

10

North Dakota

NDSA

GRADE

8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

10

PRINTED
TESTS



2

ONLINE
TESTS



Build Confidence



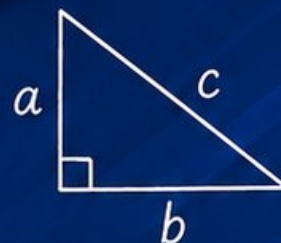
Master Key Math Skills



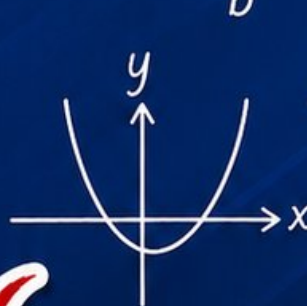
Answer Explanations for
Every Question



Test-Taking Strategies
That Work



$$y = mx + b$$



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

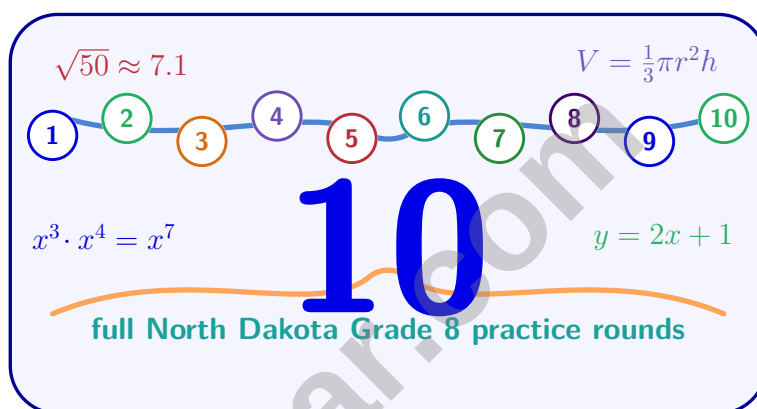


USE THESE TWO
**ADDITIONAL ONLINE
PRACTICE TESTS**

FOR EXTRA REVIEW AFTER
THE PRINTED TESTS
IN THIS BOOK.

10 North Dakota NDSA Grade 8 Math Practice Tests

North Dakota Grade 8 NDSA Practice for steady standards practice through rates, rational operations, equations, geometry, and data analysis



Ten complete 40-question Grade 8 NDSA 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



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, North Dakota Grade 8 Problem Solver!

Ten focused rounds for sharper North Dakota NDSA math thinking

This book gives you ten full Grade 8 NDSA 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 **Understanding Scientific Notation** (8.GM.GF.3): Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities. The same routine helps with **Comparing Two Functions** (8.AR.F.2): Compare properties of two functions each represented in a different way (algebraically, graphically, numerically, or verbally).

Your North Dakota 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 **Slope as Rate of Change** (8.NO.NS.1): Understand slope as a constant rate of change between two quantities. You will also meet **Congruent Figures** (8.GM.AV.1): Understand that a two-dimensional figure is congruent to another if the second can be obtained by a sequence of rotations, reflections, and translations.

North Dakota 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 North Dakota NDSA 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 North Dakota 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 **Solving Systems of Two Equations** (8.AR.F.2): Understand that solutions to a system of two linear equations correspond to points of intersection of their graphs. Solve systems algebraically and by graphing. A second useful connection is **The Pythagorean Theorem** (8.GM.GF.6): Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.



Scan me!
For more practice
& answers

Table of Contents

★ Practice Test 1	_____	14
★ Practice Test 2	_____	33
★ Practice Test 3	_____	51
★ Practice Test 4	_____	66
★ Practice Test 5	_____	81
★ Practice Test 6	_____	98
★ Practice Test 7	_____	114
★ Practice Test 8	_____	129
★ Practice Test 9	_____	146
★ Practice Test 10	_____	163
Practice Test Answer Keys	_____	179
Practice Test Answers and Explanations	_____	185

1) Point $A(3, -2)$ is rotated 90° counterclockwise about the origin. What are the coordinates of A' ?

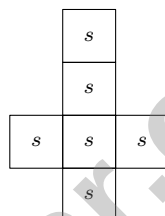
☐ A. $(2, 3)$

☐ C. $(2, -3)$

☐ B. $(-2, -3)$

☐ D. $(3, 2)$

2) Evaluate $(2x^3)^2$ when $x = 1$.



Net of cube

3)

If the net above represents a cube with edge length 3 cm, what is the total surface area of the cube?

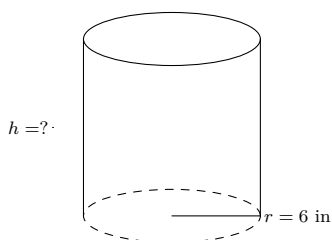
☐ A. 18 cm^2

☐ C. 36 cm^2

☐ B. 27 cm^2

☐ D. 54 cm^2





4)

A cylinder has radius 6 in and volume 1695.6 in^3 . What is its height? (Use $\pi \approx 3.14$.)

