

Massachusetts

MCAS

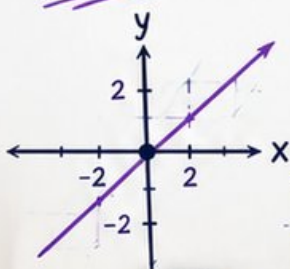
GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

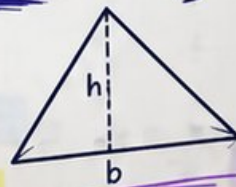
$$y = mx + b$$



**BUILD
CONFIDENCE.
SHARPEN SKILLS.
ACE YOUR
EXAM!**

Practice
Today
Succeed
Tomorrow!

$$A = \frac{1}{2}bh$$



7 PRINTED
TESTS



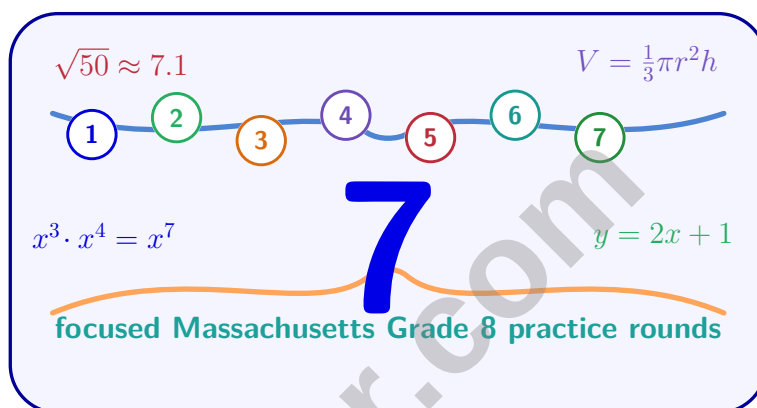
2 ONLINE
TESTS



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

7 Massachusetts MCAS Grade 8 Math Practice Tests

Seven MCAS Practice Rounds for Skills That Matter Most



Seven 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!

Seven focused rounds for sharper MCAS math thinking

This book gives you seven 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 seven-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?

Seven MCAS tests, 280 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.
Test 7	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.



Scan me!
For more practice
& answers

Table of Contents

★ Practice Test 1	_____	13
★ Practice Test 2	_____	28
★ Practice Test 3	_____	43
★ Practice Test 4	_____	59
★ Practice Test 5	_____	74
★ Practice Test 6	_____	90
★ Practice Test 7	_____	107
Practice Test Answer Keys	_____	123
Practice Test Answers and Explanations	_____	128

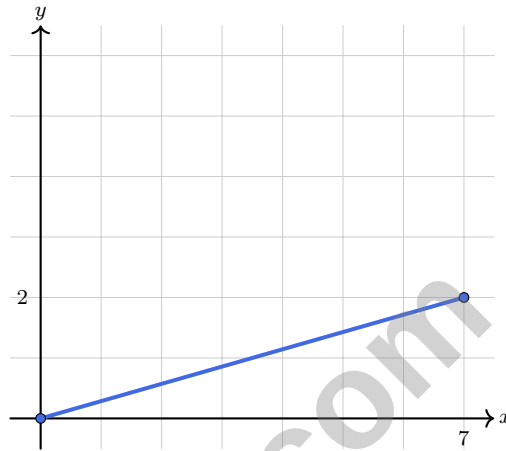
1) $(3 \times 10^{-4}) \times (6 \times 10^{-5}) \times (10^8) = ?$

☐ A. 1.8×10^{-2}

☐ C. 18×10^{-9}

☐ B. 18×10^{-2}

☐ D. 1.8×10^0



2)

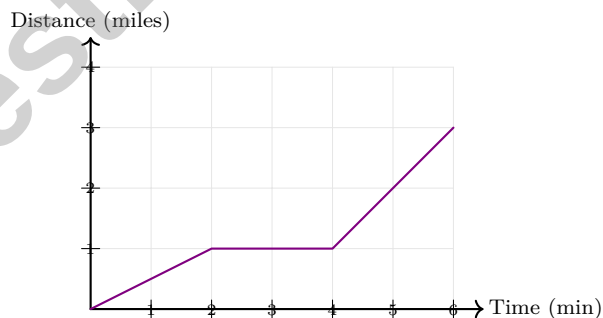
The slope is approximately:

☐ A. 3.5

☐ C. 0.29

☐ B. 0.43

☐ D. 2.86



3)

A runner travels 1 mile in 2 minutes, stops for 2 minutes, then runs 2 more miles in 2 minutes. What is the average speed over the whole journey?

