

8

Massachusetts

MCAS

GRADE 7

MATH

PRACTICE TESTS



Standards Aligned
Problem Solving

For Comprehensive
Assessment Programs



8 PRINTED TESTS



2 ONLINE TESTS



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



BUILD CONFIDENCE



STRENGTHEN SKILLS



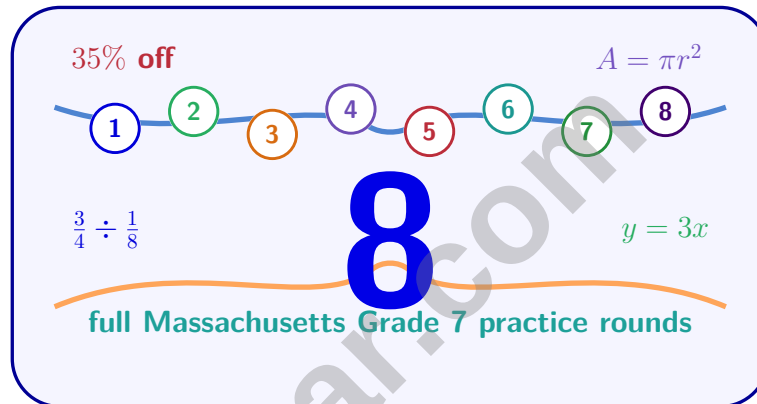
THINK SMARTER



BE TEST-READY

8 Massachusetts MCAS Grade 7 Math Practice Tests

A polished review across Massachusetts Grade 7 ratios, percents, rational numbers, algebraic models, geometry, and statistics



Eight complete 40-question Grade 7 MCAS practice rounds with proportional relationships, percents, rational numbers, expressions, equations, geometry, statistics, probability, answer keys, and clear explanations for every item.

Jay Daie and Reza Nazari



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Welcome, Massachusetts Grade 7 Problem Solver!

Eight focused rounds for sharper MCAS math thinking

This book gives you eight full Grade 7 MCAS math practice tests. Each round is built to help you notice structure, compare quantities, use proportional reasoning, handle rational numbers, 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 7 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.

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	Proportional relationships, unit rates, percents, rational-number operations, and careful reading.
Tests 4–6	Expressions, equations, inequalities, scale drawings, geometry, and multi-step problem solving.
Tests 7–8	Statistics, probability, mixed review, stamina, and choosing efficient strategies.
Answer Pages	Compact keys and explanations that show why each answer works.

The tests are mixed on purpose. Grade 7 success means recognizing which idea is being tested even when the next question changes format.



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1) When constructing a stem-and-leaf plot, why are the leaves typically arranged in order?

- ☐ A. To make the plot visually appealing ☐ C. Because it is required by mathematical law
☐ B. To make it easier to identify median, quartiles, and other statistics ☐ D. To save space in the plot

2) Which expression is equivalent to $3(2y + 7)$?

- ☐ A. $6y + 21$ ☐ C. $3y + 10$
☐ B. $6y + 7$ ☐ D. $2y + 21$

3) A football team loses 7 yards on one play and gains 13 yards on the next. What is the net change in yards?

- ☐ A. -20 yards ☐ C. 6 yards
☐ B. -6 yards ☐ D. 20 yards

4) A scientist measures a solution's volume as $\frac{7}{8}$ liter. She uses $\frac{1}{8}$ liter, then adds $\frac{3}{8}$ liter. What is the final volume?

- ☐ A. $\frac{3}{4}$ liter ☐ C. $\frac{1}{2}$ liter
☐ B. $\frac{9}{8}$ liters ☐ D. 1 liter

5) A comparison table for scientific notation values is shown below:

Scientific Notation	Standard Form
5.0×10^3	5,000
5.0×10^2	500
5.0×10^{-1}	?

What is the value for 5.0×10^{-1} ?

- ☐ A. 0.05 ☐ C. 50
☐ B. 0.5 ☐ D. 5,000



- 6) At a bakery, you have $(20x + 15)$ cookies. You sell $(8x + 6)$ cookies to a class. How many cookies remain?

