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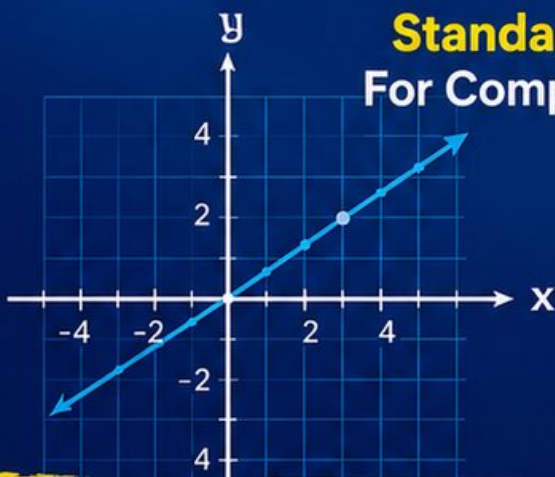
Maryland
MCAP

Grade 8

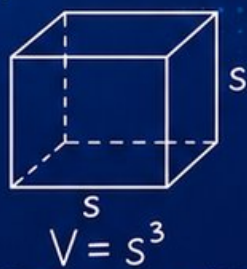
MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



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



9 PRINTED
TESTS

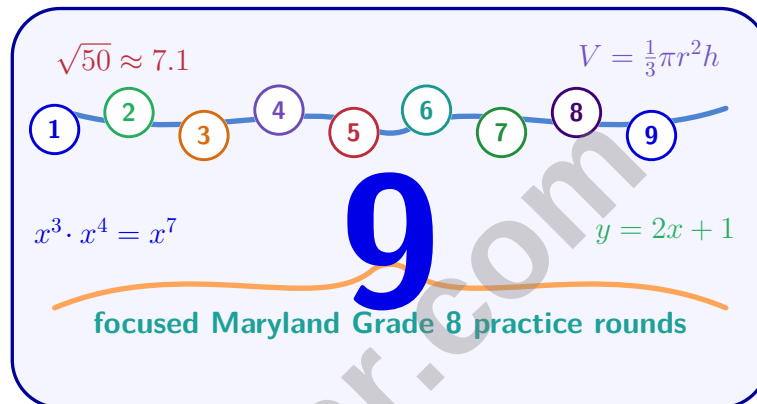


2 ONLINE
TESTS

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

9 Maryland MCAP Grade 8 Math Practice Tests

Standards-Based Maryland Practice with Review, Answer Keys, and Explanations



Nine 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!

Nine focused rounds for sharper MCAP math thinking

This book gives you nine 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 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.

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?

Nine MCAP 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.

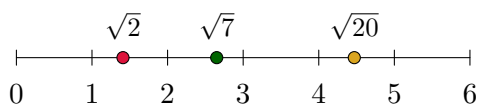


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Table of Contents

★ Practice Test 1	_____	14
★ Practice Test 2	_____	30
★ Practice Test 3	_____	46
★ Practice Test 4	_____	62
★ Practice Test 5	_____	77
★ Practice Test 6	_____	93
★ Practice Test 7	_____	108
★ Practice Test 8	_____	124
★ Practice Test 9	_____	141
Practice Test Answer Keys	_____	158
Practice Test Answers and Explanations	_____	164

1)



How many of the marked numbers are irrational?

☐ A. None

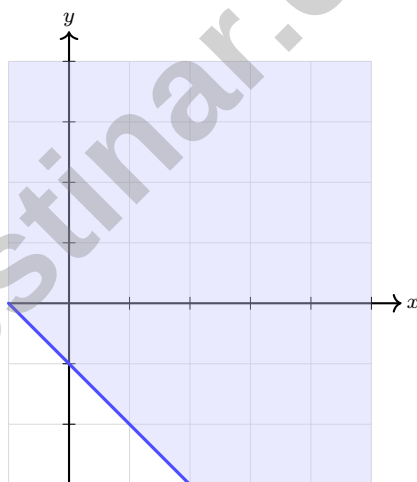
☐ C. Two

☐ B. One

☐ D. All three

2) Express 356,000 in scientific notation.

