

MICHIGAN M STEP

GRADE 8 MATH

PRACTICE TESTS

5

PRINTED
TESTS



2

 ONLINE
TESTS

**Standards Aligned
Problem Solving For
Comprehensive Assessment Programs**



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



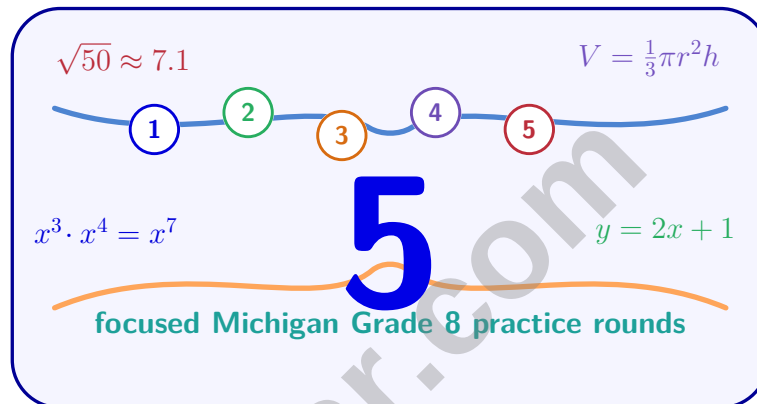
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

5 Michigan M STEP Grade 8 Math Practice Tests

Five M STEP Tests for Exponents, Equations, and Graphs



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

Five focused rounds for sharper M STEP math thinking

This book gives you five full Grade 8 M STEP 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 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 five-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.

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?

Five M STEP tests, 200 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–5	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.

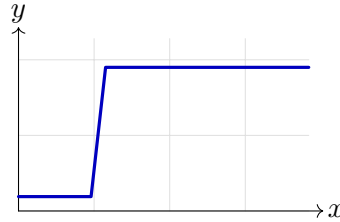


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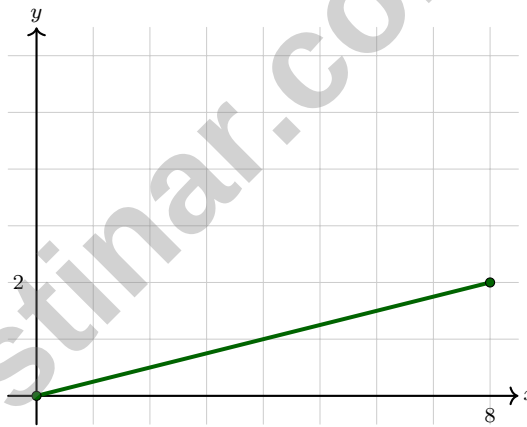
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- 1) A graph displays cumulative rainfall over a month. Which scenario matches a graph with a steep jump, then a flat section?



- ☐ A. Heavy rain one day, then no rain for several days ☐ C. No rain for a week, then a single light drizzle
☐ B. Light rain every day for a month ☐ D. Rain that decreases over time at a constant rate



2)

