

# OREGON OSAS

## GRADE 8 MATH

## PRACTICE TESTS

# 5

PRINTED  
TESTS



# 2

 ONLINE  
TESTS

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



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



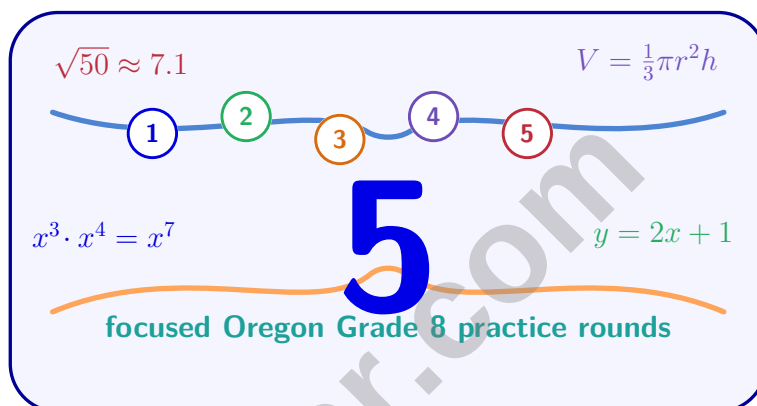
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

# 5 Oregon OSAS Grade 8 Math Practice Tests

*Practical OSAS Review for Graphs, Systems, and Geometry*



Five complete 40-question Grade 8 OSAS 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, Oregon Grade 8 Problem Solver!

Five focused rounds for sharper OSAS math thinking

This book gives you five full Grade 8 OSAS 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 Oregon 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 five-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.

**Oregon 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?

Five OSAS tests, 200 questions, and a focused review path

| Part         | What You Will Practice                                                                        |
|--------------|-----------------------------------------------------------------------------------------------|
| Tests 1–2    | Real numbers, exponents, scientific notation, equations, and careful reading.                 |
| Tests 3–5    | 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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For more practice  
& answers

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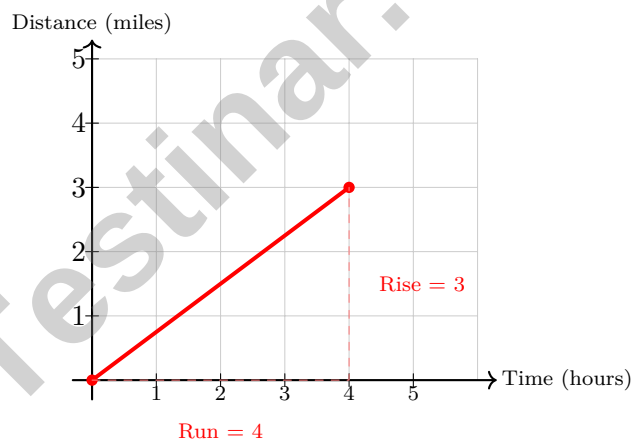
1) Which scenario represents a relation that is NOT a function?

- ☐ A. A car's speed and time (one time, one speed).  
☐ B. A student's name and age (one person, one age).  
☐ C. A product's barcode and all price changes (one barcode, many prices over time).  
☐ D. A city and its mayor (one city, one mayor).

2) Plan A costs \$10 plus \$5 per hour. Plan B costs \$20 plus \$2 per hour. After how many hours are the costs equal?

- ☐ A. 3 hours  
☐ B. 4 hours  
☐ C. 5 hours  
☐ D.  $\frac{10}{3}$  hours

3) A car travels at a constant speed. The graph shows its distance from the start over time.



What is the slope (rate of change) of the car's distance?

- ☐ A. 1 mile per hour  
☐ B.  $\frac{4}{3}$  miles per hour  
☐ C.  $\frac{3}{4}$  miles per hour  
☐ D. 4 miles per hour



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?

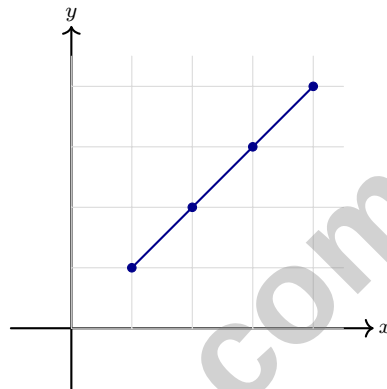
☐ A. 50 L

☐ C. 100 L

☐ B. 75 L

☐ D. 150 L

5) The graph shows function  $h$ . Which of the following is true?



