

4

Massachusetts

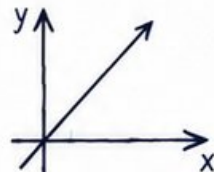
MCAS

GRADE
7
MATH

PRACTICE TESTS

Standards Aligned
Problem Solving
For Comprehensive
Assessment Programs

$$y = mx + b$$



$$\frac{2x}{3} + \frac{x}{6} = 2$$



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



4 PRINTED TESTS



2 ONLINE TESTS



USE THESE TWO
ADDITIONAL ONLINE
PRACTICE TESTS

FOR EXTRA REVIEW AFTER
THE PRINTED TESTS
IN THIS BOOK.



Build
Confidence



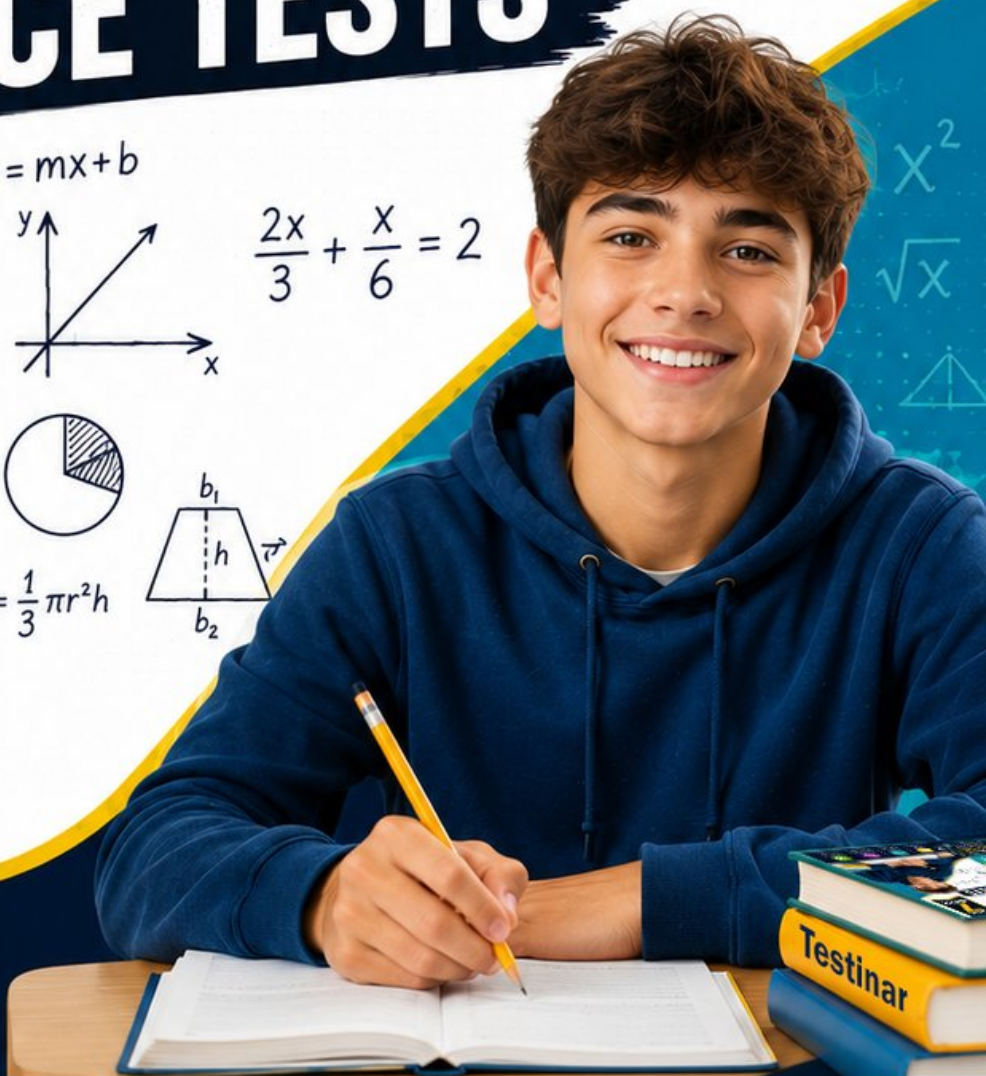
Strengthen
Math Skills



Detailed Answers
& Explanations

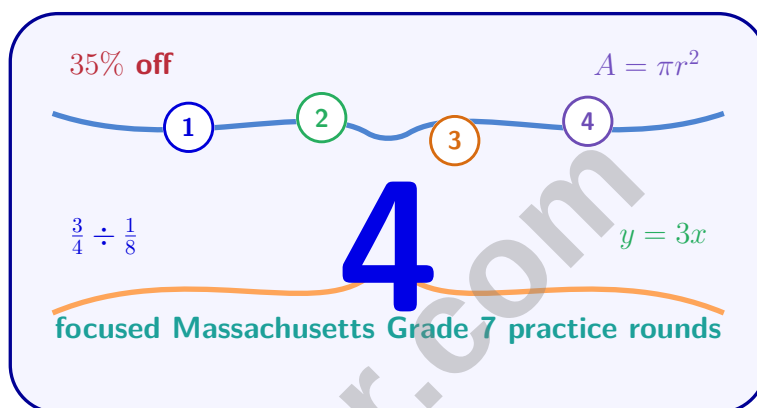


Improve Test
Performance



4 Massachusetts MCAS Grade 7 Math Practice Tests

Four Rounds of MCAS Math Practice with Solution Support



Four 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!

Four focused rounds for sharper MCAS math thinking

This book gives you four 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

A four-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?

Four MCAS tests, 160 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Proportional relationships, unit rates, percents, rational-number operations, and careful reading.
Tests 3–4	Expressions, equations, inequalities, scale drawings, geometry, data, probability, and multi-step problem solving.
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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& answers

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1) Three students each flip a coin. What is the probability that all three get heads?

- ☐ A. $\frac{1}{2}$
☐ B. $\frac{1}{8}$

- ☐ C. $\frac{3}{8}$
☐ D. $\frac{1}{4}$

2) Two circles: one with radius 3 m, another with radius 6 m. How much greater is the circumference of the second circle? Use $\pi \approx 3.14$.

- ☐ A. 18.84 m
☐ B. 9.42 m

- ☐ C. 56.52 m
☐ D. 75.36 m

