

8

Massachusetts

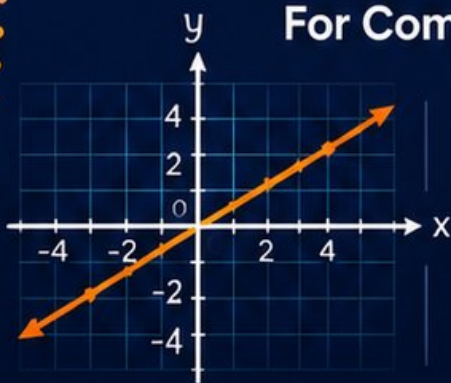
MCAS

GRADE 8

MATH

PRACTICE TESTS

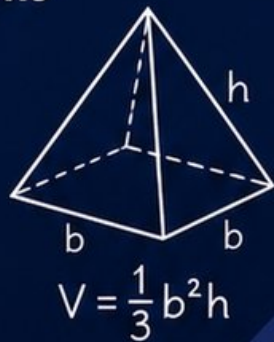
Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$

$$C = 2\pi r$$

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



8 PRINTED
TESTS



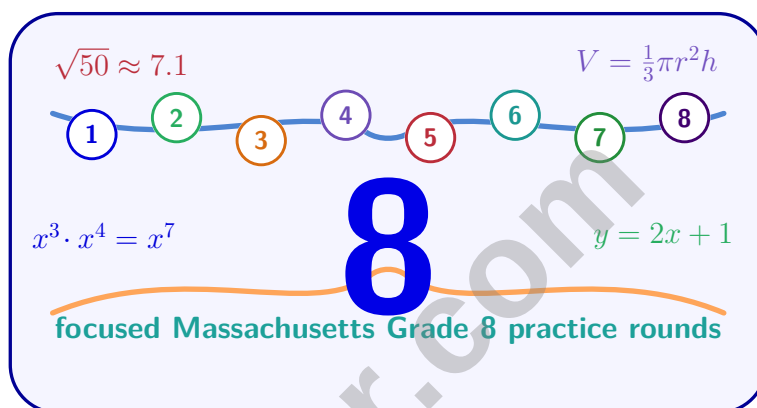
2 ONLINE
TESTS



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

8 Massachusetts MCAS Grade 8 Math Practice Tests

Massachusetts Practice for Functions, Geometry, Data, and Reasoning



Eight 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!

Eight focused rounds for sharper MCAS math thinking

This book gives you eight 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

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.

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?

Eight MCAS 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.



Scan me!
For more practice
& answers

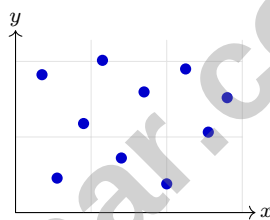
Table of Contents

★ Practice Test 1	_____	14
★ Practice Test 2	_____	28
★ Practice Test 3	_____	44
★ Practice Test 4	_____	59
★ Practice Test 5	_____	77
★ Practice Test 6	_____	95
★ Practice Test 7	_____	110
★ Practice Test 8	_____	127
Practice Test Answer Keys	_____	144
Practice Test Answers and Explanations	_____	149

1) A student claims that $x^3 \cdot x^2 = x^6$. Which statement is true?

- ☐ A. The student is correct.
- ☐ B. The student should multiply exponents: x^6 .
- ☐ C. The student should add exponents: x^5 .
- ☐ D. The answer is x^1 .

2) A rectangle has dimensions 6 units by 4 units. If the rectangle is dilated by scale factor 2.5 centered at the origin, what is the perimeter of the dilated rectangle?

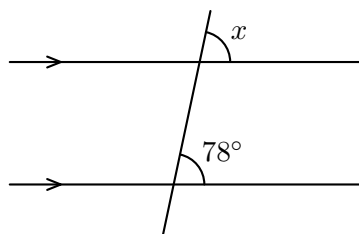


3)

A scatter plot shows no clear pattern or trend. Which line is the best fit?

- ☐ A. A line with the steepest possible slope
- ☐ B. A line that bounces between all the points randomly
- ☐ C. A vertical line
- ☐ D. A horizontal line near the mean of the y -values





4)

Two parallel lines are cut by a transversal. One angle measures 78° . What is x , the measure of the corresponding angle on the upper parallel line?

☐ A. 51° ☐ C. 102° ☐ B. 78° ☐ D. 128°

5) A square pyramid-shaped water tank has a base edge of 2 m and a height of 3 m. What is its volume in cubic meters? (If $1 \text{ m}^3 = 1000 \text{ L}$, what is the capacity in liters?)

