

10 Massachusetts MCAS Grade 7 Math Practice Tests

The Ultimate Test Prep Collection with Answer Explanations

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10 Practice Tests

10 tests × full coverage

 Grade 7 Math — Engineered for Mastery 

Welcome to **The Architect's Workshop**.

Ten practice tests. Ten floors of a tower you're about to build. Each test lays another level of understanding — from foundation to capstone.

 **Foundation (Tests 1–3):** Learn the blueprints

 **Framework (Tests 4–6):** Build structural strength

 **Finishing (Tests 7–9):** Refine under pressure

 **Capstone (Test 10):** The final inspection

Precision. Practice. Perfection.

“ Every great structure
is built one floor at a time.
Ten levels of practice makes
your math rock-solid. ”



The Architectural Plan

A 4-phase construction plan for complete mastery

Phase I: Foundation (Tests 1–3)

Untimed. Explore the test format and question types. Read every answer explanation after each test.

Goal: understand the blueprint before you build.



Phase II: Framework (Tests 4–6)

Add a timer (70 minutes). Focus on the topics that gave you trouble in Phase I. Practice showing complete work and labeling units. Goal: build structural strength.



Phase III: Finishing (Tests 7–9)

Full timed conditions (60 minutes). Simulate the real exam. Review only the questions you missed — don't re-study what you already know. Goal: refine under real pressure.



Phase IV: Capstone (Test 10)

Your final inspection. Full exam conditions. This is the capstone — compare with Test 1 and measure your entire growth arc. Goal: prove your mastery.

Blueprint Specifications

 **Multiple Choice** — select the single best answer

 **Short Answer** — show your process

 **Multi-Select** — choose ALL that apply

 **Open Response** — explain and justify

Engineering Principles

Precision techniques for building every solution

The D.R.A.F.T. Method

- D Define** What exactly is the question asking? Write it in your own words.
- R Retrieve** Pull out given information. List numbers, units, and relationships.
- A Assemble** Choose the right formula or strategy. Set up the equation or proportion.
- F Figure** Compute step by step. Show every operation. Label units.
- T Test** Does the answer make sense? Re-read the question. Verify the units.

Seven Precision Rules

1. **Read twice, solve once.** The first read gives context; the second reveals what to compute.
2. **Annotate the problem.** Circle key information and underline the question.
3. **Estimate before calculating.** A quick mental approximation catches major errors.
4. **Set up the equation.** Write down the formula and plug in the numbers.
5. **Track your signs.** Rational number operations are the #1 error source in Grade 7.
6. **Eliminate unreasonable answers.** Use logic to rule out impossible solutions.
7. **Never submit blanks.** On open response, even a partial setup can earn credit.

Timing Blueprint

Tests 1–3: **Untimed** (learn the blueprints) > Tests 4–6: **70 min** (build speed) > Tests 7–10: **60 min** (exam conditions)



“Every great structure starts with a solid plan. Study the blueprints, learn from each test, and build something extraordinary.”

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Math Reference Sheet

You may use this page during your practice tests!

Symbol	Name	What It Means
$()$	Parentheses	Do this part first. $(3 + 4) \times 2 = 14$
10^3	Exponent	Multiply the base by itself that many times. $10^3 = 1,000$
$\frac{a}{b}$	Fraction	a parts out of b equal parts; also means $a \div b$.
$\frac{7}{3}$	Improper Fraction	Numerator $\geq$ denominator. $\frac{7}{3} = 2\frac{1}{3}$
0.45	Decimal	A number with a decimal point. $0.45 = \frac{45}{100}$
$> < =$	Comparison	Greater than, less than, equal to. $0.5 > 0.35$
$(3,5)$	Ordered Pair	A point on the coordinate plane: (x, y) .

Key Formulas

- Volume of a rectangular prism:

$$V = l \times w \times h$$

- Order of operations:

Parentheses $\rightarrow$ Exponents $\rightarrow$ Multiply/Divide
 $\rightarrow$ Add/Subtract

- Powers of 10:

$$10^1 = 10 \quad 10^2 = 100$$

$$10^3 = 1,000 \quad 10^4 = 10,000$$

- Fraction as division:

$$\frac{a}{b} = a \div b$$

Place Value Chart

Millions	1,000,000
Hundred-Thousands	100,000
Ten-Thousands	10,000
Thousands	1,000
Hundreds	100
Tens	10
Ones	1

Decimals

Tenths	0.1
Hundredths	0.01
Thousandths	0.001

Each place is $10\times$ the place to its right, and $\frac{1}{10}$ of the place to its left.

Key Math Vocabulary

- **Sum** — the result of addition
- **Difference** — the result of subtraction
- **Product** — the result of multiplication
- **Quotient** — the result of division
- **Remainder** — what's left over after dividing
- **Factor** — a number you multiply
- **Expression** — numbers and operations without =
- **Equation** — a math sentence with =
- **Numerator** — the top number of a fraction
- **Denominator** — the bottom number of a fraction
- **Mixed number** — a whole number + a fraction
- **Equivalent fractions** — fractions with equal value
- **Decimal** — a number written with a decimal point
- **Volume** — the space inside a 3D shape
- **Coordinate plane** — a grid with x and y axes
- **Ordered pair** — (x, y) location on the plane

Word Problem Clue Words

- **Add (+)**: total, altogether, combined, sum, increase, more than
- **Subtract (−)**: difference, how many more, fewer, remain, decrease, left
- **Multiply (×)**: each, every, groups of, times, product, per, of (with fractions)
- **Divide (÷)**: share equally, split, each group, how many groups, quotient, per



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PREVIEW

PRACTICE TEST

1

Practice Test 1

 10 Questions

Before You Start

- ✓ *Read each question carefully before choosing your answer.*
- ✓ *Show your work on scratch paper when you need to.*
- ✓ *Skip hard questions and come back to them later.*
- ✓ *Check your answers when you're done.*
- ✓ *Take your time — there's no rush!*

★ **You've Got This!** ★

Do your best and show what you know!