☐ A. 7.5 in☐ C. 10 in☐ B. 15 in☐ D. 20 in5) $(2.1 \times 10^4) \times (3 \times 10^2) = ?$ ☐ A. 5.1×10^6 ☐ C. 0.63×10^6 ☐ B. 5.1×10^2 ☐ D. 6.3×10^6 

Scan me!
For more practice
& answers

+ -

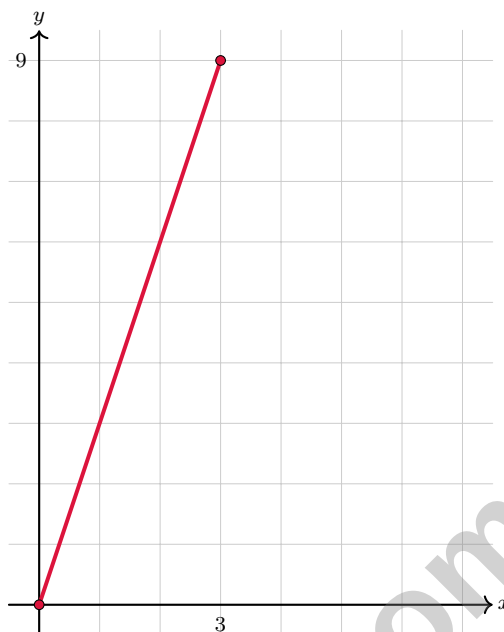
.....

17

.....

 $\times \div$

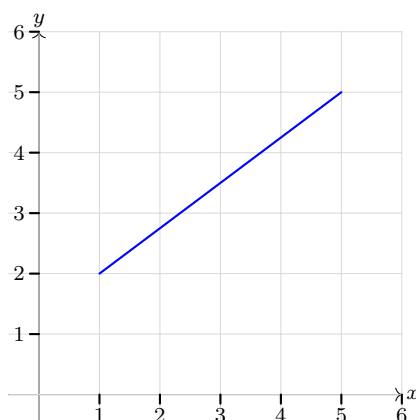
Testinar.com



6)

What is the slope?

☐ A. 2☐ B. $\frac{9}{2}$ ☐ C. $\frac{1}{3}$ ☐ D. 37) Determine how many solutions this system has:
$$\begin{cases} x - 3y = 6 \\ 2x - 6y = 12 \end{cases}$$
☐ A. No solution☐ B. Exactly one solution☐ C. Infinitely many solutions☐ D. Two solutions



1)

What is the equation of the line in the graph?

☐ A. $y = \frac{3}{4}x + \frac{5}{4}$

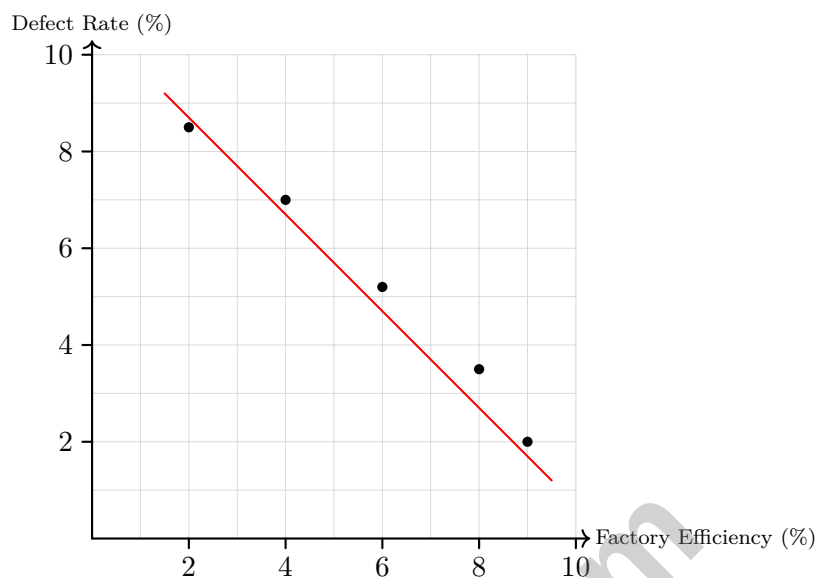
☐ B. $y = \frac{1}{2}x + 1$

☐ C. $y = \frac{3}{4}x + 1$

☐ D. $y = x + 1$



Scan me!
For more practice
& answers

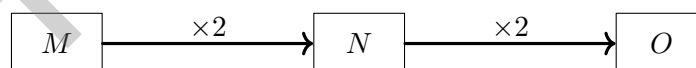


2)

A factory tracks production efficiency versus defect rate. What does the strong negative slope tell you?

