

6 Ohio OST

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 Ohio OST Grade 8 Math Practice Tests

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



Six 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!

Six focused rounds for sharper OST math thinking

This book gives you six 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 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.

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?

Six OST 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.

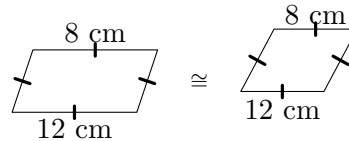


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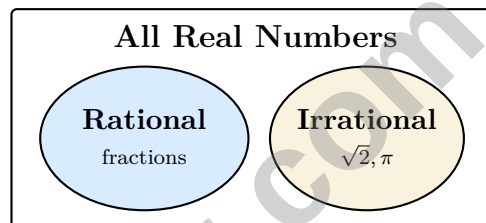
★ Practice Test 1	_____	15
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- 1) Two congruent trapezoids are shown. One trapezoid has parallel sides of 8 cm and 12 cm. What are the parallel sides of the congruent trapezoid?



- ☐ A. 4 cm and 6 cm ☐ C. 16 cm and 24 cm
☐ B. 8 cm and 12 cm ☐ D. Cannot be determined

Venn Diagram



2)

Which number belongs in the Irrational circle?

- ☐ A. -4 (negative integer) ☐ C. $\sqrt{23}$ (square root)
☐ B. $\frac{7}{9}$ (fraction) ☐ D. 2.25 (decimal)

- 3) $\sqrt{68}$ is closest to which integer?

- ☐ A. 7 ☐ C. 9
☐ B. 6 ☐ D. 8



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- 4) A data point is at $(3, 8)$ and the trend line at $x = 3$ predicts $y = 6$. What is the residual?

- 5) Which is the best estimate of $\sqrt{45}$?

☐ A. 5.5☐ C. 6.7☐ B. 6.0☐ D. 9.0

- 6) An investment grows with compound interest. If \$1,000 is invested at 8% compound interest annually, which is the closest to the amount after 2 years?

☐ A. \$1,080☐ C. \$1,166☐ B. \$1,160☐ D. \$1,200

7) Express 5^{-2} as a fraction.

☐ A. -25

☐ B. $-\frac{1}{5}$

☐ C. $\frac{2}{5}$

☐ D. $\frac{1}{25}$

8) If $x^2 = 81$, what are the possible values of x ?

☐ A. 9 only

☐ B. -9 only

☐ C. 9 or -9

☐ D. 3 or -3

9) The diameter of an atom is about 2×10^{-10} m. What is this in decimal form?

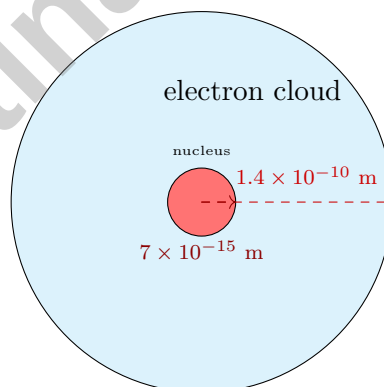
☐ A. 0.00000002 m

☐ B. 0.000000002 m

☐ C. 0.0000000002 m

☐ D. 0.00000000002 m

10) A gold nucleus has a radius of about 7×10^{-15} meters. The electron cloud of a gold atom extends to about 1.4×10^{-10} meters. The atomic radius is how many times the nuclear radius?



☐ A. 0.5×10^5

☐ B. 5×10^4

☐ C. 2×10^4

☐ D. 2×10^5



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1) Which is the best estimate of $\sqrt{48}$?

☐ A. 6.5

☐ C. 6.9

☐ B. 7.0

☐ D. 8.2

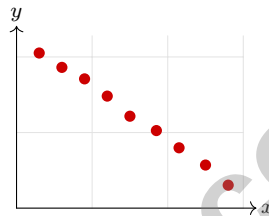
2) Triangle X is similar to Triangle Y . In Triangle X , one angle measures 60° . What is the measure of the corresponding angle in Triangle Y ?

☐ A. 30°

☐ C. 120°

☐ B. 60°

☐ D. Cannot be determined



3)

A scatter plot shows the relationship between exercise frequency (days per week) and resting heart rate (bpm). The points form a clear downward trend with minimal scatter around the trend line. A student can infer that:

☐ A. Exercise causes higher heart rates

☐ C. Exercise and heart rate are unrelated

☐ B. More exercise is associated with lower resting heart rate

☐ D. Heart rate determines exercise frequency

4) A gardening store surveys 200 customers on plant purchase preferences. 140 bought flowering plants and 60 bought non-flowering. Among flowering-plant buyers, 98 also purchased fertilizer. What percentage of all customers bought both flowering plants and fertilizer?

☐ A. 49%

☐ C. 70%

☐ B. 56%

☐ D. 82%



- 5) An angle is 12° less than three times its supplement. Write and solve an equation to find the angle's measure.

