

3

Massachusetts

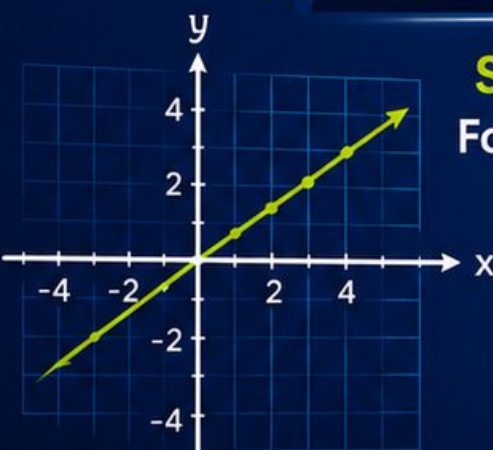
MCAS

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$V = s^3$$



$$y = mx + b$$
$$2x + 5 = 13$$
$$x = 4$$



3 PRINTED TESTS



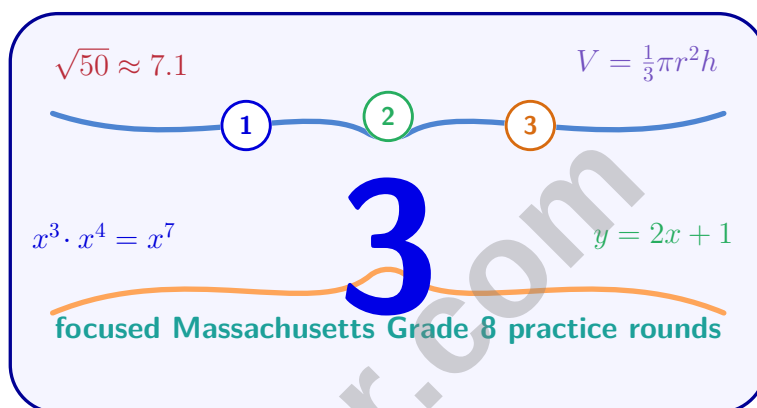
2 ONLINE TESTS



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

3 Massachusetts MCAS Grade 8 Math Practice Tests

Three Grade 8 MCAS Rounds for Confident Review



Three 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



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Welcome, Massachusetts Grade 8 Problem Solver!

Three focused rounds for sharper MCAS math thinking

This book gives you three 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 three-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?

Three MCAS tests, 120 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Test 3	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.

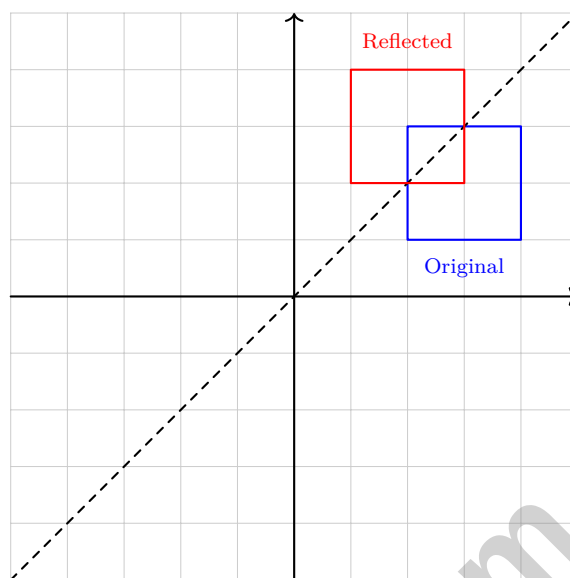


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Table of Contents



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1)

The blue rectangle is reflected across the dashed line. Which line of reflection is shown?

☐ A. $y = x$

☐ C. $y = x - 3$

☐ B. $y = -x$

☐ D. $y = 2x$

2) Express 356,000 in scientific notation.

3) A triangular prism has an isosceles triangular base with base 8 cm and two equal sides of 5 cm each. The height of the triangle is 3 cm. The prism length is 6 cm. What is the total surface area?

☐ A. 96 cm^2

☐ C. 132 cm^2

☐ B. 108 cm^2

☐ D. 156 cm^2



4) The line $y = mx + b$ has slope $\frac{2}{3}$ and passes through $(3, 6)$. What is b ?