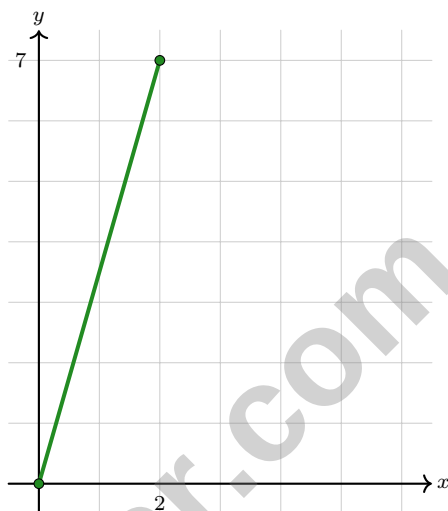
3)



The line shown has equation $y = -x - 1$. With shading above, the inequality is:

☐ A. $y > -x - 1$
☐ C. $y \geq -x - 1$
☐ B. $y < -x - 1$
☐ D. $y \leq -x - 1$


- 4) A point P is translated by the vector $(5, -2)$ to get point P' . If you want to undo this translation and return to P , which translation vector should you apply to P' ?

☐ A. $(5, -2)$ ☐ C. $(5, 2)$ ☐ B. $(-5, 2)$ ☐ D. $(-5, -2)$ 

5)

The constant of proportionality is:

☐ A. $\frac{2}{7}$ ☐ C. 2☐ B. 7☐ D. $\frac{7}{2}$

- 6) What is the slope of the line that passes through $(5, 2)$ and $(5, 7)$?

☐ A. 0☐ C. Undefined☐ B. 1☐ D. 5

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7) Solve: $5 - x > 8$

☐ A. $x > -3$

☐ C. $x < -3$

☐ B. $x > 13$

☐ D. $x < 13$

8) Which expression expands to $x^2 + 20x + 100$?

☐ A. $2(x + 10)^2$

☐ C. $(x + 10)(x + 100)$

☐ B. $(x + 10)^2$

☐ D. $(x + 50)^2$

9) Which set of ordered pairs represents a function?

☐ A. $\{(0, 1), (0, 2), (1, 3)\}$

☐ C. $\{(1, 1), (1, 2), (2, 2)\}$

☐ B. $\{(2, 4), (3, 5), (4, 6)\}$

☐ D. $\{(5, 3), (5, 4), (6, 5)\}$

10) Function f : “starts at 5, increases by 3 each unit.” Function g given in table: $(0, 10)$, $(1, 12)$, $(2, 14)$. Which has the greater y -intercept?

x	0	1	2
$g(x)$	10	12	14

☐ A. Function f

☐ C. Both same.

☐ B. Function g

☐ D. Cannot compare.

11) A line passes through $(1, 3)$ and $(3, 7)$. Is this a linear relationship?

☐ A. No, the slope is not 1

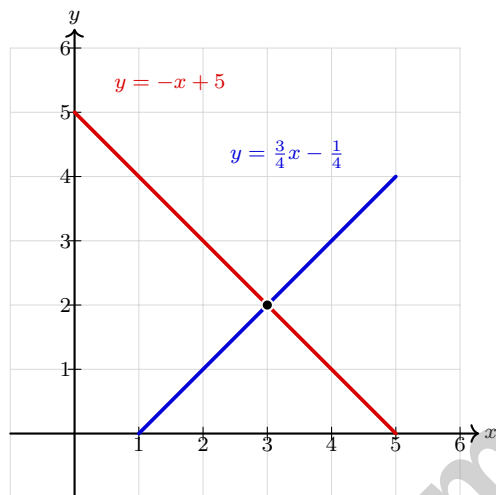
☐ C. Yes, a line is always linear

☐ B. No, because you need more than two points

☐ D. Yes, only if the slope is positive



- 1) Use the graph to identify the solution to the system: $y = -x + 5$ and $y = \frac{3}{4}x - \frac{1}{4}$.



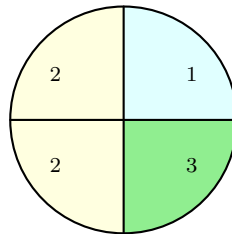
- ☐ A. (2, 3) ☐ C. (4, 1)
- ☐ B. (5, 0) ☐ D. (3, 2)
- 2) A right triangle has a hypotenuse of 20 and one leg of 12. Find the other leg.
- ☐ A. 8 ☐ C. 18
- ☐ B. 16 ☐ D. 32
- 3) In a survey of 80 coffee drinkers, 50 add cream and 30 do not. Of those who add cream, 35 are office workers. What is the relative frequency of office workers among cream-adders, rounded to the nearest whole percent?
- ☐ A. 44% ☐ C. 62%
- ☐ B. 70% ☐ D. 56%



- 4) The height of a ball (in meters) t seconds after being thrown is $h(t) = 20t - 5t^2$. Find $h(2)$.

- 5) A student found the volume of a pyramid with base area 50 ft^2 and height 12 ft by calculating $V = 50 \times 12 = 600 \text{ ft}^3$. What is the correct volume?