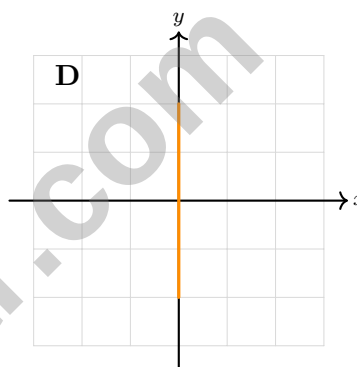
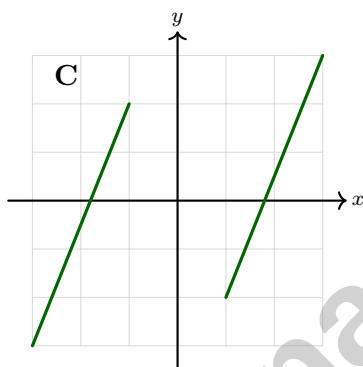
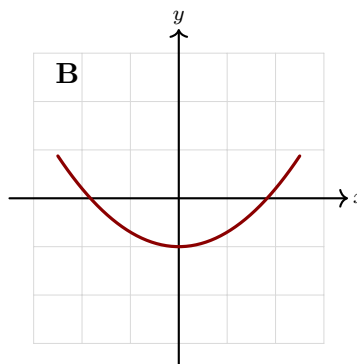
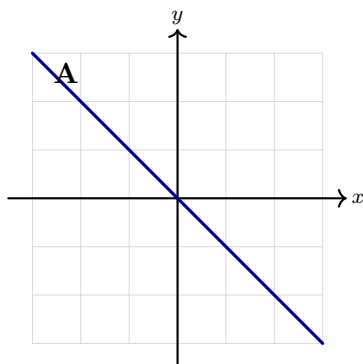
The constant of proportionality is:

- ☐ A. 4 ☐ C. 0.25
☐ B. 2 ☐ D. 8



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3) Which graph shows a single linear function?



☐ A. Graph A (diagonal line).

☐ B. Graph B (parabola).

☐ C. Graph C (two disconnected segments).

☐ D. Graph D (vertical line segment).

4) Solve the system $\begin{cases} x + y = 8 \\ x - y = 2 \end{cases}$ by elimination.



5) A student's test score improves linearly throughout a semester. After assignment 4, the score is 68. After assignment 10, the score is 82. What is the slope (improvement per assignment)?

☐ A. $\frac{7}{3}$ points per assignment

☐ C. 3 points per assignment

☐ B. 2 points per assignment

☐ D. $\frac{1}{2}$ point per assignment

6) A car traveling at 60 mph leaves 1 hour before a car traveling at 75 mph. How long does the faster car take to catch the slower car?

☐ A. 2 hours

☐ C. 4 hours

☐ B. 3 hours

☐ D. 5 hours

7) The table below shows values of function f . What is $f(2)$?

x	0	1	2	3
$f(x)$	5	7	9	11

☐ A. 7

☐ C. 11

☐ B. 9

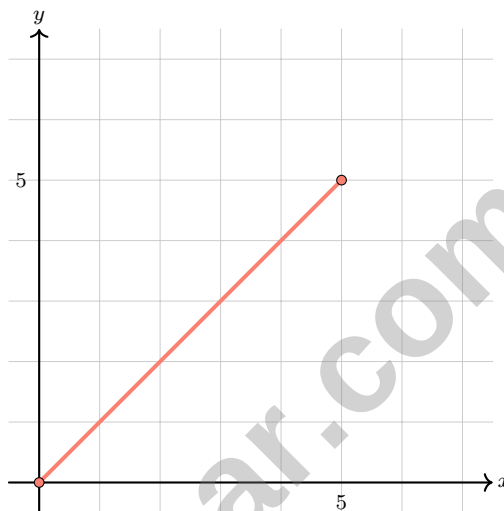
☐ D. 5



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- 1) Maria wants to borrow \$1,500 for a school trip. She can borrow from her parents at 0% interest or from a credit union at 6% simple interest. If she repays over 2 years, how much more will she owe the credit union than her parents?

- ☐ A. \$0
 ☐ C. \$180
☐ B. \$90
 ☐ D. \$360



2)

The equation is:

- ☐ A. $y = \frac{1}{5}x$
☐ C. $y = x$
☐ B. $y = 5x$
☐ D. $y = x + 5$

- 3) Which table represents a LINEAR function?

x	1	2	3	4
y	3	7	11	15

- ☐ A. Yes, the first differences are constant
 ☐ C. Yes, all y -values are positive
☐ B. No, the y -values are not all even
 ☐ D. No, the x -values increase



4) The table below shows a relation. Is it a function?