Have:	$(20x + 15)$
Sell:	$(8x + 6)$
Left:	?

- ☐ A. $12x + 9$
☐ C. $12x + 21$
☐ B. $28x + 21$
☐ D. $12x + 15$
- 7) A stock investment grows from \$5,000 to \$5,500 in one year. What is the percentage growth?

- 8) If $2^n = 32$, what is the value of n ?

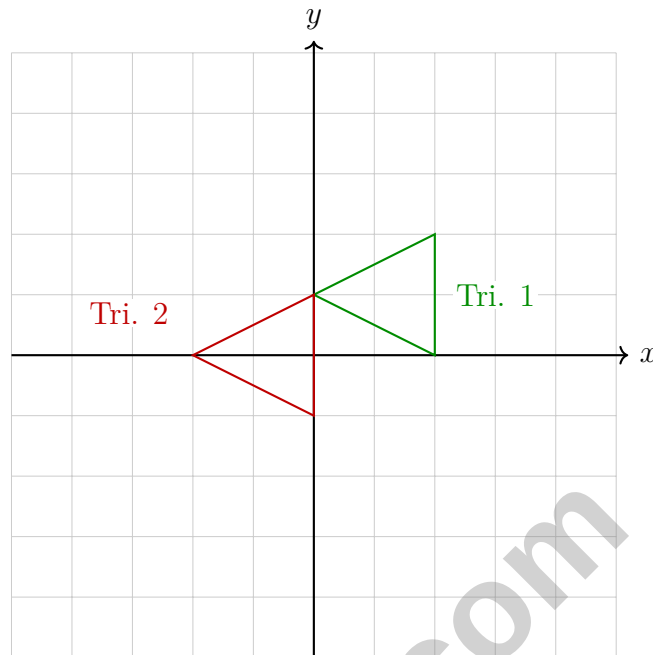
- ☐ A. 4
 ☐ C. 6
☐ B. 5
 ☐ D. 8
- 9) Solve: $-2x - 7 = 1$

$$\begin{array}{rcl}
 -2x - 7 & = & 1 \\
 \downarrow & & \boxed{\text{Add } 7} \\
 -2x & = & 8 \\
 \downarrow & & \boxed{\text{Divide by } -2} \\
 x & = & -4
 \end{array}$$

- ☐ A. $x = -4$
☐ C. $x = 2$
☐ B. $x = -2$
☐ D. $x = 4$



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10)

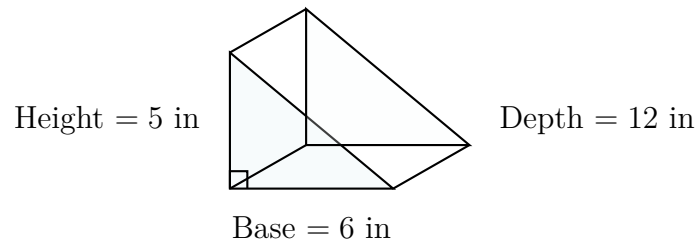
Triangle 1 (green) is transformed to Triangle 2 (red). What single transformation maps Triangle 1 to Triangle 2?

- ☐ A. Translation only ☐ D. Reflection over the x -axis followed by a translation
- ☐ B. Rotation of 180° about the origin
- ☐ C. Reflection over the y -axis

11) Which measure describes how spread out data is?

- ☐ A. Mean ☐ C. Range
- ☐ B. Median ☐ D. Mode





1)

A triangular prism has a right-triangular base with legs 6 inches and 5 inches, and the prism has a depth of 12 inches. What is the volume? (Area of a right triangle $= \frac{1}{2} \times \text{leg}_1 \times \text{leg}_2$)

☐ A. 90 in^3

☐ C. 360 in^3

☐ B. 180 in^3

☐ D. 720 in^3

2) Simplify $14s^7 \div 7s^3$:

☐ A. $2s^4$

☐ C. $2s^{21}$

☐ B. $2s^{10}$

☐ D. $7s^4$

3) Find x : $5(x - 1) = 20$

☐ A. $x = 2$

☐ C. $x = 5$

☐ B. $x = 4$

☐ D. $x = 8$

4) A bicycle wheel has diameter 0.6 meters. If the bike travels 30 meters, how many complete rotations did the wheel make? Use $\pi \approx 3.14$, round to the nearest whole number.