- ☐ A. 100 ft^3 ☐ C. 300 ft^3
☐ B. 200 ft^3 ☐ D. 600 ft^3
- 6) Which data scenario would MOST closely match a linear model $y = 0.5x + 15$?
- ☐ A. Bacteria population doubling every hour ☐ C. Height of a ball after it bounces (decreasing bounce heights)
☐ B. Water height in a tank filling at a constant rate ☐ D. Compound interest in a savings account



7)

The spinner has sections labeled 1, 2, 2, 3. What is the probability of landing on section 2?

- ☐ A. $\frac{1}{4}$ ☐ C. $\frac{1}{2}$
☐ B. $\frac{1}{3}$ ☐ D. $\frac{3}{4}$



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1) A line passes through $(1, 5)$ with slope $\frac{1}{2}$. What is the y -intercept?

☐ A. 4

☐ C. 5

☐ B. $\frac{3}{2}$

☐ D. $\frac{9}{2}$

2) A cylinder has radius 1.5 inches and height 8 inches. What is the surface area? (Use $\pi \approx 3.14$.)

☐ A. 28.3 in^2

☐ C. 75.4 in^2

☐ B. 47.1 in^2

☐ D. 89.5 in^2

3) $(4.0 \times 10^5) + (6.0 \times 10^4) = ?$

☐ A. 10×10^4

☐ C. 1.0×10^6

☐ B. 10×10^5

☐ D. 4.6×10^5

4) How many solutions does the system $\begin{cases} y = \frac{1}{2}x + 1 \\ y = \frac{1}{2}x + 4 \end{cases}$ have? Explain why.

5) Company A: $A(d) = 40 + 0.15d$. Company B through $(100, 55)$ and $(200, 80)$. Which has higher rate?

☐ A. Company A

☐ C. Both same.

☐ B. Company B

☐ D. Cannot be determined.



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& answers

6) Which equation is NONLINEAR?

☐ A. $y = -7x$

☐ B. $y = 4 - x$

☐ C. $y = x^4 - 3$

☐ D. $y = \frac{1}{3}x + 2$

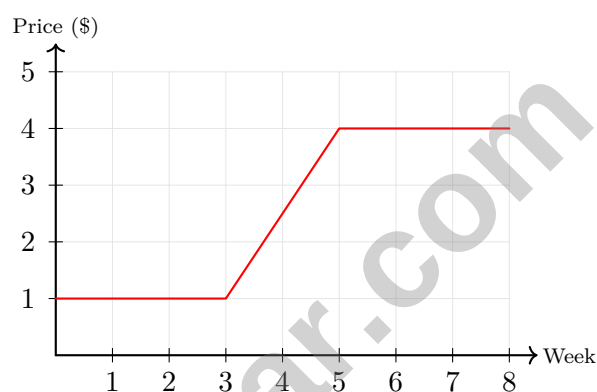
7) A line passes through $(2, 10)$ and has slope 3. What is the y -intercept?

☐ A. 3

☐ B. 4

☐ C. 10

☐ D. 6



8)

An item's price over 8 weeks is shown. During which week does the price increase the fastest?