x	y
1	3
2	6
3	9
4	12

- ☐ A. No, because the outputs are larger than inputs.
- ☐ B. Yes, each input has exactly one output.
- ☐ C. No, because y values increase by 3.
- ☐ D. Yes, because all values are positive.
- 5) A car travels 120 miles in 3 hours at a constant speed. What is the slope (speed)?
- ☐ A. 120 miles per hour
- ☐ B. 60 miles per hour
- ☐ C. 30 miles per hour
- ☐ D. 40 miles per hour
- 6) Alice, Bob, and Clara are three friends. Alice is twice as old as Bob. Clara is 1 year older than Bob. The sum of all their ages is 49 years. How old is Bob?
- ☐ A. 8
- ☐ B. 10
- ☐ C. 12
- ☐ D. 14



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1) A company's profit P (in dollars) after n years is given by $P = 1000n^2 + 500$. Is this linear or nonlinear?

- ☐ A. Linear; profit increases steadily ☐ C. Linear; the equation has two terms
☐ B. Nonlinear; n is squared, creating a parabola ☐ D. Nonlinear; profit must eventually decrease

2) Simplify $\frac{(k^2)^3 \cdot k^{-1}}{k^5}$.

- ☐ A. k^{-5} ☐ C. k^{10}
☐ B. k^2 ☐ D. $k^0 = 1$

3) A worker receives a paycheck with gross pay of \$2,000, federal tax withholding of \$240, and FICA tax of \$160. What is the net pay?

- ☐ A. \$2,000 ☐ C. \$1,840
☐ B. \$1,760 ☐ D. \$1,600

4) What is $\sqrt{225}$?

- ☐ A. 13 ☐ C. 15
☐ B. 14 ☐ D. 16

5) A scientist says the mass of a virus is 1.5×10^{-20} grams and a bacterium is 5×10^{-15} grams. The bacterium is $\frac{5 \times 10^{-15}}{1.5 \times 10^{-20}} \approx 3.3 \times 10^5$ times more massive. Is this correct?

- ☐ A. No; the quotient should be about 3.3×10^4 . ☐ C. Yes, the calculation is correct.
☐ B. No; the exponent should be 10^{-35} . ☐ D. No; the exponent should be negative.



6) A garden uses 3 gallons of water per crimson plant. After planting 12 crimson plants, how many gallons are needed?

☐ A. 24 gallons

☐ C. 36 gallons

☐ B. 30 gallons

☐ D. 40 gallons

7) Which equation represents a function where each input x has exactly one output y ?

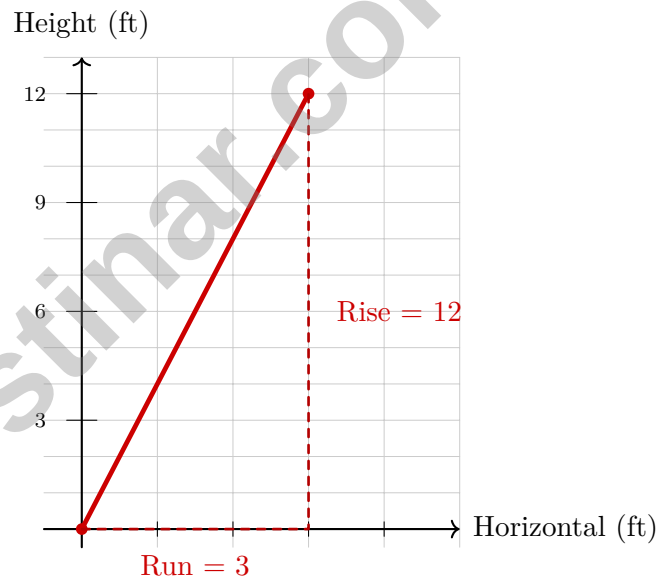
☐ A. $x^2 + y^2 = 9$ (circle)

☐ C. $|y| = x$ (absolute value of y)

☐ B. $y = \sqrt[3]{x}$ (cube root)

☐ D. $y = \pm\sqrt{x}$ (both square roots)

8) A ladder against a building creates a line from $(0, 0)$ on the ground to $(3, 12)$ where coordinates are (horizontal distance in ft, height in ft). What is the slope?