- ☐ A. Higher efficiency causes fewer defects
☐ B. As efficiency increases, the defect rate tends to decrease substantially
☐ C. Defects are always zero when efficiency is high
☐ D. The relationship is unrelated

3) If Figure M is similar to Figure N with scale factor 2, and Figure N is similar to Figure O with scale factor 2, what is the scale factor from Figure M to Figure O ?



- ☐ A. 2
☐ B. 4
☐ C. $\frac{1}{2}$
☐ D. 1



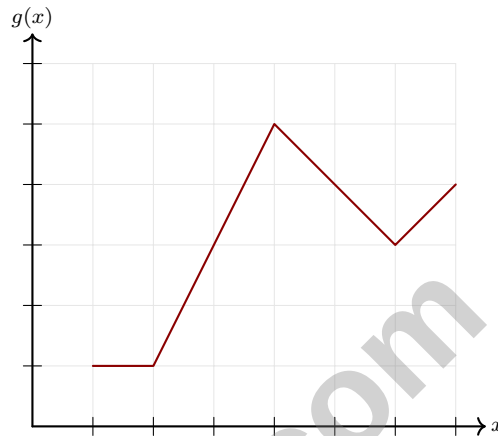
1) A right triangle has a hypotenuse of 20 and one leg of 12. Find the other leg.

☐ A. 8

☐ C. 18

☐ B. 16

☐ D. 32



2)

State the domain of the function shown.

☐ A. $[0, 5]$

☐ C. $[1, 5]$

☐ B. $[0, 6]$

☐ D. All real numbers

3) A ladder leans against a wall. The slope of the ladder line is undefined. What does this indicate?

☐ A. The ladder is horizontal

☐ C. The ladder is at a 45° angle

☐ B. The ladder is on the ground

☐ D. The ladder is vertical

4) Two rectangles are considered separately. The first rectangle is x cm long and 5 cm wide. The second rectangle is y cm long and 5 cm wide. The sum of their perimeters is 56 cm, and the difference in their lengths is 2 cm. If $x > y$, what is x ?

☐ A. 8 cm

☐ C. 10 cm

☐ B. 12 cm

☐ D. 14 cm



Scan me!
For more practice
& answers

5) A scale factor of 0.75 applied to a figure means the new figure is:

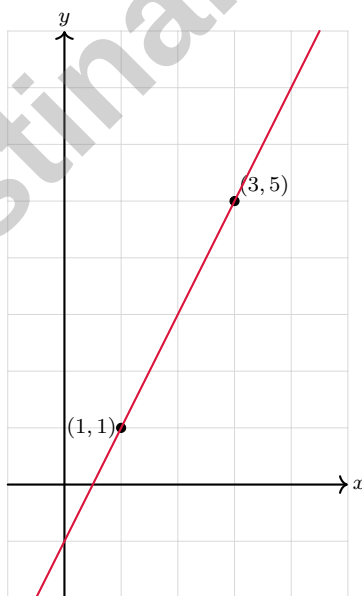
- ☐ A. Larger than the original ☐ C. 25% of the original size
☐ B. 75% of the original size ☐ D. 75% larger than the original

6) Which table would represent a NONLINEAR function with constant second differences?

x	0	1	2	3
1st diff.	—	1	3	5
2nd diff.	—	—	2	2

- ☐ A. It is linear because first differences exist ☐ C. It is cubic because second differences are positive
☐ B. It is quadratic because second differences are constant ☐ D. It is exponential because differences vary

7) The graph below shows a line. Which equation represents this line?



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



North Dakota NDSA 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 North Dakota NDSA practice test.