3) A student mistakenly used the formula $A = \pi d^2$ instead of $A = \pi r^2$ for a circle with diameter 8 inches. What answer did the student get? (Use $\pi \approx 3.14$.)

- ☐ A. 25.12 in²
☐ B. 50.24 in²

- ☐ C. 100.48 in²
☐ D. 200.96 in²

4) A cylindrical drum has a radius of 1.5 m and a height of 2 m. What is its volume? Use $\pi \approx 3.14$.

- ☐ A. 9.42 m³
☐ B. 14.13 m³

- ☐ C. 18.84 m³
☐ D. 37.68 m³

5) Two basketball teams' free-throw percentages over 10 games are shown below.

Team	Mean	MAD
Tigers	75%	8%
Sharks	72%	4%

Based on this data, which statement is most accurate?

- ☐ A. The Sharks are more reliable free-throw shooters
☐ B. The Tigers never miss a free throw
☐ C. The Sharks score more points overall
☐ D. Both teams have the same consistency



6) A scatter plot shows the relationship between hours studied (x-axis) and test score (y-axis) for 15 students. The points show a clear upward trend from (1, 60) to (5, 95). What does this scatter plot suggest?

- ☐ A. Studying more hours guarantees a higher score
- ☐ B. There is a positive association between study time and test scores
- ☐ C. All students who study 5 hours will score 95
- ☐ D. Study time has no effect on test performance

7) Two histograms show daily temperature (in degrees Fahrenheit) over a month for City A and City B. City A's temperatures cluster at 70–75 degrees (range 5 degrees). City B's temperatures span 50–90 degrees (range 40 degrees). Where do the distributions overlap?

- ☐ A. City A has more variable temperatures
- ☐ B. City B is always hotter than City A
- ☐ C. Distributions overlap at 70–75 degrees; City A is more consistent
- ☐ D. City B never reaches City A's temperature

8) A researcher rolled a number cube 500 times and recorded the results:

Face	1	2	3	4	5	6
Times	82	88	79	85	90	96

Which face has an experimental probability closest to the theoretical probability of $\frac{1}{6}$?