☐ A. 0.75 miles/min

☐ C. 1 mile/min

☐ B. 0.5 miles/min

☐ D. 1.5 miles/min



Scan me!
For more practice
& answers

4) Which set of side lengths does NOT form a right triangle?

☐ A. 9, 12, 15

☐ C. 7, 9, 11

☐ B. 8, 6, 10

☐ D. 20, 21, 29

5) A composite wall is made of a rectangle (14 ft by 9 ft) topped by an isosceles trapezoid (parallel sides 14 ft and 10 ft, height 3 ft). What is the total area?

☐ A. 36 ft²

☐ C. 126 ft²

☐ B. 90 ft²

☐ D. 162 ft²

6) A square has area 9 cm². If the square is dilated by a scale factor of 3, what is the area of the dilated square?

☐ A. 27 cm²

☐ C. 9 cm²

☐ B. 81 cm²

☐ D. 36 cm²

7) A student's age is 4 years less than twice her brother's age. If the student is currently 14 years old, how old is her brother? Write an equation and solve.

8) A student graphs $y \geq x$ and mistakenly shades BELOW the line. What is the error?

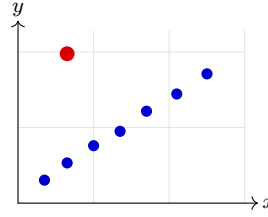
☐ A. Should have used a dashed line

☐ C. Should have shaded BELOW the line

☐ B. Should have shaded ABOVE the line

☐ D. Should have used the inequality $y < x$





9)

A scatter plot shows gas mileage (mpg) versus vehicle weight (pounds). The plot contains one point at (2500 lbs, 45 mpg) while all other points fall between (3000 lbs, 18 mpg) and (4500 lbs, 22 mpg). Which point is an outlier?

- ☐ A. The point at (3000, 18) ☐ C. The point at (4500, 22)
☐ B. The point at (2500, 45) ☐ D. All points are equally spaced

- 10) A car's fuel consumption model is $M = -0.05d + 35$, where M is miles per gallon and d is driving distance in hundreds of miles. What does the slope of -0.05 tell you?

- ☐ A. The car uses 0.05 gallons per mile ☐ C. For every 100 miles driven (1 unit of d), MPG decreases by 0.05
☐ B. The car starts with 35 gallons at $d = 0$ ☐ D. The car loses 0.05 MPG for every gallon used

- 11) A company requires workers to complete at least 100 units per day. If a worker has completed 45 units, how many more units must the worker complete?



Scan me!
For more practice
& answers

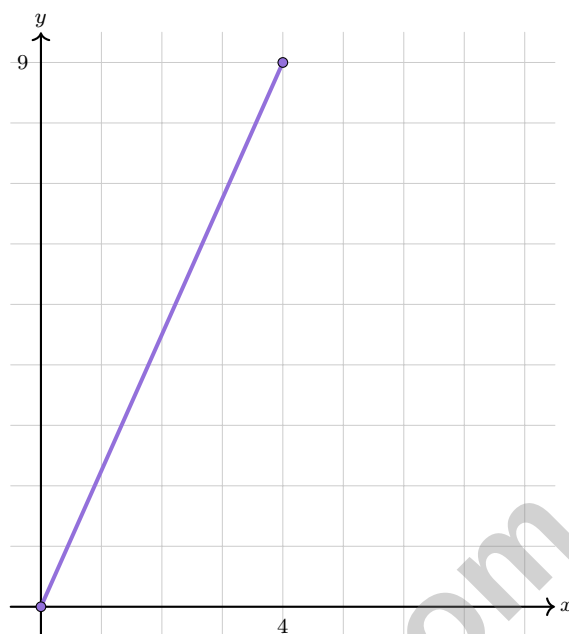
- 1) The table below shows values of function f . What is $f(2)$?

x	0	1	2	3
$f(x)$	5	7	9	11

- ☐ A. 7 ☐ C. 11
☐ B. 9 ☐ D. 5
- 2) What is the slope of a line passing through the points $(1, 2)$ and $(3, 8)$?
- ☐ A. 2 ☐ C. $\frac{1}{3}$
☐ B. -2 ☐ D. 3
- 3) A phone plan costs \$30 per month plus \$0.15 per text message. If Marcus paid \$45 last month, which equation represents the situation, where t is the number of texts?
- ☐ A. $30 + 0.15t = 45$ ☐ C. $45 + 30t = 0.15$
☐ B. $30t + 0.15 = 45$ ☐ D. $0.15t - 30 = 45$



Scan me!
For more practice
& answers



4)

The ratio $y : x$ is:☐ A. $4 : 9$ ☐ B. $0.44 : 1$ ☐ C. $1 : 2.25$ ☐ D. $9 : 4$ 5) Solve:
$$\begin{cases} 4x - 3y = 5 \\ x = 2 \end{cases}$$
☐ A. $(2, 1)$ ☐ B. $(2, -1)$ ☐ C. $(2, \frac{1}{3})$ ☐ D. $(2, 3)$ 

- 1) A graph shows medication concentration (mg) in the bloodstream versus time (hours). The line passes through (0, 50) and (8, 10).