☐ A.  $h(2) = 3$

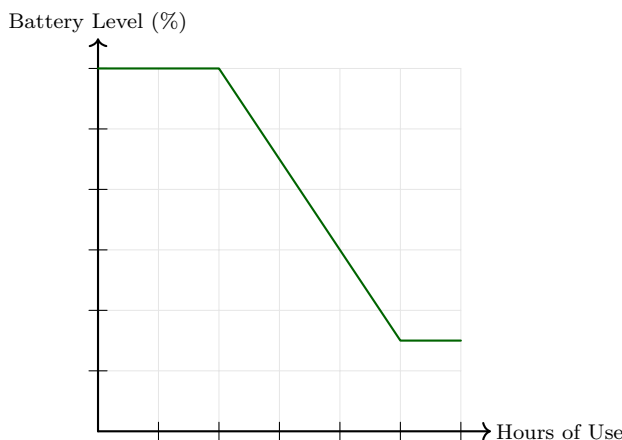
☐ C.  $h(3) = 2$

☐ B.  $h(1) = 1$

☐ D.  $h(4) = 3$



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6)

A smartphone battery charges to 100%, remains fully charged during 2 hours of non-use, then drains steadily over 3 hours of active use. Which statement is true?

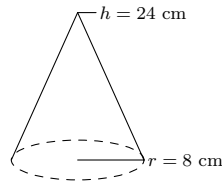
- ☐ A. The phone uses battery only during the first 2 hours  
☐ B. The battery drains faster during non-use  
☐ C. The battery level is constant from 0 to 2 hours  
☐ D. The phone battery reaches 0% at 6 hours

7) A quadrilateral is rotated 90 degrees counterclockwise about a point. Which of the following is true about the rotated figure?

- ☐ A. The angles change  
☐ B. The side lengths change  
☐ C. The figure is congruent to the original  
☐ D. The figure is similar but not congruent

8) Solve the system  $\begin{cases} 2x + y = 5 \\ x - y = 4 \end{cases}$  by elimination.





1)

A traffic cone used at a construction site has a radius of 8 cm and height of 24 cm. What is its volume? (Use  $\pi \approx 3.14$ .)

☐ A.  $602.88 \text{ cm}^3$

☐ C.  $1808.64 \text{ cm}^3$

☐ B.  $1605.12 \text{ cm}^3$

☐ D.  $4823.04 \text{ cm}^3$

2) What is the domain of the relation  $\{(1, 2), (3, 4), (5, 6), (7, 8)\}$ ?

☐ A.  $\{2, 4, 6, 8\}$

☐ C.  $\{1, 2, 3, 4, 5, 6, 7, 8\}$

☐ B.  $\{1, 3, 5, 7\}$

☐ D.  $\{3, 6, 9, 12\}$

3) The function  $y = 2 - 5x$  is linear. What are its slope and  $y$ -intercept?

☐ A. Slope =  $-5$ ,  $y$ -intercept =  $-2$

☐ C. Slope =  $-5$ ,  $y$ -intercept =  $2$

☐ B. Slope =  $2$ ,  $y$ -intercept =  $-5$

☐ D. Slope =  $5$ ,  $y$ -intercept =  $2$

4) A line passes through  $(2, 9)$  and  $(5, 18)$ . Which equation represents this line?

☐ A.  $y = 3x + 3$

☐ C.  $y = 2x + 5$

☐ B.  $y = 3x + 9$

☐ D.  $y = x + 7$

5) A cyclist travels at a constant speed. After 1.5 hours, they have traveled 22.5 miles. After 3 hours, they have traveled 45 miles. What is the slope (speed in mph)?

☐ A. 15 mph

☐ C. 30 mph

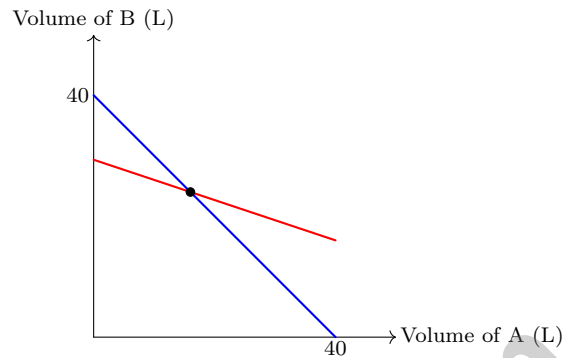
☐ B. 22.5 mph

☐ D. 45 mph



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- 6) 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)

- 7) If  $\frac{b^n}{b^4} = b^6$ , what is the value of  $n$ ?

- 8) Simplify:  $\sqrt{36} + \sqrt[3]{8}$



1) Simplify  $\frac{20x^9}{5x^3}$ .

☐ A.  $x^6$

☐ C.  $15x^6$

☐ B.  $4x^{12}$

☐ D.  $4x^6$

2) Is  $\pi^2$  greater than or less than  $(3.1)^2$ ?

