

6 Massachusetts MCAS

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



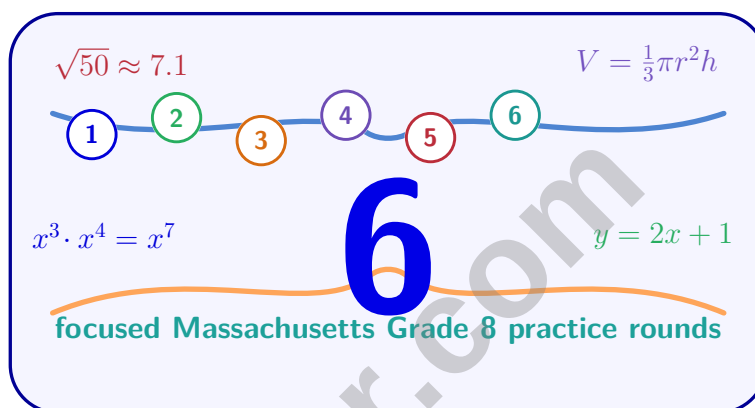
2 ONLINE
TESTS



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

6 Massachusetts MCAS Grade 8 Math Practice Tests

Focused Grade 8 Math Practice with Strong Review and Explanations



Six complete 40-question Grade 8 MCAS 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



Copyright ©

Testinar Inc



Published by Testinar Inc

Testinar.com

All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the author, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law, including Section 107 or 108 of the 1976 United States Copyright Act.

This publication is independently produced and has no official connection to any state, district, or national testing program.

Test names and organizational names used herein are the property of their respective trademark holders.



Copyright ©

Welcome, Massachusetts Grade 8 Problem Solver!

Six focused rounds for sharper MCAS math thinking

This book gives you six full Grade 8 MCAS 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 Massachusetts 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.

Massachusetts 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 MCAS 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.

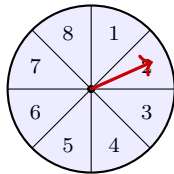


Scan me!
For more practice
& answers

Table of Contents

★ Practice Test 1	_____	14
★ Practice Test 2	_____	31
★ Practice Test 3	_____	47
★ Practice Test 4	_____	63
★ Practice Test 5	_____	79
★ Practice Test 6	_____	95
Practice Test Answer Keys	_____	111
Practice Test Answers and Explanations	_____	115

- 1) A spinner is divided into 8 equal sections. If a student spins it once, what is the probability of landing on a specific section?



- ☐ A. $\frac{8}{1}$
☐ C. $\frac{1}{2}$
☐ B. $\frac{1}{8}$
☐ D. $\frac{1}{4}$
- 2) The product of two irrational numbers is:
- ☐ A. Always rational
 ☐ C. Could be either rational or irrational
☐ B. Always irrational
 ☐ D. Always negative
- 3) Two trend-line slopes are 1.2 and 1.1. What is their difference?

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



4)

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



5) Which is the best estimate of $\frac{\sqrt{10}}{\sqrt{2}}$?

☐ A. 1.4

☐ C. 2.8

☐ B. 5.0

☐ D. 2.2

6) To simplify $\frac{(w^4)^3}{w^6}$, which law should be applied first?

☐ A. Quotient rule

☐ C. Product rule

☐ B. Zero exponent rule

☐ D. Power of a power rule

7) What is $\sqrt[3]{125}$?

☐ A. 25

☐ C. 15

☐ B. 11

☐ D. 5

8) Which value is equivalent to 7.5×10^6 ?

☐ A. 7.5,000

☐ C. 75,000,000

☐ B. 750,000

☐ D. 7,500,000

9) $(1.5 \times 10^{-3}) \times (2.4 \times 10^{-2}) = ?$

☐ A. 0.36×10^{-5}

☐ C. 3.6×10^{-5}

☐ B. 3.9×10^{-5}

☐ D. 3.6×10^{-6}

10) A sandwich shop allows customers to choose one of 3 bread types, one of 5 cheeses, and one of 4 meats. Assuming one of each component, how many different sandwiches can be made?



Scan me!

