

6 Colorado CMAS

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



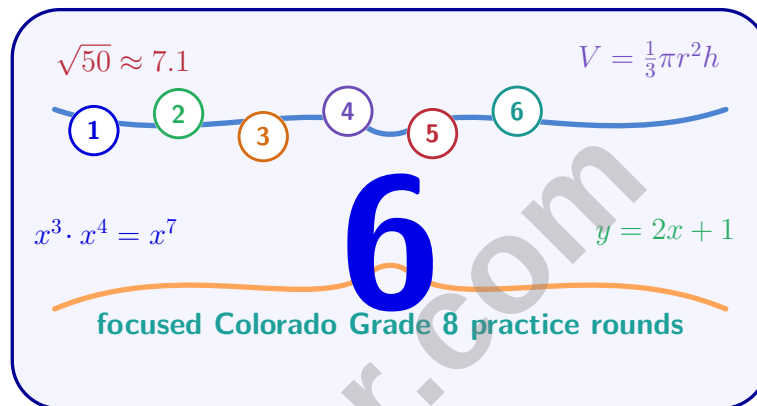
2 ONLINE
TESTS



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

6 Colorado CMAS Grade 8 Math Practice Tests

State-Test Grade 8 Math Practice with Guided Review and Full Explanations



Six 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!

Six focused rounds for sharper CMAS math thinking

This book gives you six 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 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.

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?

Six CMAS 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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1) Which pair of points has a distance of exactly 10 units?

☐ A. (0, 0) and (6, 8)

☐ C. (2, 3) and (3, 4)

☐ B. (1, 1) and (8, 8)

☐ D. (0, 5) and (5, 0)

2) Which product is rational?

☐ A. $\sqrt{6} \times \sqrt{10}$

☐ C. $\sqrt{7} \times \sqrt{11}$

☐ B. $\sqrt{3} \times \sqrt{5}$

☐ D. $\sqrt{2} \times \sqrt{2}$

3) Convert $0.\overline{18}$ to a fraction in simplest form.

☐ A. $\frac{1}{18}$

☐ C. $\frac{18}{90}$

☐ B. $\frac{18}{100}$

☐ D. $\frac{18}{99} = \frac{2}{11}$

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

☐ A. 6.5

☐ C. 6.9

☐ B. 7.0

☐ D. 8.2

5) Simplify $\frac{(b^3)^2 \cdot b^4}{b^5}$.

☐ A. b^{-5}

☐ C. b^{15}

☐ B. b^9

☐ D. b^5

6) If a square has a side length of 9 cm, what is its area?

☐ A. 36 cm^2

☐ C. 81 cm^2

☐ B. 72 cm^2

☐ D. 90 cm^2



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7) A scientist measures a cell with diameter 5.3×10^{-6} mm. Convert this to standard form.

☐ A. 5,300 mm

☐ B. 0.0053 mm

☐ C. 5.3 mm

☐ D. 0.0000053 mm

8) $(5.2 \times 10^6) - (1.5 \times 10^6) = ?$

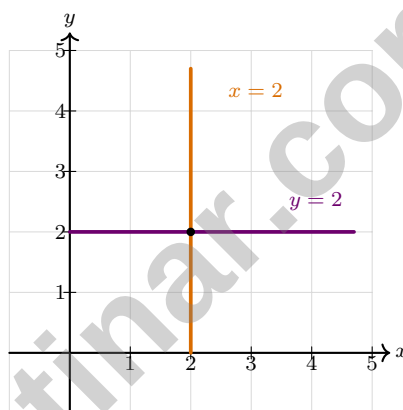
☐ A. 0.37×10^6

☐ B. 6.7×10^6

☐ C. 3.7×10^0

☐ D. 3.7×10^6

9) Graph the two equations and identify what type of solution the system has.



