

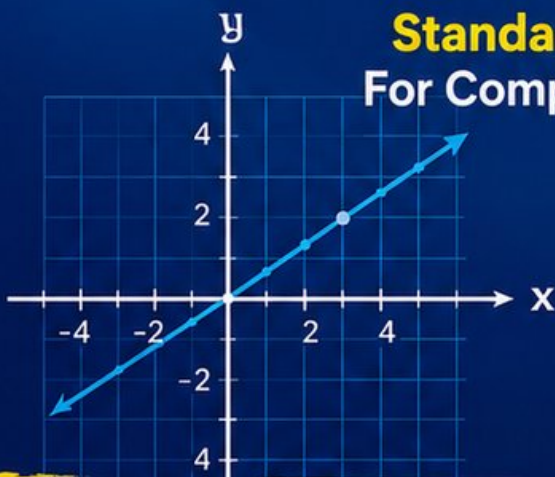
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Colorado
CMAS

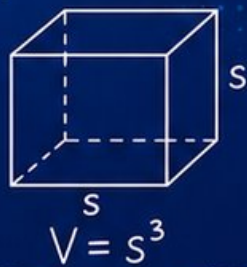
Grade 8

MATH

PRACTICE TESTS

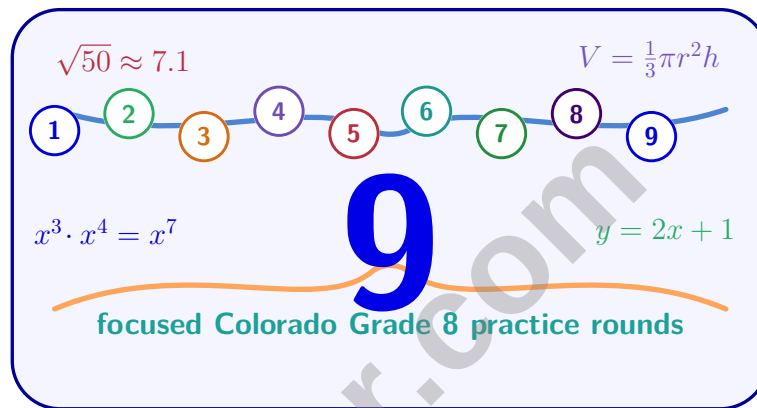
Standards Aligned Problem Solving
For Comprehensive Assessment Programs

$$2x + 3y = 12$$
$$y = mx + b$$

9 PRINTED
TESTS2 ONLINE
TESTSUse these **two additional online practice tests** for extra review after the printed tests in this book.

9 Colorado CMAS Grade 8 Math Practice Tests

Colorado Math Readiness for Exponents, Systems, Functions, Geometry, and Statistics



Nine 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!

Nine focused rounds for sharper CMAS math thinking

This book gives you nine 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 nine-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?

Nine CMAS tests, 360 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real and irrational numbers, integer exponents, scientific notation, equations, and careful reading.
Tests 4–6	Slope, systems of equations, functions, inequalities, transformations, congruence, and similarity.
Tests 7–9	Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina.
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) A student calculates the probability of rolling a 3 on a die as $\frac{1}{3}$. Which statement best corrects the mistake?

- ☐ A. The student forgot to consider all outcomes.
- ☐ B. The probability is actually $\frac{4}{6}$, not $\frac{1}{3}$.
- ☐ C. The student counted too many favorable outcomes.
- ☐ D. The probability is actually $\frac{1}{6}$, not $\frac{1}{3}$.

2) Divide $\frac{8.4 \times 10^6}{2.1 \times 10^3}$. Express in scientific notation.

- ☐ A. 4×10^2
- ☐ B. 0.4×10^2
- ☐ C. 6.3×10^3
- ☐ D. 4×10^3

3) If a line has slope $\frac{2}{5}$ and y -intercept -3 , what is its equation?

- ☐ A. $y = \frac{2}{5}x - 3$
- ☐ B. $y = -\frac{2}{5}x - 3$
- ☐ C. $y = \frac{5}{2}x - 3$
- ☐ D. $y = \frac{2}{5}x + 3$

4) The line of best fit for a dataset is $y = -3x + 48$. At what value of x is y equal to 12?