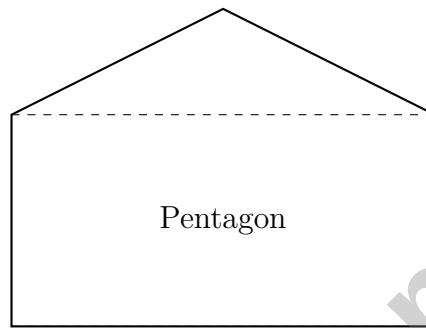
- ☐ A. Face 1
- ☐ B. Face 3
- ☐ C. Face 5
- ☐ D. Face 6



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- 9) When converting data into a stem-and-leaf plot, a student mistakenly interprets stem 11 with leaf 2 as 1.12 instead of 112. This is an example of which type of error?

☐ A. Reading error ☐ C. Conceptual error
☐ B. Computational error ☐ D. Rounding error



10)

A pentagon-shaped field can be decomposed into a rectangle (base 8 units, height 4 units) and a triangle (base 8 units, height 2 units). What is the total area?

☐ A. 24 sq units ☐ C. 40 sq units
☐ B. 32 sq units ☐ D. 48 sq units

- 11) Two prisms have the same height of 10 cm. The first has a rectangular base 4 cm by 3 cm. The second has a triangular base with area 6 cm^2 . Which prism has a larger volume?

☐ A. The rectangular prism ☐ C. Both have the same volume
☐ B. The triangular prism ☐ D. Cannot be determined

- 12) In a circle with center O and radius 10 cm, a chord is drawn. What is the maximum possible length of the chord?

☐ A. 10 cm ☐ C. 20 cm
☐ B. 15 cm ☐ D. 30 cm



- 1) A rectangular garden is 10 m wide and 8 m tall. A triangular section is removed from the bottom, with the triangle's base being 10 m and height 2 m. What is the remaining area?

☐ A. 70 m^2 ☐ C. 90 m^2 ☐ B. 80 m^2 ☐ D. 100 m^2

- 2) Account balance was $-\$45$ (overdrawn). After a deposit of $\$100$, what is the new balance?

- 3) If a square has a side length of 11 cm, what is its area?

☐ A. 110 cm^2 ☐ C. 132 cm^2 ☐ B. 121 cm^2 ☐ D. 144 cm^2

- 4) What is $-1\frac{1}{2} \times 6$?

☐ A. -9 ☐ C. 8 ☐ B. -8 ☐ D. 9

- 5) A store receipt shows: 5 apples at $\$0.60$ per apple, and 3 oranges at $\$1.20$ per orange. What is the total cost?

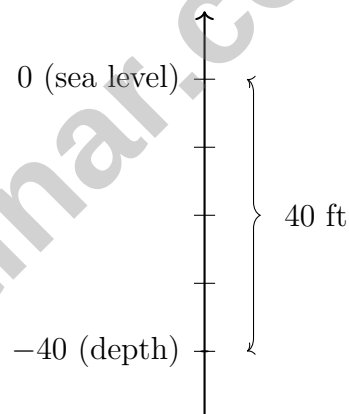
☐ A. $\$5.40$ ☐ C. $\$6.00$ ☐ B. $\$5.80$ ☐ D. $\$6.60$ 

- 6) An equilateral triangle has all sides of length 7 cm. How many distinct triangles with these side lengths exist?

☐ A. 0☐ C. 2☐ B. 1☐ D. Infinitely many

- 7) The temperature in the morning was -8°C . It rose 15°C by afternoon. Then it dropped 5°C by evening. What was the evening temperature?

- 8) A scuba diver descends 40 feet below sea level. Which integer represents this depth?



- ☐ A. 40 (ignores direction/below sea level)
☐ B. -80 (double the depth)
☐ C. 0 (at sea level, not below)
☐ D. -40 (correct; below is negative)



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- 1) A student incorrectly calculates the circumference of a circle with radius 4 m by using the formula $C = \pi r^2$. Using $\pi \approx 3.14$, what incorrect answer did the student get?

☐ A. 12.56 m ☐ C. 50.24 m
☐ B. 25.12 m ☐ D. 100.48 m

- 2) A box plot compares video game scores (in points) for two players. Player A: Median = 1500, Q1 = 1200, Q3 = 1800. Player B: Median = 1400, Q1 = 1100, Q3 = 2000. Which player has more consistent performance?