☐ A. No solution

☐ B. Infinitely many solutions

☐ C. Exactly one solution at (2, 2)

☐ D. Two solutions

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

☐ A. $4x^2 + 5x - 6$

☐ B. $4x^2 + 8x - 3x - 6$

☐ C. $4x^2 + 2x - 6$

☐ D. $4x^2 - 6x + 2$



- 11) A recipe uses 2 cups of flour for every 3 eggs. If e is the number of eggs, which expression gives the amount of flour needed?

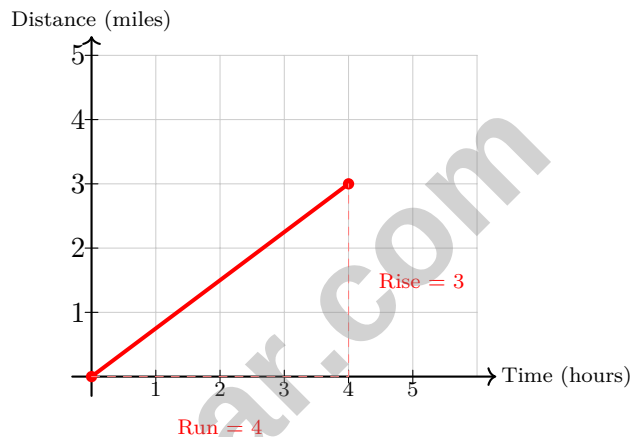
☐ A. $f = \frac{2e}{3}$

☐ C. $f = 3e + 2$

☐ B. $f = \frac{3e}{2}$

☐ D. $f = 2e - 3$

- 12) 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

☐ C. $\frac{3}{4}$ miles per hour

☐ B. $\frac{4}{3}$ miles per hour

☐ D. 4 miles per hour

- 13) A paint shop mixes white and colored paint. They want to make 50 liters of paint that is 60% colored. If they have unlimited supplies of 100% colored and 0% colored (white) paint, how many liters of colored paint do they need?

☐ A. 20 L

☐ C. 30 L

☐ B. 40 L

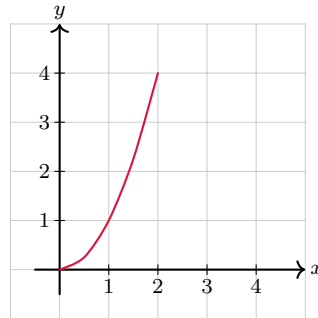
☐ D. 45 L



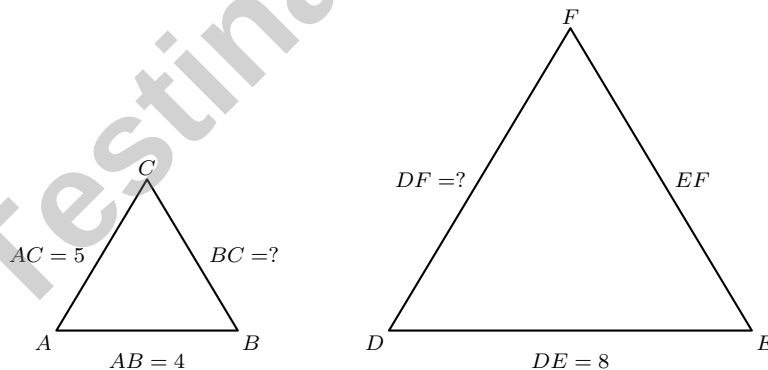
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1) The graph below curves upward. Is it linear?



- ☐ A. Yes, because x and y are both positive
☐ B. No, the curve is not a straight line
☐ C. Yes, the function is always increasing
☐ D. No, only because it starts at the origin
- 2) Two similar triangles are shown. Triangle ABC has sides 4 cm and 5 cm. Triangle DEF has a corresponding side of 8 cm. Find the length of the side in DEF corresponding to the 5 cm side in ABC .

