

10 Maryland MCAP

GRADE
8
MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

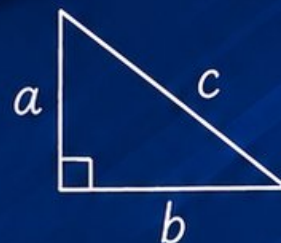
10 PRINTED
TESTS



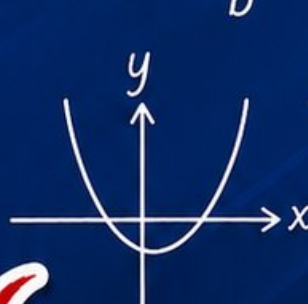
2 ONLINE
TESTS



- ✓ Build Confidence
- ✓ Master Key Math Skills
- ✓ Answer Explanations for Every Question
- ✓ Test-Taking Strategies That Work



$$y = mx + b$$



$$3x - 7 = 2(x + 5)$$
$$x = 17$$

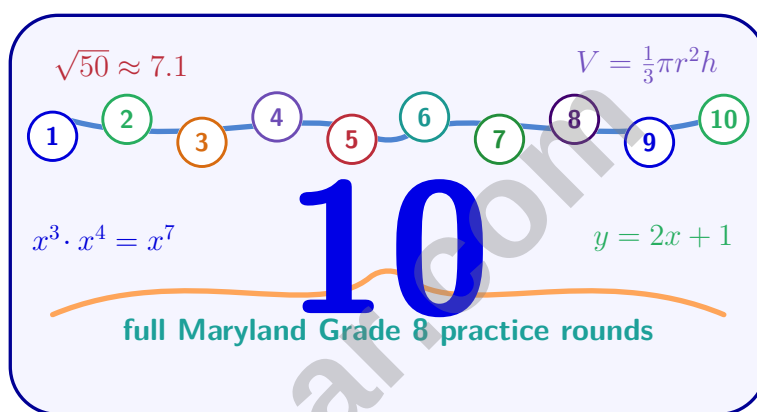


USE THESE TWO
**ADDITIONAL ONLINE
PRACTICE TESTS**

FOR EXTRA REVIEW AFTER
THE PRINTED TESTS
IN THIS BOOK.

10 Maryland MCAP Grade 8 Math Practice Tests

Maryland Grade 8 MCAP Practice for bay-smart readiness in rates, proportional models, algebra, measurement, data analysis, and chance



Ten complete 40-question Grade 8 MCAP practice rounds with linear relationships, scientific notation, real numbers, equations, functions, 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!

Ten focused rounds for sharper Maryland MCAP math thinking

This book gives you ten full Grade 8 MCAP math practice tests. Each round is built to help you notice structure, compare quantities, use linear reasoning, handle real numbers, and explain your thinking with care.

Grade 8 standards focus: This page supports **Probability of Simple and Compound Events** (8.G.B.7): Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. You will also meet **Mean Absolute Deviation** (8.G.B.8): Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

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 ten-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 a proportion, equation, diagram, number line, 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.

Grade 8 standards focus: Keep the routine connected to **Turning Repeating Decimals into Fractions** (8.NS.A.1): Convert a decimal expansion which repeats eventually into a rational number. A second useful connection is **Estimating Irrational Numbers** (8.NS.A.2): Use rational approximations of irrational numbers to compare their size and locate them approximately on a number line diagram.

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?

Ten Maryland MCAP tests, 400 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Linear relationships, integer exponents, scientific notation, real-number reasoning, and careful reading.
Tests 4–6	Expressions, equations, inequalities, transformations, geometry, and multi-step problem solving.
Tests 7–9	Data analysis, probability, mixed review, stamina, and choosing efficient strategies.
Test 10	A final Maryland round to show growth across the whole book.
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.

Grade 8 standards focus: Use these habits while practicing **Properties of Integer Exponents** (8.EE.A.1): Know and apply the properties of integer exponents to generate equivalent numerical expressions. It also prepares you for **Operations with Scientific Notation** (8.EE.A.4): Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.