☐ A. Player A (smaller IQR: 600 vs. 900) ☐ C. Both players have identical consistency
☐ B. Player B (higher third quartile) ☐ D. Player B (higher maximum score)

- 3) A student created a stem-and-leaf plot of plant heights (cm):

Stem	Leaves
8	2, 5, 9
9	1, 4, 6, 8
10	0, 3, 5, 7

A plant with height 94 cm was accidentally recorded as 49 cm. After correction, what is the new maximum?

☐ A. 94 ☐ C. 98
☐ B. 107 ☐ D. 105

- 4) A triangular prism has a right-triangular base with legs 7 cm and 4 cm, and a depth of 9 cm. What is the volume?

☐ A. 20 cm³ ☐ C. 126 cm³
☐ B. 63 cm³ ☐ D. 252 cm³



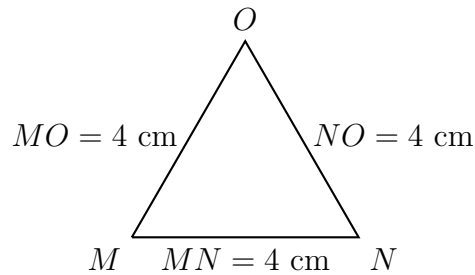
5) A circle has a radius of 5 inches. What is its diameter?

☐ A. 2.5 inches

☐ C. 10 inches

☐ B. 5 inches

☐ D. 15 inches



6)

Triangle MNO has all three sides equal: $MN = NO = OM = 4 \text{ cm}$. What are the measures of all angles?

☐ A. 60° , 60° , 60°

☐ D. Cannot be determined without more info

☐ B. 45° , 45° , 90°

☐ C. 30° , 60° , 90°

7) Factor: $25cd - 35c$

☐ A. $5c(5d - 7)$

☐ C. $c(25d - 35)$

☐ B. $5(5cd - 7c)$

☐ D. $35(25cd - c)$

8) A rectangular prism has length 8 m, width 5 m, and height 2 m. Find the surface area.

