

10

Massachusetts

MCAS

GRADE

8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

10

PRINTED
TESTS



2

ONLINE
TESTS



Build Confidence



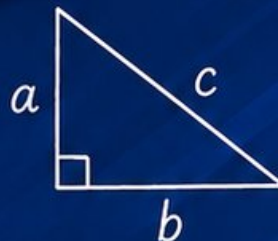
Master Key Math Skills



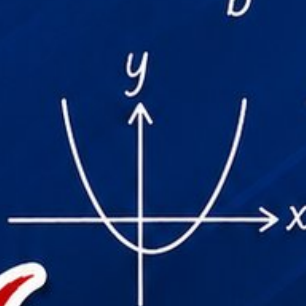
Answer Explanations for
Every Question



Test-Taking Strategies
That Work



$$y = mx + b$$



$$3x - 7 = 2(x + 5)$$
$$x = 17$$

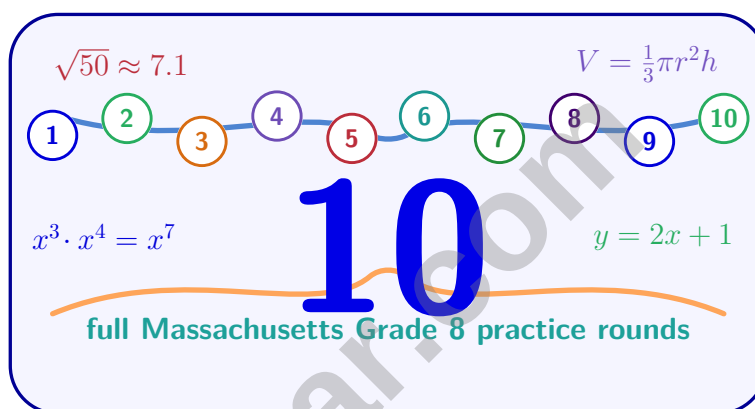


USE THESE TWO
**ADDITIONAL ONLINE
PRACTICE TESTS**

FOR EXTRA REVIEW AFTER
THE PRINTED TESTS
IN THIS BOOK.

10 Massachusetts MCAS Grade 8 Math Practice Tests

Massachusetts Grade 8 MCAS Practice for precise practice across linear reasoning, expressions, equations, geometry, data, and probability



Ten complete 40-question Grade 8 MCAS practice rounds with linear relationships, scientific notation, real numbers, equations, functions, geometry, data analysis, probability, answer keys, and clear explanations for every item.

Jay Daie and Reza Nazari



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Welcome, Massachusetts Grade 8 Problem Solver!

Ten focused rounds for sharper Massachusetts MCAS math thinking

This book gives you ten full Grade 8 MCAS math practice tests. Each round is built to help you notice structure, compare quantities, use linear reasoning, handle real numbers, and explain your thinking with care.

Grade 8 standards focus: This page supports **Square Roots and Cube Roots** (8.EE.A.2): Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational.... A second useful connection is **Graphing Proportional Relationships** (8.EE.B.5): Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

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 ten-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 a proportion, equation, diagram, number line, 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.

Grade 8 standards focus: Keep the routine connected to **Graphing Proportional Relationships** (8.EE.B.5): Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. It also prepares you for **Solving Real Problems with Systems** (8.G.C): Solve real-world and mathematical problems leading to two linear equations in two variables.

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?

Ten Massachusetts MCAS tests, 400 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Linear relationships, integer exponents, scientific notation, real-number reasoning, and careful reading.
Tests 4–6	Expressions, equations, inequalities, transformations, geometry, and multi-step problem solving.
Tests 7–9	Data analysis, probability, mixed review, stamina, and choosing efficient strategies.
Test 10	A final Massachusetts round to show growth across the whole book.
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.

Grade 8 standards focus: Use these habits while practicing **Solving Linear Equations in One Variable** (8.EE.C.7): Solve linear equations in one variable, including equations with one solution, infinitely many solutions, or no solutions. Another recurring target is **Building Linear Functions** (8.F.B.4): Construct a function to model a linear relationship between two quantities. Determine rate of change and initial value from a description, table, or graph.



