

8

Minnesota

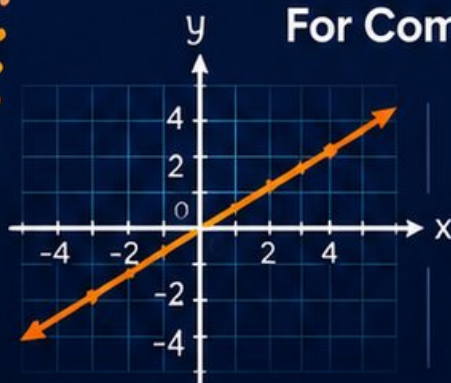
MCA III

GRADE 8

MATH

PRACTICE TESTS

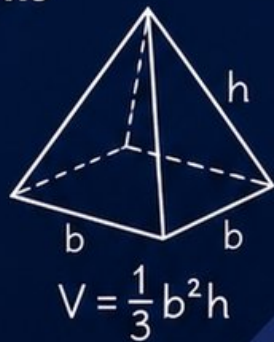
Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$$A = \pi r^2$$

$$C = 2\pi r$$

$$V = \frac{1}{3}\pi r^2 h$$



8

 PRINTED TESTS

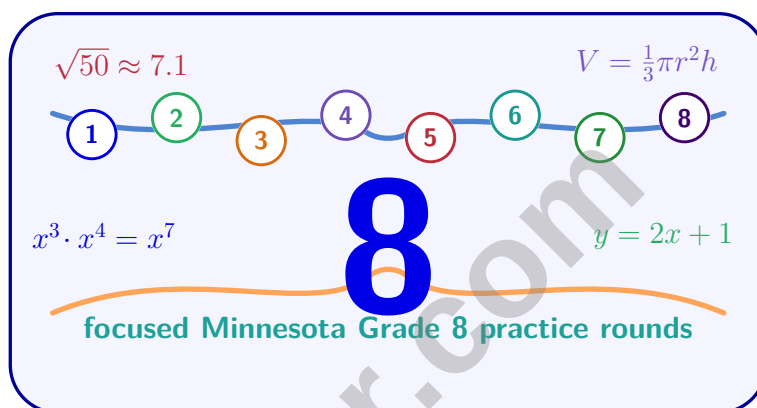
2

 ONLINE TESTS

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

8 Minnesota MCA III Grade 8 Math Practice Tests

Minnesota Practice for Grade 8 Functions, Geometry, and Statistics



Eight 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



Copyright ©

Testinar Inc



Published by Testinar Inc

Testinar.com

All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the author, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law, including Section 107 or 108 of the 1976 United States Copyright Act.

This publication is independently produced and has no official connection to any state, district, or national testing program.

Test names and organizational names used herein are the property of their respective trademark holders.



Copyright ©

Welcome, Minnesota Grade 8 Problem Solver!

Eight focused rounds for sharper MCA III math thinking

This book gives you eight 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

An eight-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?

Eight MCA III tests, 320 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 7–8	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.



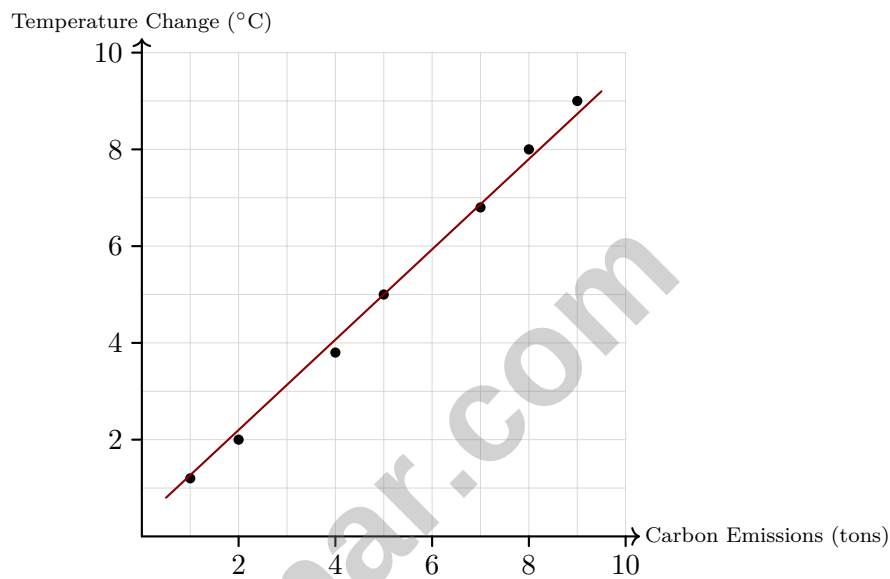
Scan me!
For more practice
& answers

Table of Contents

★ Practice Test 1	_____	15
★ Practice Test 2	_____	33
★ Practice Test 3	_____	50
★ Practice Test 4	_____	66
★ Practice Test 5	_____	84
★ Practice Test 6	_____	100
★ Practice Test 7	_____	118
★ Practice Test 8	_____	135
Practice Test Answer Keys	_____	153
Practice Test Answers and Explanations	_____	158

- 1) A vending machine contains 32 coins (dimes and quarters). The total value is \$5.30. How many dimes are there?

