

10 Michigan M STEP

GRADE
8
MATH

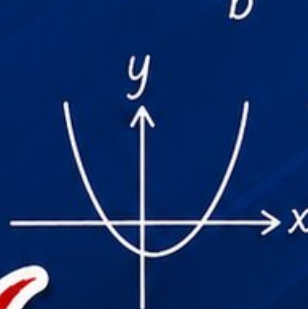
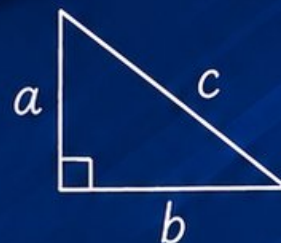
PRACTICE TESTS

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



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

$$y = mx + b$$

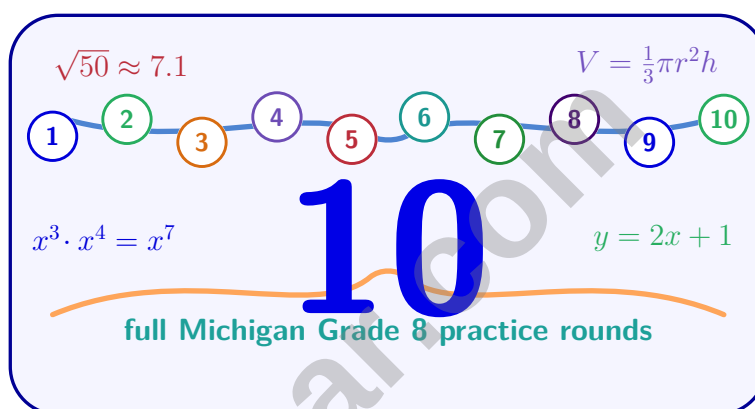


USE THESE TWO
**ADDITIONAL ONLINE
PRACTICE TESTS**

FOR EXTRA REVIEW AFTER
THE PRINTED TESTS
IN THIS BOOK.

10 Michigan M STEP Grade 8 Math Practice Tests

Michigan Grade 8 M STEP Practice for lake-strong review for functions, scientific notation, real numbers, algebra, geometry, and data analysis



Ten complete 40-question Grade 8 M STEP 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, Michigan Grade 8 Problem Solver!

Ten focused rounds for sharper Michigan M STEP math thinking

This book gives you ten full Grade 8 M STEP 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 **Solving Systems of Two Equations** (8.EE.C.8a): Understand that solutions to a system of two linear equations correspond to points of intersection of their graphs. Solve systems algebraically and by graphing. It also prepares you for **Sketching and Describing Function Graphs** (8.F.B.5): Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits qualitative features described verbally.

Your Michigan 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 **Reading Function Values** (8.F.A.1): Find outputs from a function rule, table, or graph. Another recurring target is **Angles in Triangles and Parallel Lines** (8.G.A.5): Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about angles created when parallel lines are cut by a transversal, and the....

Michigan 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 Michigan M STEP 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 Michigan 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 **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. The same routine helps with **Scatter Plots and Patterns in Data** (8.SP.A.1): Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association.



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1) In 6 years, a father will be three times as old as his son. Right now, the father is 30 years older than his son. How old is the son now?

☐ A. 9

☐ C. 15

☐ B. 12

☐ D. 18

2) A regular hexagonal pyramid has a regular hexagonal base. The base has perimeter 24 cm and area $24\sqrt{3}$ cm². The slant height is 8 cm. What is the lateral surface area?

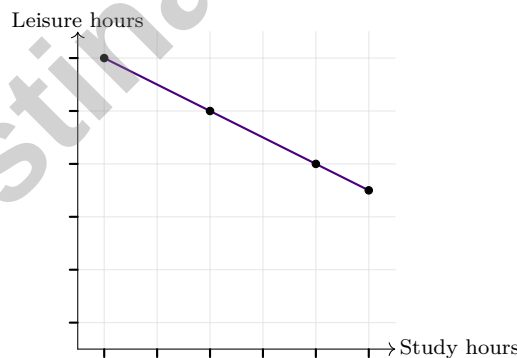
☐ A. 48 cm²
☐ C. 96 cm²
☐ B. 72 cm²
☐ D. 144 cm²

3) A cone has radius 6 cm and height 9 cm. A sphere has radius 5 cm. Which solid has the greater volume? (Use $\pi \approx 3.14$.)

☐ A. Cone ($V \approx 339.12$ cm³)

☐ C. Both have equal volume

☐ B. Sphere ($V \approx 523.33$ cm³)

☐ D. Cannot be determined


4)

The equation $y = -0.5x + 5$ represents the relationship between study hours and available leisure time. What is the x -intercept (when leisure time equals 0)?

