

Michigan

M STEP

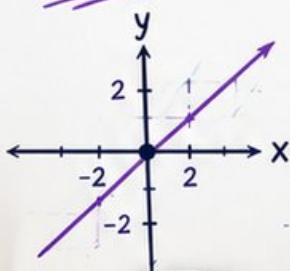
GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

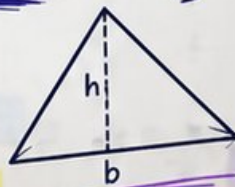
$$y = mx + b$$



**BUILD
CONFIDENCE.
SHARPEN SKILLS.
ACE YOUR
EXAM!**

Practice
Today
Succeed
Tomorrow!

$$A = \frac{1}{2}bh$$



7 PRINTED
TESTS



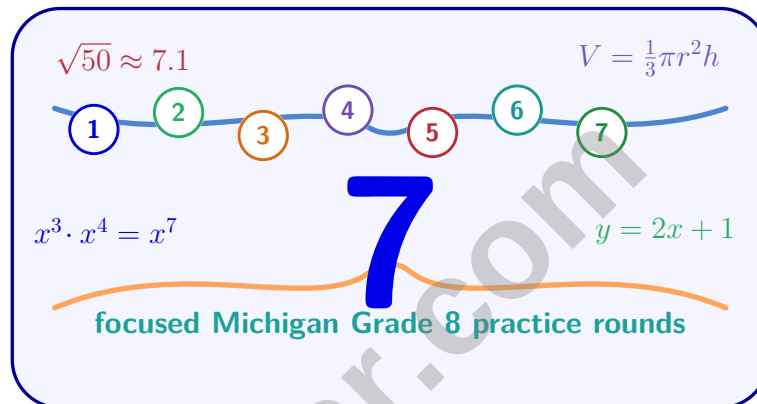
2 ONLINE
TESTS



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

7 Michigan M STEP Grade 8 Math Practice Tests

Purposeful Grade 8 M STEP Prep with Seven Complete Math Tests



Seven 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!

Seven focused rounds for sharper M STEP math thinking

This book gives you seven 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 seven-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?

Seven M STEP tests, 280 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real and irrational numbers, integer exponents, scientific notation, equations, and careful reading.
Tests 4–6	Slope, systems of equations, functions, inequalities, transformations, congruence, and similarity.
Test 7	Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina.
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.

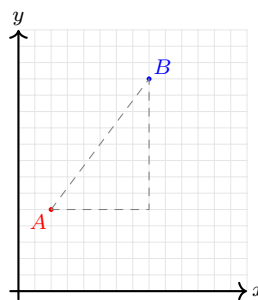


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& answers

Table of Contents

★ Practice Test 1	_____	13
★ Practice Test 2	_____	28
★ Practice Test 3	_____	43
★ Practice Test 4	_____	59
★ Practice Test 5	_____	75
★ Practice Test 6	_____	92
★ Practice Test 7	_____	108
Practice Test Answer Keys	_____	124
Practice Test Answers and Explanations	_____	129

- 1) A student plots study time versus test performance and finds that the regression line is nearly horizontal with a slope near zero. What does this suggest?
- ☐ A. Study time strongly predicts test performance ☐ C. Test performance decreases with study time
- ☐ B. There is little or no linear relationship between study time and test score ☐ D. The data contains no measurement error
- 2) What are the two factors of the constant term -12 that will correctly factor $x^2 + x - 12$?
- ☐ A. 3 and -4 ☐ C. 6 and -2
- ☐ B. -3 and 4 ☐ D. 12 and -1
- 3) Figure ABCDE is a regular pentagon (all sides equal, all angles equal). It is dilated by a scale factor of 2 to form figure A'B'C'D'E'. How does the dilated pentagon compare to the original?
- ☐ A. The pentagons are congruent ☐ C. The angles are twice as large
- ☐ B. A'B'C'D'E' has twice the side lengths ☐ D. The pentagons are identical
- 4) On a coordinate grid, point A is at $(2, 5)$ and point B is at $(8, 13)$. Use the distance formula to find the distance from A to B .



