

COLORADO CMAS

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.



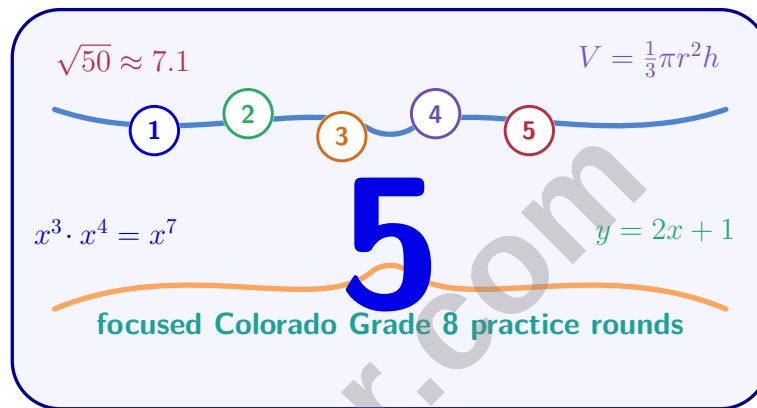
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

5 Colorado CMAS Grade 8 Math Practice Tests

Five CMAS Rounds with Review, Keys, and Explanations



Five complete 40-question Grade 8 CMAS 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, Colorado Grade 8 Problem Solver!

Five focused rounds for sharper CMAS math thinking

This book gives you five full Grade 8 CMAS 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 Colorado 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.

Colorado 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 CMAS 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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& answers

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1) Solve:
$$\begin{cases} x = 2y + 1 \\ 3x - y = 8 \end{cases}$$

☐ A. (1, 0)

☐ B. (7, 3)

☐ C. (5, 2)

☐ D. (3, 1)

2) Multiply: $(x - 4)(x - 3)$

☐ A. $x^2 - 7x + 12$

☐ B. $x^2 - 12$

☐ C. $x^2 + 7x + 12$

☐ D. $x^2 - x - 12$

3) Which of the following graphs represents a function?

☐ A. A vertical line.

☐ B. A circle.

☐ C. A point.

☐ D. An ellipse centered at the origin.

4) Two points on a line are $(-3, 2)$ and $(3, -4)$. What is the slope?

☐ A. -1

☐ B. 1

☐ C. $-\frac{1}{6}$

☐ D. 6

5) In 6 years, a father will be three times as old as his son. Right now, the father is 30 years older than his son. How old is the son now?

☐ A. 9

☐ B. 12

☐ C. 15

☐ D. 18

6) If $f(x) = 10 - x$, which is greater: $f(2)$ or $f(5)$?

☐ A. $f(2)$ is greater

☐ B. $f(5)$ is greater

☐ C. They are equal

☐ D. Cannot be determined



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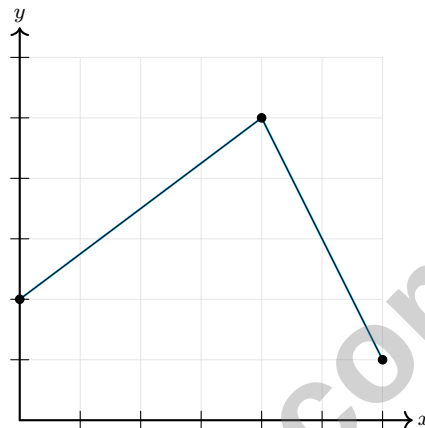
7) The relationship between Celsius (C) and Fahrenheit (F) is linear. When $C = 0$, $F = 32$; when $C = 100$, $F = 212$. What is the slope of the line?

☐ A. 1.8

☐ C. 0.56

☐ B. $\frac{5}{9}$

☐ D. $\frac{100}{180}$



8)

Which set of statements is true about the piecewise linear function?

