

6 Maryland MCAP

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



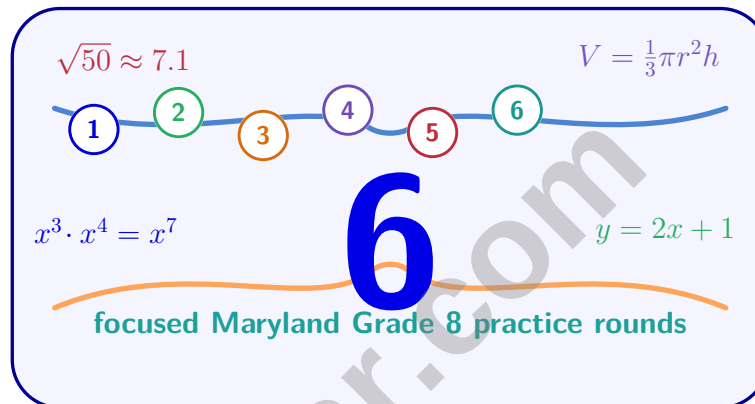
2 ONLINE
TESTS



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

6 Maryland MCAP Grade 8 Math Practice Tests

Grade 8 Review Rounds for Equations, Geometry, Functions, and Data



Six complete 40-question Grade 8 MCAP 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, Maryland Grade 8 Problem Solver!

Six focused rounds for sharper MCAP math thinking

This book gives you six full Grade 8 MCAP 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 Maryland 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.

Maryland 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 MCAP 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.



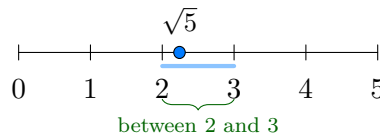
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- 1) A student's test score improves linearly throughout a semester. After assignment 4, the score is 68. After assignment 10, the score is 82. What is the slope (improvement per assignment)?

- ☐ A. $\frac{7}{3}$ points per assignment ☐ C. 3 points per assignment
☐ B. 2 points per assignment ☐ D. $\frac{1}{2}$ point per assignment



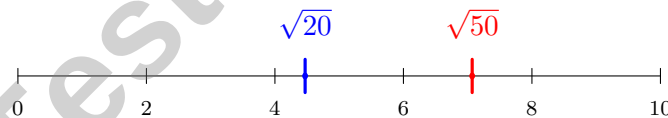
2)

Based on the number line, which statement is true?

- ☐ A. $\sqrt{5}$ is rational ☐ C. $\sqrt{5} = 2.5$
☐ B. $\sqrt{5}$ is between 1 and 2 ☐ D. $\sqrt{5} \approx 2.24$

- 3) Convert $0.\overline{27}$ to a fraction in simplest form.

- ☐ A. $\frac{27}{100}$ ☐ C. $\frac{27}{90}$
☐ B. $\frac{27}{99}$ ☐ D. $\frac{5}{18}$



4)

Based on the number line, which statement is true?

- ☐ A. Cannot determine ☐ C. They are equal
☐ B. $\sqrt{50} < \sqrt{20}$ ☐ D. $\sqrt{20} < \sqrt{50}$



- 5) A student loan of \$10,000 at 5% compound interest grows for 4 years. Approximately how much will be owed?
- ☐ A. \$10,500 ☐ C. \$12,155
☐ B. \$11,500 ☐ D. \$13,000
- 6) Rewrite 6^{-3} using only positive exponents.
- ☐ A. $\frac{6}{3}$ ☐ C. 6^3
☐ B. -6^3 ☐ D. $\frac{1}{6^3}$
- 7) A cube has a volume of 1000 cubic inches. What is the length of one edge?
- ☐ A. 9 inches ☐ C. 11 inches
☐ B. 12 inches ☐ D. 10 inches
- 8) The distance from Earth to the Sun is approximately 1.496×10^8 km. What is this distance in standard form?
- ☐ A. 149,600 km ☐ C. 149,600,000 km
☐ B. 1,496,000 km ☐ D. 1,496,000,000 km
- 9) A student reads 25 pages of a book per day. How many days to read 200 pages? (Proportional relationship.)
- ☐ A. 5 days ☐ C. 7 days
☐ B. 6 days ☐ D. 8 days
- 10) 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.