☐ A. 5

☐ C. 10

☐ B. 20

☐ D. 50


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5) Solve:
$$\begin{cases} 4x - 3y = 5 \\ x = 2 \end{cases}$$

☐ A. (2, 1)

☐ B. (2, -1)

☐ C. $(2, \frac{1}{3})$

☐ D. (2, 3)

6) Estimate the value of $\sqrt{8} + \sqrt{2}$ to the nearest tenth.

7) Factor $x^2 + 3x - 10$.

☐ A. $(x + 5)(x - 2)$

☐ B. $(x - 5)(x + 2)$

☐ C. $(x + 10)(x - 1)$

☐ D. $(x - 10)(x - 1)$

8) Which ordered pair is NOT in the solution region of $x + y \leq 4$?

☐ A. (1, 2)

☐ B. (2, 2)

☐ C. (0, 4)

☐ D. (3, 2)

9) 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. $f(x)$

☐ B. $g(x)$

☐ C. Both are equal

☐ D. Cannot be determined



10) Which of these functions is LINEAR?

☐ A. $y = 4x^2 - 1$

☐ B. $y = 10x - 6$

☐ C. $y = \frac{2}{x+3}$

☐ D. $y = 3^x$

11) If $3^a \cdot 3^5 = 3^{12}$, what is the value of a ?

12) A gym charges a \$25 sign-up fee plus \$15 per month. Which function gives the total cost C after m months?

☐ A. $C = 15m + 25$

☐ B. $C = 25m + 15$

☐ C. $C = 40m$

☐ D. $C = 15m - 25$

13) Solve for x : $x^3 = 343$

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

☐ A. Reflection across the x -axis

☐ B. Reflection across the y -axis

☐ C. Rotation 180° about the origin

☐ D. Dilation by scale factor 2

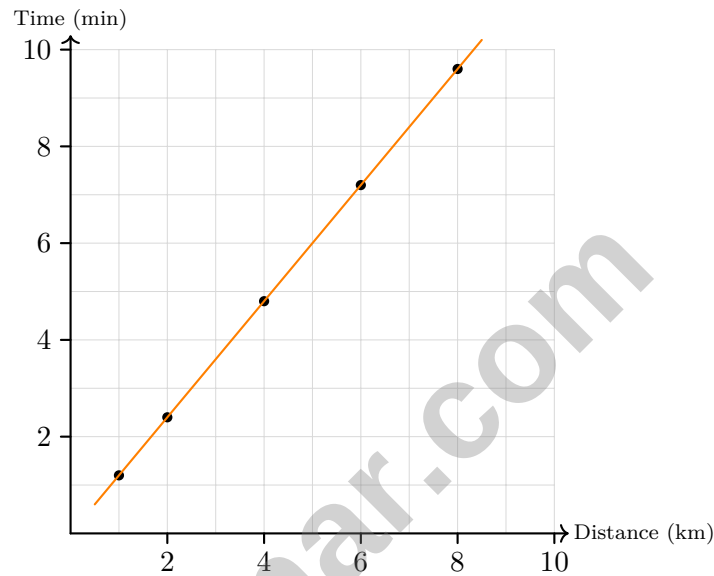


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- 1) A square prism and a square pyramid have the same base side length (5 cm) and height (15 cm). How many times larger is the prism's volume than the pyramid's?

- ☐ A. 1.5 times ☐ C. 3 times
☐ B. 2 times ☐ D. 5 times



2)

A delivery company tracks distance versus delivery time. The trend line shows an almost perfect fit with points nearly aligned. What can you conclude?

- ☐ A. Distance and time are unrelated ☐ C. The trend line should not be trusted
☐ B. There is a strong linear relationship with very small residuals ☐ D. The data contains measurement errors

- 3) An equilateral triangle has side length 5 cm. A similar equilateral triangle has perimeter 60 cm. What is the scale factor?

- ☐ A. 3 ☐ C. 12
☐ B. 4 ☐ D. $\frac{1}{4}$

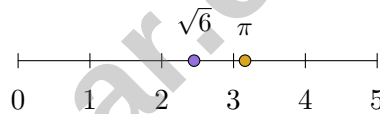


- 4) A student evaluated $f(x) = 3x + 2$ at $x = 4$ and wrote $f(4) = 3 + 2 + 4 = 9$. What error did the student make?

- ☐ A. Did not multiply x by the coefficient 3
☐ B. Multiplied 3 by 4 correctly but made an arithmetic mistake
☐ C. Added the constant instead of substituting correctly
☐ D. The answer is correct

- 5) A rectangle's length is 4 cm more than its width. If the perimeter is 32 cm, what is the length?

6)



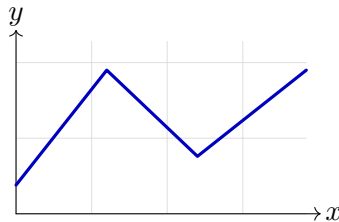
Which is true based on the number line?

