

8

Maryland

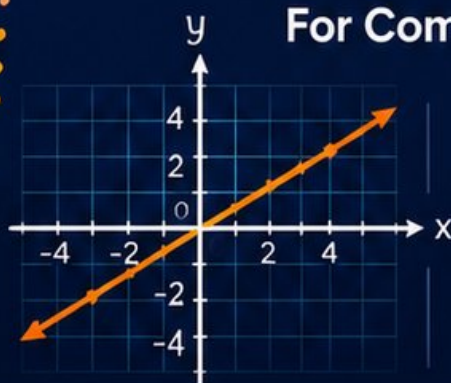
MCAP

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$
$$C = 2\pi r$$
$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}b^2 h$$



8

 PRINTED TESTS

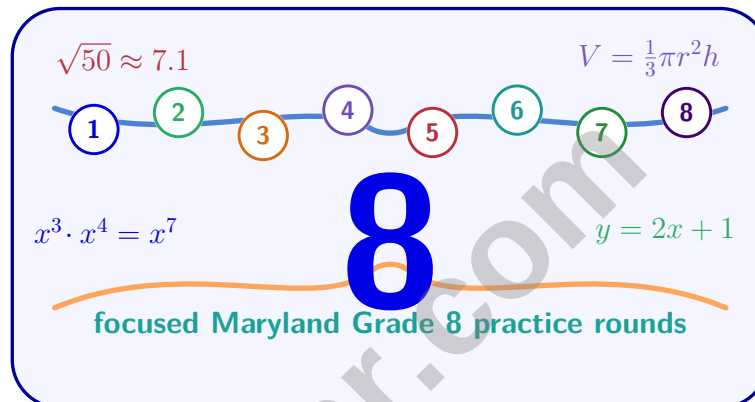
2

 ONLINE TESTS

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

8 Maryland MCAP Grade 8 Math Practice Tests

Maryland Grade 8 Review for Functions, Geometry, and Data Analysis



Eight 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!

Eight focused rounds for sharper MCAP math thinking

This book gives you eight 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

An eight-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?

Eight MCAP tests, 320 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 7–8	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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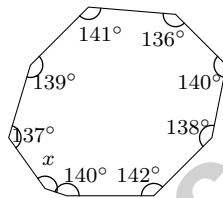
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- 1) Look at the table of values for the equation $y = 2x + 1$:

x	y
1	3
2	5
?	9

What value of x produces $y = 9$?

- ☐ A. $x = 3$
☐ C. $x = 8$
☐ B. $x = 5$
☐ D. $x = 4$



2)

A nonagon (9-sided polygon) has eight interior angles: $140^\circ, 142^\circ, 138^\circ, 140^\circ, 136^\circ, 141^\circ, 139^\circ, 137^\circ$. Find the ninth angle.

- ☐ A. 145°
☐ C. 150°
☐ B. 147°
☐ D. 152°

- 3) A number is chosen randomly from 1 to 10. What is the probability of choosing a prime number OR an even number?

- ☐ A. $\frac{7}{10}$
☐ C. $\frac{5}{10}$
☐ B. $\frac{4}{5}$
☐ D. $\frac{6}{10}$



- 4) A student creates a table of values for the function $y = 3x - 1$. Find the output when the input is 5.

x	$y = 3x - 1$
0	-1
1	2
5	?

- 5) A right triangle has legs of 14 and 48. Identify the hypotenuse from the choices.

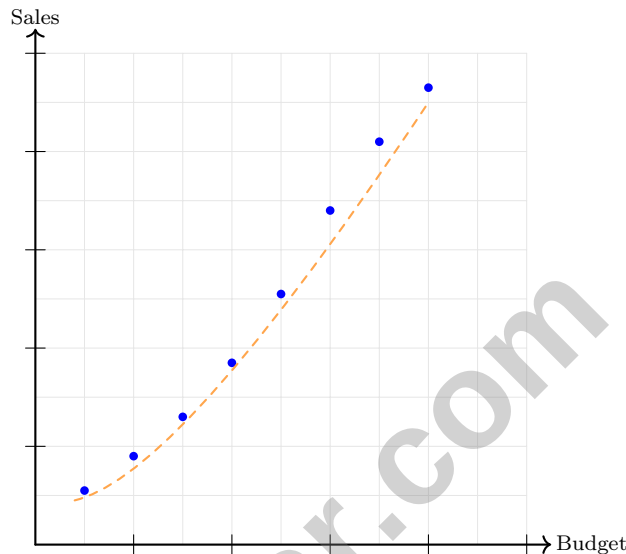
☐ A. 50☐ C. 34☐ B. 62☐ D. 52

- 6) A pyramid has a rectangular base with dimensions x meters by $3x$ meters and a height of 5 m. If the volume is 500 m^3 , what is the value of x ?