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- 11) Triangle PQR has sides of length 5 cm, 12 cm, and 13 cm. Triangle STU is congruent to triangle PQR. If side ST corresponds to side PQ , what is the length of side ST ?

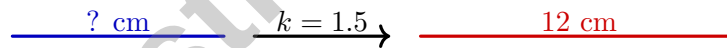
☐ A. 5 cm ☐ C. 13 cm
☐ B. 12 cm ☐ D. 30 cm

- 12) A movie theater offers two pricing schemes: Scheme A costs \$8 per ticket, Scheme B costs \$60 upfront plus \$3 per ticket. For how many tickets is Scheme A cheaper?

☐ A. Fewer than 12 tickets ☐ C. Fewer than 15 tickets
☐ B. Fewer than 10 tickets ☐ D. Fewer than 8 tickets

- 13) A residual plot has residuals 1, -2 , 1, 2, -1 , 0. What is the greatest absolute residual?

- 14) A dilated figure has a side length of 12 cm and was created with a scale factor of 1.5 from the original. What was the original side length?



☐ A. 8 cm ☐ C. 6 cm
☐ B. 18 cm ☐ D. 13.5 cm

- 15) The table shows a linear function $m(x)$:

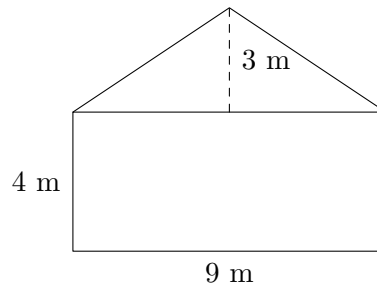
x	0	2	4	6
$m(x)$	5	11	?	23

What is $m(4)$?

☐ A. 15 ☐ C. 17
☐ B. 16 ☐ D. 18



- 1) A student mistakenly calculated the area of a composite figure (rectangle 9 m by 4 m plus triangle base 9 m, height 3 m) by adding $9 + 4 + \frac{1}{2} \times 9 \times 3 = 26.5$ instead of computing the rectangle's area. What is the correct total area?



- ☐ A. 49.5 m^2
☐ C. 54 m^2
- ☐ B. 49.5 units
 ☐ D. 58.5 m^2
- 2) A right triangle has legs of length $\sqrt{6}$ and $\sqrt{3}$. Find the length of the hypotenuse.

- 3) Which scenario represents an error in calculating MAD?

- ☐ A. Finding $\text{MAD} = 3$ but forgetting to list all deviations
 ☐ C. Using $(\text{maximum} - \text{minimum})$ instead of mean absolute deviations
- ☐ B. Calculating deviations: $|2 - 5| = 3$
☐ D. Stating $\text{MAD} = 0$ when all values are identical



- 4) Two cities are located at $(1, 3)$ and $(7, 11)$ on a map. If each unit represents 2 miles, what is the distance between the cities in miles?

- 5) A data point is at $(6, 8)$. The trend line at $x = 6$ gives a predicted value of $y = 7$. What is the residual?

☐ A. 14☐ B. 7☐ C. 1☐ D. -1 

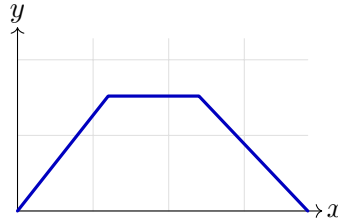
6)

A regular heptagon is shown. What is the measure of each interior angle (to nearest whole degree)?