☐ A. 4 feet per foot

☐ C. 3 feet per foot

☐ B. $\frac{1}{4}$ feet per foot

☐ D. 12 feet per foot



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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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& answers

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** (8.F.B.5) Cumulative rainfall never decreases. A steep jump indicates heavy rainfall over a short time; a flat section means zero rainfall. B would show a gradual, constant increase (not steep). C would be a small jump then flat. D is impossible for cumulative data.
- 2) **Choice C is correct.** (8.EE.B.5) $k = \frac{2}{8} = \frac{1}{4} = 0.25$.
- 3) **Choice A is correct.** (8.F.A.1) Graph A is one nonvertical straight line, so it is a linear function. Graph B is a function but not linear. Graph C is made of two separate segments, not one single linear function. Graph D is a vertical line segment, so it is not a function.
- 4) **The correct answer is (5, 3).** (8.EE.C.8a) Add the two equations to eliminate y : $(x + y) + (x - y) = 8 + 2$, so $2x = 10$, giving $x = 5$. Substitute into the first equation: $5 + y = 8$, so $y = 3$.
- 5) **Choice A is correct.** (8.EE.B.5) Using (4, 68) and (10, 82): slope = $\frac{82 - 68}{10 - 4} = \frac{14}{6} = \frac{7}{3}$ points per assignment.
- 6) **Choice C is correct.** (8.EE.C.8c) When the faster car catches up, they've traveled the same distance. Let t = time the faster car travels. The slower car travels $60(t + 1) = 60t + 60$. The faster car travels $75t$. Setting them equal: $75t = 60t + 60$, so $15t = 60$, giving $t = 4$ hours.
- 7) **Choice B is correct.** (8.F.A.1) Locate $x = 2$ in the table; the corresponding $f(x)$ value is 9.
- 8) **Choice B is correct.** (8.F.B.4) Slope: $\frac{16 - 12}{2 - 0} = \frac{4}{2} = 2$ cm/week. (Or: from week 0 to 4, height goes from 12 to 20, a change of 8 cm in 4 weeks = 2 cm/week.)
- 9) **Choice C is correct.** (8.G.A.2) Perimeter = $13 + 13 + 10 = 36$ cm. Triangle 2 is congruent, so it has the same perimeter.
- 10) **The correct answer is (3, 7).** (8.EE.C.7) The integers 3 and 7 multiply to 21 and add to 10.
- 11) **Choice C is correct.** (8.G.A.3) Under 180° rotation, $(x, y) \rightarrow (-x, -y)$: $(1, 1) \rightarrow (-1, -1)$, $(3, 1) \rightarrow (-3, -1)$, $(2, 3) \rightarrow (-2, -3)$. This matches the red triangle.
- 12) **Choice C is correct.** (8.G.A.5) An exterior angle equals the sum of the two remote interior angles: $115 = 48 + x$, so $x = 67^\circ$.
- 13) **Choice A is correct.** (8.G.B.6, 8.G.B.7) From $(\sqrt{5})^2 + (\sqrt{20})^2 = c^2$, we get $5 + 20 = 25$, so $c = \sqrt{25} = 5$.
- 14) **Choice A is correct.** (8.G.B.8) Distance = $\sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$ units.
- 15) **Choice C is correct.** (8.G.B.7) Let the angle be x . Its supplement is $180 - x$. So $x = (180 - x) + 8 \Rightarrow x = 188 - x \Rightarrow 2x = 188 \Rightarrow x = 94^\circ$.
- 16) **Choice B is correct.** (8.G.C.9) $V_A = \frac{1}{3} \times 25 \times 6 = 50 \text{ cm}^3$. $V_B = \frac{1}{3} \times 25 \times 12 = 100 \text{ cm}^3$. Difference: $100 - 50 = 50 \text{ cm}^3$.
- 17) **Choice C is correct.** (8.G.B.7) Parallelogram = $10 \times 6 = 60 \text{ m}^2$. Each triangle = $\frac{1}{2} \times 10 \times 2 = 10 \text{ m}^2$. Two triangles = 20 m^2 . Total = $60 + 20 = 80 \text{ m}^2$.
- 18) **The correct answer is B, E.** (8.EE.A.4) The product is $(4 \times 5) \times 10^{3+4} = 20 \times 10^7 = 2 \times 10^8$, so choices B and E are equivalent to the original expression. Choice A uses an exponent that is too large, and choices C and D have the wrong value.
- 19) **Choice A is correct.** (8.G.A.5) Sum for heptagon: $(7 - 2) \times 180 = 900^\circ$. Each angle: $\frac{900}{7} \approx 128.6^\circ \approx 129^\circ$.
- 20) **Choice B is correct.** (8.SP.A.1) A U-shaped (parabolic) curve is nonlinear. It cannot be well-approximated by a straight line. The relationship changes direction, which is incompatible with simple linear regression assumptions.
- 21) **Choice A is correct.** (8.SP.A.4) Men voting yes = $120 - 75 = 45$. Relative frequency = $\frac{45}{120} = 0.375 = 37.5\%$.
- 22) **Choice A is correct.** (8.G.B.8) Original data: $\{1, 2, 3\}$, mean = 2. New point must equal 2 to keep mean at 2. New data: $\{1, 2, 2, 3\}$, deviations $\{1, 0, 0, 1\}$. MAD = $2/4 = 0.5$.
- 23) **Choice D is correct.** (8.G.B.7) $5 \times 4 \times 3 = 60$ different combinations.
- 24) **Choice B is correct.** (8.SP.A.2) $14 = 3x + 2 \Rightarrow 12 = 3x \Rightarrow x = 4$.
- 25) **Choice B is correct.** (8.G.A.4) Scale factor is $\frac{15}{10} = 1.5$. Shorter base is $6 \times 1.5 = 9$ cm.



