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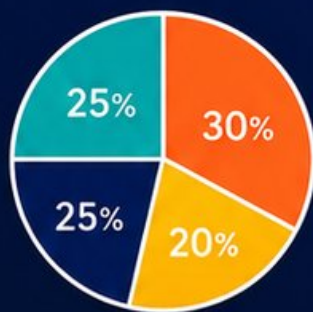
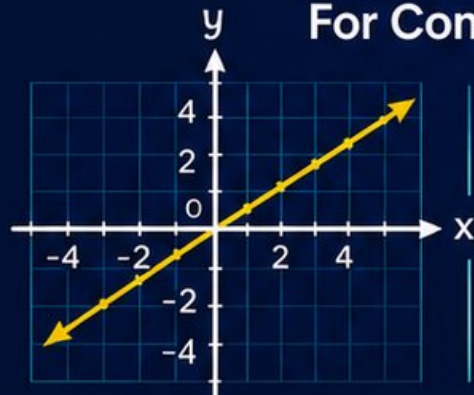
Colorado CMAS

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

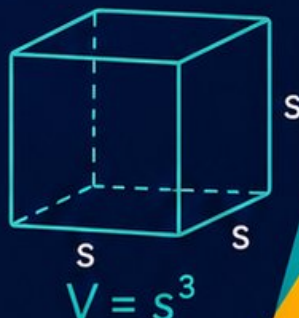


$$y = mx + b$$

$$2x - 3y = 6$$

$$\sqrt{x^2 + y^2}$$

$$A = bh$$



**4 PRINTED
TESTS**



**2 ONLINE
TESTS**

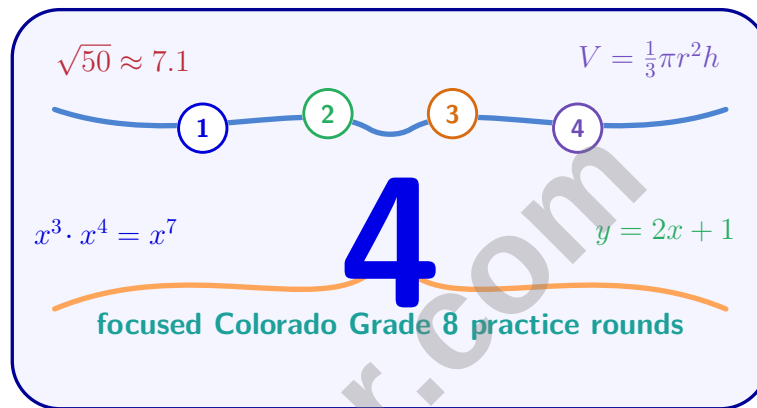


Use these **two additional online practice tests**
for extra review after the printed tests in this book.



4 Colorado CMAS Grade 8 Math Practice Tests

Four CMAS Practice Rounds for Clear Grade 8 Math Growth



Four 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!

Four focused rounds for sharper CMAS math thinking

This book gives you four 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 four-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?

Four CMAS tests, 160 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–4	Functions, systems, transformations, geometry, data analysis, and multi-step problem solving.
Answer Pages	Compact keys and explanations that show why each answer works.

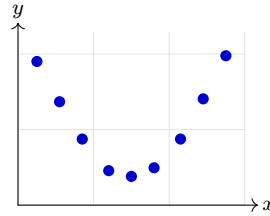
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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& answers

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1)

Consider a scatter plot where points form a U-shaped curve. As x increases from left to right, y first decreases, then increases. This pattern is an example of:

- ☐ A. Negative linear correlation ☐ C. Perfect positive correlation
☐ B. Nonlinear association ☐ D. No correlation

2) A river flows at 3 mph. A boat travels 4 hours downstream and 6 hours upstream for the same distance. What is the boat's speed in still water?

- ☐ A. 10 mph ☐ C. 15 mph
☐ B. 12 mph ☐ D. 18 mph

3) A parking meter charges \$0.50 per hour. The relation between hours h and cost c is (h, c) . Is this relation a function?