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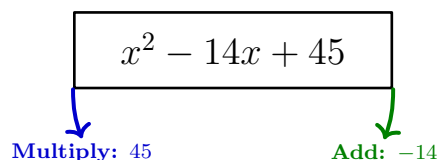
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- 1) A researcher measures the marginal relative frequency of a category as $\frac{\text{cell}}{\text{row total}}$ instead of $\frac{\text{row total}}{\text{grand total}}$. What type of frequency did the researcher calculate?
- ☐ A. Marginal relative frequency (correct). ☐ C. Row-conditional relative frequency.
- ☐ B. Joint relative frequency. ☐ D. Column-conditional relative frequency.
- 2) A triangular prism has an isosceles triangular base with base 8 cm and two equal sides of 5 cm each. The height of the triangle is 3 cm. The prism length is 6 cm. What is the total surface area?
- ☐ A. 96 cm^2 ☐ C. 132 cm^2
- ☐ B. 108 cm^2 ☐ D. 156 cm^2
- 3) Multiply: $(6 \times 10^2) \times (3 \times 10^4)$
- ☐ A. 18×10^5 ☐ C. 9×10^6
- ☐ B. 18×10^8 ☐ D. 1.8×10^7
- 4) A system of two linear equations has no solution. Which statement must be true?
- ☐ A. Both lines have the same y -intercept ☐ C. The lines have the same slope and different y -intercepts
- ☐ B. Both slopes are negative ☐ D. The lines are perpendicular
- 5) Explain: Why must the inequality symbol be flipped when solving $-3x \leq 12$?
- ☐ A. Multiplying by a negative reverses the direction of the inequality ☐ C. Dividing by any negative number requires flipping
- ☐ B. It is a rule you must always follow, regardless of the sign ☐ D. Flipping prevents getting a negative variable



6) Factor $x^2 - 14x + 45$.



☐ A. $(x - 5)(x - 9)$

☐ C. $(x - 10)(x - 4)$

☐ B. $(x - 15)(x + 1)$

☐ D. $(x - 45)(x + 1)$

7) A math teacher says: “A function is when you input a number and always get the same output.” Is this definition correct?

☐ A. Yes, this is a complete definition.

that different inputs produce the same output.

☐ B. No, because constant functions like $y = 5$ are not functions.

☐ D. Yes, as long as the input is positive.

☐ C. No, a function only requires that each input has exactly one output, not

8) Culture A: $N(t) = 100 + 50t$ bact/hr. Culture B at $t = 0$: 50, $t = 2$: 150. Faster growth?

☐ A. Culture A

☐ C. Both same.

☐ B. Culture B

☐ D. Cannot be determined.

9) Looking at the table below, is the function linear or nonlinear?

x	1	2	3	4
y	2	5	10	17
First diff.	3	5	7	

☐ A. Linear, because y increases

☐ C. Linear, because the table has 4 points

☐ B. Nonlinear, first differences are not constant

☐ D. Nonlinear, because $y > x$


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- 10) A line has slope 3 and passes through the point $(1, 7)$. Which equation represents this line?

☐ A. $y = 3x + 4$

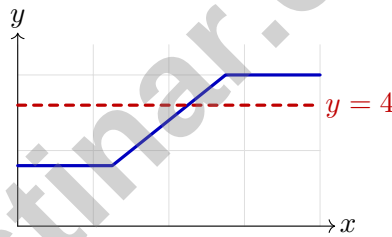
☐ C. $y = 3x - 1$

☐ B. $y = 3x + 7$

☐ D. $y = 3x + 1$

- 11) A credit card balance of \$750 charges 18% APR. If no payments are made, what is the interest charged after 1 year?

- 12) A piecewise function has: constant segment at $y = 2$, then increasing segment, then constant segment at $y = 5$. How many times does it cross a horizontal line $y = 4$?



☐ A. Zero times (never)

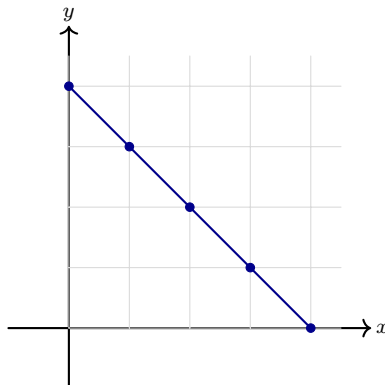
☐ C. Exactly twice (at two different points)

☐ B. Exactly once (during the increasing segment)

☐ D. Cannot determine without seeing the graph



- 1) The graph shows function $r(x)$. What is $r(0)$?