What is the slope?

- ☐ A. -5 mg/h ☐ C. 5 mg/h
☐ B. $-\frac{1}{2}$ mg/h ☐ D. $\frac{1}{2}$ mg/h
- 2) A two-way table tracks 400 students by extracurricular activity:

	Sports	No Sports	Total
Music	120	80	200
No Music	100	100	200
Total	220	180	400

What is the marginal relative frequency for students who do sports, as a decimal?

- ☐ A. 0.27 ☐ C. 0.55
☐ B. 0.45 ☐ D. 0.73



Scan me!
For more practice
& answers

3)

Points	20	25	30	35
--------	----	----	----	----

Four games scored as shown. The mean is 27.5 points. What is the MAD?

☐ A. 4☐ C. 5.625☐ B. 5☐ D. 6.25

4) A teacher selects 4 students from 10 to form a committee (all members have equal roles, no hierarchy). A student claims there are $\binom{10}{4} = 210$ ways. Is this correct?

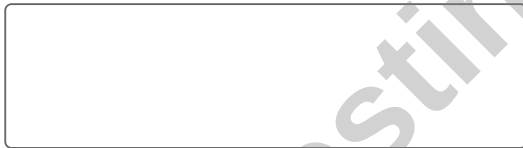
☐ A. Yes, 210 is correct (order doesn't matter, so selection is what counts).

☐ C. No, the answer is $10! = 3,628,800$.

☐ B. No, the answer is $10 \times 9 \times 8 \times 7 = 5,040$ (because we're counting arrangements).

☐ D. No, order matters because students are different people.

5) A transversal cuts two parallel lines. Three angles formed at the lower intersection are a , b , and c . If $a = 64^\circ$, find the measures of angles that are (1) vertical to a , (2) supplementary to a , and (3) alternate interior to a (on the upper line).



6) The decimal expansion of a rational number is:

☐ A. Always irrational☐ C. Always non-terminating☐ B. Cannot be written as a fraction☐ D. Either terminating or repeating