☐ A. 5 m☐ C. 20 m☐ B. 10 m☐ D. 50 m

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- 7) 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?



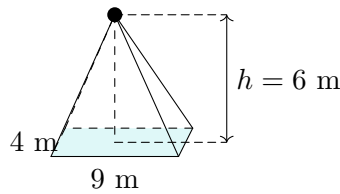
- ☐ A. Nonlinear (power or exponential) association
☐ B. Weak positive correlation
☐ C. Moderate negative correlation
☐ D. Perfect linear relationship
- 8) A two-way table shows that 30 students like pizza and 20 like sandwiches. 15 of those who like pizza are girls. What is the relative frequency of girls among pizza-likers?

	Girls	Total
Pizza	15	30
Sandwiches	–	20

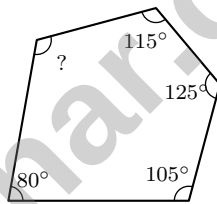
- ☐ A. 50%
☐ B. 60%
☐ C. 30%
☐ D. 75%



- 1) A pyramid has a rectangular base of 9 m by 4 m and a height of 6 m. What is its volume?



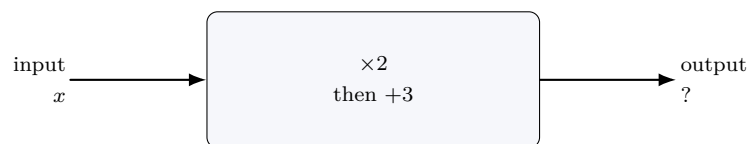
- ☐ A. 36 m^3
☐ C. 216 m^3
☐ B. 72 m^3
☐ D. 432 m^3
- 2) Factor completely: $5x^2 + 35x + 50$.
- ☐ A. $5(x^2 + 7x + 10)$
☐ C. $5(x + 2)(x + 5)$
☐ B. $(5x + 5)(x + 10)$
☐ D. $5(x + 10)(x + 1)$



3)

A pentagon has four interior angles: 80° , 105° , 125° , 115° . Find the fifth angle.

- ☐ A. 110°
☐ C. 120°
☐ B. 115°
☐ D. 125°
- 4) A function machine multiplies the input by 2 and adds 3. If the input is x , what is the output?



- ☐ A. $2x + 3$
☐ C. $3x + 2$
☐ B. $2(x + 3)$
☐ D. $x + 5$



- 5) A triangle with vertices at $(1, 0)$, $(3, 0)$, and $(2, 2)$ is reflected across the x -axis. What is the y -coordinate of the image of the vertex originally at $(2, 2)$?

☐ A. 2

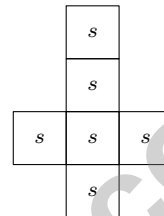
☐ C. 0

☐ B. -2
☐ D. 4

- 6) If $f(x) = x^2 - 4x + 3$, what is $f(2)$?

☐ A. -1
☐ C. 3

☐ B. 0

☐ D. 7


Net of cube

7)

If the net above represents a cube with edge length 3 cm, what is the total surface area of the cube?

☐ A. 18 cm^2
☐ C. 36 cm^2
☐ B. 27 cm^2
☐ D. 54 cm^2

- 8) A student claims that reflecting a point across the x -axis and then across the y -axis gives the same result as rotating 180° about the origin. Is this claim correct?

☐ A. No, reflections never equal rotations

☐ C. Only if the point is on an axis

☐ B. Yes, both transformations map

☐ D. Only for points in Quadrant I

$(x, y) \rightarrow (-x, -y)$

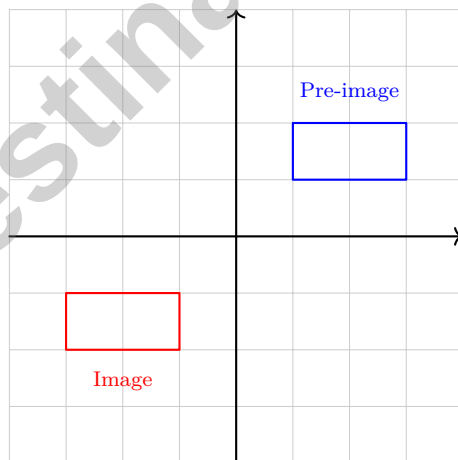


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1)

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. 62) Which is smallest: $\sqrt{10}$, $\sqrt{19}$, or $\sqrt{35}$?
3) 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

4)

Looking at the two rectangles, which transformation was applied?