☐ A. It increases from $x = 0$ to $x = 4$, decreases from $x = 4$ to $x = 6$, and has maximum value 5

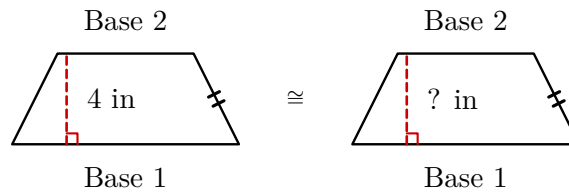
☐ B. It has a zero at $x = 3$, decreases from $x = 4$ to $x = 6$, and has y -intercept 5

☐ C. It increases from $x = 0$ to $x = 6$, has maximum value 6, and has y -intercept 2

☐ D. It decreases from $x = 0$ to $x = 4$, has a zero at $x = 3$, and has maximum value 2



- 9) Two congruent trapezoids are shown with side length markings. Trapezoid 1 has a height of 4 inches. What is the height of Trapezoid 2?



- ☐ A. 2 inches ☐ C. 8 inches
☐ B. 4 inches ☐ D. Cannot be determined
- 10) A point Q is at the origin and undergoes three transformations: first a translation right 2, then a rotation 90° counterclockwise about the origin, then a reflection across the x -axis. Where does the point end up?
- ☐ A. $(0, 2)$ ☐ C. $(2, 0)$
☐ B. $(0, -2)$ ☐ D. $(-2, 0)$
- 11) Parallel lines are cut by a transversal. Two corresponding angles measure $(9t - 15)^\circ$ and $(4t + 10)^\circ$. What is t ?
- ☐ A. 3 ☐ C. 7
☐ B. 5 ☐ D. 9
- 12) A right triangle has legs of 11 and 60. What is the hypotenuse?
- ☐ A. 49 ☐ C. 71
☐ B. 61 ☐ D. 121



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1) Under a reflection across the line $y = x$, the point $(4, 7)$ maps to which point?

☐ A. $(7, 4)$

☐ C. $(4, -7)$

☐ B. $(-4, -7)$

☐ D. $(-7, -4)$

2) Determine how many solutions this system has:
$$\begin{cases} x - 3y = 6 \\ 2x - 6y = 12 \end{cases}$$

☐ A. No solution

☐ C. Infinitely many solutions

☐ B. Exactly one solution

☐ D. Two solutions

3) Expand $(2x - 5)(3x - 2)$.

☐ A. $5x^2 - 19x + 10$

☐ C. $6x^2 - 4x - 15x - 10$

☐ B. $6x^2 - 10$

☐ D. $6x^2 - 19x + 10$

4) 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.

☐ D. Yes, because all values are positive.

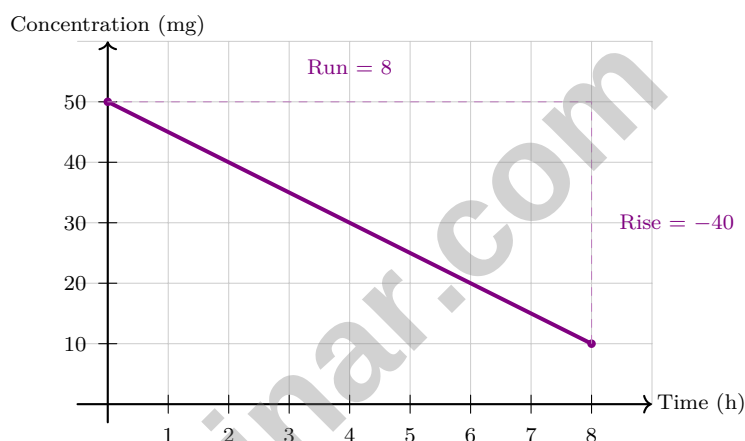
☐ B. Yes, each input has exactly one output.



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- 5) Simplify $\frac{x^{10} \cdot x^{-3}}{x^4}$. What is the exponent on x in the final answer?

- 6) A graph shows medication concentration (mg) in the bloodstream versus time (hours). The line passes through (0, 50) and (8, 10).



What is the slope?

- ☐ A. -5 mg/h ☐ C. 5 mg/h
☐ B. $-\frac{1}{2}$ mg/h ☐ D. $\frac{1}{2}$ mg/h
- 7) A 300 mL mixture contains 40% juice and 60% water. How much pure juice must be added to make the mixture 60% juice?
- ☐ A. 75 mL ☐ C. 150 mL
☐ B. 100 mL ☐ D. 200 mL



1) A right triangle has legs of 5 and 12. What is the hypotenuse?