☐ A. 4

☐ C. 6

☐ B. 2

☐ D. $\frac{2}{3}$

5) When solving $2(3x + 1) = 20$, which step comes **first** after distributing?

☐ A. Divide both sides by 3

☐ C. Add 1 to both sides

☐ B. Multiply both sides by 2

☐ D. Subtract 2 from both sides

6) Solve: $\frac{x-2}{5} \leq 3$

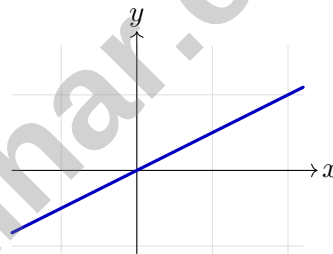
☐ A. $x \leq 13$

☐ C. $x \leq 17$

☐ B. $x \geq 13$

☐ D. $x \geq 17$

7) Graph $y \geq \frac{1}{2}x$. Which region should be shaded?



☐ A. Below the line only

☐ C. Above and on the line

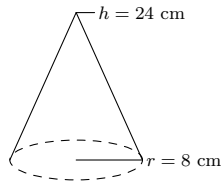
☐ B. Above the line only

☐ D. Below and on the line

8) Convert $0.\overline{3}$ to a fraction.



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9)

A traffic cone used at a construction site has a radius of 8 cm and height of 24 cm. What is its volume? (Use $\pi \approx 3.14$.)

☐ A. 602.88 cm^3

☐ C. 1808.64 cm^3

☐ B. 1605.12 cm^3

☐ D. 4823.04 cm^3

- 10) A mobile phone plan charges $M = 40 + 0.25x$, where M is monthly cost and x is gigabytes of data used. What does the slope tell you?

☐ A. The cost per gigabyte of data

☐ C. The maximum cost possible

☐ B. The fixed monthly charge

☐ D. The number of gigabytes included

- 11) A college savings plan earns 7% compound interest annually. If \$5,000 is invested for 10 years, approximately how much will be accumulated?

☐ A. \$8,500

☐ C. \$11,500

☐ B. \$13,800

☐ D. \$9,835

- 12) What is 10^{-2} ?

☐ A. 100

☐ C. 0.01

☐ B. -100

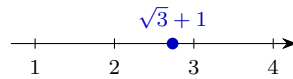
☐ D. -0.01



- 1) A student reads 25 pages of a book per day. How many days to read 200 pages?
(Proportional relationship.)

- ☐ A. 5 days ☐ C. 7 days
☐ B. 6 days ☐ D. 8 days

- 2) On a number line, where would $\sqrt{3} + 1$ fall?



- ☐ A. Between 1 and 2 ☐ C. Between 3 and 4
☐ B. Greater than 4 ☐ D. Between 2 and 3

- 3) Which of the following equals 3.8×10^2 ?

- ☐ A. 38 ☐ C. 3,800
☐ B. 38,000 ☐ D. 380

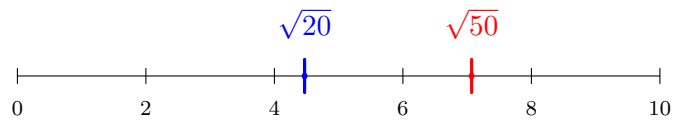
- 4) Convert $0.\overline{142857}$ (6-digit repeat) to a fraction.

- ☐ A. $\frac{1}{6}$ ☐ C. $\frac{142857}{99999}$
☐ B. $\frac{142857}{100000}$ ☐ D. $\frac{142857}{99999} = \frac{1}{7}$

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



6)



Based on the number line, which statement is true?

- ☐ A. Cannot determine
 ☐ C. They are equal
- ☐ B. $\sqrt{50} < \sqrt{20}$
☐ D. $\sqrt{20} < \sqrt{50}$
- 7) A rectangular prism has length $\frac{3}{2}$ ft, width 1 ft, and height $\frac{1}{2}$ ft. What is its surface area?
- ☐ A. $\frac{11}{4}$ ft²
☐ C. 7 ft²
- ☐ B. $\frac{11}{2}$ ft²
☐ D. $\frac{15}{2}$ ft²
- 8) A parallelogram has a base of 8 inches and a slant side of 6 inches. After a reflection, what are the dimensions of the reflected parallelogram?
- ☐ A. 4 inches and 3 inches
 ☐ C. 12 inches and 9 inches
- ☐ B. 8 inches and 6 inches
 ☐ D. 16 inches and 12 inches



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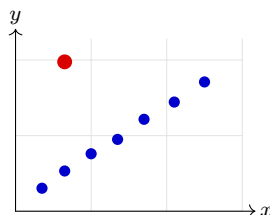
1) A reasonable decimal approximation for $\sqrt{21}$ is closest to?