☐ A. $4 \text{ m}^3 / 4000 \text{ L}$ ☐ C. $8 \text{ m}^3 / 8000 \text{ L}$ ☐ B. $6 \text{ m}^3 / 6000 \text{ L}$ ☐ D. $12 \text{ m}^3 / 12000 \text{ L}$

6) A polygon has an interior angle sum of 1260° . How many sides does it have?

☐ A. 9☐ C. 7☐ B. 8☐ D. 10

7) A two-way table categorizes 150 households by income level and internet access:

	Has Internet	No Internet	Total
Low Income	40	50	90
High Income	55	5	60
Total	95	55	150

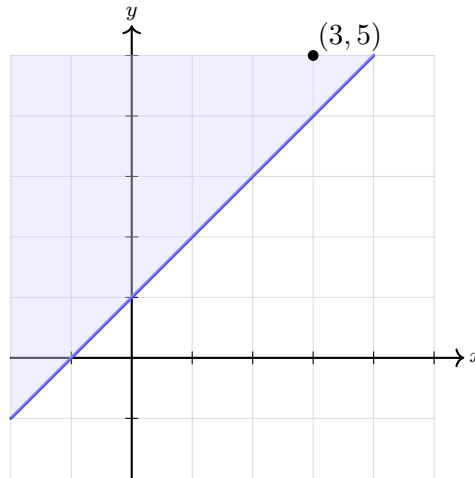
Among high-income households, what is the relative frequency of those without internet, as a decimal?

☐ A. 0.033☐ C. 0.367☐ B. 0.083☐ D. 0.917

Scan me!
For more practice
& answers

- 8) If the MAD of a data set is 0, and you add a new value equal to the current mean, what happens to the MAD?
- ☐ A. MAD becomes positive ☐ D. Cannot determine without knowing the data
- ☐ B. MAD stays 0
- ☐ C. MAD doubles
- 9) A car manufacturer offers 3 body styles, 5 paint colors, 4 interior designs, and 2 engine options. How many different car configurations are possible?
- ☐ A. $3 + 5 + 4 + 2 = 14$ ☐ C. $(3 + 5 + 4 + 2)^2 = 196$
- ☐ B. $3 \times 5 \times 4 \times 2 = 120$ ☐ D. $5^4 = 625$
- 10) If $\sqrt{x}$ is rational and x is a positive integer, what must be true about x ?
- ☐ A. x is odd ☐ C. x is prime
- ☐ B. x is greater than 10 ☐ D. x is a perfect square
- 11) What is $0.\overline{3}$ as a fraction?
- ☐ A. $\frac{1}{10}$ ☐ C. $\frac{3}{99}$
- ☐ B. $\frac{3}{10}$ ☐ D. $\frac{3}{9} = \frac{1}{3}$
- 12) To the nearest tenth, $\sqrt{35} \approx$?
- ☐ A. 5.7 ☐ C. 6.1
- ☐ B. 6.3 ☐ D. 5.9
- 13) A circular garden has radius 2 meters. Using $\pi \approx 3.14$, which is the best estimate of the circumference?
- ☐ A. 6.28 m ☐ C. 12.8 m
- ☐ B. 25.12 m ☐ D. 12.56 m





1)

The graph shows a solid line and shading above. The point $(3, 5)$ is marked in the shaded region. Which inequality is represented?

☐ A. $y > x + 1$

☐ C. $y < x + 1$

☐ B. $y \geq x + 1$

☐ D. $y \leq x + 1$

2) Which statement best explains why the table represents a linear function?

x	-2	-1	0	1
y	-5	-2	1	4

☐ A. The first differences are constant

☐ C. The y -values are all positive

(3)

☐ D. It is nonlinear because x includes negative values

☐ B. The equation is $y = x + 3$
3) Factor $x^2 - 25$.

☐ A. $(x - 5)^2$

☐ C. $(x + 5)(x - 5)$

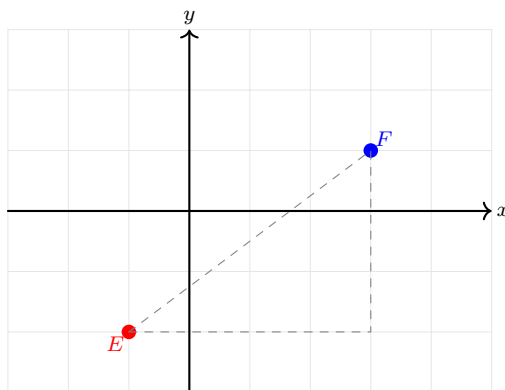
☐ B. $(x + 5)^2$

☐ D. $(x - 25)(x + 1)$



Scan me!
For more practice
& answers

- 4) Points $E = (-1, -2)$ and $F = (3, 1)$ are plotted on a coordinate grid. Calculate the distance between them.