☐ A. Reflection across the x -axis☐ C. 180° rotation about the origin☐ B. Reflection across the y -axis☐ D. Dilation by scale factor 2

5) Which number is the largest?

☐ A. 3.1×10^{-2}

☐ B. 3.1×10^{-1}

☐ C. 3.1×10^0

☐ D. 3.1×10^1

6) A runner trains at 6 miles per hour. Write the equation $d = kt$ for distance d (miles) and time t (hours). What is k ?

7) A temperature increases by 3° per hour. If it starts at $12^\circ C$ and must stay below $30^\circ C$, which inequality represents valid times (in hours)?

☐ A. $t < 6$

☐ B. $t > 6$

☐ C. $t \leq 6$

☐ D. $t \geq 6$

8) A student expands $(x - 4)^2$ and gets $x^2 - 16$. What is the error?

☐ A. Missing the middle term.☐ B. Forgot to square the coefficient of x .☐ C. Used subtraction instead of FOIL.☐ D. The answer is correct; there is no error.

9) A taxi charges \$3 per mile plus a \$5 base fare. If m is the number of miles, which expression represents the total charge?

☐ A. $5m + 3$

☐ B. $3m + 5$

☐ C. $3m - 5$

☐ D. $\frac{3m}{5}$



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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 D is correct.** (8.EE.C.7) Use $y = 2x + 1$: $9 = 2x + 1 \Rightarrow 8 = 2x \Rightarrow x = 4$.
- 2) **Choice B is correct.** (8.G.A.5) A nonagon's interior angles sum to $(9 - 2) \times 180 = 1260^\circ$. The eight known angles sum to $140 + 142 + 138 + 140 + 136 + 141 + 139 + 137 = 1113^\circ$, so the ninth angle is $1260 - 1113 = 147^\circ$.
- 3) **Choice B is correct.** (8.G.B.7) Prime: 2, 3, 5, 7. Even: 2, 4, 6, 8, 10. Prime OR even: 2, 3, 4, 5, 6, 7, 8, 10 = 8 numbers. Note: 2 is both prime and even, counted once. $P = \frac{8}{10} = \frac{4}{5}$.
- 4) **The correct answer is 14.** (8.F.A.1) Substitute $x = 5$ into the function: $y = 3(5) - 1 = 15 - 1 = 14$.
- 5) **Choice A is correct.** (8.G.B.6, 8.G.B.7) Using $a^2 + b^2 = c^2$: $14^2 + 48^2 = 196 + 2304 = 2500$, so $c = 50$ (scaled 7-24-25 triple).
- 6) **Choice B is correct.** (8.G.C.9) $B = x \times 3x = 3x^2$. $500 = \frac{1}{3} \times 3x^2 \times 5 \Rightarrow 500 = 5x^2 \Rightarrow x^2 = 100 \Rightarrow x = 10$ m.
- 7) **Choice A is correct.** (8.SP.A.1) The changing return on spending (10 dollars $\rightarrow$ 25 dollars) indicates a nonlinear relationship. A linear relationship would show constant returns.
- 8) **Choice A is correct.** (8.SP.A.4) This is a row-conditional relative frequency. Among pizza-likers (30 total), 15 are girls: $\frac{15}{30} = 0.5 = 50\%$.
- 9) **Choice D is correct.** (8.NS.A.1) Let $x = 0.\overline{999} = 0.999\dots$. Then $1000x = 999.\overline{999}$. Subtracting: $999x = 999$, so $x = 1$.
- 10) **Choice D is correct.** (8.NS.A.1) Only $\sqrt{5}$ is irrational (a square root of a non-perfect square). The others are rational: $0.5 = \frac{1}{2}$, 2 is an integer, and $3.\overline{3} = \frac{10}{3}$.
- 11) **Choice C is correct.** (8.G.B.7) $A = 1000(1.08)^2 = 1000 \times 1.1664 = \$1,166.40 \approx \$1,166$.
- 12) **Choice B is correct.** (8.NS.A.2) Two location choices times three time options: $2 \times 3 = 6$ possible arrangements.
- 13) **The correct answer is 3.** (8.G.C.9) $h = \frac{942}{3.14 \times 10^2} = \frac{942}{3.14 \times 100} = \frac{942}{314} = 3$ m.
- 14) **Choice D is correct.** (8.NS.A.2) $9^2 = 81$ and $10^2 = 100$. Since $81 < 99 < 100$, we have $9 < \sqrt{99} < 10$.
- 15) **Choice D is correct.** (8.NS.A.2) Since $2.6^2 = 6.76 \approx 7$ and $2.65^2 \approx 7.02$, we estimate $\sqrt{7} \approx 2.65$.