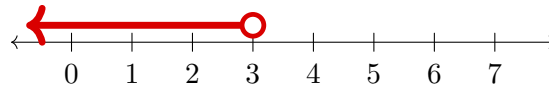
5) Solve for x : $\frac{x}{4} - 2 = 3$

- ☐ A. $x = 4$
- ☐ B. $x = 8$
- ☐ C. $x = 12$
- ☐ D. $x = 20$



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6) Solve: $x + 7 < 10$. Which number line shows the solution?



☐ A. $x < 3$

☐ C. $x \leq 3$

☐ B. $x > 3$

☐ D. $x \geq 3$

7) A figure is rotated 45° clockwise about the origin. Which of the following best describes what happens to a side parallel to the x -axis?

☐ A. It remains parallel to the x -axis☐ D. It becomes perpendicular to the y -axis☐ B. It becomes parallel to the y -axis☐ C. It tilts at a 45° angle below the horizontal

8) What is $\sqrt{196}$?

☐ A. 12

☐ C. 14

☐ B. 13

☐ D. 15

9) To find the solution region of $5x + 2y < 10$, rewrite as $y < -\frac{5}{2}x + 5$. Where should the shading be?

☐ A. Below a dashed line☐ C. Below a solid line☐ B. Above a dashed line☐ D. Above a solid line

10) Convert the mixed decimal $0.5\overline{8}$ to a fraction in simplest form.



11) Line A passes through $(0, 0)$ and $(3, 6)$. Line B passes through $(0, 1)$ and $(2, 7)$. Which line increases faster?

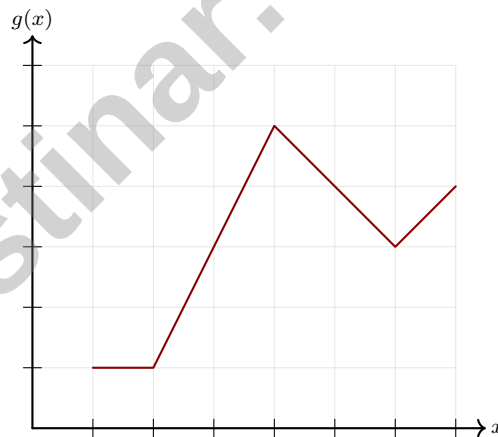
- ☐ A. Line A ☐ C. Both increase equally.
☐ B. Line B ☐ D. Cannot determine.

12) Which of the following equations represents a LINEAR function?

- ☐ A. $y = x^3 - 2$ ☐ C. $y = \frac{1}{x} + 1$
☐ B. $y = \sqrt{x}$ ☐ D. $y = 5 - 4x$

13) 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 ☐ C. 5 hours
☐ B. 4 hours ☐ D. $\frac{10}{3}$ hours



14)

State the domain of the function shown.

- ☐ A. $[0, 5]$ ☐ C. $[1, 5]$
☐ B. $[0, 6]$ ☐ D. All real numbers



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- 1) Given $f(x) = x^2$ and $g(x) = 2x + 1$, which statement is true?
- ☐ A. $f(3) = g(3)$ ☐ C. $f(3) < g(3)$
☐ B. $f(3) > g(3)$ ☐ D. Cannot be determined
- 2) In a study, the relationship between calories burned and exercise minutes is $B = 4m + 50$. Is predicting calories burned after 25 minutes of exercise interpolation or extrapolation, given that the data was collected for exercises lasting 5 to 20 minutes?
- ☐ A. Interpolation, because 25 is between 5 and 20 ☐ C. Neither; the model does not apply
☐ B. Extrapolation, because 25 is outside the data range ☐ D. Interpolation, because 25 is close to 20
- 3) In a survey of 200 people on movie preferences, 120 prefer comedy. Of those who prefer comedy, 84 are female. What is the relative frequency of females among comedy-lovers?
- ☐ A. 0.42 ☐ C. 0.70
☐ B. 0.60 ☐ D. 0.84
- 4) A square pyramid has a base edge of 4 cm and a height of $3\sqrt{2}$ cm. What is its volume?
- ☐ A. 16 cm^3 ☐ C. $32\sqrt{2} \text{ cm}^3$
☐ B. $16\sqrt{2} \text{ cm}^3$ ☐ D. 48 cm^3
- 5) A sphere has a volume of approximately 904.32 cm^3 . Find its radius. (Use $\pi \approx 3.14$.)