6)

Temperature ($^\circ\text{C}$)	15	18	21	24	27
----------------------------------	----	----	----	----	----

Five days with temperatures shown. Mean = 21°C . Find MAD.

- ☐ A. 2.4

☐ B. 3

☐ C. 3.6

☐ D. 6
- 7) When rolling two six-sided dice, what is the probability of rolling a sum of 7?
- ☐ A. $\frac{1}{5}$

☐ B. $\frac{1}{6}$

☐ C. $\frac{1}{12}$

☐ D. $\frac{7}{36}$
- 8) How many ways can 4 books be arranged on a shelf?
- ☐ A. $4 + 3 + 2 + 1 = 10$

☐ B. $4^4 = 256$

☐ C. $4! = 24$

☐ D. $\binom{4}{2} = 6$



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

x	2	5	8
y	3	?	15

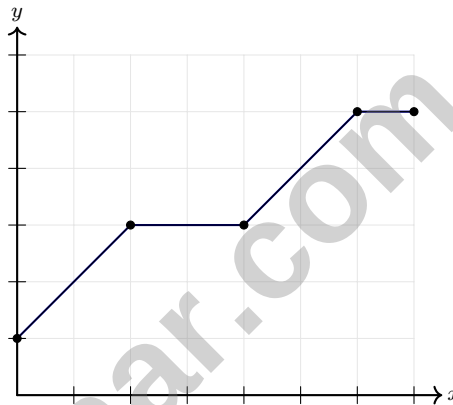
What is the missing y -value?

☐ A. 8

☐ C. 10

☐ B. 12

☐ D. 9



2)

Identify all intervals where the function is increasing.

☐ A. $[0, 2]$ only

☐ C. $[2, 4]$ and $[4, 6]$

☐ B. $[0, 2]$ and $[4, 6]$

☐ D. $[0, 2]$, $[4, 6]$, and $[6, 7]$

3) A point is distance $\sqrt{13}$ from the origin $(0, 0)$. Which of these could be the point's coordinates?

☐ A. $(2, 3)$

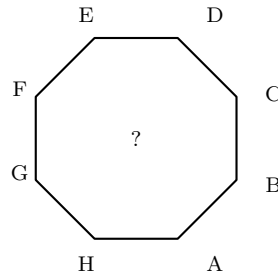
☐ C. $(2, 2)$

☐ B. $(3, 3)$

☐ D. $(4, 1)$



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4)

A regular octagon $ABCDEFGH$ is shown. Each interior angle measures:

☐ A. 120°
☐ C. 135°
☐ B. 125°
☐ D. 140°

5) A cube is dilated by a scale factor of 2. If the original cube has volume 27 cm^3 , what is the volume of the dilated cube?

☐ A. 54 cm^3
☐ C. 216 cm^3
☐ B. 108 cm^3
☐ D. 81 cm^3

6) Factor completely: $x^3 + 5x^2$.

☐ A. $x^2(x + 5)$
☐ C. $5x(x^2 + x)$
☐ B. $x(x^2 + 5x)$
☐ D. $x(x + 5)^2$

7) Real-world extrapolation: Email subscribers grow as $S(d) = 150 + 40d$ per day. Competitor at day 5 has 500 subscribers, day 10 has 700. Which will have more subscribers at day 15?