- ☐ A. 10 ☐ C. $\sqrt{90}$
- ☐ B. 14 ☐ D. 8

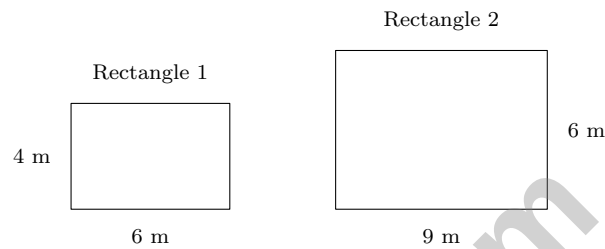


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5) A regular nonagon (9-sided polygon) has each interior angle equal to:

☐ A. 120°
☐ C. $\approx 140^\circ$
☐ B. $\approx 128.6^\circ$
☐ D. 144°

6) Two rectangles are shown with proportional dimensions. Which similarity statement is correct?


☐ A. Rectangle 1 $\sim$ Rectangle 2 with scale factor 1.5

☐ C. Rectangle 1 $\sim$ Rectangle 2 with scale factor 0.5

☐ B. The rectangles are not similar

☐ D. They are congruent

7) Which point is on the boundary line of $3x - y = 9$ but NOT in the solution region of $3x - y < 9$?

☐ A. (3, 0)

☐ C. (1, 6)

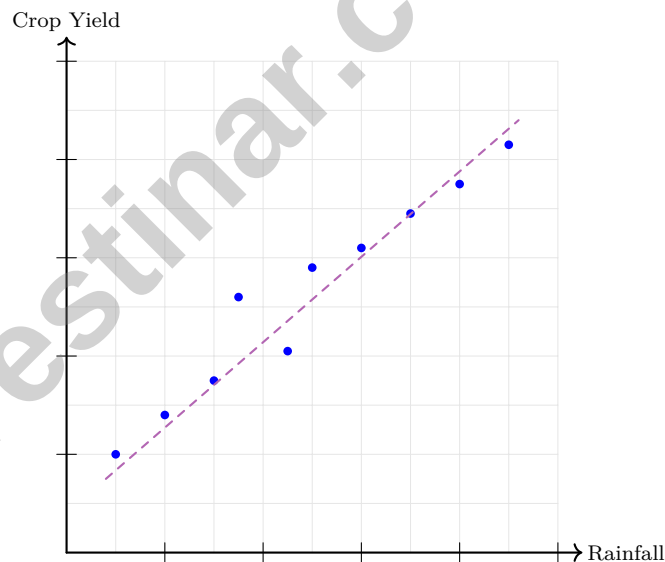
☐ B. (0, 9)

☐ D. (2, 1)

8) Solve for m : $\frac{m}{5} - 2 = 3$. Show all work and verify your solution.



- 9) Video streaming Plan A: \$2.99 base, \$0.50 per movie. Plan B through (0, 1) and (10, 6) on a cost-movie plane. Which plan costs more at 20 movies?
- ☐ A. Plan A ☐ C. Both equal
☐ B. Plan B ☐ D. Cannot be determined
- 10) A student computed the volume of a cylinder with radius 3 cm and height 8 cm as $V = 3.14 \times 3 \times 8 = 75.36 \text{ cm}^3$. What error did the student make?
- ☐ A. Used diameter instead of radius ☐ C. Used the cone formula by mistake
☐ B. Forgot to square the radius ☐ D. Did not use π correctly
- 11) A scatter plot of rainfall versus crop yield shows $r = 0.68$. A farmer reads this and concludes: **“More rain always means higher yields.”** Is this conclusion reasonable?



- ☐ A. No; correlation of 0.68 indicates a moderate relationship, not always
☐ B. Yes; positive correlation means the relationship always holds
☐ C. No; rainfall has no effect on yields at all
☐ D. Yes; any positive correlation guarantees the outcome



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- 1) Two parallel lines are cut by a transversal. If one pair of corresponding angles measures 70° , what is the measure of the corresponding angle on the other line?