☐ A. Cannot be determined

☐ C. Exactly equal to  $(3.1)^2$

☐ B. Less than  $(3.1)^2$

☐ D. Greater than  $(3.1)^2$

3) Sarah invests \$2,000 at 5% simple interest for 3 years. At the end of 3 years, she decides whether to withdraw all her money or let it grow another 3 years at the same rate. Which statement correctly predicts the impact of waiting another 3 years?

☐ A. No additional interest accrues after 3 years

☐ C. Interest compounds, so she earns more than \$300

☐ B. She will earn another \$600 in interest (total after 6 years: \$2,900)

☐ D. She will earn another \$300 in interest (total after 6 years: \$2,600)

4) The relationship between inches ( $x$ ) and centimeters ( $y$ ) is  $y = 2.54x$ . How many centimeters equal 10 inches?

☐ A. 20.4 cm

☐ C. 25.4 cm

☐ B. 23.4 cm

☐ D. 26.4 cm



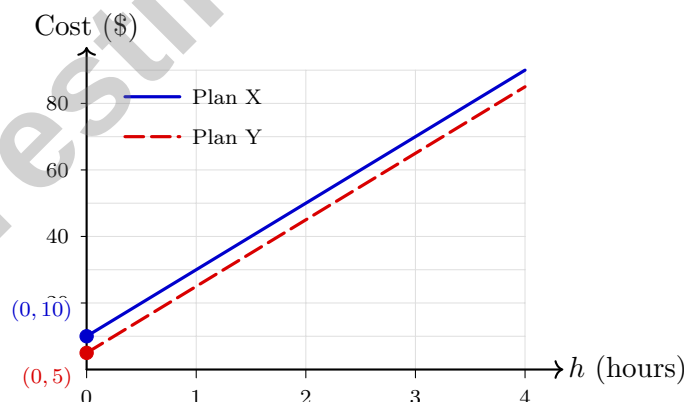
5) The table below shows a relation. Is it a function?

| $x$ | $y$ |
|-----|-----|
| 1   | 3   |
| 2   | 6   |
| 3   | 9   |
| 4   | 12  |

- ☐ A. No, because the outputs are larger than inputs.
 ☐ C. No, because  $y$  values increase by 3.
 ☐ B. Yes, each input has exactly one output.
 ☐ D. Yes, because all values are positive.

6) Which equation is LINEAR?

- ☐ A.  $y = 5 - 3x^2$ 
☐ C.  $y = 7 + 2x$ 
☐ B.  $y = \sqrt{x + 4}$ 
☐ D.  $y = \frac{10}{x}$
- 7) Plan X:  $C_X = 20h + 10$ . Plan Y:  $C_Y = 20h + 5$ . Both have the same hourly rate of \$20. Which plan is cheaper initially?



- ☐ A. Plan X is cheaper initially.
 ☐ D. Cannot be determined from the equations.
 ☐ B. Plan Y is cheaper initially.
 ☐ C. Both cost the same initially.



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**Oregon OSAS 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 Oregon OSAS practice test.**



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## Practice Test Answers and Explanations