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Hi, Persistent Problem Solver!

◇ Some Grade 8 questions ask you to hold several ideas in your mind at once. That can feel hard, and that is exactly why practice matters. ◇

★ **Remember this:** You showed persistence by continuing through the set. That habit is powerful because difficult problems often open after one more good attempt. You practiced across 5 full Grade 8 practice tests, and that repeated effort matters. ★

Persistence Tools

- **Try a Smaller Case:** Use an easier number to see the pattern.
- **Draw It:** Make the situation visible.
- **Restate It:** Say the question in your own words.
- **Check One Step:** Fix the first unclear place.

Grade 8 test-day tip: When stuck, do not restart everything. Find the first step you trust, then rebuild from there.

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

Jay Daie

Your Persistence Coach

Practice Today. Succeed Tomorrow!

Give your child the confidence and skills they need with **5 full-length Grade 8 Math** practice tests that reflect real test formats and cover all key math standards. Perfect for building skills, strengthening problem-solving abilities, and achieving 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.

COVERS ALL ESSENTIAL TOPICS

- | | |
|---------------------------------------|----------------------------|
| ✓ The Number System | ✓ Statistics & Probability |
| ✓ Expressions & Equations | ✓ Pythagorean Theorem |
| ✓ Ratios & Proportional Relationships | ✓ Volume & Surface Area |
| ✓ Linear Equations | ✓ Transformations |
| ✓ Functions | ✓ Inequalities |
| ✓ Geometry | ✓ Data Analysis & Graphing |
| ✓ Measurement & Data | ✓ And More! |

5
PRINTED
TESTS



2 ONLINE
TESTS



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