)** This is a row-conditional relative frequency. Among cream-adders (50 total), 35 are office workers: $\frac{35}{50} = 0.70 = 70\%$.
- 7) **The correct answer is -2 .** **(8.F.4)** A descent means the rate of change is negative, so the slope is -2 .
- 8) **Choice A is correct.** **(8.G.7)** $P(3 \text{ then } 2) = \frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$.
- 9) **The correct answer is $(-5, -3)$.** **(8.G.3)** Subtract coordinates: $(-2, 4) - (3, 7) = (-5, -3)$.
- 10) **Choice B is correct.** **(8.EE.7b)** First digit: 6 choices. Second digit: 5 remaining (no repetition). Third: 4 remaining. Total: $6 \times 5 \times 4 = 120$.
- 11) **Choice C is correct.** **(8.NS.2)** $\sqrt{36} = 6$ (rational), π is irrational, and $0.333\ldots = \frac{1}{3}$ (rational). $\sqrt{11}$ cannot be expressed as a ratio of integers.
- 12) **Choice C is correct.** **(8.NS.1)** Only $-\frac{9}{2}$ is rational (a fraction of two integers). The others are irrational: $\sqrt{13}$ is a non-perfect-square root, $2 + \sqrt{5}$ is a sum involving an irrational, and $\sqrt{\pi}$ is the root of an irrational.
- 13) **Choice D is correct.** **(8.NS.1)** For a pure repeating decimal with block length n , the denominator is $\underbrace{99\ldots9}_n$. A 4-digit block uses 9999.
- 14) **Choice D is correct.** **(8.G.7)** Solve for r : $450 = 3000 \times r \times 3 \Rightarrow r = \frac{450}{9000} = 0.05 = 5\%$.
- 15) **Choice D is correct.** **(8.EE.3)** Move the decimal 4 places left to get 4.2; the exponent is positive 4. Thus $42,000 = 4.2 \times 10^4$.
- 16) **Choice D is correct.** **(8.EE.7b)** Subtract $2x$ and add 3: $3x = 12$. Divide by 3: $x = 4$. (Distractor A: result of dividing 12 by 3 incorrectly; C: forgetting to distribute constant; D: result of incorrect arithmetic.)
- 17) **Choice D is correct.** **(8.NS.2)** Since $\sqrt{2}$ is irrational and 1 is rational, $\sqrt{2} + 1$ is irrational. (The sum of an irrational and a rational is irrational.)
- 18) **Choice D is correct.** **(8.EE.1)** Multiply exponents sequentially: $(d^2)^2 = d^{2 \cdot 2} = d^4$; then $(d^4)^3 = d^{4 \cdot 3} = d^{12}$. OR multiply all three: $2 \times 2 \times 3 = 12$, so d^{12} .
- 19) **Choice C is correct.** **(8.EE.5)** If $y = 3x$ (cups per batch), then $12 = 3x$, so $x = 4$. Four batches require 12 cups.
- 20) **Choice D is correct.** **(8.EE.6)** The y -intercept is where the line crosses the y -axis, which occurs at $(0, 2)$.
- 21) **Choice B is correct.** **(8.G.2)** 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).
- 22) **The correct answer is B,C.** **(8.EE.8c)** $(x + 6)^2 = (x + 6)(x + 6) = x^2 + 12x + 36$. 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 $(x + 6)^2$.
- 23) **Choice C is correct.** **(8.EE.2)** $7^2 = 49$ and $8^2 = 64$, so $\sqrt{50}$ is a little more than 7. Since $\sqrt{50} \approx 7.07$, it is closest to 7.1.
- 24) **Choice B is correct.** **(8.EE.8)** In option B, the y coefficients are $+3$ and -3 . Adding these equations eliminates y : $(4x + 3y) + (2x - 3y) = 12 + 6 \Rightarrow 6x = 18$.
- 25) **Choice C is correct.** **(8.F.1)** Each barcode corresponds to a product, but the price can change multiple times, giving the barcode multiple price outputs. The other options satisfy the one-input-one-output rule.



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The Power of Showing Work

Hi, Organized Solver!

◇ You practiced Grade 8 skills that often require more than one step. That means your written work matters. ◇

★ **Remember this:** Showing work is not extra. It is how you track your thinking, find errors, and prove that your answer did not happen by luck. You practiced across 8 full Grade 8 practice tests, and that repeated effort matters. ★

Organized Work Habits

- **One Line Per Step:** Keep the path readable.
- **Box the Answer:** Make the final result easy to find.
- **Use Labels:** Tell what each value represents.
- **Check the Path:** Follow your steps backward if needed.

Grade 8 test-day tip: When a problem has several steps, write less on each line. Space makes checking easier.

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

Jay Daie

Your Organized-Work Coach

PRACTICE TODAY, SUCCEED TOMORROW!

Give your child the confidence and skills they need with **8 full-length Grade 8** Math practice tests that mirror 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.



BUILD SKILLS & BOOST CONFIDENCE

Strengthen understanding and feel prepared for test day.



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!



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Better Results.