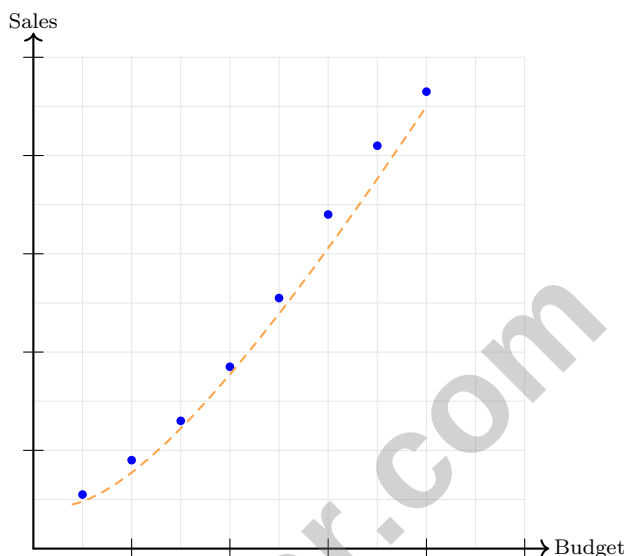


- ☐ A. 10 cm
☐ B. 6.5 cm
☐ C. 9 cm
☐ D. 2.5 cm



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- 3) A scatter plot of advertising budget (thousands of dollars) versus sales revenue (thousands) displays a curved, accelerating upward pattern. Initially, each dollar spent increases sales by 10 dollars; later, each dollar spent increases sales by 25 dollars. Which term describes this relationship?



- ☐ A. Nonlinear (power or exponential) association
☐ B. Weak positive correlation
☐ C. Moderate negative correlation
☐ D. Perfect linear relationship
- 4) Of 200 high school students surveyed, 120 play sports and 80 do not. Among those who play sports, 72 are boys. What fraction of sports players are girls?

- ☐ A. $\frac{48}{200}$
☐ B. $\frac{48}{120}$
☐ C. $\frac{72}{120}$
☐ D. $\frac{48}{80}$



1) What is $\sqrt{289}$?

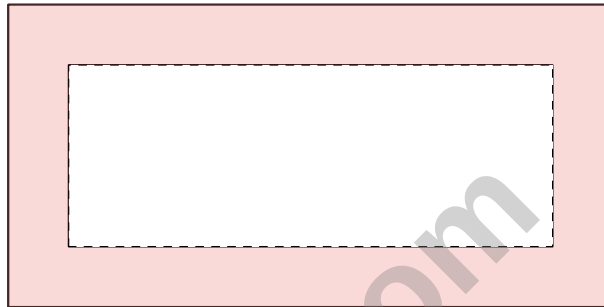
☐ A. 16

☐ C. 18

☐ B. 19

☐ D. 17

2) A rectangular path (outer dimensions 20 m by 10 m, inner rectangle 16 m by 6 m) forms a frame. What is the area of the path only?



☐ A. 56 m²

☐ C. 96 m²

☐ B. 76 m²

☐ D. 104 m²

3) Function u passes through $(0, -1)$ and $(2, 3)$. Function $v(x) = -x + 5$. Which has a positive slope?

☐ A. Only u

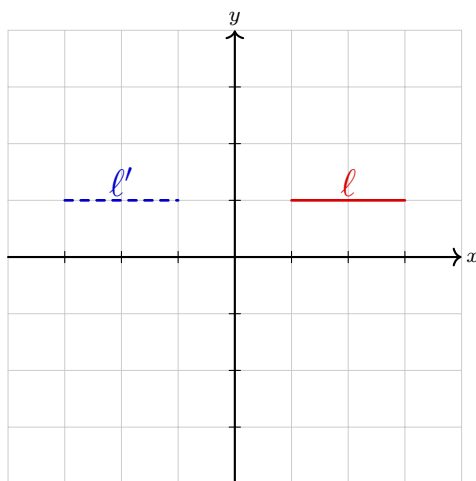
☐ C. Both u and v

☐ B. Only v

☐ D. Neither u nor v



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4)

Segment ℓ (red) is reflected across the y -axis to produce ℓ' (blue). If the length of ℓ is 2 units, what is the length of ℓ' ?