- ☐ A. 8 ☐ C. 14
☐ B. 12 ☐ D. 18



2)

A scientist studies the relationship between carbon emissions and temperature change. The trend line shows a strong positive relationship. Which is the best interpretation?

- ☐ A. As carbon emissions increase, temperature tends to increase on average
☐ B. Temperature change has no relationship to emissions
☐ C. Higher temperatures cause carbon emissions
☐ D. The relationship is random



Scan me!
For more practice
& answers

3) Two fair coins are tossed. How many total outcomes are in the sample space?

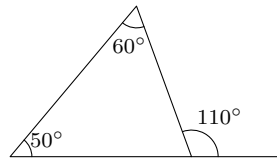
☐ A. 2

☐ C. 8

☐ B. 4

☐ D. 3

4) A student claims that an exterior angle of a triangle is always acute. Which explains why this is incorrect?

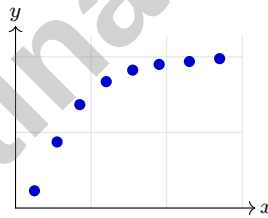


☐ A. An exterior angle equals the sum of the two remote interior angles, which can be greater than 90° .

☐ C. Triangles can have obtuse interior angles, making exterior angles obtuse too.

☐ B. Exterior angles are always congruent to adjacent interior angles.

☐ D. An exterior angle depends on which side is extended.



5)

A scatter plot shows years of experience (x-axis, 0–40 years) versus annual salary (y-axis, \$0–\$200k) for 100 workers. For the first 25 years, salaries increase steadily in a clear upward trend. After 25 years, salaries level off and stay relatively flat. What does this pattern indicate?

☐ A. The relationship is purely linear across all 40 years

☐ C. The relationship changes: linear growth early, then levels off (plateau)

☐ B. A single straight line can predict all salaries equally well

☐ D. Experience has no effect on salary after 25 years



6) Which data set has a MAD of 2?

☐ A. {1, 2, 3, 4, 5}

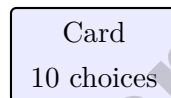
☐ B. {2, 4, 6, 10}

☐ C. {5, 7, 9, 11}

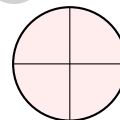
☐ D. {1, 3, 5, 9}

7) Two congruent rectangles have a perimeter of 48 cm. If one side of the rectangle is 10 cm, find the length of an adjacent side.

8) A game requires picking a card from a deck of 10 cards and then spinning a spinner with 4 sections. How many possible results are there?



×



4 sections

☐ A. $10 + 4 = 14$

☐ B. $10 \times 4 = 40$

☐ C. $10 - 4 = 6$

☐ D. 4^{10}

9) Which is closest to $\sqrt{40}$?

☐ A. 5

☐ B. 6

☐ C. 6.3

☐ D. 7



Scan me!

For more practice
& answers

1) You invest \$4,000 in a 3-year CD (Certificate of Deposit) at 3% simple interest. What is your final amount?

☐ A. \$4,120

☐ C. \$4,240

☐ B. \$4,180

☐ D. \$4,360

2) Which statement about $y = \frac{3}{4}x + 2$ is TRUE?

☐ A. It is nonlinear because the slope is a fraction

☐ C. It is nonlinear because the y -intercept is positive

☐ B. It is linear and can be written in the form $y = mx + b$

☐ D. It is linear only if m is a whole number

3) An equilateral triangle has sides of 6 cm. It is reflected across one of its altitudes. What is true about the resulting triangle?

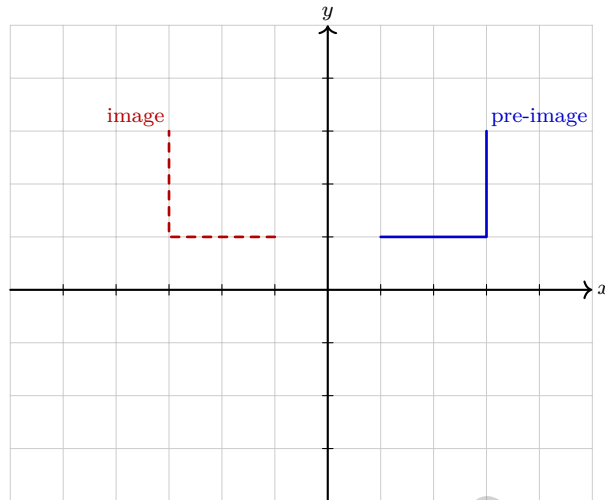
☐ A. The resulting triangle has sides of 3 cm

☐ C. The resulting triangle is no longer equilateral

☐ B. The resulting triangle is congruent to the original

☐ D. The angles increase to 90°





4)

The segment (blue pre-image) is transformed to the red image. Which transformation is applied?