For more practice
& answers

- 11) A parking meter charges \$0.50 per hour. The relation between hours h and cost c is (h, c) . Is this relation a function?

- ☐ A. No, because cost increases with time. ☐ C. No, because the cost depends on the time.
☐ B. Yes, each hour value gives exactly one cost value. ☐ D. Yes, only if the meter is working correctly.

- 12) Function $f(x) = \frac{3}{4}x + 2$ and g shown in table: $(0, 3)$, $(4, 5)$, $(8, 7)$. Which has steeper slope?

x	0	4	8
$g(x)$	3	5	7

- ☐ A. $f(x)$ is steeper ☐ C. Equal slopes
☐ B. $g(x)$ is steeper ☐ D. Cannot compare
- 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) A plane is descending. Its altitude decreases 2000 feet for every 5 minutes. What is the slope of altitude versus time?
- ☐ A. 400 feet per minute ☐ C. $\frac{5}{2000}$ feet per minute
☐ B. 2000 feet per minute ☐ D. -400 feet per minute

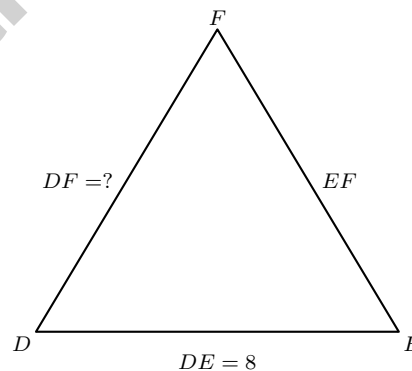
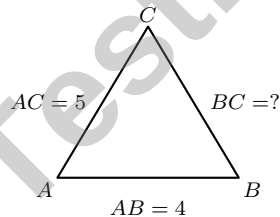


- 1) The wavelength of visible light is about 5×10^{-7} m, while the wavelength of a radio wave is about 3×10^3 m. How many times larger is the radio wavelength?

- ☐ A. 1.67×10^9 times ☐ C. 6×10^{-4} times
☐ B. 1.5×10^4 times ☐ D. 6×10^9 times

- 2) A point on a coordinate grid is at distance $\sqrt{50}$ from the origin. If one coordinate is 5, what is the other coordinate?

- 3) Two similar triangles are shown. Triangle ABC has sides 4 cm and 5 cm. Triangle DEF has a corresponding side of 8 cm. Find the length of the side in DEF corresponding to the 5 cm side in ABC .



- ☐ A. 10 cm ☐ C. 9 cm
☐ B. 6.5 cm ☐ D. 2.5 cm



Scan me!
For more practice
& answers

4) A quadrilateral has interior angles 72° , 88° , 95° , and x . What is x ?

☐ A. 100°

☐ C. 110°

☐ B. 105°

☐ D. 115°

5) A two-way table shows 160 athletes:

	Morning	Evening	Total
Track	50	30	80
Swim	35	45	80
Total	85	75	160

What percentage of all athletes train in the morning on the track team?

☐ A. 31.25%

☐ C. 58.8%

☐ B. 37.5%

☐ D. 62.5%

6)

Sales	\$100	\$150	\$200	\$250	\$300
-------	-------	-------	-------	-------	-------

Five days of sales shown. Mean = \$200. What is the MAD?

☐ A. \$40

☐ C. \$60

☐ B. \$50

☐ D. \$75

7) A team has 10 players. The coach assigns a captain, a co-captain, and a goalkeeper. How many different leadership combinations are possible?

☐ A. $10 + 9 + 8 = 27$

☐ C. $\binom{10}{3} = 120$

☐ B. $10 \times 9 \times 8 = 720$

☐ D. $10^3 = 1,000$



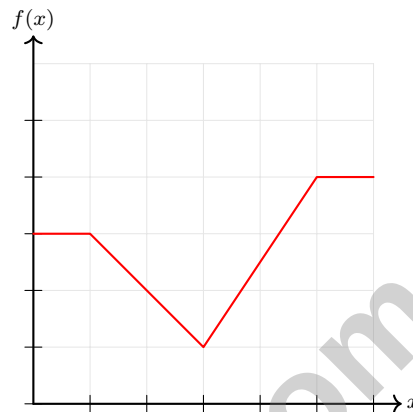
1) Which value is irrational?