- ☐ A. No, because cost increases with time. ☐ C. No, because the cost depends on the time.
☐ B. Yes, each hour value gives exactly one cost value. ☐ D. Yes, only if the meter is working correctly.

4)

Temperature (°C)	15	18	21	24	27
------------------	----	----	----	----	----

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

- ☐ A. 2.4 ☐ C. 3.6
☐ B. 3 ☐ D. 6



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5) A line of best fit for a data set is $y = 2x + 5$. What is the y -intercept, and what does it represent?

- ☐ A. The intercept is 2; it is the starting value
- ☐ B. The intercept is 5; it is the predicted value when $x = 0$
- ☐ C. The intercept is 7; it is the sum of slope and starting value
- ☐ D. The intercept is $2x$; it is the slope

6) A student says that if a cube is dilated by scale factor 3, the volume is multiplied by 3. Is this correct?

- ☐ A. Yes, volume always scales linearly
- ☐ B. No, volume is multiplied by 9
- ☐ C. No, volume is multiplied by 27
- ☐ D. No, the volume remains the same

7) If $f(x) = \begin{cases} 2x & \text{if } x < 2 \\ 5 & \text{if } x \geq 2 \end{cases}$, what is $f(3)$?

- ☐ A. 6
- ☐ B. 3
- ☐ C. 5
- ☐ D. 8

8) Which expression equals a rational number?

- ☐ A. $\sqrt{2} \times \sqrt{3}$
- ☐ B. $\sqrt{4} + \sqrt{5}$
- ☐ C. $\sqrt{3} + \sqrt{3}$
- ☐ D. $\sqrt{9} \times \sqrt{4}$

9) Between which two consecutive integers does $\sqrt[3]{100}$ lie?

- ☐ A. 2 and 3
- ☐ B. 5 and 6
- ☐ C. 3 and 4
- ☐ D. 4 and 5



- 10) A square tile has side length 5 cm. The diagonal is $5\sqrt{2}$ cm. What is the best estimate of the diagonal?
- ☐ A. 5.5 cm ☐ C. 7.1 cm
☐ B. 6.5 cm ☐ D. 10.0 cm
- 11) Convert 950 to scientific notation.
- ☐ A. 9.5×10^1 ☐ C. 9.5×10^3
☐ B. 95×10^1 ☐ D. 9.5×10^2
- 12) You invest \$4,000 in a 3-year CD (Certificate of Deposit) at 3% simple interest. What is your final amount?
- ☐ A. \$4,120 ☐ C. \$4,240
☐ B. \$4,180 ☐ D. \$4,360
- 13) A cylindrical storage tank has a radius of 2.5 m and height of 4 m. What is the total surface area (including top and bottom)? Use $\pi \approx 3.14$.
- ☐ A. 62.8 m^2 ☐ C. 102.05 m^2
☐ B. 82.25 m^2 ☐ D. 128.1 m^2
- 14) Which line is perpendicular to $y = \frac{1}{2}x - 3$?
- ☐ A. $y = \frac{1}{2}x + 4$ ☐ C. $y = -2x + 5$
☐ B. $y = 2x + 1$ ☐ D. $y = -\frac{1}{2}x - 2$
- 15) At a movie theater, adult tickets cost \$12 and child tickets cost \$8. If a family paid \$60 total for 6 tickets (mix of adult and child), which equation correctly represents the situation, where a is the number of adult tickets?
- ☐ A. $12a + 8(6 - a) = 60$ ☐ C. $a + 8 = 60$
☐ B. $12a + 8a = 60$ ☐ D. $12(6) + 8a = 60$



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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 table of values for a linear relationship is partially filled:

x	2	5	8
y	3	?	15

What is the missing y -value?

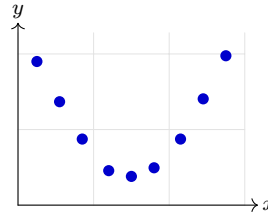
- ☐ A. 8
 ☐ C. 10
 ☐ B. 12
 ☐ D. 9

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

4) A chemist mixes a 30% acid solution with an 80% acid solution to make 100 mL of a 50% solution. Let x = volume of 30% solution (mL). Which equation represents the acid content?