- ☐ A. Reflection across the y -axis ☐ C. Translation left 2
☐ B. Rotation 180° ☐ D. Reflection across $y = x$

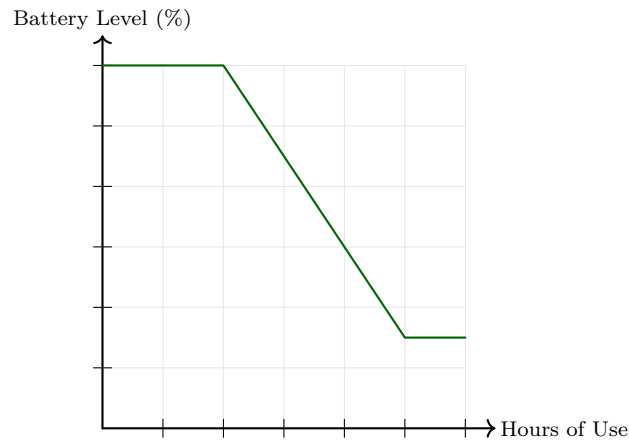
5) Two students sketch different trend lines through the same scatter plot. Student A's line has a gentler slope, while Student B's line has a steeper slope. What could explain this difference?

- ☐ A. One student made a calculation error ☐ C. Only one line can ever be correct
☐ B. The students used different data sets ☐ D. Sketching a trend line by eye allows for reasonable variation



Scan me!
For more practice
& answers

1)

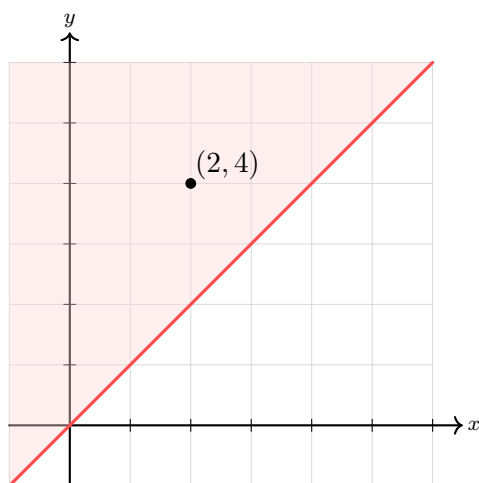


A smartphone battery charges to 100%, remains fully charged during 2 hours of non-use, then drains steadily over 3 hours of active use. Which statement is true?

- ☐ A. The phone uses battery only during the first 2 hours
- ☐ B. The battery drains faster during non-use
- ☐ C. The battery level is constant from 0 to 2 hours
- ☐ D. The phone battery reaches 0% at 6 hours



Scan me!
For more practice
& answers



2)

The test point $(2, 4)$ is marked in the shaded region. Which inequality does this represent?

☐ A. $y > x$

☐ C. $y \geq x$

☐ B. $y < x$

☐ D. $y \leq x$



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.