☐ A. First email service

☐ C. Both equal

☐ B. Competitor

☐ D. Cannot determine


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 B is correct.** **(8.G.2)** Congruent figures have equal corresponding sides. The congruent trapezoid has the same parallel sides: 8 cm and 12 cm.
- 2) **Choice C is correct.** **(8.NS.1)** $\sqrt{23}$ is irrational because 23 is not a perfect square. The other values are all rational: -4 is an integer, $\frac{7}{9}$ is a fraction, and $2.25 = \frac{9}{4}$ is a terminating decimal.
- 3) **Choice D is correct.** **(8.NS.2)** $8^2 = 64$ and $9^2 = 81$. Since 68 is closer to 64 than to 81 (distance 4 vs. 13), $\sqrt{68} \approx 8.25$ is closest to 8.
- 4) **The correct answer is 2.** **(8.NS.2)** Residual = actual – predicted = $8 - 6 = 2$.
- 5) **Choice C is correct.** **(8.NS.2)** $\sqrt{45} = 3\sqrt{5} \approx 3 \times 2.24 = 6.71$.
- 6) **Choice C is correct.** **(8.G.7)** $A = 1000(1.08)^2 = 1000 \times 1.1664 = \$1,166.40 \approx \$1,166$.
- 7) **Choice D is correct.** **(8.EE.1)** A negative exponent means reciprocal: $5^{-2} = \frac{1}{5^2} = \frac{1}{25}$.
- 8) **Choice C is correct.** **(8.EE.2)** Both $9^2 = 81$ and $(-9)^2 = 81$, so both 9 and -9 are solutions.
- 9) **Choice D is correct.** **(8.EE.3)** A negative exponent means move the decimal to the left. With 10^{-10} , move 10 places left: $2 \times 10^{-10} = 0.0000000002$ m.
- 10) **Choice C is correct.** **(8.EE.4)** $\frac{1.4 \times 10^{-10}}{7 \times 10^{-15}} = \frac{1.4}{7} \times 10^5 = 0.2 \times 10^5 = 2 \times 10^4$.
- 11) **Choice C is correct.** **(8.F.1)** A relation is a function only if each input has exactly one output. If input 5 appears three times but with the same output, it is still a function (just redundantly listed).
- 12) **Choice A is correct.** **(8.F.3)** The first differences are constant: $24 - 12 = 12$, $36 - 24 = 12$, $48 - 36 = 12$. This represents a linear relationship where cost increases by \$12 per item.
- 13) **Choice C is correct.** **(8.EE.8)** From (1, 1) to (3, 4): slope = $\frac{4-1}{3-1} = \frac{3}{2}$.
- 14) **The correct answer is $\frac{1}{6}$.** **(8.G.7)** Favorable outcomes: (1,6), (2,5), (3,4), (4,3), (5,2), (6,1). That's 6 of 36. $P = \frac{6}{36} = \frac{1}{6}$.
- 15) **Choice C is correct.** **(8.EE.8c)** Let w = width. First field: $2(50) + 2w = 180$, so $100 + 2w = 180$, giving $2w = 80$ and $w = 40$ m. Check with second field: $2(60) + 2w = 200$, so $120 + 2w = 200$, giving $w = 40$ m. ✓
- 16) **Choice A is correct.** **(8.F.2)** Substitute $x = 1$: $h(1) = -(1) + 4 = -1 + 4 = 3$.
- 17) **Choice D is correct.** **(8.G.9)** Two triangular bases: $2 \times \frac{1}{2}(3)(4) = 12 \text{ cm}^2$. Three rectangular sides: $7(3 + 4 + 5) = 84 \text{ cm}^2$. Total surface area = $12 + 84 = 96 \text{ cm}^2$.
- 18) **Choice A is correct.** **(8.EE.8b)** Dividing by -5 requires flipping: $x \geq -3$, not $x \leq -3$.
- 19) **The correct answer is A,C.** **(8.G.4)** 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.
- 20) **Choice A is correct.** **(8.G.1)** Reflection across the line $y = x$ swaps coordinates: $(x, y) \rightarrow (y, x)$. So $(4, 7) \rightarrow (7, 4)$. Distractor D represents reflection across $y = -x$.
- 21) **Choice C is correct.** **(8.SP.3)** Substitute $n = 100$: $C = 2(100) + 50 = 200 + 50 = \250 .
- 22) **Choice C is correct.** **(8.EE.6)** The slope of the given line is 2. The perpendicular slope is $-\frac{1}{2}$ (negative reciprocal).
- 23) **Choice A is correct.** **(8.EE.7b)** Expand: $2x + 6 = 3x - 3$. Subtract $2x$ and add 3: $9 = x$, so $x = 9$.
- 24) **Choice A is correct.** **(8.EE.8c)** Dashed horizontal line at $y = 1$ with shading ABOVE (in the positive y direction) means $y > 1$.
- 25) **Choice C is correct.** **(8.G.7)** $V = \pi r^2 h = 3.14 \times 20.25 \times 11 = 3.14 \times 222.75 = 699.44 \text{ m}^3$.
- 26) **Choice C is correct.** **(8.EE.5)** Slope = $\frac{8-0}{1-0} = 8$. This is a steep line passing through (0, 0) and (1, 8).
- 27) **Choice D is correct.** **(8.EE.8)** Substitute $x = y - 4$ into $2x + 3y = 2$: $2(y - 4) + 3y = 2$, so $2y - 8 + 3y = 2$, giving $5y = 10$ and $y = 2$. Then $x = 2 - 4 = -2$. Solution: $(-2, 2)$.



One Last Encouragement

Hi, Determined Student!

◇ You did meaningful Grade 8 practice. That matters because confidence is built through action, not waiting until everything feels easy. 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:** Carry this with you: you can learn hard things by breaking them into steps, asking good questions, and reviewing with honesty. ★

Take This With You

- **You Can Start:** Even when the problem looks big.
- **You Can Adjust:** When the first method is not enough.
- **You Can Learn:** From every corrected mistake.
- **You Can Improve:** One practice session at a time.

Grade 8 test-day tip: Walk into test day ready to think, not ready to be perfect. Thinking clearly is the goal.

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

Jay Daie

Your Grade 8 Math Friend

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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2 ONLINE TESTS



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