☐ A. 1 unit☐ C. 4 units☐ B. 2 units☐ D. $\sqrt{2}$ units

5) Trapezoid $PQRS$ is similar to Trapezoid $TUVW$ with scale factor $\frac{3}{2}$. If $PQ = 8$ cm in trapezoid $PQRS$, what is the length of TU in trapezoid $TUVW$?

☐ A. 12 cm☐ C. 8 cm☐ B. 5.33 cm☐ D. 10.67 cm

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 A is correct.** **(8.G.B.8)** Distance = $\sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$ units.
- 2) **Choice D is correct.** **(8.NS.A.1)** $\sqrt{2} \times \sqrt{2} = 2$, which is rational. The other products simplify to square roots of non-perfect squares: $\sqrt{3} \times \sqrt{5} = \sqrt{15}$, $\sqrt{7} \times \sqrt{11} = \sqrt{77}$, and $\sqrt{6} \times \sqrt{10} = \sqrt{60} = 2\sqrt{15}$. Those are irrational.
- 3) **Choice D is correct.** **(8.NS.A.1)** Let $x = 0.18$. Then $100x = 18.18$. Subtracting: $99x = 18$, so $x = \frac{18}{99} = \frac{2}{11}$.
- 4) **Choice C is correct.** **(8.NS.A.2)** $\sqrt{48} = 4\sqrt{3} \approx 4 \times 1.73 = 6.92 \approx 6.9$. Distractor B (7.0) confuses with nearby perfect square $\sqrt{49} = 7$; A and D are unreasonable bounds.
- 5) **Choice D is correct.** **(8.EE.A.1)** $(b^3)^2 = b^6$; then $b^6 \cdot b^4 = b^{10}$; then $\frac{b^{10}}{b^5} = b^5$.
- 6) **Choice C is correct.** **(8.EE.A.2)** Area of a square = $s^2 = 9^2 = 81 \text{ cm}^2$.
- 7) **Choice D is correct.** **(8.EE.A.3)** Move the decimal 6 places left: $5.3 \times 10^{-6} = 0.0000053 \text{ mm}$.
- 8) **Choice D is correct.** **(8.EE.A.4)** Same exponents: $(5.2 - 1.5) \times 10^6 = 3.7 \times 10^6$.
- 9) **Choice C is correct.** **(8.EE.C)** A horizontal line $y = 2$ and a vertical line $x = 2$ intersect at exactly one point: $(2, 2)$.
- 10) **Choice A is correct.** **(8.EE.C.7)** FOIL: $(4x - 3)(x + 2) = 4x^2 + 8x - 3x - 6 = 4x^2 + 5x - 6$.
- 11) **Choice A is correct.** **(8.F.A.1)** The ratio is 2 cups flour : 3 eggs. For e eggs, flour needed is $\frac{2}{3} \times e = \frac{2e}{3}$.
- 12) **Choice C is correct.** **(8.EE.B.5)** The rise is 3 miles and the run is 4 hours. Slope = $\frac{3}{4}$ miles per hour. This is the constant speed.
- 13) **Choice C is correct.** **(8.G.C)** Let c = liters of colored paint. Then white paint = $50 - c$. The mixture is 60% colored: $c = 0.60(50) = 30 \text{ L}$.
- 14) **Choice A is correct.** **(8.F.A.1)** Substitute $x = 2$: $f(2) = 2^2 - 4(2) + 3 = 4 - 8 + 3 = -1$.
- 15) **Choice B is correct.** **(8.G.C.9)** $SA = 2(6 \times 4 + 6 \times 3 + 4 \times 3) = 2(24 + 18 + 12) = 2(54) = 108 \text{ cm}^2$.
- 16) **Choice A is correct.** **(8.G.A.1)** Reflecting A across the x -axis maps $(x, y) \rightarrow (x, -y)$: $(1, 1) \rightarrow (1, -1)$, $(3, 1) \rightarrow (3, -1)$, $(2, 3) \rightarrow (2, -3)$, giving B exactly.
- 17) **Choice A is correct.** **(8.EE.B.6)** Using points $(0, 1)$ and $(4, 5)$: slope = $\frac{5 - 1}{4 - 0} = \frac{4}{4} = 1$.