Scan me!
For more practice
& answers

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- Choice D is correct.** (8.2.4.8) Let d = dimes and q = quarters. Then $d + q = 32$ and $10d + 25q = 530$ in cents. Substitute $d = 32 - q$: $10(32 - q) + 25q = 530$, so $320 + 15q = 530$. Thus $q = 14$ and $d = 18$.
- Choice A is correct.** (8.4.1.2) The positive slope shows association: higher emissions correspond to higher temperatures on average.
- Choice B is correct.** (8.3.1) Sample space: HH, HT, TH, TT. There are 4 total outcomes.
- Choice A is correct.** (8.3.2.2) By the exterior angle theorem, an exterior angle of a triangle equals the sum of the two remote interior angles. If those two angles have a sum greater than 90° , the exterior angle is obtuse.
- Choice C is correct.** (8.4.1.1) The scatter plot shows two distinct regions: early years display a clear upward trend (positive correlation), while later years show salaries staying flat (no change). This means a single straight line cannot describe the entire relationship accurately.
- Choice C is correct.** (8.3.1.2) Mean = 8. Absolute deviations: $|5 - 8| = 3$, $|7 - 8| = 1$, $|9 - 8| = 1$, $|11 - 8| = 3$. Sum = 8. MAD = $8/4 = 2$.
- The correct answer is 14.** (8.3.2.2) The perimeter formula is $P = 2l + 2w = 48$. If one side is 10 cm, then $2(10) + 2w = 48$, so $20 + 2w = 48$, which gives $2w = 28$ and $w = 14$ cm.
- Choice B is correct.** (8.3.2.2) Card pick (10 choices) times spinner section (4 choices): $10 \times 4 = 40$ possible results.
- Choice C is correct.** (8.1.1.1) Since $6^2 = 36$ and $6.3^2 = 39.69 \approx 40$, we have $\sqrt{40} \approx 6.3$. Also, $7^2 = 49 > 40$.
- Choice D is correct.** (8.1.1.1) Let $x = 0.4\bar{5} = 0.4555\dots$. Then $10x = 4.\bar{5}$ and $100x = 45.\bar{5}$. Subtracting: $90x = 41$, so $x = \frac{41}{90}$.
- Choice D is correct.** (8.1.1.2) $5.9^2 = 34.81$ and $6^2 = 36$. Since 35 is closer to 34.81 than to 36, $\sqrt{35} \approx 5.9$.
- Choice D is correct.** (8.1.1.5) Move the decimal 9 places left: $2.0 \times 10^{-9} = 0.000000002$ m.
- Choice D is correct.** (8.4.1.3) D is incorrect: $\frac{32}{80} = 0.40$ is a row-conditional frequency (among teens), not the percentage of all shoppers. The joint relative frequency is $\frac{32}{240} \approx 0.13$. Options A, B, C are correct frequency calculations.
- Choice D is correct.** (8.1.1.2) Circumference = $2\pi r = 2 \times 3.14 \times 2 = 12.56$ m.
- Choice D is correct.** (8.1.1.5) $4 \times 5 = 20$ and $10^{3+2} = 10^5$, so the arithmetic is correct. However, 20×10^5 violates the standard form requirement that the coefficient be between 1 and 10. Proper form: 2×10^6 .
- Choice A is correct.** (8.2.2.2) Slope = $\frac{3-0}{0-(-1)} = 3$. When $x = 0$, $y = 3$, so $b = 3$. Thus $y = 3x + 3$.
- Choice D is correct.** (8.2.4.2) Distribute: $-2n + 8 = 10$. Subtract 8: $-2n = 2$. Divide by -2 : $n = -1$.
- Choice D is correct.** (8.2.4.7) Set the expressions equal: $\frac{1}{3}x + 2 = -\frac{2}{3}x + 5$. Add $\frac{2}{3}x$ to both sides: $x + 2 = 5$, so $x = 3$. Then $y = \frac{1}{3}(3) + 2 = 3$. Solution: $(3, 3)$.
- Choice D is correct.** (8.2.4.5) Subtract 3: $-2x < -4$. Divide by -2 (FLIP): $x > 2$. Open circle and right ray.
- Choice A is correct.** (8.3.1.2) By the Pythagorean Theorem, $c^2 = 6^2 + 8^2 = 36 + 64 = 100$. Taking the square root: $c = \sqrt{100} = 10$.
- The correct answer is A,D.** (8.3.2.2) Reflection across the x -axis maps (x, y) to $(x, -y)$, so $(0, 1) \rightarrow (0, -1)$ and $(2, 3) \rightarrow (2, -3)$. A dilation by scale factor 1 does not change the figure, so option D also results in the same reflection. Reflection across $y = 1$ would not map the whole rectangle to the purple image.
- Choice C is correct.** (8.1.1.4) Interest: $I = 15000 \times 0.07 \times 5 = \$5,250$.
- Choice C is correct.** (8.1.1.4) When dividing powers with the same base, subtract exponents: $\frac{x^7}{x^3} = x^{7-3} = x^4$.
- Choice C is correct.** (8.2.4.9) Both $15^2 = 225$ and $(-15)^2 = 225$, so $x = 15$ or $x = -15$.
- Choice C is correct.** (8.2.2.2) Slope $k = \frac{3}{4}$. Line passes through origin and $(4, 3)$, so $y = \frac{3}{4}x$.
- Choice A is correct.** (8.2.2.1) Sum of areas: $x^2 + 2x + 4x + 8 = x^2 + 6x + 8$.
- Choice B is correct.** (8.2.2.2) $S(15) = 150 + 40(15) = 750$. Competitor slope: $(700 - 500)/5 = 40$ per day. From day 5 point: $C(d) = 500 + 40(d - 5) = 40d + 300$, so $C(15) = 40(15) + 300 = 900$. Since $900 > 750$, Competitor has more.



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 8 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 **8 full-length Grade 8** Math practice tests that mirror 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.



BUILD SKILLS & BOOST CONFIDENCE

Strengthen understanding and feel prepared for test day.



COVERS ALL ESSENTIAL TOPICS

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



2 EXTRA ONLINE PRACTICE TESTS INCLUDED!

Use these two additional online practice tests for extra review after the printed tests.

testinar.com/math8

PRACTICE. PREPARE. SUCCEED.



Testinar

More Practice. More Confidence.
Better Results.