

9

Minnesota

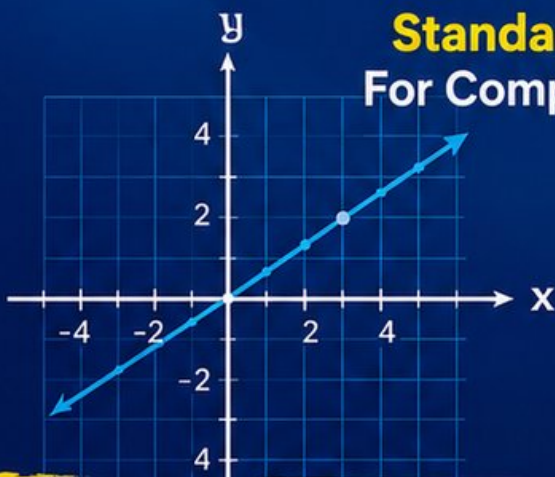
MCA III

Grade 8

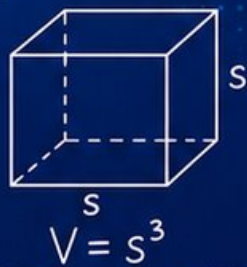
MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



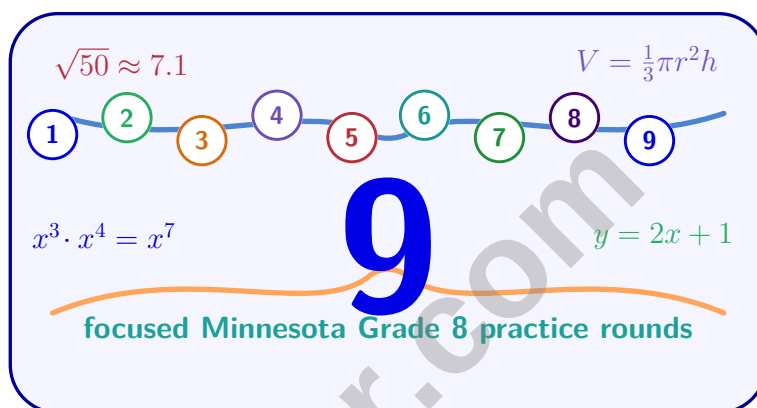
$$2x + 3y = 12$$
$$y = mx + b$$

**9** PRINTED
TESTS**2** ONLINE
TESTS

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

9 Minnesota MCA III Grade 8 Math Practice Tests

Clear Minnesota Review for Algebra, Geometry, Functions, Statistics, and Probability



Nine complete 40-question Grade 8 MCA III 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, Minnesota Grade 8 Problem Solver!

Nine focused rounds for sharper MCA III math thinking

This book gives you nine full Grade 8 MCA III 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 Minnesota 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 nine-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.

Minnesota 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?

Nine MCA III tests, 360 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.
Tests 7–9	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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1) Which value is closest to $\sqrt{35}$?

☐ A. 5

☐ C. 6

☐ B. 7

☐ D. 5.8

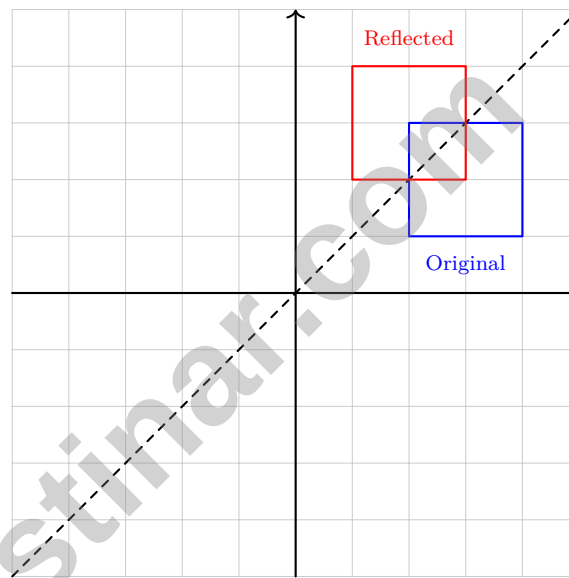
2) For the inequality $y \leq -\frac{1}{2}x + 3$, which point is in the solution region?

☐ A. (0, 5)

☐ C. (2, 4)

☐ B. (0, 0)

☐ D. (4, 4)



3)

The blue rectangle is reflected across the dashed line. Which line of reflection is shown?

☐ A. $y = x$

☐ C. $y = x - 3$

☐ B. $y = -x$

☐ D. $y = 2x$



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4) Which is the best estimate of $\sqrt{48}$?