### Practice Test 1 Answers and Explanations

- 1) **Choice C is correct.** **(8.AFN.A.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.
- 2) **Choice D is correct.** **(8.AFN.B.4)** Plan A:  $C_A = 5h + 10$ . Plan B:  $C_B = 2h + 20$ . Set equal:  $5h + 10 = 2h + 20$ , so  $3h = 10$  and  $h = \frac{10}{3}$  hours.
- 3) **Choice C is correct.** **(8.AFN.B)** The rise is 3 miles and the run is 4 hours. Slope =  $\frac{3}{4}$  miles per hour. This is the constant speed.
- 4) **Choice C is correct.** **(8.AEE.C.8)** Initial salt amount:  $0.02(100) = 2$  L. After adding  $x$  liters of pure water, total volume is  $100 + x$  and salt amount is still 2 L. Setting concentration to 1%:  $\frac{2}{100+x} = 0.01$ , so  $2 = 0.01(100 + x) = 1 + 0.01x$ , giving  $0.01x = 1$ , thus  $x = 100$  L.
- 5) **Choice B is correct.** **(8.NS.A.1)** From the graph, at  $x = 1$  the point is at  $(1, 1)$ , so  $h(1) = 1$ . Options A, C, and D are incorrect based on the plotted points.
- 6) **Choice C is correct.** **(8.AFN.B.5)** The graph shows a flat segment at 100% from hours 0 to 2, indicating no charge change during idle time. From hour 2 onward, the slope is negative (draining). Option D is false because the battery approaches 1.5%, not 0%.
- 7) **Choice C is correct.** **(8.GM.A.2)** Rotation is a rigid motion, so it preserves all distances and angles. The rotated figure is congruent to the original.
- 8) **The correct answer is (3, -1).** **(8.AEE.C.8)** Add the equations:  $(2x + y) + (x - y) = 5 + 4$ , so  $3x = 9$ , giving  $x = 3$ . Substitute:  $3 - y = 4$ , so  $y = -1$ .
- 9) **Choice C is correct.** **(8.GM.A.3)** Under  $180^\circ$  rotation,  $(x, y) \rightarrow (-x, -y)$ :  $(1, 0) \rightarrow (-1, 0)$ ,  $(3, 0) \rightarrow (-3, 0)$ ,  $(2, 3) \rightarrow (-2, -3)$ .
- 10) **Choice C is correct.** **(8.GM.A.5)** The angles sum to  $180^\circ$ :  $4x + (2x + 10) + (3x - 10) = 180$ , so  $9x = 180$  and  $x = 20$ . Therefore angle  $P = 4x = 80^\circ$ .
- 11) **Choice B is correct.** **(8.GM.B.6, 8.GM.B.7)** Using the Pythagorean Theorem:  $11^2 + 60^2 = 121 + 3600 = 3721$ , so  $c = 61$  (the 11-60-61 triple).
- 12) **Choice A is correct.** **(8.GM.B.8)**  $d = \sqrt{(4-0)^2 + (0-3)^2} = \sqrt{16+9} = \sqrt{25} = 5$ .
- 13) **Choice A is correct.** **(8.GM.C.9)** Cone:  $V = \frac{1}{3} \times 3.14 \times 4 \times 6 = 25.12 \text{ cm}^3$ . Sphere:  $V = \frac{4}{3} \times 3.14 \times 8 = 33.49 \text{ cm}^3$ . Cylinder:  $V = 3.14 \times 4 \times 6 = 75.36 \text{ cm}^3$ . Order: Cone < Sphere < Cylinder.
- 14) **Choice B is correct.** **(8.GM.B.7)** Corresponding angles are congruent:  $7z - 8 = 5z + 20 \Rightarrow 2z = 28 \Rightarrow z = 14^\circ$ .
- 15) **Choice C is correct.** **(8.GM.C.9)**  $V_A = \frac{1}{3} \times 16 \times 9 = 48 \text{ cm}^3$ .  $V_B = \frac{1}{3} \times 64 \times 18 = 384 \text{ cm}^3$ . Ratio:  $\frac{384}{48} = 8$ . When linear scale is  $2\times$ , volume scales by  $2^3 = 8\times$ .
- 16) **Choice B is correct.** **(8.GM.A.3)** Decompose: square plus triangles. Square area =  $9 \times 9 = 81 \text{ cm}^2$ . Each right triangle area =  $\frac{1}{2} \times 3 \times 4 = 6 \text{ cm}^2$ . Three triangles total =  $18 \text{ cm}^2$ . Total area =  $81 + 18 = 99 \text{ cm}^2$ .
- 17) **Choice B is correct.** **(8.GM.A.5)** An interior angle and its adjacent exterior angle are supplementary—they form a straight line and sum to  $180^\circ$ .
- 18) **The correct answer is A,D.** **(8.AEE.B.5)** Line 1:  $k = \frac{6}{4} = 1.5$ , so  $y = 1.5x$  (\$1.50/lb). Line 2:  $k = \frac{12}{6} = 2$ , so  $y = 2x$  (\$2.00/lb). A is correct (Line 1 equation and price). D is correct (Line 2 has greater slope:  $2 > 1.5$ ). C is wrong (Line 2 is steeper, not Line 1). B is correct but not a correct pair; E is subjective (worse deal, not better). Answer: A and D.
- 19) **Choice A is correct.** **(8.DR.D.4)** Points scattered randomly with no visible trend or pattern indicate no correlation between the variables. There is no identifiable relationship.
- 20) **Choice A is correct.** **(8.DR.C.3)** This is a column-conditional frequency. Among tea drinkers (90 total), afternoon drinkers are 40. Relative frequency:  $\frac{40}{90} \approx 0.44$ .
- 21) **Choice B is correct.** **(8.GM.B.8)** Absolute deviations:  $|4 - 6| = 2$ ,  $|4 - 6| = 2$ ,  $|8 - 6| = 2$ ,  $|8 - 6| = 2$ . Sum = 8. MAD =  $8/4 = 2$ .
- 22) **Choice D is correct.** **(8.AEE.A.1)** Even: 2, 4, 6. Less than 3: 1, 2. Union: 1, 2, 4, 6. That's 4 outcomes.  $P = \frac{4}{6} = \frac{2}{3}$ .



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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 5 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](mailto:jay@testinar.com).

**Jay Daie**

Your Persistence Coach

# Practice Today. Succeed Tomorrow!

Give your child the confidence and skills they need with **5 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 |
| ✓ Measurement & Data                  | ✓ And More!                |

**5**  
PRINTED  
TESTS



**2** ONLINE  
TESTS



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