- ☐ A. $0.3x + 0.8(100 - x) = 0.5(100)$
☐ C. $30x + 80x = 50 \cdot 100$
☐ B. $0.3(100 - x) + 0.8x = 50$
☐ D. $0.3x + 0.8x = 50$

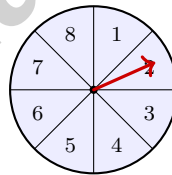




5)

A scatter plot shows social media usage (hours/day) versus self-reported happiness (scale 1–10) for 200 teenagers. The points show no clear linear pattern. A parent concludes: “**Social media has no effect on happiness.**” What is wrong with this conclusion?

- ☐ A. The parent misunderstood what a correlation coefficient measures
 ☐ C. The sample size is too large for any conclusions
- ☐ B. No linear pattern does not mean there is no relationship at all
 ☐ D. A positive correlation would automatically prove causation
- 6) A spinner is divided into 8 equal sections. If a student spins it once, what is the probability of landing on a specific section?



- ☐ A. $\frac{8}{1}$
☐ C. $\frac{1}{2}$
- ☐ B. $\frac{1}{8}$
☐ D. $\frac{1}{4}$
- 7) A sandwich shop offers 2 types of bread and 7 topping options. How many different one-topping sandwiches can be made?
- ☐ A. $2 + 7 = 9$
☐ C. $7^2 = 49$
- ☐ B. $2 \times 7 = 14$
☐ D. $2 \times 7 \times 7 = 98$



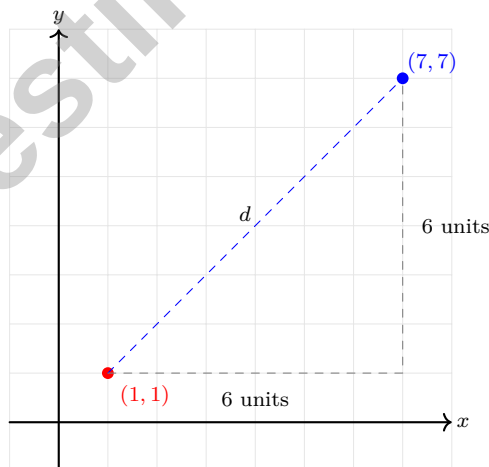
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- 1) A credit card offers 0% APR for 12 months on purchases, then 15% APR. If you buy \$800 during the promotional period and pay nothing, how much is owed after 12 months?
- ☐ A. \$1,400 ☐ C. \$1,200
☐ B. \$920 ☐ D. \$800
- 2) Factor $x^2 - 25$.
- ☐ A. $(x - 5)^2$ ☐ C. $(x + 5)(x - 5)$
☐ B. $(x + 5)^2$ ☐ D. $(x - 25)(x + 1)$
- 3) A student claims: "If input 5 appears three times in a table, it cannot be a function." Is the student correct?
- ☐ A. Yes, any repeated input means it is not a function. ☐ C. No, repeated inputs are only a problem if outputs differ.
☐ B. No, repeated inputs are never a problem. ☐ D. Yes, the domain cannot have repeated values.
- 4) Identify the system with no solution.
- ☐ A. $y = \frac{1}{2}x + 1$ and $y = \frac{1}{2}x - 3$ ☐ C. $y = \frac{1}{2}x + 1$ and $x - 2y = -2$
☐ B. $y = \frac{1}{2}x + 1$ and $y = -2x + 1$ ☐ D. $y = \frac{1}{2}x + 1$ and $2y = x + 2$
- 5) Which scenario describes a negative slope?
- ☐ A. Population increases each year ☐ C. Your bank account grows with deposits
☐ B. Temperature increases over time ☐ D. Water drains from a tank over time