☐ A. 7

☐ C. 17

☐ B. 13

☐ D. 15

2) What is $(-3)^{-2}$?

☐ A. $-\frac{1}{9}$

☐ C. $-\frac{9}{1}$

☐ B. 9

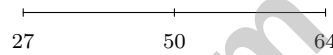
☐ D. $\frac{1}{9}$

3) Between which two consecutive integers does $\sqrt[3]{50}$ lie?

$$3^3 = 27$$

$$4^3 = 64$$

$$\sqrt[3]{50} = ?$$



☐ A. 2 and 3

☐ C. 4 and 5

☐ B. 5 and 6

☐ D. 3 and 4

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

☐ A. 0.3×10^{-2}

☐ C. 3.2×10^{-2}

☐ B. 5×10^{-3}

☐ D. 3×10^{-3}

5) Solve the system using elimination:
$$\begin{cases} 5x + 2y = 16 \\ 3x - 2y = 0 \end{cases}$$

☐ A. (2, 3)

☐ C. $(3, \frac{1}{2})$

☐ B. $(\frac{8}{5}, \frac{12}{5})$

☐ D. (0, 8)



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6) Which is the complete factorization of $6x + 9$?

☐ A. $3(2x + 3)$

☐ C. $9(x + 1)$

☐ B. $6x(1 + \frac{9}{6})$

☐ D. $2x(3 + \frac{9}{2})$

7) Which representation does NOT show a function?

☐ A. A table where each x -value appears exactly once.☐ C. A parabola opening to the right: $x = y^2$.☐ B. A graph of $y = |x|$.☐ D. The relation $\{(1, 1), (2, 2), (3, 3)\}$.

8) A line has a slope of $-\frac{1}{2}$ and passes through $(4, 6)$. What is the y -coordinate when $x = 8$?

☐ A. 4

☐ C. 6

☐ B. 8

☐ D. 2

9) To find the number of \$0.50 postage stamps and \$0.37 postage stamps that total \$3.74 with 10 stamps, which approach is best?

☐ A. Guess and check☐ C. Solving a system of equations☐ B. Proportional reasoning☐ D. Trial by tables

10) Explain why 10^5 is 100 times greater than 10^3 . Use exponents in your reasoning.