☐ A. Weeks 1-3

☐ B. Week 3

☐ C. Weeks 3-5

☐ D. Weeks 5-8



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.NS.A.1) $\sqrt{2}$, $\sqrt{7}$, and $\sqrt{20}$ are all irrational because 2, 7, and 20 are not perfect squares. None of these can be simplified to a rational number.
- 2) **The correct answer is 3.56×10^5 .** (8.EE.A.3) Move the decimal 5 places left to get 3.56; since the original number is greater than 1, the exponent is positive 5.
- 3) **Choice C is correct.** (8.G.B.8) SOLID line (includes boundary) with shading ABOVE means $y \geq -x - 1$.
- 4) **Choice B is correct.** (8.G.A.1) To undo a translation, apply the opposite (inverse) vector. If you moved by $(5, -2)$, move back by $(-5, 2)$. This is the additive inverse: $(5, -2) + (-5, 2) = (0, 0)$.
- 5) **Choice D is correct.** (8.EE.B.5) $k = \frac{y}{x} = \frac{7}{2} = 3.5$. The line passes through $(0, 0)$ and $(2, 7)$.
- 6) **Choice C is correct.** (8.EE.B.6) Both points have the same x -coordinate, making this a vertical line. Vertical lines have undefined slope.
- 7) **Choice C is correct.** (8.EE.C.7) Subtract 5: $-x > 3$. Multiply by -1 (FLIP): $x < -3$.
- 8) **Choice B is correct.** (8.EE.C.7) $(x + 10)^2 = x^2 + 2(10)(x) + 100 = x^2 + 20x + 100$. Pattern: $a^2 + 2ab + b^2 = (a + b)^2$.
- 9) **Choice B is correct.** (8.F.A.1) Each input $(2, 3, 4)$ maps to exactly one output $(4, 5, 6)$. The other sets have repeated inputs.
- 10) **Choice B is correct.** (8.F.A.2) From verbal description, f has y -intercept 5. From table g , the y -intercept is 10. Since $10 > 5$, g is greater.
- 11) **Choice C is correct.** (8.F.A.3) By definition, a line represents a linear function. Since the graph is a line, the relationship is linear.
- 12) **Choice A is correct.** (8.F.B.4) Cost per item is \$8 (slope), flat shipping is \$12 (intercept). Total: $C = 8n + 12$.
- 13) **Choice B is correct.** (8.F.B.5) Cost equals price times quantity, which is a linear function with constant slope. A is oscillating, C and D are exponential.
- 14) **Choice B is correct.** (8.G.B.7) The square area is $20 \times 20 = 400 \text{ m}^2$. Four corner triangles are removed, and each has area $\frac{1}{2} \times 3 \times 3 = 4.5 \text{ m}^2$. The octagon area is $400 - 4(4.5) = 382 \text{ m}^2$.
- 15) **Choice B is correct.** (8.G.A.5) A hexagon's interior angles add to 720° . The known angles add to $88 + 112 + 95 + 118 + 147 = 560^\circ$, so the sixth angle is $720 - 560 = 160^\circ$.
- 16) **Choice B is correct.** (8.G.B.8) MAD represents the average distance each value is from the mean, showing variability. It cannot be negative because it uses absolute values.
- 17) **The correct answer is $\frac{34}{99}$.** (8.NS.A.1) Set $x = 0.\overline{34}$, so $100x = 34.\overline{34}$. Subtracting: $100x - x = 34$, giving $99x = 34$ and $x = \frac{34}{99}$.
- 18) **Choice D is correct.** (8.G.B.7) Net pay = \$2,000 - \$240 - \$160 = \$1,600.
- 19) **Choice C is correct.** (8.EE.A.1) The diagram shows the product rule (add exponents). (C) uses it: $2^{4+5} = 2^9$. (A) is power of product, (B) is quotient rule, (D) is power of power.
- 20) **The correct answer is A,B.** (8.SP.A.4) Statement A is correct because all joint relative frequencies together make the whole table. Statement B is correct because a row-conditional frequency uses the row total as the denominator. Statement C describes a conditional frequency, D uses the wrong denominator, and E is false because conditional frequencies depend on the denominator.
- 21) **Choice D is correct.** (8.EE.A.2) Solve $x^3 = 512$ by taking the cube root: $x = \sqrt[3]{512} = 8$.
- 22) **Choice C is correct.** (8.EE.A.4) Divide: $\frac{2 \times 10^{12}}{4 \times 10^{12}} = \frac{2}{4} \times 10^0 = 0.5 \times 10^0 = 0.5$ kilotons.
- 23) **Choice D is correct.** (8.EE.C) Subtract the second from the first: $(2x + 3y) - (2x - y) = 11 - 3$, so $4y = 8$, giving $y = 2$. Substitute: $2x - 2 = 3$, so $2x = 5$ and $x = \frac{5}{2}$. Solution: $(\frac{5}{2}, 2)$.
- 24) **Choice D is correct.** (8.G.A.2) Rotation is a rigid motion that preserves shape and size. Rectangle M'N'O'P' is congruent to MNOP (same dimensions, though the length and width labels may have switched visually).
- 25) **Choice B is correct.** (8.G.A.3) The translation vector is $(4, 5) - (1, 2) = (3, 3)$. So $Q' = Q + (3, 3) = (4, 2) + (3, 3) = (7, 5)$.
- 26) **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: $41 + 89 = 130^\circ$).



Hi, Calm Solver!

◇ This high-stamina book gave you nine substantial Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. A calm mind can see choices more clearly. That matters in Grade 8, where one problem may have several possible entry points. ◇

★ **Remember this:** You practiced building calm by doing full tests. Each completed page is rehearsal for staying steady when the real test feels serious. ★

Calm-Test Moves

- **Pause:** Give your brain one quiet second.
- **Choose:** Pick the first useful step.
- **Continue:** Do not demand perfection immediately.
- **Check:** Use review time wisely.

Grade 8 test-day tip: If you feel rushed, slow your reading for one sentence. Clear reading saves time.

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

Jay Daie

Your Calm-Test Coach

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 |
| ✓ Geometry | ✓ Data Analysis & Graphing |
| ✓ Measurement & Data | ✓ And More! |



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Better **Results**.