- 16) **Choice D is correct.** (8.EE.B.5) A proportional equation is $y = kx$ (no constant term). Choice D has $+1$, so it's linear but not proportional.
- 17) **Choice D is correct.** (8.EE.B.6) The y -intercept is where the line crosses the y -axis, at point $(0, -1)$.
- 18) **Choice C is correct.** (8.EE.C.7) Set up: $12h + 50 \geq 170$. Subtract 50: $12h \geq 120$. Divide by 12: $h \geq 10$ hours.
- 19) **The correct answer is A,C.** (8.G.A.3) A 180° rotation about the origin transforms $(x, y) \rightarrow (-x, -y)$. Reflecting across the x -axis and then the y -axis also transforms (x, y) to $(-x, -y)$. Both map $(1, 1)$, $(3, 2)$, and $(1, 3)$ to the red image points. B, D, and E do not match the image.
- 20) **Choice D is correct.** (8.G.B.7) Rectangle = $18 \times 6 = 108 \text{ cm}^2$. Triangle = $\frac{1}{2} \times 6 \times 8 = 24 \text{ cm}^2$. Total = $108 + 24 = 132 \text{ cm}^2$.
- 21) **Choice C is correct.** (8.EE.A.1) When exponents are equal: $\frac{t^9}{t^9} = t^{9-9} = t^0 = 1$ (for $t \neq 0$).
- 22) **Choice D is correct.** (8.EE.A.2) $13 \times 13 = 169$, so $\sqrt{169} = 13$.
- 23) **Choice D is correct.** (8.EE.A.3) $9.9 \times 10^2 = 990$ and $1.0 \times 10^3 = 1,000$. The exponent dominates when coefficients are close.
- 24) **Choice D is correct.** (8.EE.A.4) Divide coefficients: $8 \div 2 = 4$. Subtract exponents: $10^{8-3} = 10^5$. Result: 4×10^5 .
- 25) **The correct answer is 107.** (8.G.B.7) Co-interior angles are supplementary: $x + 73 = 180$, so $x = 107^\circ$.
- 26) **Choice D is correct.** (8.EE.C) Check $(2, 3)$: $5(2) - 2(3) = 10 - 6 = 4$ and $2(2) + 3 = 7$. So the solution is $(2, 3)$.
- 27) **Choice A is correct.** (8.F.A.2) Rate = $(1 - 3)/(1 - 0) = -2/1 = -2$. A quick check with the next two points gives $(-1 - 1)/(2 - 1) = -2$ again, so the rate is consistent.
- 28) **Choice C is correct.** (8.F.A.3) Absolute value functions are nonlinear. They produce a V-shaped graph, not a straight line.



Hi, Math Hero!

◇ This wide-ranging book gave you eight serious Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. You showed up for Grade 8 practice again and again. That is what real growth looks like: steady effort, honest review, and a willingness to try. ◇

★ **Remember this:** A math hero is not someone who never misses a question. A math hero learns from the miss and comes back stronger. ★

Hero Habits

- **Courage:** You try problems that are not automatic.
- **Honesty:** You review what needs work.
- **Patience:** You let skills grow over time.
- **Pride:** You recognize the effort you gave.

Grade 8 test-day tip: Save one solved problem you are proud of. Looking back at progress helps motivation stay strong.

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

Jay Daie

Your Math Hero Guide

PRACTICE TODAY, SUCCEED TOMORROW!

Give your child the confidence and skills they need with **8 full-length Grade 8** Math practice tests that mirror 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.



BUILD SKILLS & BOOST CONFIDENCE

Strengthen understanding and feel prepared for test day.



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!



2 EXTRA ONLINE PRACTICE TESTS INCLUDED!

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

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PRACTICE. PREPARE. SUCCEED.



Testinar

More Practice. More Confidence.
Better Results.