- 18) **Choice A is correct.** **(8.EE.C.7)** Subtract $4x$ and add 12: $4x = 20$. Divide by 4: $x = 5$.
- 19) **The correct answer is A, C.** **(8.G.A.4)** Correct: (A) All linear measurements (sides, perimeter) are multiplied by 2.5. (C) Area is multiplied by $(2.5)^2 = 6.25$. Incorrect: (B) Angles are congruent in dilation, not scaled. (D) Perimeter is multiplied, not divided, by 2.5. (E) Dilation preserves shape; polygon type does not change.
- 20) **Choice C is correct.** **(8.EE.C.7)** Divide by -4 (FLIP the inequality): $x < \frac{12}{-4} = -3$.
- 21) **The correct answer is 5.** **(8.SP.A.2)** The constant term is the y -intercept, so it is 5.
- 22) **Choice A is correct.** **(8.G.B.8)** The DASHED line and shading ABOVE indicate a strict inequality with y greater: $y > -3x$.
- 23) **Choice C is correct.** **(8.G.B.6, 8.G.B.7)** From $(\sqrt{15})^2 + b^2 = (\sqrt{31})^2$, we get $15 + b^2 = 31$, so $b^2 = 16$ and $b = 4$.
- 24) **Choice C is correct.** **(8.G.C.9)** $V = \pi r^2 h = 3.14 \times 9 \times 8 = 3.14 \times 72 = 226.08 \text{ yd}^3$.
- 25) **Choice A is correct.** **(8.G.A.5)** Sum for heptagon: $(7 - 2) \times 180 = 900^\circ$. Each angle: $\frac{900}{7} \approx 128.6^\circ \approx 129^\circ$.
- 26) **Choice B is correct.** **(8.SP.A.3)** The data shown covers speeds 1–5 mph. Predicting at 60 mph is extreme extrapolation, where the linear model's assumptions break down.
- 27) **Choice D is correct.** **(8.G.B.7)** At 5% over 2 years, higher principal earns more interest: $I = P \times 0.05 \times 2 = 0.1P$. Largest P is \$2,500.
- 28) **The correct answer is $\frac{1}{7}$.** **(8.G.B.7)** Total: 15 tokens. $P(\text{black first}) = \frac{6}{15}$; $P(\text{black second} \mid \text{black first}) = \frac{5}{14}$. Product: $\frac{6}{15} \times \frac{5}{14} = \frac{1}{7}$.
- 29) **Choice C is correct.** **(8.EE.B.5)** Proportional: $y = 15x$. For $x = 2.5$: $y = 15(2.5) = 37.5 \text{ MB}$.



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Hi, Grade 8 Math Star!

◇ You finished this practice set with real effort. Grade 8 math asks you to connect ideas, explain your thinking, and stay steady through multi-step problems. ◇

★ **Remember this:** Every page you completed helped build stronger habits: reading carefully, choosing a method, showing work, and checking whether the answer makes sense. You practiced across 6 full Grade 8 practice tests, and that repeated effort matters. ★

What You Built

- **Focus:** You stayed with challenging questions.
- **Accuracy:** You learned to slow down when details matter.
- **Reasoning:** You practiced explaining why a method works.
- **Readiness:** You are more prepared than when you started.

Grade 8 test-day tip: Before test day, review the questions that made you pause. Those are the best teachers.

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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