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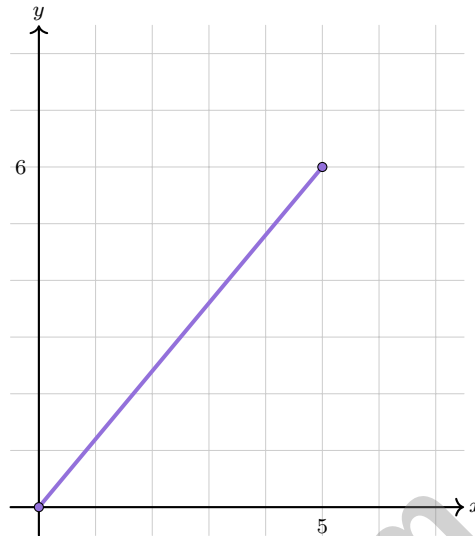
- 6) A polygon has an interior angle sum of 2340° . How many sides does it have?
- ☐ A. 15 ☐ C. 14
☐ B. 13 ☐ D. 16
- 7) A bag contains 7 red marbles and 3 blue marbles. If two marbles are drawn without replacement, what is the probability that the first is red AND the second is blue?
- ☐ A. $\frac{3}{10}$ ☐ C. $\frac{21}{100}$
☐ B. $\frac{7}{30}$ ☐ D. $\frac{7}{90}$
- 8) A menu offers 4 appetizers, 6 entrees, and 3 desserts. How many different meal combinations of one appetizer, one entree, and one dessert are possible?
- ☐ A. 13 ☐ C. 72
☐ B. 24 ☐ D. 120
- 9) If the MAD of a data set is 0, and you add a new value equal to the current mean, what happens to the MAD?
- ☐ A. MAD becomes positive ☐ D. Cannot determine without knowing the data
☐ B. MAD stays 0
☐ C. MAD doubles
- 10) Which statement about the square roots of perfect squares is true?
- ☐ A. They cannot be classified as rational ☐ C. They never equal an integer
☐ B. They are always irrational ☐ D. They can always be written as whole numbers



- 1) A figure has a perimeter of 24 units. After a dilation by scale factor 0.5, what is the perimeter of the dilated figure?
- ☐ A. 48 units ☐ C. 6 units
☐ B. 24 units ☐ D. 12 units
- 2) A student calculates the lateral surface area of a square pyramid with base side 10 cm and altitude (height) 8 cm as: $\text{Lateral} = 4 \times \frac{1}{2}(10)(8) = 160 \text{ cm}^2$. What is the error?
- ☐ A. Used altitude instead of slant height ☐ C. Used diameter instead of radius
☐ B. Forgot to multiply by 4 triangles ☐ D. The calculation is correct
- 3) Two linear models are tested on the same dataset. Model 1 predicts a value of 50, and the actual is 48 (residual = -2). Model 2 predicts a value of 90, and the actual is 85 (residual = -5). Which model has the larger error?
- ☐ A. Model 1, because its residual is closer to zero ☐ C. They have equal error because both residuals are negative
☐ B. Model 2, because its residual has a larger absolute value ($|-5| > |-2|$) ☐ D. Model 1 has larger error in dollars



4)

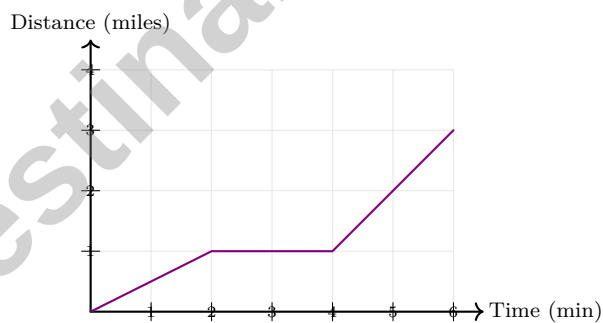


What is the slope?