- ☐ A. 0
- ☐ B. 2
- ☐ C. 4
- ☐ D. 1
- 2) A scientist collected data on plant height (cm) versus days of growth. Which scatter plot shows a trend line that is a POOR fit?
- ☐ A. Points spread far from the line with large vertical distances
- ☐ B. Half the points are above the line and half are below
- ☐ C. Line passes through the center of the data cloud
- ☐ D. Points clustered tightly around the line with minimal scatter
- 3) A model car is 12 cm long. The actual car is 4.8 m long. What is the scale factor from the model to the actual car?
- ☐ A. 40
- ☐ B. 4
- ☐ C. 0.4
- ☐ D. 0.25



4) Which of the following best describes $0.\overline{99}$?

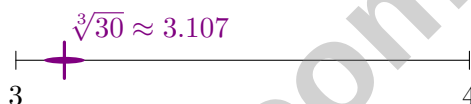
- ☐ A. Irrational ☐ C. Equal to 1, rational
☐ B. Between 0 and 1, rational ☐ D. Greater than 1, irrational

5) Convert $0.\overline{45}$ to a fraction in simplest form.

- ☐ A. $\frac{9}{20}$ ☐ C. $\frac{45}{90} = \frac{1}{2}$
☐ B. $\frac{45}{100}$ ☐ D. $\frac{45}{99} = \frac{5}{11}$

Cube values: $3^3 = 27$, $4^3 = 64$

6)



Between which two consecutive integers does $\sqrt[3]{30}$ lie?

- ☐ A. 1 and 2 ☐ C. 3 and 4
☐ B. 2 and 3 ☐ D. 4 and 5

7) Which is the best estimate of $\sqrt{26}$?

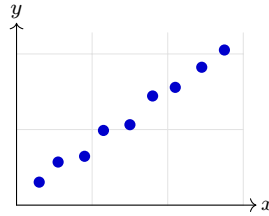
- ☐ A. 4.5 ☐ C. 5.1
☐ B. 5.0 ☐ D. 6.0

8) Multiply $(2 \times 10^3) \times (3 \times 10^2)$. Express in scientific notation.

- ☐ A. 60×10^5 ☐ C. 5×10^5
☐ B. 6×10^6 ☐ D. 6×10^5



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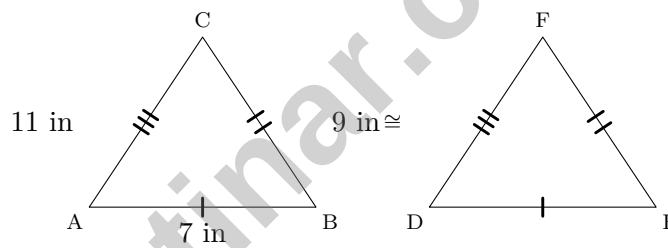


1)

In a scatter plot with 50 data points, the line of best fit passes exactly through 12 points. The other 38 points stay fairly close to the line, with 19 points above it and 19 points below it. This distribution suggests:

- ☐ A. Very weak correlation ☐ C. Moderate to strong correlation
☐ B. No correlation ☐ D. Perfect linear relationship

2) Triangle ABC is congruent to triangle DEF. In triangle ABC: $AB = 7$ in, $BC = 9$ in, $AC = 11$ in. In triangle DEF, which side corresponds to side AC?



- ☐ A. Side DE ☐ D. Cannot be determined from the diagram
☐ B. Side EF
☐ C. Side DF

3) Which scenario describes a negative slope?

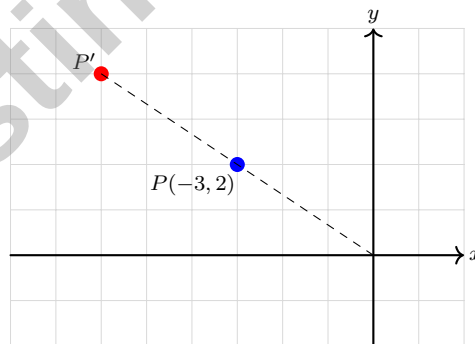
- ☐ A. Population increases each year ☐ C. Your bank account grows with deposits
☐ B. Temperature increases over time ☐ D. Water drains from a tank over time



- 4) A phone company charges \$25 per month plus \$0.10 per text message. What is the total monthly cost for 100 texts?