- ☐ A. $\sqrt{6} > \pi$
☐ B. $\sqrt{6} + \pi$ is rational
☐ C. $\sqrt{6} = \pi$
☐ D. $\sqrt{6} < \pi$
- 7) A function shows distance from home vs. time. The distance is zero at time $t = 0$, increases to a maximum of 150 miles at $t = 2$, then decreases back to zero at $t = 4$. Is this best described as one linear function or a piecewise linear function?



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- 1) A function exhibits error: a student says “The graph increases at all points.” But the actual graph increases, then decreases, then increases again. Which statement correctly identifies the student’s error?



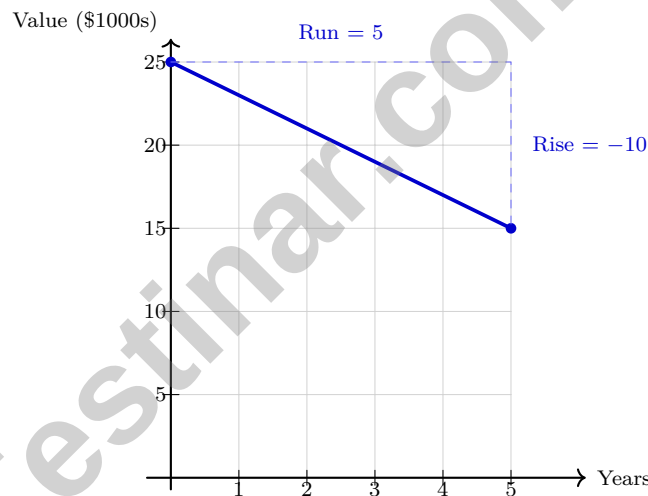
- ☐ A. The student only looked at one part of the graph
- ☐ B. The graph is increasing everywhere
- ☐ C. The graph is decreasing everywhere
- ☐ D. The graph is constant everywhere
- 2) A farmer plants rows of corn. Each row contains 20 plants. The relationship between rows (x) and total plants (y) is proportional. How many plants are in 8 rows?
- ☐ A. 120 plants
- ☐ B. 140 plants
- ☐ C. 160 plants
- ☐ D. 180 plants
- 3) Which statement best defines a function?
- ☐ A. A relation where every output has exactly one input.
- ☐ B. A relation where every input has exactly one output.
- ☐ C. A set of ordered pairs with different x -coordinates.
- ☐ D. Any relation that includes both positive and negative values.



- 4) The table has points $(0, -3)$, $(2, -1)$, and $(4, 1)$. What is its rate of change?

x	0	2	4
y	-3	-1	1

- 5) 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
- ☐ B. -\$1000 per year
- ☐ C. \$2000 per year
- ☐ D. 5 years per \$1000



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Michigan M STEP 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 Michigan M STEP practice test.