Scan me!
For more practice
& answers

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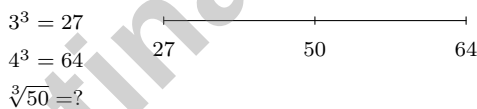
★ Practice Test 1	_____	14
★ Practice Test 2	_____	30
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- 1) A two-way table with 280 people:

	Owens Phone	No Phone	Total
Age 13–17	175	21	196
Age 18+	78	6	84
Total	253	27	280

Among those who own a phone, what is the relative frequency for ages 13–17, rounded to the nearest hundredth?

- ☐ A. 0.62 ☐ C. 0.78
☐ B. 0.69 ☐ D. 0.89
- 2) Simplify $\frac{(k^2)^3 \cdot k^{-1}}{k^5}$.
- ☐ A. k^{-5} ☐ C. k^{10}
☐ B. k^2 ☐ D. $k^0 = 1$
- 3) Between which two consecutive integers does $\sqrt[3]{50}$ lie?



- ☐ A. 2 and 3 ☐ C. 4 and 5
☐ B. 5 and 6 ☐ D. 3 and 4
- 4) A bacterium is 9×10^{-6} meters long. A virus is 3×10^{-8} meters long. The bacterium is how many times longer?
- ☐ A. 3×10^3 ☐ C. 3×10^2
☐ B. 3×10^{-2} ☐ D. 6×10^{-6}



5) For what value of c does the system $\begin{cases} y = 2x + 3 \\ y = 2x + c \end{cases}$ have no solution?

☐ A. $c = 3$ only

☐ C. Any $c \neq 3$

☐ B. $c = 0$ only

☐ D. c can be any value

6) A student has 45 points and earns 5 points per quiz. How many quizzes are needed to reach at least 70 points?

7) A student claims that $10x + 25$ factors as $5(2x + 5)$. Is this completely factored?

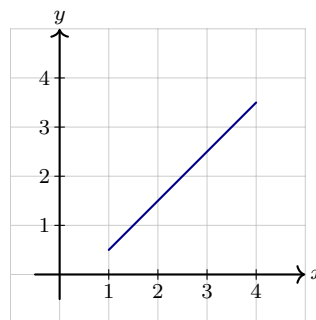
☐ A. Yes, this is the complete factorization.

☐ C. No; $2x + 5$ can be factored further.

☐ B. No; the GCF should be 10.

☐ D. No; a factor of 5 can still be removed.

8) Which graph BEST represents a linear function?



☐ A. The curved path

☐ C. Only if it starts at origin

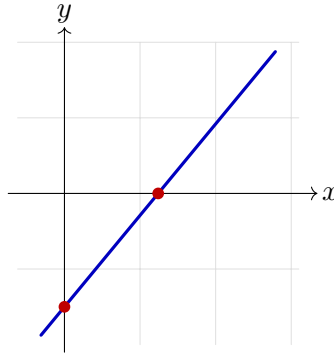
☐ B. The straight line shown

☐ D. The slopes of individual segments

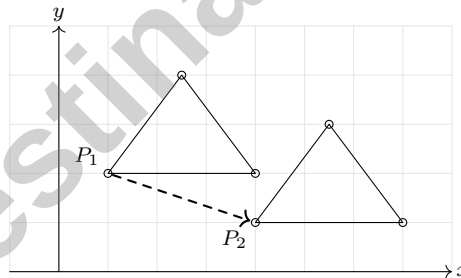


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- 9) A function has a y -intercept of -3 and an x -intercept of 2 . On the graph, these appear at which points?



- ☐ A. $(0, -3)$ and $(2, 0)$
- ☐ B. $(-3, 0)$ and $(0, 2)$
- ☐ C. $(0, 2)$ and $(-3, 0)$
- ☐ D. $(2, 0)$ and $(0, 0)$
- 10) Two congruent polygons are positioned on a coordinate grid. Polygon 1 has vertices at $(1, 2)$, $(4, 2)$, and $(2.5, 4)$. Polygon 2 is translated 3 units right and 1 unit down. Which set of coordinates represents Polygon 2?



- ☐ A. $(1, 2)$, $(4, 2)$, $(2.5, 4)$
- ☐ B. $(2, 3)$, $(5, 3)$, $(3.5, 5)$
- ☐ C. $(4, 1)$, $(7, 1)$, $(5.5, 3)$
- ☐ D. $(0, 3)$, $(3, 3)$, $(1.5, 5)$



1) Which is a rational number?