1. The table shows a proportional relationship. Find k and the missing value.

x	y
3	7.5
?	15
10	25

Your Answer:

2. Two proportional lines are graphed below. Which statement is correct?



- (A) Line Q has the greater unit rate because it is longer
- (B) Line P has the greater unit rate because it is steeper
- (C) Both lines have the same unit rate
- (D) Line Q has the greater unit rate because $6 > 5$



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3. The graph below compares the rates of two workers packaging boxes. Which worker is faster, and by how many boxes per hour?



- (A) Worker A, by 3 boxes/hr
(B) Worker B, by 3 boxes/hr
(C) Worker A, by 15 boxes/hr
(D) They work at the same rate
4. A store has 300 items in stock. If 60% are on sale, how many items are on sale?

- (A) 120
(B) 150
(C) 180
(D) 200



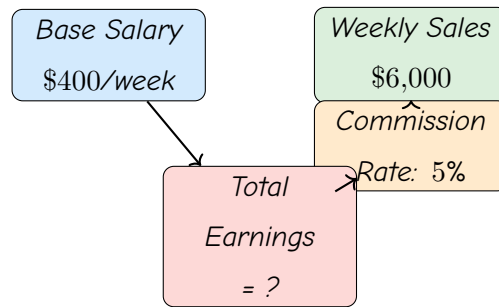
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5. The diagram shows how a salesperson's earnings are calculated. What are the total earnings?

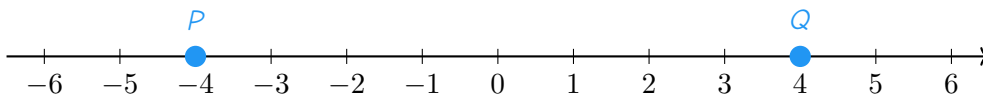


- (A) \$430
(B) \$700
(C) \$6,400
(D) \$6,700

6. A jogger estimated running 5 miles but actually ran 4.8 miles. What is the percent error (rounded to the nearest tenth)?

Your Answer:

7. The number line below shows two points. Which statement is correct?



- (A) P and Q are the same number
(B) P and Q are opposites
(C) $|P| > |Q|$
(D) $P > Q$

8. What is $0 + (-7)$?

- (A) 7
(B) 0
(C) -7
(D) -14



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9. Evaluate $\frac{x^2-1}{4}$ when $x = 5$.

Your Answer:

10. Simplify $\frac{1}{2}x + \frac{3}{4}x - 2$.



Your Answer:



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★ *End of Practice Test 1* ★

Great job finishing the test!

My Score

I got _____ out of 10 questions right.

*Check your answers in the **Answer Key** at the back of the book.*

 *Review any questions you missed. That's how we learn!*

Answer Key & Explanations



Answer Key

First try each test on your own, then check your work here.



Practice Test 1 — Answer Key

1 $k = 2.5$; missing $x = 6$

2 B

3 A

4 C

5 B

6 $\approx 4.2\%$

7 B

8 C

9 6

10 $\frac{5}{4}x - 2$ or $1\frac{1}{4}x - 2$

💡 Time to Learn! 💡

Review the explanations below, **especially for the questions you missed**.

Understanding why each answer is correct builds stronger problem-solving skills.

Tip: Circle any questions you got wrong, then read their explanation carefully.



Practice Test 1 — Detailed Explanations

1 $k = \frac{7.5}{3} = 2.5$. For the missing row: $15 = 2.5x$ so $x = 15 \div 2.5 = 6$.

2 Line P: $k = \frac{7}{5} = 1.4$. Line Q: $k = \frac{6}{6} = 1$. Line P is steeper and has the greater unit rate.



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3 Worker A: $60 \div 5 = 12$ boxes/hr. Worker B: $45 \div 5 = 9$ boxes/hr. Worker A is faster by $12 - 9 = 3$ boxes/hr.

4 $60\% = 0.60$. Multiply: $0.60 \times 300 = 180$ items.

5 Commission: $6,000 \times 0.05 = \$300$. Total: $400 + 300 = \$700$.

6 $\frac{|5-4.8|}{4.8} \times 100 = \frac{0.2}{4.8} \times 100 \approx 4.17 \approx 4.2\%$.

7 Point P is at -4 and Q is at 4 . They are the same distance from 0 on opposite sides, so they are opposites.

8 Adding 0 to any number gives that number: $0 + (-7) = -7$.

9 Substitute: $\frac{5^2-1}{4} = \frac{25-1}{4} = \frac{24}{4} = 6$.

10 Find a common denominator: $\frac{2}{4}x + \frac{3}{4}x = \frac{5}{4}x$. The constant stays: $\frac{5}{4}x - 2$.



Well done checking your answers!

Keep practicing to strengthen your skills.



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THANK YOU

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Get the Full Book!

This preview shows just a small sample of what's inside.

The complete book includes:

- ✓ *All chapters and topics*
- ✓ *Hundreds of practice problems*
- ✓ *Complete answer key with explanations*
- ✓ *Colorful visuals and step-by-step examples*
- ✓ *Reference sheets and progress trackers*

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