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- 6) A gym offers two membership plans. Plan A costs \$50 upfront plus \$10 per month. Plan B costs \$20 per month with no upfront fee. After how many months do the total costs equal?
- ☐ A. 3 months ☐ C. 5 months
☐ B. 4 months ☐ D. 6 months
- 7) Two parallel lines cut by a transversal. If one angle formed is 78° , how many angles of 102° are formed?
- ☐ A. 1 ☐ C. 3
☐ B. 2 ☐ D. 4
- 8) A right triangle has legs of $\sqrt{2}$ and $\sqrt{2}$. What is the hypotenuse?
- ☐ A. 2 ☐ C. 4
☐ B. $\sqrt{2}$ ☐ D. $2\sqrt{2}$
- 9) Two points are plotted on a coordinate grid at $(1, 1)$ and $(7, 7)$. What is the distance between them, simplified?



- ☐ A. $6\sqrt{2}$ units ☐ C. $\sqrt{72}$ units
☐ B. 12 units ☐ D. 36 units



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 B is correct.** (8.SP.A.1) A U-shaped curve represents a nonlinear relationship. The direction changes, so it is not a simple linear correlation.
- 2) **Choice C is correct.** (8.G.C) Let b = boat's speed in still water. Downstream: $d = (b+3) \times 4$. Upstream: $d = (b-3) \times 6$. Setting them equal: $4(b+3) = 6(b-3)$, so $4b+12 = 6b-18$, giving $30 = 2b$, thus $b = 15$ mph.
- 3) **Choice B is correct.** (8.F.A.1) For each hour parked, the cost is uniquely determined: $c = 0.50h$. This satisfies the definition of a function.
- 4) **Choice C is correct.** (8.G.B.8) Absolute deviations: $|15-21| = 6$, $|18-21| = 3$, $|21-21| = 0$, $|24-21| = 3$, $|27-21| = 6$. Sum = 18. MAD = $18/5 = 3.6$.
- 5) **Choice B is correct.** (8.SP.A.2) In $y = mx + b$, $b = 5$ is the y -intercept, representing the y -value when $x = 0$.
- 6) **Choice C is correct.** (8.G.A.4) Volume scales by the cube of the linear scale factor: $3^3 = 27$. This is a common error.
- 7) **Choice C is correct.** (8.F.A.1) Since $3 \geq 2$, use the second rule: $f(3) = 5$.
- 8) **Choice D is correct.** (8.NS.A.1) $\sqrt{9} \times \sqrt{4} = 3 \times 2 = 6$, which is rational. The other expressions yield irrationals: $\sqrt{3} + \sqrt{3} = 2\sqrt{3}$, $\sqrt{4} + \sqrt{5} = 2 + \sqrt{5}$, and $\sqrt{2} \times \sqrt{3} = \sqrt{6}$.
- 9) **Choice D is correct.** (8.NS.A.2) $4^3 = 64$ and $5^3 = 125$. Since $64 < 100 < 125$, we have $4 < \sqrt[3]{100} < 5$.
- 10) **Choice C is correct.** (8.NS.A.2) $5\sqrt{2} \approx 5 \times 1.41 = 7.05$ cm.
- 11) **Choice D is correct.** (8.EE.A.3) Move the decimal 2 places left to get 9.5; the exponent is 2.
- 12) **Choice D is correct.** (8.G.B.7) Interest: $I = 4000 \times 0.03 \times 3 = \360 . Final: $4000 + 360 = \$4,360$.
- 13) **Choice C is correct.** (8.G.C.9) $SA = 2\pi r^2 + 2\pi rh = 2(3.14)(2.5)^2 + 2(3.14)(2.5)(4) = 39.25 + 62.8 = 102.05$ m².
- 14) **Choice C is correct.** (8.EE.B.6) The given line has slope $\frac{1}{2}$. A perpendicular line has slope -2 (negative reciprocal).
- 15) **Choice A is correct.** (8.EE.C.7) Total cost is adult tickets plus child tickets. If a adults, then $(6-a)$ children. Equation: $12a + 8(6-a) = 60$.
- 16) **Choice A is correct.** (8.EE.C.7) Add 8 to both sides: $x \leq -2 + 8 = 6$.