☐ A. $\sqrt{11}$

☐ B. $\sqrt{20}$

☐ C. $\sqrt{49}$

☐ D. $\sqrt{23}$

2) A student plots study time versus test performance and finds that the regression line is nearly horizontal with a slope near zero. What does this suggest?

☐ A. Study time strongly predicts test performance☐ B. There is little or no linear relationship between study time and test score☐ C. Test performance decreases with study time☐ D. The data contains no measurement error

3) A figure is dilated by a scale factor of 3. How does the length of each side change?

☐ A. Divided by 3☐ B. Multiplied by 3☐ C. Unchanged☐ D. Increased by 3 inches

4) If $g(x) = 5x - 3$ and $g(x) = 12$, what is x ?

☐ A. 3☐ B. 2☐ C. 4☐ D. 15

5) The number $\sqrt[3]{8}$ (cube root of 8) is:

☐ A. Irrational☐ B. Between 8 and 16☐ C. 2.67☐ D. 2, which is rational

6) Which expression is larger: $\sqrt{5} + \sqrt{6}$ or 4.8?

☐ A. $\sqrt{5} + \sqrt{6}$ is larger

☐ B. Cannot be determined

☐ C. They are equal

☐ D. 4.8 is larger

7) Write 0.000284 in scientific notation.

☐ A. 2.84×10^4

☐ B. 2.84×10^{-3}

☐ C. 28.4×10^{-5}

☐ D. 2.84×10^{-4}

8) A chemist combines a 25% salt solution with an 80% salt solution to make 100 mL of a 50% solution. How many mL of the 25% solution are used?

9) A line passes through the points (2, 5) and (6, 17). Find the slope of the line.

10) Triangle PQR is dilated by scale factor $\frac{1}{4}$ about the origin. If the area of triangle PQR is 96 square units, what is the area of the dilated triangle?



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- 1) A transformation maps the point $(3, 5)$ to $(-3, -5)$. Which of the following best describes this transformation?

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

- 2) What two positive integers multiply to 12 and add to 7?

- 3) What are the domain and range of the relation $\{(-2, 0), (0, 4), (2, 0), (4, 4)\}$?

- ☐ A. Domain: $\{-2, 2\}$; Range: $\{0\}$ ☐ C. Domain: $\{0, 4\}$; Range: $\{0, 4\}$
☐ B. Domain: $\{-2, 0, 2, 4\}$; Range: $\{-2, 0, 2, 4\}$
☐ D. Domain: $\{-2, 0, 2\}$; Range: $\{4\}$

- 4) Function f is given by $f(x) = 4x + 1$. Function g is given by the table: $g(0) = 2$, $g(1) = 5$, $g(2) = 8$. Which function has the greater rate of change?

x	0	1	2
$g(x)$	2	5	8

- ☐ A. $f(x)$ ☐ C. Both are equal
☐ B. $g(x)$ ☐ D. Cannot be determined

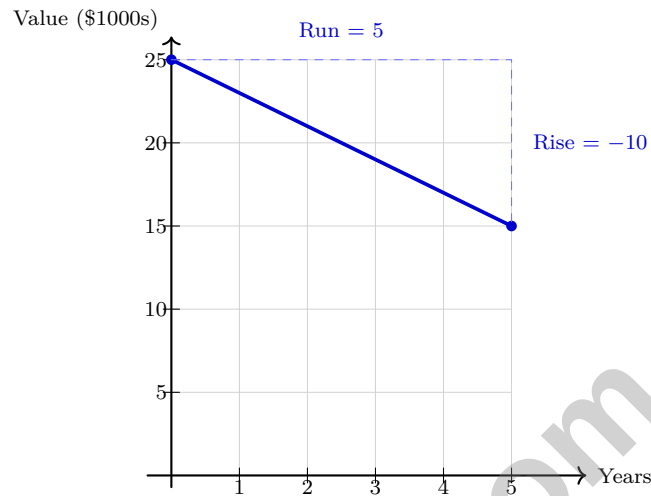
- 5) A music streaming service charges \$8 for premium features plus \$12 per month for access. Which equation represents the total cost T for m months of service?