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5) Which factorization of $20x + 30$ is correct?

- ☐ A. $10(2x + 3)$ ☐ C. $20(x + 1.5)$
☐ B. $5(4x + 6)$ ☐ D. All are correct

6) A box contains cards numbered 5 through 14. A card is drawn at random. What is the probability of drawing a card with a number divisible by 3?

- ☐ A. $\frac{1}{5}$ ☐ C. $\frac{2}{5}$
☐ B. $\frac{3}{10}$ ☐ D. $\frac{1}{3}$

7) A coin is flipped and a number is chosen from a spinner with sections 1, 2, 3, 4. How many favorable outcomes result in a heads and an odd number?

- ☐ A. 1 ☐ C. 3
☐ B. 2 ☐ D. 4

8) A histogram shows the frequency of ages in a fitness class: 10–20 (6), 20–30 (18), 30–40 (24), 40–50 (12). A promotional flyer claims “Our class serves ALL age groups equally.” Is this supported by the histogram?

- ☐ A. Yes, because four different age intervals are shown ☐ C. Yes, because the highest bar represents the most popular age group
☐ B. No, because frequencies vary significantly (6 to 24) ☐ D. No, because the bar widths are all equal

9) A dot plot shows the number of cookies sold daily by two bakeries. Bakery A: 15, 16, 16, 17, 17, 17, 17, 18, 19 cookies; Bakery B: 10, 12, 18, 20, 22, 25 cookies. Which bakery has more stable sales?

- ☐ A. Bakery A (most values cluster at 16–17) ☐ C. Both bakeries have identical sales patterns
☐ B. Bakery B (sold more cookies overall) ☐ D. Bakery B (wider range shows more opportunity)



1) Expand: $(3x + 2) \cdot 5$

☐ A. $3x + 10$

☐ C. $15x + 2$

☐ B. $15x + 10$

☐ D. $8x + 5$

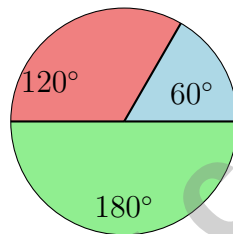
2) Two angles are supplementary. If one angle measures 65° , what is the measure of the other angle?

☐ A. 25°

☐ C. 115°

☐ B. 35°

☐ D. 295°



3)

This spinner has sectors of 60° , 120° , and 180° . Which probability is correct?

☐ A. $P(\text{red}) = \frac{1}{3}$

☐ C. $P(\text{blue}) = \frac{1}{3}$

☐ B. The spinner is uniform.

☐ D. $P(\text{green}) = \frac{1}{2}$

4) Two box plots compare the number of hours worked per week by employees at two stores. Store 1: $Q1 = 30$, Median = 35, $Q3 = 40$. Store 2: $Q1 = 25$, Median = 35, $Q3 = 45$. Which statement correctly compares the two stores?

☐ A. Store 2 has a larger spread in the upper half

☐ C. Both stores have the same work hour distribution

☐ B. Store 1 employees work more hours

☐ D. Store 1 has more variability overall



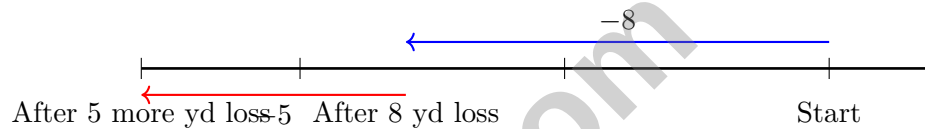
5) Four Estimation Attempts

Attempt	Estimate	Actual	% Error
P	84	100	?
Q	28	32	?
R	66	75	?
S	54	60	?