- 17) **Choice D is correct.** (8.G.B.8) (A) TRUE: strict $<$ uses dashed boundary. (B) TRUE: test $(0, 4)$: $0 + 2(4) = 8$, NOT < 8 , so the point is on the line but not in the solution. (C) TRUE: test $(0, 0)$: $0 + 0 = 0 < 8$ ✓. (D) FALSE: rewrite $x + 2y = 8$ as $y = -\frac{1}{2}x + 4$, so slope is $-\frac{1}{2}$ (negative), not $+\frac{1}{2}$.
- 18) **Choice C is correct.** (8.G.A.1) A 90° CCW rotation uses $(x, y) \rightarrow (-y, x)$. So $(3, 2) \rightarrow (-2, 3)$.
- 19) **Choice D is correct.** (8.G.C.9) From $V = \frac{1}{3}\pi r^2 h$: $150\pi = \frac{1}{3}\pi \times 25 \times h \Rightarrow 450 = 25h \Rightarrow h = 18$ cm.
- 20) **The correct answer is 3.** (8.EE.B.5) Slope = $\frac{14-5}{2-(-1)} = \frac{9}{3} = 3$.
- 21) **Choice B is correct.** (8.SP.A.3) Negative slope means as one variable increases, the other decreases. More training leads to fewer errors.
- 22) **The correct answer is B,D.** (8.EE.C) Option A is false: identical equations create the same line (infinitely many solutions). Option B is true: parallel lines never intersect. Option C is false: lines with different slopes intersect once. Option D is true: all points on the line satisfy both equations. Option E is false: perpendicularity means the lines meet at a right angle, so they still have one solution.
- 23) **Choice D is correct.** (8.NS.A.1) Let $x = 0.\overline{13} = 0.1333\dots$. Then $10x = 1.\overline{3}$ and $100x = 13.\overline{3}$. Subtracting: $100x - 10x = 12$, so $90x = 12$ and $x = \frac{12}{90} = \frac{2}{15}$.
- 24) **Choice D is correct.** (8.EE.A.1) Divide coefficients: $\frac{4}{2} = 2$. Divide powers: $\frac{x^5}{x^3} = x^2$. Result: $2x^2$.
- 25) **Choice D is correct.** (8.EE.A.2) $\sqrt{4} = 2$. The other choices do not equal 2: $\sqrt[3]{9} \neq 2$, $\sqrt{16} = 4$, and $\sqrt[3]{4} \neq 2$.
- 26) **The correct answer is (3, 7).** (8.EE.C.7) The integers 3 and 7 multiply to 21 and add to 10.
- 27) **Choice C is correct.** (8.EE.A.4) Divide: $\frac{5 \times 10^6}{2.5 \times 10^3} = \frac{5}{2.5} \times 10^{6-3} = 2 \times 10^3$.
- 28) **Choice C is correct.** (8.EE.B.5) $k = \frac{2}{8} = \frac{1}{4} = 0.25$.



Hi, Progress Maker!

◇ You have done more than complete a set of tests. You have rehearsed the habits that make Grade 8 math feel less surprising. ◇

★ **Remember this:** Progress is not always loud. Sometimes it looks like fewer careless errors, clearer work, better pacing, and more confidence when a problem is unfamiliar. You practiced across 4 full Grade 8 practice tests, and that repeated effort matters. ★

Signs of Growth

- **Clear Work:** Your steps are easier to follow.
- **Better Pacing:** You know when to move on and return.
- **Stronger Checks:** You catch mistakes earlier.
- **Calmer Thinking:** You know what to try next.

Grade 8 test-day tip: Keep one short list of mistakes you often make, then check that list before each practice session.

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

Jay Daie

Your Growth Coach

PRACTICE TODAY, ACHIEVE TOMORROW!

Give your child the confidence and skills they need with **4 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!

4



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
- ✓ 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!



4 PRINTED TESTS

+



2 ONLINE TESTS



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