- 5) A store has two types of mangoes. Premium mangoes cost \$2 each, standard mangoes cost \$1 each. A customer buys 15 mangoes for \$20. Solving the system $p + s = 15$ and $2p + s = 20$ gives $p = 5, s = 10$. Is this solution valid in the real world?

- ☐ A. No, because only the first equation is satisfied.
- ☐ B. No, because p is not a whole number.
- ☐ C. Yes, because it represents a realistic purchase.
- ☐ D. No, because the total cost should be higher.
- 6) Point $P(-3, 2)$ is dilated by scale factor 2 from the origin. What are the coordinates of P' ?



- ☐ A. $(-6, 4)$
- ☐ B. $(-3, 4)$
- ☐ C. $(6, -4)$
- ☐ D. $(-6, -4)$



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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 C is correct.** (8.SP.A.4) Dividing a cell by its row total is the definition of row-conditional frequency. The researcher either mislabeled their calculation or confused marginal (row total / grand total) with conditional (cell / row total).
- 2) **Choice C is correct.** (8.G.C.9) Two triangular bases: $2 \times \frac{1}{2}(8)(3) = 24 \text{ cm}^2$. Perimeter of triangle: $8 + 5 + 5 = 18 \text{ cm}$. Lateral area: $6 \times 18 = 108 \text{ cm}^2$. Total = $24 + 108 = 132 \text{ cm}^2$.
- 3) **Choice D is correct.** (8.EE.A.4) Multiply: $6 \times 3 = 18 = 1.8 \times 10^1$. Add exponents: $10^{2+4} = 10^6$. Combine: $1.8 \times 10^1 \times 10^6 = 1.8 \times 10^7$.
- 4) **Choice C is correct.** (8.EE.C) For a system to have no solution, the lines must be parallel. This requires the same slope but different y -intercepts.
- 5) **Choice C is correct.** (8.EE.C.7) When dividing (or multiplying) both sides of an inequality by a negative number, the inequality symbol must flip to preserve the truth of the statement. For example, if $2 > 1$ (true), multiplying by -1 gives $-2 > -1$ (false), so we flip to get $-2 < -1$ (true).
- 6) **Choice A is correct.** (8.EE.C.7) Find two numbers that multiply to 45 and add to -14 : -5 and -9 . Verify: $(-5)(-9) = 45$ and $-5 - 9 = -14$.
- 7) **Choice C is correct.** (8.F.A.1) The definition of a function only requires that each input has exactly one output. Different inputs can produce different outputs, and some functions are constant while others are not.
- 8) **Choice C is correct.** (8.F.A.2) A grows at 50/hr. B grows at $(150 - 50)/2 = 50/\text{hr}$. Both equal.
- 9) **Choice B is correct.** (8.F.A.3) The first differences are 3, 5, 7, which are not constant. When first differences vary, the function is nonlinear.
- 10) **Choice A is correct.** (8.F.B.4) Using $y = mx + b$ with $m = 3$ and point $(1, 7)$: $7 = 3(1) + b \Rightarrow b = 4$. Equation: $y = 3x + 4$.
- 11) **The correct answer is \$135.** (8.G.B.7) $I = 750 \times 0.18 \times 1 = \135 .
- 12) **Choice B is correct.** (8.F.B.5) The constant segments at $y = 2$ and $y = 5$ stay below and above $y = 4$. The increasing segment must cross $y = 4$ exactly once.
- 13) **Choice C is correct.** (8.G.A.2) Translation is a rigid motion that preserves all angles. Since polygon $A'B'C'D'$ is congruent to $ABCD$, angle $A' = \text{angle } A = 85^\circ$.
- 14) **Choice C is correct.** (8.G.A.5) Co-interior angles (also called same-side interior or consecutive interior angles) are on the same side of the transversal and between the parallel lines.
- 15) **Choice B is correct.** (8.G.B.8) Distance = $\sqrt{(5-0)^2 + (12-0)^2} = \sqrt{25+144} = \sqrt{169} = 13.0$. (This is a 5-12-13 Pythagorean triple.)
- 16) **Choice A is correct.** (8.G.C.9) $V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times 3.14 \times 1000 = 4186.67 \text{ cm}^3$.
- 17) **Choice B is correct.** (8.G.B.7) When corresponding angles are not congruent, the lines are not parallel. Corresponding angles are congruent only when lines are parallel.
- 18) **The correct answer is B,E.** (8.G.B.7) There are 10 marbles total. B is true because $P(\text{blue}) = \frac{3}{10}$. E is true because $P(\text{red or blue}) = \frac{5+3}{10} = \frac{8}{10} = \frac{4}{5}$. A is false because $P(\text{red}) = \frac{1}{2}$. C is false because $P(\text{green}) = \frac{1}{5}$. D is false because $P(\text{yellow}) = 0$.
- 19) **Choice A is correct.** (8.G.C.9) $V = \frac{1}{3} \times 2.25 \times 10 = \frac{22.5}{3} = 7.5 \text{ m}^3$.
- 20) **Choice B is correct.** (8.G.B.7) Two congruent right triangles form a rectangle. Area = $5 \times 12 = 60 \text{ ft}^2$.
- 21) **Choice C is correct.** (8.G.A.5) An exterior angle and its adjacent interior angle sum to 180° . For a regular hexagon with interior angle 120° , the exterior angle is $180 - 120 = 60^\circ$. Or: $\frac{360}{6} = 60^\circ$.
- 22) **Choice B is correct.** (8.SP.A.3) Set $R = 8900$: $8900 = 12x + 500 \Rightarrow 12x = 8400 \Rightarrow x = 700$.
- 23) **Choice D is correct.** (8.EE.A.1) (D) is $x^6 + 1$, not x^6 , because addition is not an exponent law.
- 24) **Choice A is correct.** (8.G.A.3) Reverse the translation: $(x, y) \rightarrow (x + 6, y - 4)$. So $P = (1 + 6, 8 - 4) = (7, 4)$.
- 25) **Choice A is correct.** (8.G.B.6, 8.G.B.7) Using $a^2 + b^2 = c^2$: $20^2 + 21^2 = 400 + 441 = 841$, so $c = 29$ (the 20-21-29 triple).