- ☐ A. 5
☐ B. 7

- ☐ C. $\sqrt{26}$
☐ D. 3



1) A coach recorded sprint times (in seconds): $\{8, 8, 8, 9, 10\}$. Mean = 8.6 seconds. What is the MAD?

☐ A. 0.4

☐ C. 0.6

☐ B. 0.72

☐ D. 1.2

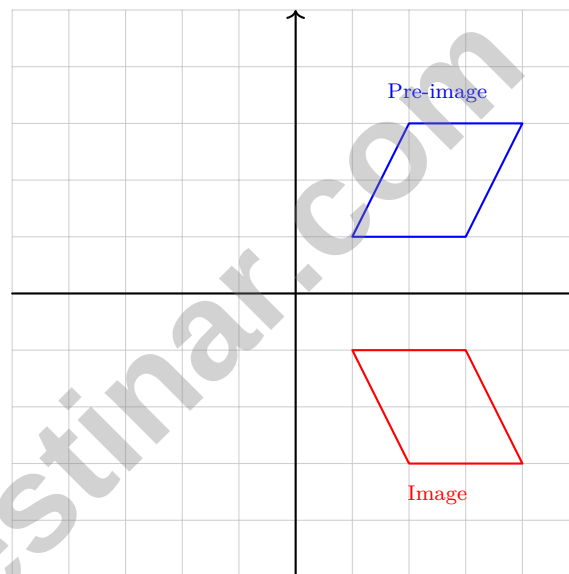
2) For a dashed boundary line, the inequality must use which symbol(s)?

☐ A. $\leq$ only

☐ C. $<$ or $>$

☐ B. $\geq$ only

☐ D. $\leq$ or $\geq$



3)

The figure shows a transformation. If this is a reflection across the x -axis, which vertex of the pre-image corresponds to the vertex at $(3, -1)$ in the image?

☐ A. $(1, 1)$

☐ C. $(4, 3)$

☐ B. $(3, 1)$

☐ D. $(2, 3)$



Scan me!
For more practice
& answers

4) A scientist measures a cell with diameter 5.3×10^{-6} mm. Convert this to standard form.

☐ A. 5,300 mm

☐ B. 0.0053 mm

☐ C. 5.3 mm

☐ D. 0.0000053 mm

5) What is $\frac{3.6 \times 10^6}{1.2 \times 10^2}$?

☐ A. 3×10^8

☐ B. 2.4×10^4

☐ C. 0.3×10^4

☐ D. 3×10^4

6) Solve for x : $-5x + 12 = -2x - 6$

☐ A. $x = -6$

☐ B. $x = 2$

☐ C. $x = -2$

☐ D. $x = 6$

7) Which equation is NONLINEAR?

☐ A. $y = 100 - 5x$

☐ B. $y = \frac{1}{4}x$

☐ C. $y = \frac{1}{x^2}$

☐ D. $y = 8x$



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.