☐ A. 4

☐ C. 5

☐ B. 5.5

☐ D. 4.5



2)

A scatter plot shows the time spent studying versus quiz grade. One point is far below the trend line, which could indicate:

☐ A. The trend line is incorrect

☐ C. Studying does not affect quiz grades

☐ B. That student may have been unprepared despite studying, or the data was recorded incorrectly

☐ D. The student did not study enough

3) The sum of two people's ages is 35. In 5 years, the older person will be twice the age of the younger person. If the younger person is currently y years old, find y .

4) A triangle has area 36 cm^2 . If the triangle is dilated by a scale factor of $\frac{2}{3}$, what is the area of the dilated triangle?

☐ A. 16 cm^2

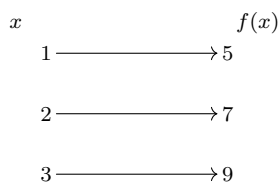
☐ C. 36 cm^2

☐ B. 24 cm^2

☐ D. 54 cm^2



5) The mapping diagram shows function f . What is $f(2)$?


☐ A. 5

☐ C. 9

☐ B. 7

☐ D. 2

6) What is $\sqrt{121}$?

☐ A. 10

☐ C. 12

☐ B. Irrational

☐ D. 11

7) Which is the best estimate of $3\sqrt{5}$?

☐ A. 4.5

☐ C. 6.7

☐ B. 6.0

☐ D. 9.8

8) Which pair has the same value?

☐ A. 5.0×10^3 and 0.5×10^4
☐ C. 3.2×10^{-2} and 0.32×10^{-1}
☐ B. 4.5×10^2 and 4.5×10^{-2}
☐ D. 3.3×10^4 and 3.3×10^{-4}

9) Maria converts $0.4\overline{5}$ and gets $\frac{40}{90}$. Is this correct?

☐ A. Yes, $\frac{40}{90}$ is the correct answer.

☐ C. No, the correct answer is $\frac{45}{90} = \frac{1}{2}$.

☐ B. No, but $\frac{40}{90}$ simplifies to $\frac{4}{9}$, which is wrong anyway.

☐ D. No, she should get $\frac{41}{90}$ after checking her arithmetic.