☐ A. 6.5

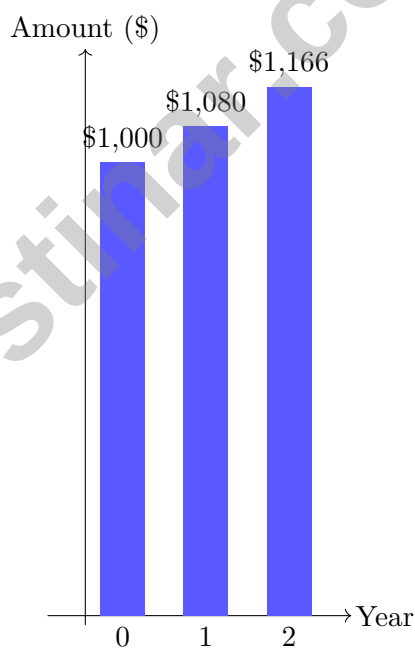
☐ C. 6.9

☐ B. 7.0

☐ D. 8.2

5) A virus has diameter 1.2×10^{-7} m. Bacteria has diameter 8×10^{-6} m. How many times larger is the bacterium than the virus?

6) An investment grows with compound interest. If \$1,000 is invested at 8% compound interest annually, which is the closest to the amount after 2 years?



☐ A. \$1,080

☐ C. \$1,166

☐ B. \$1,160

☐ D. \$1,200



7) $\frac{\frac{8 \times 10^9}{2 \times 10^3}}{4 \times 10^2} = ?$

☐ A. 10^5

☐ B. 1×10^6

☐ C. 4×10^4

☐ D. 1×10^4

8) Estimate $\sqrt{50}$ to the nearest tenth and explain how you found your estimate.

9)

x	y
1	6
2	9
3	12

What is the slope represented by the table?

☐ A. 1

☐ B. 2

☐ C. 3

☐ D. 6

10) What value of x makes $10 - 3x = 1$ true?

☐ A. $x = 3$

☐ B. $x = -3$

☐ C. $x = 9$

☐ D. $x = 11$

11) Solve by elimination: $\begin{cases} 2x + y = 7 \\ x - y = 2 \end{cases}$

☐ A. (2, 3)

☐ B. (1, 5)

☐ C. (3, 1)

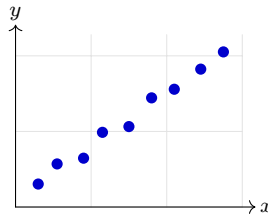
☐ D. (4, -1)



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- 1) In a right triangle, one acute angle measures 38° . What is the measure of the other acute angle?

- ☐ A. 38° ☐ C. 52°
☐ B. 42° ☐ D. 90°



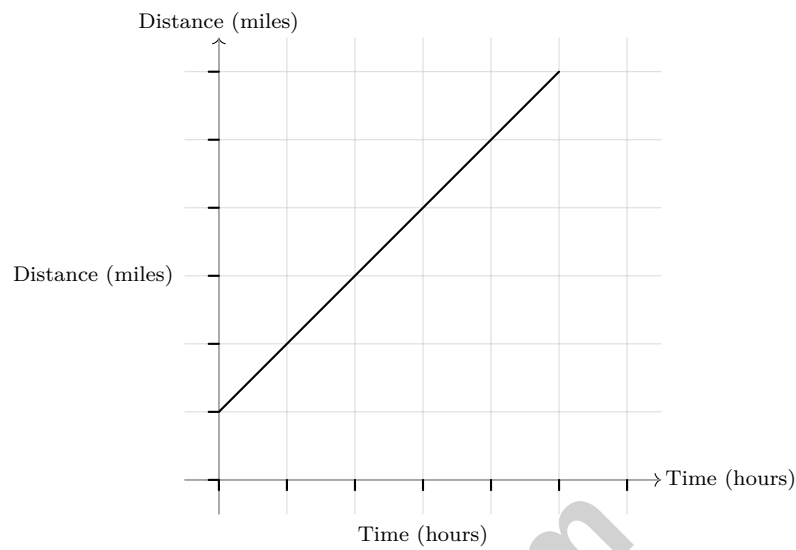
2)

A scatter plot shows the relationship between advertising spending (in hundreds of dollars) and product sales (in units). The data points form a tight cluster around an imaginary upward line. What does this indicate?

- ☐ A. Weak positive correlation ☐ C. Weak negative correlation
☐ B. No correlation ☐ D. Strong positive correlation
- 3) A shape is made of a right triangle (legs 6 in and 8 in) with a rectangle (length 6 in, width 2 in) attached to the longer leg. Find the total area.

- ☐ A. 12 in^2 ☐ C. 36 in^2
☐ B. 24 in^2 ☐ D. 48 in^2





4)

A distance-time line is shown. What is the y -intercept?

☐ A. 0

☐ C. 5

☐ B. 1

☐ D. 6

5) Among high-quality products in the table below, what relative frequency are premium-priced?