- ☐ A. 20°
☐ C. 110°
☐ B. 70°
☐ D. 180°

2)

x	y
-1	0
0	3
1	6

What is the equation of the line represented by the table?

- ☐ A. $y = 3x + 3$
☐ C. $y = -3x + 3$
☐ B. $y = 3x - 3$
☐ D. $y = x + 3$

- 3) Solve for x : $3(x + 1) = 2(x + 4)$

- ☐ A. $x = 2$
☐ C. $x = -1$
☐ B. $x = 8$
☐ D. $x = 5$

- 4) Determine how many solutions this system has:
$$\begin{cases} x - 3y = 6 \\ 2x - 6y = 12 \end{cases}$$

- ☐ A. No solution
 ☐ C. Infinitely many solutions
☐ B. Exactly one solution
 ☐ D. Two solutions

- 5) Factor $x^2 + 7x + 12$.

- ☐ A. $(x + 3)(x + 4)$
☐ C. $(x + 1)(x + 12)$
☐ B. $(x + 2)(x + 6)$
☐ D. $(x + 4)(x + 4)$



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- 6) A dust particle has a mass of 2×10^{-8} kg. If 500 such particles are stacked, what is the total mass in scientific notation?

- 7) A shape is reflected across a vertical line and then translated 5 units to the right. If the original shape has area 24 square units, what is the area of the final shape?

- ☐ A. 12 square units ☐ C. 48 square units
☐ B. 24 square units ☐ D. 120 square units

- 8) What is the distance between the points (1, 2) and (4, 6)?

- ☐ A. 5 ☐ C. $\sqrt{7}$
☐ B. 7 ☐ D. $\sqrt{26}$

- 9) If each interior angle of a regular polygon is 144° , how many sides does it have?

- ☐ A. 8 ☐ C. 10
☐ B. 9 ☐ D. 12

- 10) If 5 kilograms of rice cost \$15, what is the unit price (constant of proportionality) in dollars per kilogram?



1) Divide $\frac{8.4 \times 10^6}{2.1 \times 10^3}$. Express in scientific notation.

☐ A. 4×10^2

☐ C. 6.3×10^3

☐ B. 0.4×10^2

☐ D. 4×10^3

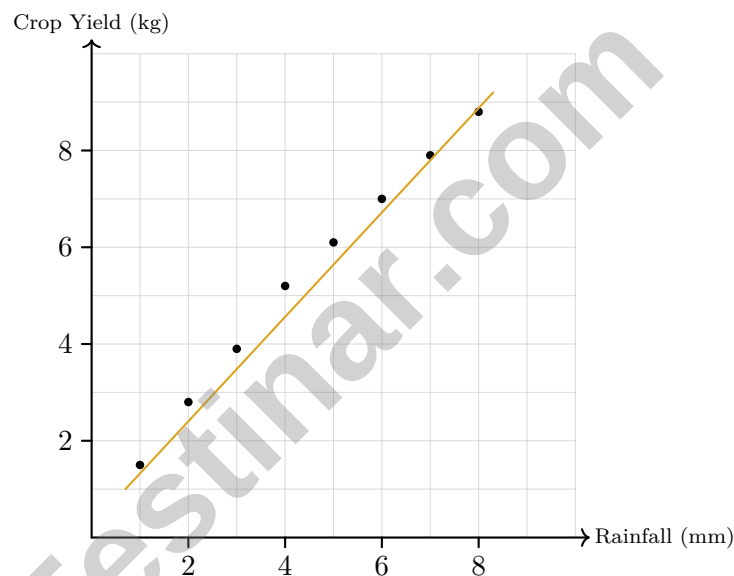
2) A fair coin is flipped and a fair die is rolled. What is the probability of getting tails AND rolling a 5 or 6?

☐ A. $\frac{1}{6}$

☐ C. $\frac{2}{18}$

☐ B. $\frac{1}{4}$

☐ D. $\frac{2}{6}$



3)

In a study of rainfall and crop yield, the trend line shows a positive relationship. How much would yield increase for every 1 mm increase in rainfall?