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One Last Encouragement

Hi, Determined Student!

◇ You did meaningful Grade 8 practice. That matters because confidence is built through action, not waiting until everything feels easy. This full-length book gave you ten complete Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. ◇

★ **Remember this:** Carry this with you: you can learn hard things by breaking them into steps, asking good questions, and reviewing with honesty. ★

Take This With You

- **You Can Start:** Even when the problem looks big.
- **You Can Adjust:** When the first method is not enough.
- **You Can Learn:** From every corrected mistake.
- **You Can Improve:** One practice session at a time.

Grade 8 test-day tip: Walk into test day ready to think, not ready to be perfect. Thinking clearly is the goal.

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. SUCCEED TOMORROW!

This book includes **10** full-length Math practice tests and **2** online tests to help Grade 8 students build confidence, strengthen skills, and excel on standardized assessments.

Each practice test is carefully crafted to reflect the latest standards and includes a variety of question types, realistic test conditions, and detailed answer explanations.

Perfect for classroom use, homework, test preparation, and extra practice at home.



THIS BOOK INCLUDES:

10

Full-Length
Printed Tests

2

Online
Practice Tests



Detailed Answers
& Explanations



**MORE PRACTICE.
GREATER RESULTS.**

Give your child the tools to build strong math skills, confidence, and a positive attitude toward learning.

WHAT YOU'LL GAIN



**Build
Confidence**

Practice regularly to feel prepared and test-ready.



**Master
Key Skills**

Develop strong math skills and problem solving abilities.



**Improve
Understanding**

Learn with clear explanations and step-by-step solutions.



**Test
Strategies**

Learn proven strategies to approach every question with confidence.



**Boost
Performance**

Apply your knowledge and achieve your best score!

TOPICS COVERED

- ✓ The Number System
- ✓ Expressions & Equations
- ✓ Inequalities
- ✓ Functions
- ✓ Geometry
- ✓ Ratios & Proportions
- ✓ Statistics & Probability
- ✓ Data Analysis
- ✓ Measurement
- ✓ Pythagorean Theorem
- ✓ Surface Area & Volume
- ✓ And More!



2 ONLINE TESTS

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



2 EXTRA ONLINE TEST ACCESS CODE IS INSIDE THE BOOK!

Don't lose it—your extra practice and success start here!



PRACTICE
REGULARLY



STAY
FOCUSED



SOLVE
CONFIDENTLY



SUCCEED
BRIGHTLY