Which attempt has the largest percent error?

☐ A. P (16%)☐ C. R (12%)☐ B. Q (12.5%)☐ D. S (10%)

6)



A football team loses 8 yards on one play and then loses 5 more yards on the next play. Using subtraction with negative numbers, which expression represents the total change in position?

☐ A. $0 - 8 - 5$ ☐ C. $0 - 8 + 5$ ☐ B. $8 + 5$ ☐ D. $0 + 8 - 5$

7) A pair of shoes is on sale for \$45. If the original price was \$60, what is the percent discount?

☐ A. 15%☐ C. 33%☐ B. 40%☐ D. 25%

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Massachusetts MCAS Grade 7 Practice Test Answer Keys**How to use this section with a Grade 7 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.** (7.SP.1-7.SP.4) Ordering leaves helps quickly locate the median and identify patterns in the data distribution.
- 2) **Choice A is correct.** (7.EE.1-7.EE.2) Distribute: $3(2y + 7) = 3(2y) + 3(7) = 6y + 21$. Check: factor back to verify.
- 3) **Choice C is correct.** (7.NS.1-7.NS.3) Loss of 7 yards is -7 ; gain of 13 is $+13$: $-7 + 13 = 6$ yards.
- 4) **Choice B is correct.** (7.NS.1-7.NS.3) Volume = $\frac{7}{8} - \frac{1}{8} + \frac{3}{8} = \frac{7-1+3}{8} = \frac{9}{8}$ liters.
- 5) **Choice B is correct.** (7.NS.1-7.NS.3) $5.0 \times 10^{-1} = 5.0 \times 0.1 = 0.5$. The pattern shows decreasing powers yield smaller values.
- 6) **Choice A is correct.** (7.EE.1-7.EE.2) Subtract: $(20x + 15) - (8x + 6) = 20x + 15 - 8x - 6 = 12x + 9$ cookies.
- 7) **The correct answer is 10%.** (7.RP.3) Percentage growth = $(\$5,500 - \$5,000) \div \$5,000 = \$500 \div \$5,000 = 0.10 = 10\%$.
- 8) **Choice B is correct.** (7.EE.1-7.EE.2) $2^5 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32$. You can also recognize that $32 = 2^5$.
- 9) **Choice A is correct.** (7.EE.3-7.EE.4) Add 7: $-2x = 8$. Divide by -2 : $x = -4$.
- 10) **Choice B is correct.** (7.G.1-7.G.5) Under a 180° rotation, $(0, 1) \rightarrow (0, -1)$, $(2, 0) \rightarrow (-2, 0)$, and $(2, 2) \rightarrow (-2, -2)$. Adjusting for the triangle's position, this matches Triangle 2.
- 11) **Choice C is correct.** (7.SP.1-7.SP.4) Range (max $-$ min) measures how spread out data is. Mean, median, and mode measure center, not spread.
- 12) **Choice C is correct.** (7.NS.2d) Divide $13 \div 20 = 0.65$. The denominator $20 = 2^2 \times 5$ produces a terminating decimal.
- 13) **The correct answer is \$155.83.** (7.RP.3) Final balance: $600(1.08)^3 = 600 \times 1.2597 = 755.83$. Interest earned: $755.83 - 600 = 155.83$.
- 14) **Choice B is correct.** (7.EE.1-7.EE.2) Distribute the 4 and 3 to each term in the parentheses: $4x - 8 + 3x + 3$. Then combine like terms: $(4x + 3x) + (-8 + 3) = 7x - 5$. The simplified form shows the final equivalent expression.
- 15) **Choice A is correct.** (7.EE.4a) Repair fee is \$40 plus \$8 per item. Equation: $8i + 40 = 120$.
- 16) **Choice C is correct.** (7.EE.4a) Distribute left side: $2(x) + 2(-7) = 2x - 14$. This gives $2x - 14 = 2x - 14$, an identity. Since both sides are identical for every value of x , all real numbers are solutions. (This is a special case showing the importance of distributing correctly.)
- 17) **The correct answer is 55.** (7.NS.1-7.NS.3) To cancel out the loss of -55 , you add its opposite, which is $+55$. Then $-55 + 55 = 0$ (break even).