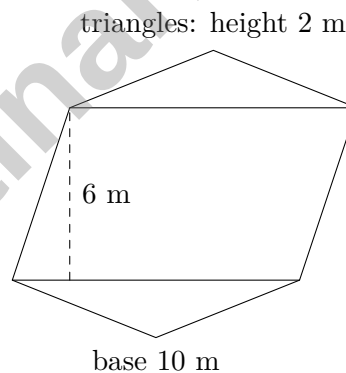
☐ A. $\approx 129^\circ$ ☐ B. $\approx 138^\circ$ ☐ C. $\approx 148^\circ$ ☐ D. $\approx 158^\circ$ 

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- 1) A graph of a function shows distance from home (in miles) vs. time. The graph rises, then is flat, then falls. Which real-world scenario matches?



- ☐ A. Drive somewhere, stop, then drive home
☐ B. Walk faster and faster until stopping
☐ C. Stay home, then drive faster
☐ D. Drive home directly from work
- 2) A composite figure has a parallelogram base (base 10 m, height 6 m) with two congruent triangles placed on opposite sides (base 10 m, height 2 m each). What is the total area?



- ☐ A. 40 m^2
☐ B. 60 m^2
☐ C. 80 m^2
☐ D. 100 m^2



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& answers

- 3) Find $(1.2 \times 10^6) + (8 \times 10^5)$ in scientific notation.

- 4) A student has 45 points and earns 5 points per quiz. How many quizzes are needed to reach at least 70 points?

- 5) Which table represents a LINEAR function?

x	0	2	4	6
y	10	16	22	28

- ☐ A. No, y is always greater than x ☐ C. No, because x increases by 2
☐ B. Yes, the first difference is constant (3 per unit change in x) ☐ D. Yes, because all points are positive
- 6) In a right triangle, one acute angle measures 38° . What is the measure of the other acute angle?
- ☐ A. 38° ☐ C. 52°
☐ B. 42° ☐ D. 90°