	Premium	Standard	Total
High Quality	240	80	320
Low Quality	48	112	160
Total	288	192	480

☐ A. $\frac{240}{480} = 0.50$
☐ C. $\frac{240}{320} = 0.75$
☐ B. $\frac{240}{288} \approx 0.83$
☐ D. $\frac{240}{480} = 0.60$


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- 1) Two runners train with proportional relationships. Runner A: $y = 6x$ (miles per hour y at time x in hours). Runner B: $y = 8x$. Who runs faster?

☐ A. Runner A
 ☐ C. They run at the same speed
☐ B. Cannot determine from the equations
 ☐ D. Runner B

- 2) A rectangular prism has length 10 ft, width 5 ft, and surface area 250 ft^2 . What is its height?

☐ A. 3 ft
 ☐ C. 5 ft
☐ B. 4 ft
 ☐ D. 6 ft

- 3) The table shows the distance traveled over time. Is this a linear relationship?

Time (h)	1	2	3	4
Distance (mi)	60	120	180	240

☐ A. No, time goes up to 4
 ☐ C. No, the distances double
☐ B. Yes, the first differences are constant (60 mi)
 ☐ D. Yes, the ratio of distance to time is not constant

- 4) Which function is NOT proportional (i.e., does not pass through the origin)?

☐ A. $y = 3x$
☐ C. $y = 2x + 1$
☐ B. $y = 5x$
☐ D. $y = \frac{1}{2}x$

- 5) Which graph feature indicates that an object momentarily stops during a distance-time journey?

☐ A. A vertical line segment
 ☐ C. A steep downward slope
☐ B. A horizontal line segment
 ☐ D. A negative y -intercept



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6) If a segment has length 15 units and is dilated by scale factor $\frac{2}{3}$, what is the length of the dilated segment?

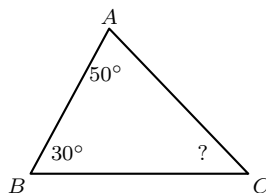
☐ A. 10 units

☐ C. 22.5 units

☐ B. 15 units

☐ D. 20 units

7) In triangle ABC , angle $BAC = 50^\circ$ and angle $ABC = 30^\circ$. What is angle ACB ?



☐ A. 20°

☐ C. 80°

☐ B. 50°

☐ D. 100°

8) A diagonal walkway connects two opposite corners of a rectangular plaza that is 30 m by 40 m. How long is the walkway?