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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 A is correct.** (8.G.A.1) Reflecting across $y = x$ swaps coordinates: $(x, y) \rightarrow (y, x)$. The vertex $(2, 1) \rightarrow (1, 2)$, which is part of the reflected rectangle shown.
- 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.C.9) Two triangular bases: $2 \times \frac{1}{2}(8)(3) = 24 \text{ cm}^2$. Perimeter of triangle: $8 + 5 + 5 = 18 \text{ cm}$. Lateral area: $6 \times 18 = 108 \text{ cm}^2$. Total = $24 + 108 = 132 \text{ cm}^2$.
- 4) **Choice A is correct.** (8.EE.B.6) Substitute: $6 = \frac{2}{3}(3) + b$, so $6 = 2 + b$, thus $b = 4$.
- 5) **Choice D is correct.** (8.EE.C.7) After distributing $2(3x + 1) = 6x + 2$, you have $6x + 2 = 20$. The next step is to isolate the variable term by subtracting 2: $6x = 18$, then divide by 6 to get $x = 3$.
- 6) **Choice C is correct.** (8.EE.C.7) Multiply by 5: $x - 2 \leq 15$. Add 2: $x \leq 17$.
- 7) **Choice C is correct.** (8.G.B.8) The inequality $\geq$ means "greater than or equal," so shade ABOVE the line. The SOLID line is included in the solution.
- 8) **The correct answer is $\frac{1}{3}$.** (8.NS.A.1) Let $x = 0.\bar{3}$. Then $10x = 3.\bar{3}$, so $9x = 3$ and $x = \frac{1}{3}$.
- 9) **Choice B is correct.** (8.G.C.9) $V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times 3.14 \times 64 \times 24 = \frac{1}{3} \times 4815.36 = 1605.12 \text{ cm}^3$.
- 10) **Choice A is correct.** (8.SP.A.3) The slope (0.25) represents the rate of change: for every 1 GB used, cost increases by \$0.25.
- 11) **Choice D is correct.** (8.G.B.7) $A = 5000(1.07)^{10} \approx 5000 \times 1.967 = \$9,835$.
- 12) **Choice C is correct.** (8.EE.A.1) $10^{-2} = \frac{1}{10^2} = \frac{1}{100} = 0.01$.
- 13) **Choice D is correct.** (8.EE.A.2) If the area is 169 square inches, then $s^2 = 169$, so $s = \sqrt{169} = 13$ inches.
- 14) **Choice C is correct.** (8.EE.A.4) Multiply coefficients: $4.8 \times 1.25 = 6$. Add exponents: $10^{-2+2} = 10^0 = 1$. Result: $6 \times 10^0 = 6 \times 1 = 6$.
- 15) **The correct answer is (6, 7).** (8.NS.A.2) $6^2 = 36$ and $7^2 = 49$. Since $36 < 45 < 49$, we have $6 < \sqrt{45} < 7$.
- 16) **Choice C is correct.** (8.EE.C) The two lines intersect at the marked point, which is (1, 1).
- 17) **Choice C is correct.** (8.EE.C.7) FOIL: $(3x + 4)(2x - 1) = 6x^2 - 3x + 8x - 4 = 6x^2 + 5x - 4$.
- 18) **Choice B is correct.** (8.F.A.3) The y -differences are $16 - 10 = 6$, $22 - 16 = 6$, $28 - 22 = 6$. Since x changes by 2 each time, the rate of change is $\frac{6}{2} = 3$, constant and linear.
- 19) **Choice A is correct.** (8.F.B.5) From $x = -1$ to $x = 1$: the function is constant at $f(x) = 2$ (neither increasing nor decreasing). From $x = 1$ to $x = 3$: the function increases from 2 to 4. From $x = 3$ onward: the function decreases.
- 20) **The correct answer is A, C.** (8.NS.A.1) $\sqrt{169} = 13$ is rational (perfect square). The repeating decimal $0.777\ldots = \frac{7}{9}$ is rational. The other values are irrational: $\sqrt{170}$ (non-perfect square), 2π (irrational multiple of π), and $\sqrt{2} + 1$ (irrational plus rational is irrational).
- 21) **Choice B is correct.** (8.G.A.2) Both reflection and rotation are rigid motions that preserve area. A sequence of rigid motions preserves the original area, so the final triangle has area 35 sq cm.
- 22) **Choice B is correct.** (8.G.A.5) The angles sum to 180° : $(n + 15) + (n + 20) + (2n + 25) = 180$. Thus $4n + 60 = 180$, so $4n = 120$ and $n = 30$.
- 23) **Choice A is correct.** (8.G.B.8) $d = \sqrt{(9 - 1)^2 + (8 - 2)^2} = \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10$ units.
- 24) **Choice C is correct.** (8.G.B.7) If the angles are $2k$ and $3k$, then $2k + 3k = 90$, so $5k = 90$ and $k = 18^\circ$. The angles are 36° and 54° .
- 25) **Choice B is correct.** (8.G.C.9) For a right triangle, base area is $\frac{1}{2} \times 6 \times 8 = 24 \text{ cm}^2$ (not 48 cm^2). Correct volume: $V = \frac{1}{3} \times 24 \times 10 = 80 \text{ cm}^3$.
- 26) **Choice B is correct.** (8.G.B.7) Rectangle area is $11 \times 7 = 77 \text{ cm}^2$. The removed quarter-circle area is $\frac{1}{4} \times 3.14 \times 7^2 = 38.465 \text{ cm}^2$. Remaining area is $77 - 38.465 = 38.535 \text{ cm}^2$.
- 27) **The correct answer is 5.7.** (8.NS.A.2) $\sqrt{32} = 4\sqrt{2} \approx 4 \times 1.41 = 5.66 \approx 5.7$ meters.



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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 3 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, ACHIEVE TOMORROW!

GRADE
8

Give your child the edge they need with **3 full-length** Grade 8 Math practice tests that reflect real test formats and cover all key math standards. Perfect for building skills, boosting confidence, and preparing for 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**.