- ☐ A. $T = 12m + 8$ ☐ C. $T = 20m$
☐ B. $T = 8m + 12$ ☐ D. $T = 8m - 12$



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- 6) A graph shows the value of a car (in \$1000s) depreciating over years. The line passes through $(0, 25)$ and $(5, 15)$.



- ☐ A. -\$2000 per year ☐ C. \$2000 per year
☐ B. -\$1000 per year ☐ D. 5 years per \$1000
- 7) Sarah is 5 years older than Tom. In 5 years, the sum of their ages will be 45. How old is Tom now?

- ☐ A. 12 ☐ C. 15
☐ B. 18 ☐ D. 20



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.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice B is correct.** (8.SP.A.4) This is a column-conditional frequency. Among phone owners (253 total), ages 13–17 number 175. Relative frequency: $\frac{175}{253} \approx 0.69$.
- 2) **Choice D is correct.** (8.EE.A.1) $(k^2)^3 = k^6$; then $k^6 \cdot k^{-1} = k^5$; then $\frac{k^5}{k^5} = k^0 = 1$.
- 3) **Choice D is correct.** (8.EE.A.2) $3^3 = 27$ and $4^3 = 64$. Since $27 < 50 < 64$, we have $3 < \sqrt[3]{50} < 4$.
- 4) **Choice C is correct.** (8.EE.A.4) Divide: $\frac{9 \times 10^{-6}}{3 \times 10^{-8}} = \frac{9}{3} \times 10^{-6-(-8)} = 3 \times 10^2$.
- 5) **Choice C is correct.** (8.EE.C) Both equations have slope 2. If $c \neq 3$, the lines are parallel and have no solution. If $c = 3$, the equations are identical and there are infinitely many solutions.
- 6) **The correct answer is 5.** (8.EE.C.7) Solve $45 + 5q \geq 70$, giving $q \geq 5$. The minimum whole number is 5.
- 7) **Choice A is correct.** (8.EE.C.7) GCF of $10x$ and 25 is 5 , so $10x + 25 = 5(2x + 5)$ is completely factored (since $2x + 5$ is linear and cannot be factored further).
- 8) **Choice B is correct.** (8.F.A.3) Linear functions are represented by straight lines. The graph clearly shows a straight line, confirming a linear relationship.
- 9) **Choice A is correct.** (8.F.B.5) A y -intercept occurs where $x = 0$, giving point $(0, -3)$. An x -intercept occurs where $y = 0$, giving point $(2, 0)$.
- 10) **Choice C is correct.** (8.G.A.2) Add 3 to each x -coordinate and subtract 1 from each y -coordinate: $(1+3, 2-1) = (4, 1)$, $(4+3, 2-1) = (7, 1)$, $(2.5+3, 4-1) = (5.5, 3)$.
- 11) **Choice C is correct.** (8.G.A.5) Let the angles be $2x$, $3x$, and $4x$. Sum: $2x + 3x + 4x = 180$, so $9x = 180$ and $x = 20^\circ$. Smallest angle: $2x = 40^\circ$.
- 12) **Choice A is correct.** (8.G.B.8) $d = \sqrt{(1 - (-2))^2 + (7 - 3)^2} = \sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5$.
- 13) **Choice A is correct.** (8.G.B.7) Angles on a straight line sum to 180° . So $z = 180 - 38 - 71 = 71^\circ$.
- 14) **Choice C is correct.** (8.G.C.9) $V = \frac{1}{3} \times B \times h \Rightarrow 500 = \frac{1}{3} \times 100 \times h \Rightarrow h = 15$ m.
- 15) **Choice B is correct.** (8.G.B.7) Perimeter $= 8 + 5 + 5 + \pi \times 4 = 18 + 12.56 = 30.56$ m. The top edge is not counted because the semicircle is attached there.
- 16) **Choice A is correct.** (8.G.A.5) The sum of angles in a pentagon is 540° . So $\angle E = 540 - 100 - 120 - 110 - 130 = 80^\circ$.
- 17) **Choice A is correct.** (8.SP.A.1) Random scatter with no visible trend or pattern indicates no correlation between the two variables.
- 18) **Choice C is correct.** (8.SP.A.3) When $w = 0$, $P = -800$, meaning there is a \$800 loss with no sales. This represents fixed costs or initial loss.
- 19) **The correct answer is B,E.** (8.G.B.7) There are 10 marbles total. B is true because $P(\text{blue}) = \frac{3}{10}$. E is true because $P(\text{red or blue}) = \frac{5+3}{10} = \frac{8}{10} = \frac{4}{5}$. A is false because $P(\text{red}) = \frac{1}{2}$. C is false because $P(\text{green}) = \frac{1}{5}$. D is false because $P(\text{yellow}) = 0$.
- 20) **Choice B is correct.** (8.G.B.8) Mean = 10. Deviations: $|7 - 10| = 3$, $|9 - 10| = 1$, $|11 - 10| = 1$, $|13 - 10| = 3$. Sum = 8. MAD = $8/4 = 2$.
- 21) **The correct answer is 0.** (8.G.B.8) Substitute $(0, 0)$: $0 + 3(0) = 0$.
- 22) **The correct answer is 4.** (8.G.A.1) Reflections preserve side lengths. The reflected side has the same length as the original, which is 4 units.
- 23) **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.
- 24) **The correct answer is 6.** (8.G.C.9) From $V = \frac{4}{3}\pi r^3$: $904.32 = \frac{4}{3} \times 3.14 \times r^3 \Rightarrow r^3 = 216 \Rightarrow r = 6$ cm.
- 25) **Choice A is correct.** (8.F.A.1) Each vertical line at $x = a$ represents all points with that x -coordinate. If the line intersects the graph more than once, the input a has multiple outputs, violating the function definition.
- 26) **Choice B is correct.** (8.F.A.2) X at day 0: 10 cm. Y at day 0: 15 cm. Since $15 > 10$, Y started taller.