Colorado CMAS 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 Colorado CMAS practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** (8.EE.C) Substitute $x = 2y + 1$ into $3x - y = 8$: $3(2y + 1) - y = 8$, so $6y + 3 - y = 8$, giving $5y = 5$ and $y = 1$. Then $x = 2(1) + 1 = 3$. Solution: $(3, 1)$.
- 2) **Choice A is correct.** (8.EE.C.7) FOIL: $(x - 4)(x - 3) = x^2 - 3x - 4x + 12 = x^2 - 7x + 12$.
- 3) **Choice C is correct.** (8.F.A.1) A point has one x -value with one y -value, so it passes the vertical line test. A vertical line is not a function (fails VLT). Circles and ellipses fail the VLT.
- 4) **Choice A is correct.** (8.EE.B.5) Slope = $\frac{-4 - 2}{3 - (-3)} = \frac{-6}{6} = -1$.
- 5) **Choice A is correct.** (8.G.C) Let s = son's current age. Then father's age is $s + 30$. In 6 years, $s + 36 = 3(s + 6)$. So $s + 36 = 3s + 18$, which gives $18 = 2s$ and $s = 9$.
- 6) **Choice A is correct.** (8.F.A.1) $f(2) = 10 - 2 = 8$ and $f(5) = 10 - 5 = 5$. Since $8 > 5$, we have $f(2) > f(5)$.
- 7) **Choice A is correct.** (8.F.B.4) Slope is $m = \frac{212 - 32}{100 - 0} = \frac{180}{100} = 1.8$. Be careful to use change in F over change in C .
- 8) **Choice A is correct.** (8.F.B.5) The graph rises from $(0, 2)$ to $(4, 5)$, then falls from $(4, 5)$ to $(6, 1)$. Its greatest y -value is 5, and the y -intercept is 2, so choice A is the only correct set.
- 9) **Choice B is correct.** (8.G.A.2) Congruent trapezoids have equal heights. Since Trapezoid 1 has a height of 4 inches and Trapezoid 2 is congruent, Trapezoid 2 also has a height of 4 inches.
- 10) **Choice B is correct.** (8.G.A.3) Start at $(0, 0)$. After translation right 2: $(2, 0)$. After rotation 90° counterclockwise: $(-0, 2) = (0, 2)$. After reflection across x -axis: $(0, -2)$.
- 11) **Choice B is correct.** (8.G.A.5) Corresponding angles are congruent: $9t - 15 = 4t + 10 \Rightarrow 5t = 25 \Rightarrow t = 5$.
- 12) **Choice B is correct.** (8.G.B.6, 8.G.B.7) Using the Pythagorean Theorem: $11^2 + 60^2 = 121 + 3600 = 3721$, so $c = 61$ (the 11-60-61 triple).
- 13) **Choice C is correct.** (8.G.B.8) $d = \sqrt{24^2 + 7^2} = \sqrt{576 + 49} = \sqrt{625} = 25$ units. (This is a 7-24-25 Pythagorean triple.)
- 14) **Choice B is correct.** (8.G.B.7) Vertical angles are congruent. When two lines intersect, opposite angles are equal, so $a = 110^\circ$.
- 15) **The correct answer is 6.** (8.EE.B.5) The unit rate is 6 miles per hour, so $k = 6$ and $d = 6t$.
- 16) **Choice B is correct.** (8.G.B.7) $V_X = \frac{1}{3} \times 9 \times 10 = 30 \text{ cm}^3$. $V_Y = \frac{1}{3} \times 36 \times 10 = 120 \text{ cm}^3$. Ratio: $\frac{30}{120} = 1 : 4$.
- 17) **Choice C is correct.** (8.G.B.7) Vertical rectangle = $3 \times 10 = 30 \text{ m}^2$. Horizontal rectangle = $8 \times 2 = 16 \text{ m}^2$. Overlap = $3 \times 2 = 6 \text{ m}^2$. Total = $30 + 16 - 6 = 40 \text{ m}^2$.
- 18) **Choice B is correct.** (8.G.A.5) A hexagon's interior angles add to 720° . The known angles add to $88 + 112 + 95 + 118 + 147 = 560^\circ$, so the sixth angle is $720 - 560 = 160^\circ$.
- 19) **The correct answer is A,B.** (8.EE.A.4) Division rule: divide coefficients ($6.4 \div 1.6 = 4$, choice A) and subtract exponents ($-3 - (-5) = 2$, choice B). This gives 4×10^2 . Choice C is wrong, choice D incorrectly adds exponents, and choice E has the wrong exponent sign.
- 20) **The correct answer is 1.** (8.F.A.2) The rate of change is $\frac{-1 - (-3)}{2 - 0} = 1$.
- 21) **Choice A is correct.** (8.SP.A.1) Points scattered randomly with no visible trend or pattern indicate no correlation between the variables. There is no identifiable relationship.
- 22) **Choice A is correct.** (8.G.B.7) $P(\text{tails}) = \frac{1}{2}$; $P(5 \text{ or } 6) = \frac{2}{6}$. Product: $\frac{1}{2} \times \frac{2}{6} = \frac{2}{12} = \frac{1}{6}$.
- 23) **Choice B is correct.** (8.NS.A.2) Count the cells in the table: 3 numbers $\times$ 2 letters = 6 total outcomes, shown as rows and columns.
- 24) **The correct answer is 2.** (8.F.A.3) Slope = $\frac{1 - (-3)}{2 - 0} = 2$.
- 25) **Choice B is correct.** (8.G.B.8) Absolute deviations are $|5 - 10| = 5$, $|8 - 10| = 2$, $|12 - 10| = 2$, and $|15 - 10| = 5$. The sum is 14, so the MAD is $14 \div 4 = 3.5$.
- 26) **The correct answer is 75%.** (8.SP.A.4) Relative frequency among cardio users: $\frac{90}{120} = 0.75 = 75\%$.



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.

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.