☐ A. $0.5 + 0.25$

☐ B. $\frac{1}{2} + \frac{1}{3}$

☐ C. $\sqrt{10} + 1$

☐ D. 2^2



2)

On which interval is the rate of change the most negative?

☐ A. From $x = 0$ to $x = 1$

☐ B. From $x = 1$ to $x = 3$

☐ C. From $x = 3$ to $x = 5$

☐ D. From $x = 5$ to $x = 6$

3) A student incorrectly solved: "If legs are 5 and 12, then hypotenuse = $5 + 12 = 17$." What is the error and the correct answer?

☐ A. Correct: hypotenuse is 17

☐ B. Error: student added instead of squaring. Correct hypotenuse is 13

☐ C. Error: student forgot to square root. Correct hypotenuse is 119

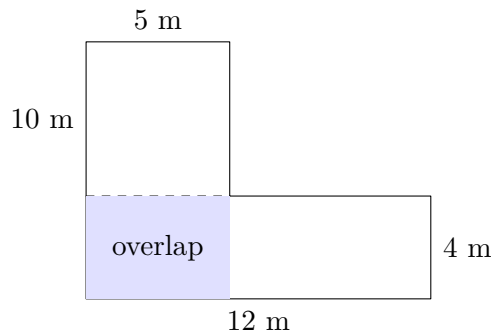
☐ D. Error: student computed $5 \times 12 = 60$ instead



Scan me!

For more practice
& answers

- 4) A composite figure is an L-shape where a 5 m by 10 m vertical rectangle overlaps with a 12 m by 4 m horizontal rectangle. The overlap is 5 m by 4 m. Which calculation finds the correct total area?



- ☐ A. $(5 \times 10) + (12 \times 4) = 98 \text{ m}^2$
☐ C. $(5 + 10 + 12 + 4) \times 2 = 62 \text{ m}$
☐ B. $(5 \times 10) + (12 \times 4) - (5 \times 4) = 78 \text{ m}^2$
☐ D. $\sqrt{50^2 + 48^2} \approx 69.3 \text{ m}$
- 5) Triangle P has sides 8, 15, 17. Triangle Q has sides 12, 22.5, 25.5. Are they similar?
- ☐ A. No, the sides are not equal
 ☐ C. Yes, all sides have the same ratio 1.5 to Q 's sides
☐ B. No, the ratios are 1.5, 1.5, 1.5 which is not constant
 ☐ D. Only if corresponding angles equal 90°



Massachusetts MCAS 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 Massachusetts MCAS practice test.