- 18) **Choice B is correct.** (7.SP.5-7.SP.8) Total marbles: $3 + 5 + 2 = 10$. Red: 3 out of 10 gives $\frac{3}{10}$. (Blue would be $\frac{5}{10}$, green $\frac{2}{10}$, not red $\frac{7}{10}$).
- 19) **The correct answer is B,C.** (7.NS.2) A: FALSE—three negatives give one negative. B: TRUE—two negatives cancel (positive); two positives remain positive. C: TRUE—always negative. D: FALSE— $(-5) \times (-2) \times (-1) = 10 \times (-1) = -10$, not 10.
- 20) **Choice D is correct.** (7.RP.3) Tip: $0.20 \times 36 = \$7.20$. Total bill: $36 + 7.20 = \$43.20$. Each person pays $43.20 \div 2 = \$21.60$.
- 21) **Choice A is correct.** (7.G.4-7.G.6) True triangle area: $\frac{1}{2} \times 10 \times 2 = 10 \text{ in}^2$. Student's error: $20 - 10 = 10 \text{ in}^2$ overestimate.
- 22) **Choice D is correct.** (7.RP.1-7.RP.3) Total gas cost: $25 \times 3.50 = \$87.50$. Cost per mile: $\$87.50 \div 350 = \0.25 per mile.
- 23) **The correct answer is 13.** (7.NS.1-7.NS.3) Since the area is 169, the side length is $\sqrt{169} = 13$ units.
- 24) **Choice C is correct.** (7.G.4-7.G.6) Volume of first prism = $2 \times 3 \times 4 = 24 \text{ ft}^3$. Volume of second = $4 \times 6 \times 8 = 192 \text{ ft}^3$. Ratio = $\frac{192}{24} = 8$.
- 25) **Choice B is correct.** (7.G.1-7.G.5) Diagonal of a square with side s is $s\sqrt{2} = 6\sqrt{2}$ cm.
- 26) **Choice C is correct.** (7.G.4-7.G.6) A diameter is a chord that passes through the center. All diameters are chords.
- 27) **Choice C is correct.** (7.G.1-7.G.5) Triangle Inequality requires: $x + x > 11$, so $x > 5.5$. The other conditions $11 + x > x$ and $x + 11 > x$ are always true. There is no upper bound on x from the Triangle Inequality.
- 28) **Choice B is correct.** (7.SP.1-7.SP.4) East: $\frac{56}{200} = 0.28$ or 28%; West: $\frac{36}{150} = 0.24$ or 24%; North: $\frac{70}{250} = 0.28$ or 28%. West is lowest.



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Hi, Number Sense Builder!

◇ Grade 7 numbers do more than sit on a page. They describe rates, changes, comparisons, distances, chances, and 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 7 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!

This book includes **8** full-length Math practice tests and **2** online tests to help Grade 7 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:

8 Full-Length Printed Tests

2 Online Practice Tests

 Detailed Answer 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



Stronger Math Skills

Build a solid foundation through targeted practice and review.



Better Problem Solving

Develop logical thinking and effective solution strategies.



Deeper Understanding

Reinforce key concepts with clear explanations and meaningful practice.



Test Confidence

Familiarize with test formats and improve accuracy and speed.



Achieve Success

Build confidence and perform your best on test day.

TOPICS COVERED

- ✓ Ratios & Proportions
- ✓ The Number System
- ✓ Expressions & Equations
- ✓ Geometry
- ✓ Percents & Decimals
- ✓ Statistics & Probability
- ✓ Data Analysis
- ✓ Measurement & Conversions
- ✓ Algebraic Thinking
- ✓ 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!

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