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

- Choice D is correct.** **(8.EE.A.4)** Multiply coefficients: $3 \times 6 = 18$. Add exponents: $10^{-4+(-5)+8} = 10^{-1}$. Rewrite $18 \times 10^{-1} = 1.8 \times 10^0 = 1.8$.
- Choice C is correct.** **(8.EE.B.5)** Slope = $\frac{2}{7} \approx 0.286 \approx 0.29$. This is a shallow line (slope less than 1).
- Choice B is correct.** **(8.F.B.5)** Total distance = 3 miles. Total time = 6 minutes. Average speed = $3 \div 6 = 0.5$ miles/min. The flat segment adds time but no distance.
- Choice C is correct.** **(8.G.B.6, 8.G.B.7)** Check C: $7^2 + 9^2 = 49 + 81 = 130 \neq 121 = 11^2$. All others satisfy the Pythagorean Theorem (A: 9-12-15 is 3-4-5 scaled by 3; B: 6-8-10 is 3-4-5 scaled by 2; D: 20-21-29 is a Pythagorean triple).
- Choice D is correct.** **(8.G.B.7)** Rectangle = $14 \times 9 = 126 \text{ ft}^2$. Trapezoid = $\frac{1}{2}(14 + 10) \times 3 = 36 \text{ ft}^2$. Total = $126 + 36 = 162 \text{ ft}^2$.
- Choice B is correct.** **(8.G.A.4)** Area scales by the square of the scale factor: original side is 3 cm, new side is 9 cm, new area is 81 cm^2 (or $9 \times 3^2 = 81$).
- The correct answer is 9.** **(8.EE.C.7)** Let b be the brother's age. The equation is $2b - 4 = 14$. Add 4: $2b = 18$. Divide by 2: $b = 9$.
- Choice B is correct.** **(8.G.B.8)** For $y \geq x$, the solution region is above the line. The boundary is solid because the inequality includes equality.
- Choice B is correct.** **(8.SP.A.1)** The point at (2500, 45) lies far from the main cluster of data, making it an outlier. The other points are grouped in a much lower mpg range, so this one point stands apart.
- Choice C is correct.** **(8.SP.A.3)** The slope -0.05 is the rate of change in M per unit increase in d . Since d is measured in hundreds of miles, each 100-mile interval causes MPG to drop by 0.05.
- The correct answer is 55 units.** **(8.EE.C.7)** The inequality is $45 + x \geq 100$. Subtract 45: $x \geq 55$. The worker must complete at least 55 more units.
- Choice A is correct.** **(8.EE.C)** The graph shows the lines $y = \frac{3}{5}x + 1$ (blue) and $y = -x + 5$ (red) intersecting at (2.5, 2.5).
- Choice A is correct.** **(8.EE.C.7)** FOIL: $(x - 4)(x - 3) = x^2 - 3x - 4x + 12 = x^2 - 7x + 12$.
- Choice C is correct.** **(8.F.A.3)** $y = x^4 - 3$ contains an exponent of 4, making it nonlinear. Options A, B, and D all have the form $y = mx + b$, so they are linear.
- Choice B is correct.** **(8.G.A.2)** Congruent triangles have equal corresponding angles. Regardless of which triangle is labeled first or second, the three angles must be identical: $40^\circ, 60^\circ, 80^\circ$. The order of listing doesn't matter; the angles are the same.
- Choice B is correct.** **(8.G.A.3)** Reflections preserve distance. So ℓ' has the same length as ℓ : 2 units.
- Choice B is correct.** **(8.G.A.5)** The exterior angle at C is 123° , so the interior angle $\angle ACD = 180 - 123 = 57^\circ$.
- Choice C is correct.** **(8.G.B.8)** $d = \sqrt{(13 - 1)^2 + (6 - 1)^2} = \sqrt{12^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169} = 13$. (This is a 5-12-13 Pythagorean triple.)
- The correct answer is A,B.** **(8.EE.B.6)** Options A and B both have slope 4, making them parallel. Option C has slope -4 , option D has slope $\frac{1}{4}$, and option E has slope 2, so none of these match.
- Choice A is correct.** **(8.G.B.7)** Corresponding angles are congruent. So $r = 41^\circ$.
- Choice C is correct.** **(8.G.C.9)** $V_A = \frac{1}{3} \times 16 \times 9 = 48 \text{ cm}^3$. $V_B = \frac{1}{3} \times 64 \times 18 = 384 \text{ cm}^3$. Ratio: $\frac{384}{48} = 8$. When linear scale is $2\times$, volume scales by $2^3 = 8\times$.
- Choice B is correct.** **(8.G.A.5)** An interior angle and its adjacent exterior angle are supplementary—they form a straight line and sum to 180° .
- Choice A is correct.** **(8.SP.A.4)** Joint frequency is the intersection count divided by the grand total: $\frac{63}{150} = \frac{21}{50} = 0.42$.
- Choice B is correct.** **(8.G.B.8)** Set P: MAD = $(2 + 1 + 0 + 1 + 2)/5 = 1.2$. Set Q: MAD = $(9 + 5 + 0 + 5 + 9)/5 = 5.6$. Q has much larger spread.
- Choice B is correct.** **(8.NS.A.2)** Choose from 3 math classes and 2 science classes: $3 \times 2 = 6$ possible combinations.



Hi, Thoughtful Reader!

◇ A strong Grade 8 test taker is also a strong reader. You practiced turning words, tables, graphs, and diagrams into math decisions. ◇

★ **Remember this:** That skill grows each time you slow down enough to ask what the problem is really telling you and what it is really asking for. This version gave you 7 opportunities to rehearse test-day habits. ★

Reader-to-Solver Skills

- **Circle the Ask:** Make the target visible.
- **Sort Information:** Separate useful facts from extra words.
- **Match Units:** Keep quantities connected.
- **Answer Fully:** Include the value and what it means.

Grade 8 test-day tip: After solving, reread only the final question. Make sure your answer matches it exactly.

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

Jay Daie

Your Reading-and-Math Helper

PRACTICE TODAY SUCCEED TOMORROW!

Give your child the confidence and skills they need with **7 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!

GRADE 8

Practice
Today
Succeed
Tomorrow!

Algebra

Geometry

Statistics

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! |



2 EXTRA ONLINE PRACTICE TESTS INCLUDED!

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

testinar.com/math8

BUILD CONFIDENCE. SHARPEN SKILLS. ACE YOUR EXAM!