Scan me!
For more practice
& answers

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice B is correct.** (8.G.B.7) Each of the 8 equal sections has probability $\frac{1}{8}$.
- 2) **Choice C is correct.** (8.NS.A.1) For example, $\sqrt{2} \times \sqrt{8} = \sqrt{16} = 4$ (rational), but $\sqrt{2} \times \sqrt{3} = \sqrt{6}$ (irrational). So the product can be either.
- 3) **The correct answer is 0.1 .** (8.SP.A.2) Compute $1.2 - 1.1 = 0.1$.
- 4) **Choice C is correct.** (8.NS.A.2) $3^3 = 27$ and $4^3 = 64$. Since $27 < 30 < 64$, we have $3 < \sqrt[3]{30} < 4$.
- 5) **Choice D is correct.** (8.NS.A.2) $\frac{\sqrt{10}}{\sqrt{2}} = \sqrt{5} \approx 2.236$.
- 6) **Choice D is correct.** (8.EE.A.1) Simplify the numerator first: $(w^4)^3 = w^{12}$ (power of a power), then apply quotient rule.
- 7) **Choice D is correct.** (8.EE.A.2) $5 \times 5 \times 5 = 125$, so $\sqrt[3]{125} = 5$.
- 8) **Choice D is correct.** (8.EE.A.3) Move the decimal 6 places to the right: $7.5 \times 10^6 = 7,500,000$.
- 9) **Choice C is correct.** (8.EE.A.4) Multiply coefficients: $1.5 \times 2.4 = 3.6$. Add exponents: $10^{-3+(-2)} = 10^{-5}$. Result: 3.6×10^{-5} .
- 10) **The correct answer is 60 .** (8.NS.A.2) Apply the Counting Principle: $3 \times 5 \times 4 = 60$ different sandwiches.
- 11) **Choice B is correct.** (8.F.A.1) For each hour parked, the cost is uniquely determined: $c = 0.50h$. This satisfies the definition of a function.
- 12) **Choice A is correct.** (8.F.A.2) Slope of f : $\frac{3}{4} = 0.75$. Slope of g : $(5-3)/4 = 2/4 = 0.5$. Since $0.75 > 0.5$, f is steeper.
- 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 D is correct.** (8.EE.B.5) Change in altitude is -2000 feet over 5 minutes. Slope = $\frac{-2000}{5} = -400$ feet per minute.
- 15) **Choice C is correct.** (8.G.C) Let $x = \text{mL of } 100\% \text{ alcohol solution}$. The 500 mL of 20% solution contains 100 mL of alcohol. Set up $\frac{x+100}{x+500} = 0.50$. Then $x + 100 = 0.5x + 250$, so $0.5x = 150$ and $x = 300$.
- 16) **Choice A is correct.** (8.F.A.1) $f(2) = 10 - 2 = 8$ and $f(5) = 10 - 5 = 5$. Since $8 > 5$, we have $f(2) > f(5)$.
- 17) **Choice D is correct.** (8.G.C.9) A cube has 6 equal square faces, each with area $5 \times 5 = 25 \text{ cm}^2$. Total surface area = $6 \times 25 = 150 \text{ cm}^2$.
- 18) **Choice A is correct.** (8.G.A.1) Figure E and Figure F have the same size and orientation. Each point moves 5 units left and 1 unit up (translation), not a rotation which would change orientation.
- 19) **The correct answer is $\frac{53}{90}$.** (8.NS.A.1) Set $x = 0.5\bar{8} = 0.5888\dots$. Then $10x = 5.\bar{8}$ and $100x = 58.\bar{8}$. Subtracting: $90x = 53$, so $x = \frac{53}{90}$.
- 20) **The correct answer is A,C.** (8.G.A.4) Correct: (A) Corresponding angles are congruent — definition of similarity. (C) Corresponding sides are proportional — they scale by a constant factor k . Incorrect: (B) Equal length is congruence, not similarity. (D) Congruence requires equality; similarity allows scaling. (E) Scale factor can be any positive number; $k < 1$ is a reduction, still similarity.
- 21) **Choice A is correct.** (8.G.C.9) Cylinder A: $V_A = \pi \times 16 \times 10 = 160\pi$. For equal volumes: $160\pi = \pi \times 25 \times h_B \Rightarrow h_B = \frac{160}{25} = 6.4 \text{ m}$.
- 22) **Choice A is correct.** (8.EE.B.6) Substitute: $-3 = -\frac{3}{4}(4) + b$, so $-3 = -3 + b$, thus $b = 0$.
- 23) **Choice A is correct.** (8.EE.C.7) Substitution is the definitive test: $2(3) + 5 = 11$ ✓ and $2(4) + 5 = 13 \neq 11$ ✗. Student A is correct.
- 24) **Choice A is correct.** (8.EE.C.7) Subtract 4: $x < 3$. The open circle and left-pointing ray show all numbers less than 3.
- 25) **Choice A is correct.** (8.G.B.8) Subtract $3x$ from both sides: $-2y < -3x + 6$. Divide by -2 (flip inequality): $y > \frac{3}{2}x - 3$.
- 26) **Choice D is correct.** (8.SP.A.1) The red points form one cluster, and the blue points form another. The graph therefore contains two distinct groups rather than one random set or one common linear pattern.



Scan me!
For more practice
& answers

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 deep and steady book gave you six full 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. 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! |



6 PRINTED TESTS



2 ONLINE TESTS



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