- ☐ A. $\frac{5}{6}$
☐ B. $\frac{6}{4}$

- ☐ C. 1.1
☐ D. 1.2

5)



A runner travels 1 mile in 2 minutes, stops for 2 minutes, then runs 2 more miles in 2 minutes. What is the average speed over the whole journey?

- ☐ A. 0.75 miles/min
☐ B. 0.5 miles/min

- ☐ C. 1 mile/min
☐ D. 1.5 miles/min



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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.G.B.7) Rolling exactly a 3 has only 1 favorable outcome out of 6. So $P(3) = \frac{1}{6}$, not $\frac{1}{3}$.
- 2) **Choice D is correct.** (8.EE.A.3) Divide coefficients and subtract exponents: $\frac{8.4}{2.1} = 4$ and $10^{6-3} = 10^3$, giving 4×10^3 .
- 3) **Choice A is correct.** (8.EE.B.6) In slope-intercept form $y = mx + b$, with $m = \frac{2}{5}$ and $b = -3$, we get $y = \frac{2}{5}x - 3$.
- 4) **The correct answer is 12.** (8.SP.A.3) Set $y = 12$: $12 = -3x + 48 \Rightarrow -3x = -36 \Rightarrow x = 12$.
- 5) **Choice D is correct.** (8.EE.C.7) Add 2: $\frac{x}{4} = 5$. Multiply by 4: $x = 20$. Check: $\frac{20}{4} - 2 = 5 - 2 = 3$ ✓. (Distractor A: not multiplying by 4; C: arithmetic error; D: forgetting to add 2.)
- 6) **Choice A is correct.** (8.EE.C.7) Subtract 7: $x < 3$. The open circle and left ray match this solution.
- 7) **Choice C is correct.** (8.G.A.1) A 45° clockwise rotation tilts all sides by 45° downward. A horizontal side becomes a line sloping downward at 45° (parallel to $y = -x$ region).
- 8) **Choice C is correct.** (8.EE.A.2) $14 \times 14 = 196$, so $\sqrt{196} = 14$.
- 9) **Choice A is correct.** (8.G.B.8) The strict inequality $<$ uses a DASHED line. Since $y <$ the expression, shade BELOW.
- 10) **The correct answer is $\frac{53}{90}$.** (8.NS.A.1) Set $x = 0.5\overline{8} = 0.5888\dots$. Then $10x = 5.\overline{8}$ and $100x = 58.\overline{8}$. Subtracting: $90x = 53$, so $x = \frac{53}{90}$.
- 11) **Choice B is correct.** (8.F.A.2) Slope of A: $(6 - 0)/(3 - 0) = 2$. Slope of B: $(7 - 1)/(2 - 0) = 3$. Since $3 > 2$, Line B increases faster.
- 12) **Choice D is correct.** (8.F.A.3) The equation $y = 5 - 4x$ is in the form $y = mx + b$ with $m = -4$ and $b = 5$, so it is linear. The other functions contain exponents (3), square roots, or reciprocals, making them nonlinear.
- 13) **Choice D is correct.** (8.F.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.
- 14) **Choice B is correct.** (8.F.B.5) The graph is defined from $x = 0$ to $x = 6$, so the domain is $[0, 6]$. The range would be $[1, 5]$, but the question asks for domain.
- 15) **Choice D is correct.** (8.G.A.2) Rotation is a rigid motion that preserves lengths. If two segments are congruent before rotation, they remain congruent after rotation. Both still have their original lengths.
- 16) **Choice B is correct.** (8.G.B.7) Rectangle = $12 \times 8 = 96 \text{ m}^2$. Each triangle = $\frac{1}{2} \times 2 \times 2 = 2 \text{ m}^2$. Four triangles = 8 m^2 . Total = $96 + 8 = 104 \text{ m}^2$.
- 17) **Choice C is correct.** (8.G.B.7) $A = 5000(1.06)^2 = 5000 \times 1.1236 = \$5,618$.
- 18) **Choice D is correct.** (8.EE.A.1) Numerator: $g^8 \cdot g^{-2} = g^6$. Then $\frac{g^6}{g^3} = g^3$.
- 19) **Choice C is correct.** (8.EE.A.4) $3.2 \times 10^{-3} = 3.2 \div 1,000 = 0.0032$. Moving the decimal 3 places left.
- 20) **Choice D is correct.** (8.EE.B.5) Check ratio: $(2, 6) \rightarrow 6/2 = 3$ and $(4, 12) \rightarrow 12/4 = 3$. Same ratio means proportional. Choice D has $k = 3$.
- 21) **The correct answer is A, C.** (8.G.B.6, 8.G.B.7) A: $6^2 + 8^2 = 36 + 64 = 100 = 10^2$ ✓. C: $8^2 + 15^2 = 64 + 225 = 289 = 17^2$ ✓. B: $49 + 64 = 113 \neq 81$. D: $100 + 225 = 325 \neq 400$. E: $25 + 49 = 74 \neq 81$.
- 22) **Choice A is correct.** (8.EE.C) Check $(3, 6)$ in both equations: $6 = 2(3) = 6$ ✓ and $6 = 3 + 3 = 6$ ✓. The solution is correct.
- 23) **Choice A is correct.** (8.EE.C.7) FOIL: $(x + 2)(x + 6) = x^2 + 6x + 2x + 12 = x^2 + 8x + 12$.
- 24) **Choice D is correct.** (8.F.A.1) Divide 10 by 2: $10 \div 2 = 5$. Subtract 1: $5 - 1 = 4$.
- 25) **The correct answer is 12.96.** (8.NS.A.2) $(3.6)^2 = 12.96$, which is slightly less than 13.
- 26) **Choice B is correct.** (8.G.A.3) The orange rectangle has width 2; the purple has width 1. Scale factor is $\frac{1}{2}$.
- 27) **Choice C is correct.** (8.G.A.5) The third interior angle is $180 - 41 - 89 = 50^\circ$. The exterior angle is $180 - 50 = 130^\circ$ (or sum of remote interior angles: $41 + 89 = 130^\circ$).
- 28) **The correct answer is 4.2.** (8.NS.A.2) $\sqrt{8} = 2\sqrt{2} \approx 2.83$ and $\sqrt{2} \approx 1.41$, so $2.83 + 1.41 = 4.24 \approx 4.2$.
- 29) **Choice A is correct.** (8.SP.A.1) An outlier is a data point that deviates significantly from the general trend or pattern shown by the rest of the data. It stands apart and deserves investigation.