Maryland MCAP 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 Maryland MCAP practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** (8.EE.B.5) Using (4, 68) and (10, 82): slope = $\frac{82 - 68}{10 - 4} = \frac{14}{6} = \frac{7}{3}$ points per assignment.
- 2) **Choice D is correct.** (8.NS.A.1) The number line shows $\sqrt{5}$ positioned between 2 and 3, closer to 2.2. Since $2.2^2 = 4.84$ and $2.24^2 \approx 5.02$, we have $\sqrt{5} \approx 2.24$. Also, $\sqrt{5}$ is irrational.
- 3) **Choice D is correct.** (8.NS.A.1) Let $x = 0.2\overline{7} = 0.2777\dots$. Then $10x = 2.\overline{7}$ and $100x = 27.\overline{7}$. Subtracting: $90x = 25$, so $x = \frac{25}{90} = \frac{5}{18}$.
- 4) **Choice D is correct.** (8.NS.A.2) Since the square root function is increasing and $20 < 50$, we have $\sqrt{20} < \sqrt{50}$. The number line shows $\sqrt{20} \approx 4.5$ and $\sqrt{50} \approx 7.1$, confirming $\sqrt{20} < \sqrt{50}$.
- 5) **Choice C is correct.** (8.G.B.7) $A = 10000(1.05)^4 \approx 10000 \times 1.2155 = \$12,155$.
- 6) **Choice D is correct.** (8.EE.A.1) Negative exponent rule: $6^{-3} = \frac{1}{6^3}$.
- 7) **Choice D is correct.** (8.EE.A.2) $e^3 = 1000$, so $e = \sqrt[3]{1000} = 10$ inches.
- 8) **Choice C is correct.** (8.EE.A.3) Move the decimal 8 places right: $1.496 \times 10^8 = 149,600,000$ km.
- 9) **Choice D is correct.** (8.EE.B.5) $y = 25x$. Solve $200 = 25x$: $x = 200/25 = 8$ days.
- 10) **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.
- 11) **Choice A is correct.** (8.G.A.2) Since triangle STU is congruent to triangle PQR and ST corresponds to PQ , we have $ST = PQ = 5$ cm.
- 12) **Choice A is correct.** (8.G.C) Scheme A costs $8n$ for n tickets. Scheme B costs $60 + 3n$. Setting them equal: $8n = 60 + 3n$, so $5n = 60$, giving $n = 12$. For $n < 12$, Scheme A is cheaper.
- 13) **The correct answer is 2.** (8.SP.A.2) The largest absolute value among the residuals is 2.
- 14) **Choice A is correct.** (8.G.A.4) If the new length is 12 and the scale factor is 1.5, then original = $\frac{12}{1.5} = 8$ cm. Distractor D adds the scale factor instead of dividing.
- 15) **Choice C is correct.** (8.F.A.1) The pattern shows the function increases by 3 for each unit increase in x (or by 6 for each 2-unit increase). So $m(4) = 11 + 6 = 17$.
- 16) **Choice C is correct.** (8.G.C.9) Lateral area = $2(10)(4) + 2(6)(4) = 80 + 48 = 128 \text{ cm}^2$ ✓. Area of two bases = $2(10)(6) = 120 \text{ cm}^2$. Total = $128 + 120 = 248 \text{ cm}^2$.
- 17) **Choice C is correct.** (8.G.A.1) All rigid transformations preserve distance (side length) and angles. Position, orientation, and quadrant location may change during transformation.
- 18) **Choice A is correct.** (8.EE.B.6) Using points (1, -1) and (5, 3): slope = $\frac{3 - (-1)}{5 - 1} = \frac{4}{4} = 1$.
- 19) **Choice D is correct.** (8.EE.C.7) Expand: $3x + 3 = 2x + 8$. Subtract $2x$ and 3: $x = 5$.
- 20) **Choice D is correct.** (8.EE.C.7) Base (20) plus texts at 0.10 each ($0.10t$), total at most 35.
- 21) **The correct answer is A, C.** (8.G.B.8) A is correct: MAD is the average absolute deviation from the mean. C is correct: it restates this in slightly different language. B is incorrect: MAD is not about range. D is incorrect: MAD is the mean, not median, of deviations. E is incorrect: MAD is symmetric around the mean regardless of median position.
- 22) **Choice C is correct.** (8.EE.C.7) FOIL: $(3x + 4)(2x - 1) = 6x^2 - 3x + 8x - 4 = 6x^2 + 5x - 4$.
- 23) **The correct answer is 0.7.** (8.G.B.7) Total: 10 marbles. Not blue: $5 + 2 = 7$. $P(\text{not blue}) = \frac{7}{10} = 0.7$.
- 24) **The correct answer is 24.** (8.NS.A.2) Calculate the factorial: $4! = 4 \times 3 \times 2 \times 1 = 24$ different arrangements.
- 25) **Choice B is correct.** (8.G.B.8) SOLID line means the boundary is INCLUDED ($\leq$ or $\geq$). Shading to the LEFT means x values are at most 4, so $x \leq 4$.
- 26) **Choice C is correct.** (8.G.C.9) $V = \pi r^2 h = 3.14 \times 20.25 \times 11 = 3.14 \times 222.75 = 699.44 \text{ m}^3$.
- 27) **Choice B is correct.** (8.SP.A.3) Residual = actual - predicted = $35 - 32 = 3$. The model underestimated by 3 points.
- 28) **Choice D is correct.** (8.EE.A.4) Multiply coefficients: $3 \times 6 = 18$. Add exponents: $10^{-4+(-5)+8} = 10^{-1}$. Rewrite $18 \times 10^{-1} = 1.8 \times 10^0 = 1.8$.



Hi, Math Communicator!

◇ Grade 8 math is not only about getting a number. It is about explaining relationships and making your reasoning visible. ◇

★ **Remember this:** When you show steps, label diagrams, and write clear answers, you are joining the conversation that math is trying to have. You practiced across 6 full Grade 8 practice tests, and that repeated effort matters. ★

Communication Skills

- **Use Words:** Explain what the answer means.
- **Use Symbols:** Keep equations accurate.
- **Use Diagrams:** Show relationships visually.
- **Use Units:** Connect math to context.

Grade 8 test-day tip: For open-ended questions, answer in a complete thought: value, unit, and reason.

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

Jay Daie

Your Math Communication Coach

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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