Testinar.com



Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice C is correct.** (8.EE.A.1) Product rule: add exponents. $x^3 \cdot x^2 = x^{3+2} = x^5$, not x^6 (which is the error of multiplying exponents).
- 2) **The correct answer is 50.** (8.G.A.3) Original perimeter: $2(6 + 4) = 20$. Dilated perimeter: $20 \times 2.5 = 50$.
- 3) **Choice D is correct.** (8.SP.A.2) When there is no clear trend (no correlation), data appears randomly scattered. The best fit is a horizontal line at the average y -value, since no slope can be meaningfully determined.
- 4) **Choice B is correct.** (8.G.B.7) Corresponding angles are congruent when a transversal cuts parallel lines. So $x = 78^\circ$.
- 5) **Choice A is correct.** (8.G.C.9) $V = \frac{1}{3} \times (2 \times 2) \times 3 = \frac{1}{3} \times 4 \times 3 = 4 \text{ m}^3 = 4000 \text{ L}$.
- 6) **Choice A is correct.** (8.G.A.5) Set $(n - 2) \times 180 = 1260$. Then $n - 2 = 7$, so $n = 9$ (a nonagon).
- 7) **Choice B is correct.** (8.SP.A.4) Among high-income households (total 60), those without internet = 5. Relative frequency = $\frac{5}{60} \approx 0.083$.
- 8) **Choice B is correct.** (8.G.B.8) Original data has MAD = 0 (all identical). Adding a value equal to the mean keeps all deviations at 0. New MAD = 0.
- 9) **Choice B is correct.** (8.NS.A.2) Multiply independent choices: 3 styles $\times$ 5 colors $\times$ 4 designs $\times$ 2 engines = 120 configurations.
- 10) **Choice D is correct.** (8.NS.A.1) For $\sqrt{x}$ to be rational when x is a positive integer, x must be a perfect square (like 1, 4, 9, 16, 25, etc.). Non-perfect squares have irrational square roots.
- 11) **Choice D is correct.** (8.NS.A.1) Let $x = 0.\bar{3}$. Then $10x = 3.\bar{3}$. Subtracting: $9x = 3$, so $x = \frac{3}{9} = \frac{1}{3}$.
- 12) **Choice D is correct.** (8.NS.A.2) $5.9^2 = 34.81$ and $6^2 = 36$. Since 35 is closer to 34.81 than to 36, $\sqrt{35} \approx 5.9$.
- 13) **Choice D is correct.** (8.NS.A.2) Circumference = $2\pi r = 2 \times 3.14 \times 2 = 12.56 \text{ m}$.
- 14) **The correct answer is 12.** (8.G.B.8) $13^2 = 5^2 + b^2$, so $169 = 25 + b^2$. Thus $b^2 = 144$ and $b = 12$ units.
- 15) **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.
- 16) **Choice D is correct.** (8.EE.C.7) Subtract 8: $-3x \geq -6$. Divide by -3 (FLIP): $x \leq 2$.
- 17) **Choice D is correct.** (8.G.B.7) Remaining = $\$3,000 - (\$900 + \$400 + \$300 + \$200) = \$3,000 - \$1,800 = \$1,200$.
- 18) **Choice D is correct.** (8.EE.A.3) Move the decimal 2 places left: $8.2 \times 10^{-2} = 0.082$.
- 19) **The correct answer is B, C.** (8.EE.C.7) $(x + 6)^2 = (x + 6)(x + 6) = x^2 + 12x + 36$. Choice B is the expanded form, and choice C is the factored form. Choice A ignores the middle term. Choice D has an error. Choice E is a different factorization that does not equal $(x + 6)^2$.
- 20) **Choice B is correct.** (8.EE.A.4) Scientific notation requires the coefficient to be in the range $[1, 10)$. In choice B, $10.2 \geq 10$, so it is not in standard form. It should be 1.02×10^5 .
- 21) **Choice A is correct.** (8.EE.C.7) Subtract $2x$ and 7: $2x = 12$. Divide by 2: $x = 6$.
- 22) **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.
- 23) **Choice D is correct.** (8.EE.A.2) $125 = 5^3$. The other options are not perfect cubes.
- 24) **Choice A is correct.** (8.EE.B.5) For $y = 2x$: at $x = 1$, $y = 2(1) = 2$. Only choice A gives the correct point.
- 25) **Choice A is correct.** (8.EE.C) Set the expressions for y equal: $x + 2 = 2x - 1$, so $x = 3$. Then $y = 3 + 2 = 5$. Solution: $(3, 5)$.
- 26) **Choice C is correct.** (8.F.A.1) For each time of day, there is exactly one temperature reading. Options A, B, and D can give more than one output for the same input.
- 27) **Choice A is correct.** (8.F.A.2) Slope of r : $(7 - 3)/(3 - 1) = 4/2 = 2$. Slope of s : 1. Since $2 > 1$, r increases faster.
- 28) **Choice A is correct.** (8.F.B.4) Slope: $m = \frac{18 - 9}{5 - 2} = \frac{9}{3} = 3$. Using point $(2, 9)$: $9 = 3(2) + b \Rightarrow b = 3$. So $y = 3x + 3$.
- 29) **Choice B is correct.** (8.G.B.6, 8.G.B.7) The 3-4-5 triple scaled by 10 is 30-40-50. The diagonal $d^2 = 30^2 + 40^2 = 900 + 1600 = 2500$, so $d = 50 \text{ m}$.



Scan me!
For more practice
& answers

Hi, Number Sense Builder!

◇ Grade 8 mathematics connects numbers, algebra, geometry, and data. It helps you model linear change, compare functions, estimate irrational values, measure distance, and explain patterns. ◇

★ **Remember this:** You practiced listening to that story. When the answer makes sense in the situation, your math becomes much stronger. This version gave you 8 opportunities to rehearse test-day habits. ★

Number Sense Checks

- **Too Big?:** Compare with an estimate.
- **Too Small?:** Use the context to judge.
- **Right Sign?:** Positive and negative values matter.
- **Right Unit?:** A number needs meaning.

Grade 8 test-day tip: Before choosing an answer, ask whether it fits the story of the problem.

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

Jay Daie

Your Number-Sense Friend

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.

testinar.com/math8

PRACTICE. PREPARE. SUCCEED.



Testinar

More Practice. More Confidence.
Better Results.