☐ A. 80 m^2

☐ C. 132 m^2

☐ B. 112 m^2

☐ D. 176 m^2



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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.5-7.SP.8) $P(\text{HHH}) = \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{8}$.
- 2) **Choice A is correct.** (7.G.4-7.G.6) $C_1 = 2\pi(3) = 18.84$ m; $C_2 = 2\pi(6) = 37.68$ m; difference = $37.68 - 18.84 = 18.84$ m. (B is half the difference; C is sum of both; D is incorrect product.)
- 3) **Choice D is correct.** (7.G.4-7.G.6) Incorrect: $3.14 \times 8^2 = 3.14 \times 64 = 200.96$ in². Correct: $r = 4$, so $A = 3.14 \times 16 = 50.24$ in².
- 4) **Choice B is correct.** (7.G.4-7.G.6) $V = \pi r^2 h \approx 3.14 \times 1.5^2 \times 2 = 3.14 \times 2.25 \times 2 = 14.13$ m³.
- 5) **Choice A is correct.** (7.SP.1-7.SP.4) Although Tigers have a higher mean (75% vs. 72%), the Sharks have much lower MAD (4% vs. 8%), indicating more consistent free-throw shooting.
- 6) **Choice B is correct.** (7.SP.1-7.SP.4) A positive trend means variables tend to increase together, but it does not guarantee outcomes or mean all data points fall exactly on a line.
- 7) **Choice C is correct.** (7.SP.3) City A clusters at 70–75 (range 5), indicating consistency. City B spans 50–90 (range 40), showing high variability. Both distributions include temperatures 70–75 degrees, so they overlap there.
- 8) **Choice B is correct.** (7.SP.6) Face 3: $\frac{79}{500} = 0.158$. Theoretical: $\frac{1}{6} \approx 0.167$. Difference: $|0.158 - 0.167| \approx 0.009$, smallest among all faces.
- 9) **Choice C is correct.** (7.SP.1-7.SP.4) The student misunderstands how stems and leaves combine, not reading or computational. This is a conceptual misunderstanding.
- 10) **Choice C is correct.** (7.G.4-7.G.6) Rectangle: $8 \times 4 = 32$ sq units. Triangle: $\frac{1}{2} \times 8 \times 2 = 8$ sq units. Total: $32 + 8 = 40$ sq units.
- 11) **Choice A is correct.** (7.G.4-7.G.6) Rectangular: $V = 4 \times 3 \times 10 = 120$ cm³. Triangular: $V = 6 \times 10 = 60$ cm³. The rectangular prism is larger.
- 12) **Choice C is correct.** (7.G.4-7.G.6) The longest chord is the diameter, which equals $2r = 2 \times 10 = 20$ cm.
- 13) **Choice D is correct.** (7.G.1-7.G.5) The sum of the other two angles is $180^\circ - 100^\circ = 80^\circ$. If both were at least 50° , their sum would exceed 100° . Therefore, at least one must be less than 50° .
- 14) **Choice B is correct.** (7.SP.5-7.SP.8) Every number from 1 to 10 is less than 11, so this event is certain (probability = 1).
- 15) **Choice B is correct.** (7.SP.1-7.SP.4) First sample (downtown only): $\frac{20}{100} = 0.20$ or 20%, but biased to one area. The larger random sample showing 15% is more representative of the entire city population.
- 16) **Choice D is correct.** (7.NS.1-7.NS.3) $-8 - (-2) = -8 + 2 = -6$. Subtracting the negative shifts right by 2 on the number line.
- 17) **Choice B is correct.** (7.SP.1-7.SP.4) 50% of $360^\circ = 0.50 \times 360^\circ = 180^\circ$.
- 18) **The correct answer is 16.** (7.NS.1-7.NS.3) The change is final minus initial: $8 - (-8) = 8 + 8 = 16$ degrees.
- 19) **The correct answer is B,C.** (7.RP.1-7.RP.3) Option B: cost = $1.50 \times$ pounds (proportional, of form $y = kx$). Option C: distance = speed $\times$ time (proportional). Option A is a general trend but not a strict proportional relationship. Option D: height does not scale proportionally with age (growth rates vary).
- 20) **Choice C is correct.** (7.RP.1-7.RP.3) Divide the real length by the scale factor: $72 \div 72 = 1$ meter.
- 21) **Choice D is correct.** (7.RP.3) Discount = $\frac{1}{5} \times 80 = \16 . Sale price = $80 - 16 = \$64$.
- 22) **Choice D is correct.** (7.RP.1-7.RP.3) The ratio is $\frac{2}{5} : \frac{3}{5} = 2 : 3$.
- 23) **Choice D is correct.** (7.RP.1-7.RP.3) Calculate the unit rate from each data point: $\$450 \div 3 = \150 per month and $\$1200 \div 8 = \150 per month. Since both unit rates are $\$150$ per month, the relationship is proportional.
- 24) **Choice D is correct.** (7.RP.1-7.RP.3) Each ratio: $12/1 = 12, 24/2 = 12, 36/3 = 12, 48/4 = 12$. Constant rate of $\$12$ per shirt.
- 25) **Choice D is correct.** (7.RP.1-7.RP.3) Cost is price times quantity. The constant $k = 4$ dollars per pound, so $c = 4p$.
- 26) **Choice D is correct.** (7.RP.3) To convert a decimal to a percent, multiply by 100: $0.45 \times 100 = 45\%$. Alternatively, $0.45 = \frac{45}{100} = 45\%$.
- 27) **Choice C is correct.** (7.SP.5-7.SP.8) For two spinners each with 3 outcomes, the sample space has $3 \times 3 = 9$ outcomes: (A, A), (A, B), (A, C), (B, A), (B, B), (B, C), (C, A), (C, B), (C, C).



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Hi, Grade 7 Math Star!

◇ You finished this practice set with real effort. Grade 7 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 4 full Grade 7 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 7 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 7 Math Friend

PRACTICE TODAY. SUCCEED TOMORROW!

This book includes **4** full-length Math practice tests and **2** online tests to help Grade **7** students build confidence, strengthen skills, and excel on standardized assessments.

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Develop key math concepts and problem solving abilities.



Improve Understanding

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Familiarize with test formats and improve accuracy and speed.



Boost Performance

Apply your knowledge and achieve your best score!

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- ✓ Data Analysis
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