☐ A. Between 1 and 2 kg☐ C. Between 2 and 3 kg☐ B. Less than 1 kg☐ D. More than 3 kg

Number Sorting $\pi, \sqrt{4}, 0.\bar{5}, -2.5, \sqrt{11}$

How many are rational?

4)

- ☐ A. One ($\sqrt{4}$ only) ☐ C. Three ($\sqrt{4}$, $0.\bar{5}$, and -2.5)
☐ B. Two ($\sqrt{4}$ and $0.\bar{5}$) ☐ D. Four (all but π or $\sqrt{11}$)

5) Convert $0.\bar{7}$ to a fraction. Which step is incorrect?

- ☐ A. Let $x = 0.\bar{7}$. ☐ C. $10x - x = 7.\bar{7} - 0.\bar{7} = 7$ is wrong; should be 0.7 .
☐ B. $10x = 7.\bar{7}$. ☐ D. $9x = 7$, so $x = \frac{7}{9}$.

6) In a triangle, the three angles are in the ratio 1 : 2 : 3. Find the measure of the largest angle.

7) A square has an area of 75 square units. Between which two integers is the side length?

- ☐ A. Between 7 and 8 ☐ C. Between 6 and 7
☐ B. Between 5 and 6 ☐ D. Between 8 and 9