Hi, Strategy Solver!

◇ Grade 8 math rewards students who think before they calculate. You practiced choosing strategies, not just hunting for answers. This high-stamina book gave you nine substantial Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. ◇

★ **Remember this:** That matters because stronger math students do not use one method for every question. They notice the structure and choose the tool that fits. ★

Strategy Moves

- **Estimate:** Know the neighborhood of the answer.
- **Simplify:** Rewrite numbers in friendlier forms.
- **Model:** Draw what the words describe.
- **Verify:** Put the answer back into the problem.

Grade 8 test-day tip: Pause for ten seconds before hard questions. A short plan can save several minutes.

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

Jay Daie

Your Strategy Guide

CONFIDENCE TODAY, SUCCESS TOMORROW!

GRADE

8

Help your child excel in math with **9 full-length Grade 8 practice tests** designed to reflect real test formats and cover all key math standards.

With a wide variety of questions and real-world applications, this book builds the skills and confidence students need to achieve their best!



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.



Build Skills & Boost Confidence

Strengthen understanding and feel prepared for test day.

COVERS ALL ESSENTIAL TOPICS

- | | |
|---------------------------------------|----------------------------|
| ✓ The Number System | ✓ Statistics & Probability |
| ✓ Expressions & Equations | ✓ Pythagorean Theorem |
| ✓ Ratios & Proportional Relationships | ✓ Volume & Surface Area |
| ✓ Linear Equations | ✓ Transformations |
| ✓ Functions | ✓ Inequalities |
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