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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** (8.EE.C.8c) Let s = son's current age. Then father's age is $s + 30$. In 6 years, $s + 36 = 3(s + 6)$. So $s + 36 = 3s + 18$, which gives $18 = 2s$ and $s = 9$.
- 2) **Choice C is correct.** (8.G.C.9) Lateral surface area $= 6 \times \frac{1}{2}(\text{base edge})(\text{slant height}) = 6 \times \frac{1}{2}(4)(8) = 6 \times 16 = 96 \text{ cm}^2$. (Base edge $= 24/6 = 4 \text{ cm}$.)
- 3) **Choice B is correct.** (8.G.C.9) Cone: $V = \frac{1}{3} \times 3.14 \times 36 \times 9 = 339.12 \text{ cm}^3$. Sphere: $V = \frac{4}{3} \times 3.14 \times 125 = 523.33 \text{ cm}^3$.
- 4) **Choice C is correct.** (8.SP.A.3) Set $y = 0$: $0 = -0.5x + 5 \Rightarrow 0.5x = 5 \Rightarrow x = 10$.
- 5) **Choice A is correct.** (8.EE.C.8a) Substitute $x = 2$ into $4x - 3y = 5$: $8 - 3y = 5$, so $-3y = -3$ and $y = 1$. The solution is $(2, 1)$.
- 6) **The correct answer is 4.2.** (8.NS.A.2) $\sqrt{8} = 2\sqrt{2} \approx 2.83$ and $\sqrt{2} \approx 1.41$, so $2.83 + 1.41 = 4.24 \approx 4.2$.
- 7) **Choice A is correct.** (8.EE.C.7) Find two numbers that multiply to -10 and add to 3 : 5 and -2 . Check: $5 \cdot (-2) = -10$ and $5 - 2 = 3$.
- 8) **Choice D is correct.** (8.EE.C.8b) Test $(3, 2)$: $3 + 2 = 5 \not\leq 4$ FALSE. The other points all satisfy $x + y \leq 4$.
- 9) **Choice A is correct.** (8.F.A.2) The slope of f is 4 . For g : $\Delta y / \Delta x = 3/1 = 3$. Since $4 > 3$, f has the greater rate of change.
- 10) **Choice B is correct.** (8.F.A.3) $y = 10x - 6$ is in the form $y = mx + b$ with $m = 10$ and $b = -6$, making it linear. The others involve exponents, fractions with x , or exponential bases.
- 11) **The correct answer is 7.** (8.EE.A.1) Using the product rule, $a + 5 = 12$, so $a = 7$. Verification: $3^7 \cdot 3^5 = 3^{12}$.
- 12) **Choice A is correct.** (8.F.B.4) The sign-up fee $\$25$ is a one-time cost (the y -intercept, the value when $m = 0$). The monthly rate $\$15$ is the slope (rate of change per month). Therefore, $C = 15m + 25$. The slope tells how much additional cost per month; the intercept tells the starting cost.
- 13) **The correct answer is 7.** (8.EE.A.2) $\sqrt[3]{343} = 7$ because $7 \times 7 \times 7 = 343$.
- 14) **Choice C is correct.** (8.G.A.3) The rule $(x, y) \rightarrow (-x, -y)$ describes a 180° rotation about the origin. So $(3, 5) \rightarrow (-3, -5)$.
- 15) **Choice B is correct.** (8.G.B.6, 8.G.B.7) The correct calculation uses the Pythagorean Theorem: $5^2 + b^2 = 13^2$ gives $25 + b^2 = 169$, so $b = 12$. The student's error was subtracting instead of using $a^2 + b^2 = c^2$.
- 16) **Choice A is correct.** (8.G.B.8) Distance $= \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10$.
- 17) **Choice A is correct.** (8.G.B.7) Corresponding angles are congruent. So $r = 41^\circ$.
- 18) **The correct answer is A, C.** (8.G.B.8) A is correct: MAD is the average absolute deviation from the mean. C is correct: it restates this in slightly different language. B is incorrect: MAD is not about range. D is incorrect: MAD is the mean, not median, of deviations. E is incorrect: MAD is symmetric around the mean regardless of median position.
- 19) **Choice B is correct.** (8.G.B.7) Trapezoid area $= \frac{1}{2}(b_1 + b_2) \times h = \frac{1}{2}(4 + 6) \times 2 = 10 \text{ m}^2$.
- 20) **Choice D is correct.** (8.SP.A.1) The red points form one cluster, and the blue points form another. The graph therefore contains two distinct groups rather than one random set or one common linear pattern.
- 21) **Choice C is correct.** (8.SP.A.4) Row-conditional frequency: among high-quality products (row total 320), premium count 240. Denominator is row total. This is 0.75 or 75% .
- 22) **Choice B is correct.** (8.EE.C.7b) Seat 1: 8 choices. Seat 2: 7 remaining. Seat 3: 6 remaining. Using permutation notation: $\frac{8!}{5!} = 8 \times 7 \times 6 = 336$.
- 23) **Choice D is correct.** (8.EE.A.4) First divide: $\frac{8 \times 10^9}{2 \times 10^3} = 4 \times 10^6$. Then divide again: $\frac{4 \times 10^6}{4 \times 10^2} = 1 \times 10^4$.
- 24) **Choice D is correct.** (8.EE.B.5) Slope $= \frac{8}{2} = 4$. The line passes through $(0, 0)$ and $(2, 8)$.
- 25) **Choice B is correct.** (8.F.A.1) Input 5 maps to both 10 and 15, violating the definition of a function.
- 26) **The correct answer is 5.** (8.EE.C.8b) Solve $45 + 5q \geq 70$, giving $q \geq 5$. The minimum whole number is 5.
- 27) **Choice C is correct.** (8.F.B.5) By the vertical line test, a function can have at most one y -intercept (at $x = 0$). But it can have many x -intercepts (zeros). Options A violates the vertical line test, B is sometimes false, D is false for functions that don't cross an axis.



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A Note for a Careful Thinker

Hi, Careful Thinker!

◇ This full-length book gave you ten complete Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. This book gave you room to practice the kind of thinking eighth graders need: modeling linear relationships, solving systems, connecting algebra and geometry, and interpreting data. ◇

★ **Remember this:** The goal was never just to finish pages. The goal was to become the kind of student who knows how to begin, how to adjust, and how to check. ★

Your Careful-Thinking Toolkit

- **Read Twice:** First for the story, second for the math.
- **Label Values:** Give each number a job.
- **Check Signs:** Negatives and inequalities deserve attention.
- **Use Evidence:** Let the work prove the answer.

Grade 8 test-day tip: On test day, underline the question before solving. It keeps your answer aimed at the right target.

If you want to share something or ask a question, please email me at jay@testinar.com.

Jay Daie

Your Math Practice Coach

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