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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 B is correct.** (8.SP.A.2) A near-zero slope indicates weak or no correlation between the variables.
- 2) **Choice B is correct.** (8.EE.C.7) These two numbers multiply to -12 and add to 1 (the middle coefficient). So $x^2 + x - 12 = (x - 3)(x + 4)$.
- 3) **Choice B is correct.** (8.G.A.2) Dilation by scale factor 2 enlarges all side lengths by a factor of 2 , but angles remain unchanged. The dilated pentagon is SIMILAR to the original, not congruent (unless the scale factor is 1).
- 4) **Choice A is correct.** (8.G.B.8) $d = \sqrt{(8-2)^2 + (13-5)^2} = \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$.
- 5) **Choice C is correct.** (8.G.A.5) The sum for a nonagon is $(9-2) \times 180 = 1260^\circ$. Each angle is $\frac{1260}{9} = 140^\circ$.
- 6) **Choice A is correct.** (8.G.A.4) Ratio of corresponding sides: $\frac{9}{6} = 1.5$ and $\frac{6}{4} = 1.5$. Constant ratio confirms similarity.
- 7) **Choice A is correct.** (8.EE.C.8b) Boundary points satisfy $3x - y = 9$. For $(3, 0)$, $3(3) - 0 = 9$, so it is on the boundary. Because the inequality is strict, boundary points are not in the solution region.
- 8) **The correct answer is $m = 25$.** (8.EE.C.7) Add 2 to both sides: $\frac{m}{5} = 5$. Multiply both sides by 5 : $m = 25$. Verify: $\frac{25}{5} - 2 = 5 - 2 = 3 \checkmark$.
- 9) **Choice A is correct.** (8.F.A.2) $A(20) = 2.99 + 0.50(20) = 12.99$. B slope: $(6-1)/10 = 0.5$, so $B(20) = 1 + 0.5(20) = 11$. Since $12.99 > 11$, Plan A costs more.
- 10) **Choice B is correct.** (8.G.C.9) Correct formula: $V = \pi r^2 h = 3.14 \times 3^2 \times 8 = 3.14 \times 9 \times 8 = 226.08 \text{ cm}^3$. Student omitted r^2 , computing $\pi r h$ instead.
- 11) **Choice A is correct.** (8.SP.A.1) A correlation of 0.68 shows a moderate positive trend, but it is not deterministic. Some years with above-average rain may have below-average yields due to other factors (pests, soil quality, temperature). The relationship is probabilistic, not absolute.
- 12) **Choice B is correct.** (8.EE.C.7b) Two morning choices times three afternoon choices: $2 \times 3 = 6$ possible schedules.
- 13) **Choice B is correct.** (8.F.B.4) Initial height is 60 inches (intercept). Melts (decreases) at 4 inches per day (negative slope). Equation: $h = -4d + 60$.
- 14) **Choice A is correct.** (8.F.B.5) From 0 to 2 minutes, the graph shows the temperature decreasing from 6°C to 4°C . Option A claims an increase, so it is false.
- 15) **Choice B is correct.** (8.G.A.3) A 270° counterclockwise rotation (or 90° clockwise) maps $(x, y) \rightarrow (y, -x)$.
- 16) **Choice A is correct.** (8.G.A.5) Co-interior angles (same-side interior angles) are supplementary: $124 + y = 180$, so $y = 56^\circ$.
- 17) **Choice B is correct.** (8.G.B.6, 8.G.B.7) From $6^2 + b^2 = 10^2$, we get $36 + b^2 = 100$, so $b = 8$ (scaled 3-4-5 triple).
- 18) **Choice B is correct.** (8.G.B.7) Alternate interior angles formed by a transversal cutting parallel lines are congruent. So $z = 62^\circ$.
- 19) **Choice B is correct.** (8.G.C.9) $V_X = \frac{1}{3} \times 64 \times 10 \approx 213.3 \text{ cm}^3$. $V_Y = \frac{1}{3} \times 60 \times 12 = 240 \text{ cm}^3$. Pyramid Y is larger.
- 20) **Choice C is correct.** (8.G.B.7) Each rectangle area $= 4 \times 2 = 8 \text{ m}^2$. Three rectangles $= 3 \times 8 = 24 \text{ m}^2$.
- 21) **The correct answer is B,E.** (8.EE.B.6) The equation has slope $-\frac{2}{3}$ and y -intercept 5 , so B and E are correct. The point $(5, 0)$ is not on the line because $-\frac{2}{3}(5) + 5 = \frac{5}{3}$, not 0 . A perpendicular line would have slope $\frac{3}{2}$, not $-\frac{3}{2}$.
- 22) **The correct answer is no solution.** (8.EE.C.8a) The two equations represent lines with the same slope $\frac{1}{2}$ but different y -intercepts (1 and 4), making them parallel. Parallel lines never intersect, so the system has no solution.
- 23) **Choice A is correct.** (8.SP.A.4) Joint relative frequency: $\frac{63}{420} = 0.15 = 15\%$.
- 24) **Choice B is correct.** (8.G.B.8) Mean $= 6$. Absolute deviations: $|2-6| = 4$, $|4-6| = 2$, $|6-6| = 0$, $|8-6| = 2$, $|10-6| = 4$. Sum $= 12$. MAD $= 12/5 = 2.4$.
- 25) **Choice C is correct.** (8.G.B.7) Sums of $10, 11, 12$: $(4,6)$, $(5,5)$, $(6,4)$, $(5,6)$, $(6,5)$, $(6,6)$. That's 6 outcomes.
- 26) **Choice D is correct.** (8.NS.A.1) Square roots of perfect squares always yield whole numbers. For example, $\sqrt{36} = 6$, $\sqrt{49} = 7$, $\sqrt{100} = 10$. Whole numbers are integers and therefore rational.



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The Power of Showing Work

Hi, Organized Solver!

◇ You practiced Grade 8 skills that often require more than one step. That means your written work matters. ◇

★ **Remember this:** Showing work is not extra. It is how you track your thinking, find errors, and prove that your answer did not happen by luck. You practiced across 7 full Grade 8 practice tests, and that repeated effort matters. ★

Organized Work Habits

- **One Line Per Step:** Keep the path readable.
- **Box the Answer:** Make the final result easy to find.
- **Use Labels:** Tell what each value represents.
- **Check the Path:** Follow your steps backward if needed.

Grade 8 test-day tip: When a problem has several steps, write less on each line. Space makes checking easier.

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

Jay Daie

Your Organized-Work Coach

PRACTICE TODAY SUCCEED TOMORROW!

Give your child the confidence and skills they need with **7 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!

GRADE 8

Practice
Today
Succeed
Tomorrow!

Algebra

Geometry

Statistics

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.



Build Skills & Boost Confidence

Strengthen understanding and feel prepared for test day.

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! |



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