Hi, Grade 8 Math Star!

◇ You finished this practice set with real effort. Grade 8 math asks you to connect ideas, explain your thinking, and stay steady through multi-step problems. ◇

★ **Remember this:** Every page you completed helped build stronger habits: reading carefully, choosing a method, showing work, and checking whether the answer makes sense. You practiced across 10 full Grade 8 practice tests, and that repeated effort matters. ★

What You Built

- **Focus:** You stayed with challenging questions.
- **Accuracy:** You learned to slow down when details matter.
- **Reasoning:** You practiced explaining why a method works.
- **Readiness:** You are more prepared than when you started.

Grade 8 test-day tip: Before test day, review the questions that made you pause. Those are the best teachers.

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. SUCCEED TOMORROW!

This book includes **10** full-length Math practice tests and **2** online tests to help Grade 8 students build confidence, strengthen skills, and excel on standardized assessments.

Each practice test is carefully crafted to reflect the latest standards and includes a variety of question types, realistic test conditions, and detailed answer explanations.

Perfect for classroom use, homework, test preparation, and extra practice at home.



THIS BOOK INCLUDES:

10

Full-Length
Printed Tests

2

Online
Practice Tests



Detailed Answers
& Explanations



MORE PRACTICE. GREATER RESULTS.

Give your child the tools to build strong math skills, confidence, and a positive attitude toward learning.

WHAT YOU'LL GAIN



Build Confidence

Practice regularly to feel prepared and test-ready.



Master Key Skills

Develop strong math skills and problem solving abilities.



Improve Understanding

Learn with clear explanations and step-by-step solutions.



Test Strategies

Learn proven strategies to approach every question with confidence.



Boost Performance

Apply your knowledge and achieve your best score!

TOPICS COVERED

- ✓ The Number System
- ✓ Expressions & Equations
- ✓ Inequalities
- ✓ Functions
- ✓ Geometry
- ✓ Ratios & Proportions
- ✓ Statistics & Probability
- ✓ Data Analysis
- ✓ Measurement
- ✓ Pythagorean Theorem
- ✓ Surface Area & Volume
- ✓ And More!



2 ONLINE TESTS

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



2 EXTRA ONLINE TEST ACCESS CODE IS INSIDE THE BOOK!

Don't lose it—your extra practice and success start here!



PRACTICE
REGULARLY



STAY
FOCUSED



SOLVE
CONFIDENTLY



SUCCEED
BRIGHTLY