☐ A. 35 m

☐ C. 70 m

☐ B. 50 m

☐ D. 1200 m



Minnesota MCA III 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 Minnesota MCA III practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** (8.2.4.9) $5^2 = 25$ and $6^2 = 36$. Since 35 is between these but closer to 36, $\sqrt{35} \approx 5.92$, closest to 5.8 among the choices.
- 2) **Choice B is correct.** (8.3.1.2) Test each point in $y \leq -\frac{1}{2}x + 3$: (A) $5 \leq -\frac{1}{2}(0) + 3 = 3$? NO. (B) $0 \leq 3$? YES. (C) $4 \leq -\frac{1}{2}(2) + 3 = 2$? NO. (D) $4 \leq -\frac{1}{2}(4) + 3 = 1$? NO.
- 3) **Choice A is correct.** (8.3.2.2) Reflecting across $y = x$ swaps coordinates: $(x, y) \rightarrow (y, x)$. The vertex $(2, 1) \rightarrow (1, 2)$, which is part of the reflected rectangle shown.
- 4) **Choice C is correct.** (8.1.1.2) $\sqrt{48} = 4\sqrt{3} \approx 4 \times 1.73 = 6.92 \approx 6.9$. Distractor B (7.0) confuses with nearby perfect square $\sqrt{49} = 7$; A and D are unreasonable bounds.
- 5) **The correct answer is 66.67.** (8.1.1.5) Divide: $\frac{8 \times 10^{-6}}{1.2 \times 10^{-7}} = \frac{8}{1.2} \times 10^1 = 6.67 \times 10^1 \approx 66.67$.
- 6) **Choice C is correct.** (8.1.1.4) $A = 1000(1.08)^2 = 1000 \times 1.1664 = \$1,166.40 \approx \$1,166$.
- 7) **Choice D is correct.** (8.1.1.5) First divide: $\frac{8 \times 10^9}{2 \times 10^3} = 4 \times 10^6$. Then divide again: $\frac{4 \times 10^6}{4 \times 10^2} = 1 \times 10^4$.
- 8) **The correct answer is 7.1.** (8.1.1.1) Since $7^2 = 49$ and $7.1^2 = 50.41$, we have $\sqrt{50}$ between 7.0 and 7.1, closer to 7.1. More precisely, $7.07^2 \approx 49.98 \approx 50$. To the nearest tenth, $\sqrt{50} \approx 7.1$.
- 9) **Choice C is correct.** (8.2.2.2) As x increases by 1, y increases by 3. Slope = $\frac{\Delta y}{\Delta x} = \frac{3}{1} = 3$.
- 10) **Choice A is correct.** (8.2.4.2) Subtract 10: $-3x = -9$. Divide by -3 : $x = 3$. Check: $10 - 3(3) = 10 - 9 = 1$ ✓. (Distractor B: sign error when dividing; C: incorrect arithmetic.)
- 11) **Choice C is correct.** (8.2.4.7) Add the equations to eliminate y : $(2x + y) + (x - y) = 7 + 2$, so $3x = 9$, giving $x = 3$. Substitute: $3 - y = 2$, so $y = 1$. Solution: $(3, 1)$.
- 12) **Choice C is correct.** (8.2.4.5) Multiply by -1 (FLIP): $x \geq -5$.
- 13) **The correct answer is $\frac{37}{900}$.** (8.1.1.1) Set $x = 0.12\bar{3} = 0.12333\dots$. Then $100x = 12.\bar{3}$ and $1000x = 123.\bar{3}$. Subtracting: $900x = 111$, so $x = \frac{111}{900} = \frac{37}{300}$.
- 14) **Choice C is correct.** (8.2.1.1) For each time of day, there is exactly one temperature reading. Options A, B, and D can give more than one output for the same input.
- 15) **Choice B is correct.** (8.2.2.2) Constant second differences indicate a quadratic (degree-2 polynomial) function, which is nonlinear.
- 16) **Choice A is correct.** (8.2.4.3) Using $y = mx + b$ with $m = -2$ and $b = 5$: equation is $y = -2x + 5$.
- 17) **Choice C is correct.** (8.2.2.4) The graph rises from day 0 to day 3, then decreases from day 3 to day 4 as the tank drains. After day 4, the level increases again as the tank refills.
- 18) **The correct answer is A,B.** (8.3.2.1) Cylinder $V = 3.14 \times 9 \times 7 = 197.82 \text{ cm}^3$ (A correct); Cone $V = \frac{1}{3} \times 3.14 \times 9 \times 7 = 65.94 \text{ cm}^3$ (B correct). C is wrong (incorrect cylinder volume), D is wrong (that's the cylinder volume), E is wrong (cone is $\frac{1}{3}$ cylinder).
- 19) **Choice C is correct.** (8.3.2.2) Reflecting $(1, 1) \rightarrow (1, -1)$, then translating left 1 gives $(0, -1)$. This matches a vertex of H' , and the same rule maps the whole rectangle correctly.
- 20) **Choice C is correct.** (8.3.1.1) Using the Pythagorean Theorem: $7^2 + 24^2 = 49 + 576 = 625$, so $c = 25$ (the 7-24-25 triple).
- 21) **Choice A is correct.** (8.3.1.2) $d = \sqrt{(8-2)^2 + (13-5)^2} = \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$.
- 22) **Choice D is correct.** (8.1.1.4) After $3^2 = 9$ hours, doubling 9 times means multiply by 2^9 . Total: $10^2 \cdot 2^9$.
- 23) **Choice D is correct.** (8.2.2.2) A proportional equation is $y = kx$ (no constant term). Choice D has $+1$, so it's linear but not proportional.
- 24) **Choice C is correct.** (8.2.2.1) Difference of squares: $(x+4)(x-4) = x^2 - 4^2 = x^2 - 16$.
- 25) **Choice A is correct.** (8.2.2.2) In $y = mx + b$: $m = 2$, $b = -5$, so $y = 2x - 5$.
- 26) **Choice C is correct.** (8.3.2.2) Both reflection and rotation are rigid motions that preserve distances and angles. Any sequence of rigid motions produces a congruent figure.



Hi, Confident Learner!

◇ This high-stamina book gave you nine substantial Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. Grade 8 math can feel big because it connects real numbers and exponents with linear equations, systems, functions, transformations, geometry, and data.

◇

★ **Remember this:** But big topics become manageable when you practice one skill at a time. That is what you have been doing with every test in this book. ★

Confidence Builders

- **Know the Goal:** Identify what the question asks.
- **Use Vocabulary:** Math words point to math actions.
- **Show Work:** Give yourself something to check.
- **Celebrate Effort:** Practice is proof that you are moving.

Grade 8 test-day tip: When reviewing, do not only mark wrong answers. Write one sentence about what you learned from each one.

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

Jay Daie

Your Confidence Coach

CONFIDENCE TODAY, SUCCESS TOMORROW!

GRADE

8

Help your child excel in math with **9 full-length Grade 8 practice tests** designed to reflect real test formats and cover all key math standards.

With a wide variety of questions and real-world applications, this book builds the skills and confidence students need to achieve their best!



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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