Scan me!
For more practice
& answers

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** **(8.GM.GF.2)** The rule for a 90° counterclockwise rotation about the origin is $(x, y) \rightarrow (-y, x)$. Applying: $(3, -2) \rightarrow (-(-2), 3) = (2, 3)$.
- 2) **The correct answer is 4.** **(8.AR.F.2)** $(2x^3)^2 = 4x^6$. With $x = 1$, the value is 4.
- 3) **Choice D is correct.** **(8.GM.AV.1)** The net shows all 6 faces of a cube. Each face has area $3^2 = 9 \text{ cm}^2$. Total surface area $= 6 \times 9 = 54 \text{ cm}^2$.
- 4) **Choice B is correct.** **(8.GM.AV.1)** From $V = \pi r^2 h$: $1695.6 = 3.14 \times 36 \times h \Rightarrow h = \frac{1695.6}{113.04} = 15 \text{ in.}$
- 5) **Choice D is correct.** **(8.AR.EE.3)** Multiply coefficients: $2.1 \times 3 = 6.3$. Add exponents: $10^{4+2} = 10^6$. Result: 6.3×10^6 .
- 6) **Choice D is correct.** **(8.AR.EE.3)** Slope $= \frac{9-0}{3-0} = \frac{9}{3} = 3$. The rise is 9 and the run is 3, so the slope is 3.
- 7) **Choice C is correct.** **(8.AR.F.2)** The second equation is exactly 2 times the first equation. They represent the same line, so the system has infinitely many solutions.
- 8) **Choice A is correct.** **(8.AR.EE.4)** Area $= (2x + 1)(x + 3) = 2x^2 + 6x + x + 3 = 2x^2 + 7x + 3 \text{ m}^2$.
- 9) **Choice B is correct.** **(8.AR.F.1)** The domain is the set of all inputs (x -coordinates). From the pairs, the inputs are 1, 3, 5, 7.
- 10) **Choice A is correct.** **(8.AR.F.2)** Rate $= (1 - 3)/(1 - 0) = -2/1 = -2$. A quick check with the next two points gives $(-1 - 1)/(2 - 1) = -2$ again, so the rate is consistent.
- 11) **Choice D is correct.** **(8.AR.F.1)** A straight line indicates a linear function, regardless of slope or intercept. This graph clearly shows a straight line.
- 12) **Choice A is correct.** **(8.AR.F.4)** Initial balance \$50 (intercept). Monthly deposit \$10 (slope). Equation: $B = 10m + 50$.
- 13) **Choice A is correct.** **(8.AR.F.5)** Rising segment = increasing speed (acceleration). Flat = constant speed. Falling = decreasing speed (braking).
- 14) **Choice D is correct.** **(8.GM.AV.1)** Reflection is a rigid motion that preserves side lengths. The reflected rhombus has sides of 8 cm.
- 15) **Choice B is correct.** **(8.GM.GF.1)** The two acute angles in a right triangle sum to 90° . So $p + (2p + 18) = 90$, which gives $3p = 72$ and $p = 24^\circ$.
- 16) **Choice A is correct.** **(8.GM.GF.6)** $d = \sqrt{(5 - 0)^2 + (12 - 0)^2} = \sqrt{25 + 144} = \sqrt{169} = 13$.
- 17) **Choice A is correct.** **(8.GM.GF.4)** Corresponding angles are congruent. So $r = 41^\circ$.
- 18) **The correct answer is A, C.** **(8.GM.GF.6)** A is correct: $P(\text{heads}) = \frac{1}{2}$. C is correct: $P(\text{heads and 4}) = \frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$. B is wrong: $P(4) = \frac{1}{6}$. D is wrong: total outcomes = 12. E is wrong: $P(\text{not heads}) = \frac{1}{2}$.
- 19) **The correct answer is 7.** **(8.AR.EE.2)** $\sqrt[3]{343} = 7$ because $7 \times 7 \times 7 = 343$.
- 20) **Choice B is correct.** **(8.GM.GF.6)** Decompose: rectangle and semicircle. Rectangle area $= 10 \times 4 = 40 \text{ ft}^2$. Semicircle has diameter 4 ft, so radius $r = 2 \text{ ft}$. Semicircle area $= \frac{1}{2}\pi r^2 = \frac{1}{2} \times 3.14 \times 2^2 = 6.28 \text{ ft}^2$. Total $= 40 + 6.28 = 46.28 \text{ ft}^2$.
- 21) **Choice A is correct.** **(8.GM.GF.4)** The sum of interior angles in a hexagon is 720° . The known angles add to $85 + 125 + 140 + 110 + 98 = 558^\circ$, so $x = 720 - 558 = 162^\circ$.
- 22) **Choice B is correct.** **(8.DPS.D.3)** The line passes through $(0, 1)$ and $(6, 6)$. Slope $= \frac{6-1}{6-0} = \frac{5}{6}$.
- 23) **Choice D is correct.** **(8.GM.GF.6)** Correct: $I = 400 \times (0.12/12) \times 1 = \4 . She incorrectly applied 12% for 1 month (should use the monthly rate of 1%), mistaking APR as a monthly rate.
- 24) **Choice D is correct.** **(8.GM.GF.6)** Check option D: $7^2 + 8^2 = 49 + 64 = 113 \neq 81 = 9^2$. The other options are all known Pythagorean triples.
- 25) **The correct answer is -4.** **(8.AR.EE.5)** Solving gives $x > -4$, so the boundary value is -4.
- 26) **Choice B is correct.** **(8.GM.AV.1)** $B = 9 \times 4 = 36 \text{ m}^2$. $V = \frac{1}{3} \times 36 \times 6 = 72 \text{ m}^3$.
- 27) **Choice C is correct.** **(8.DPS.D.1)** The points form an upward trend. As age increases, income increases, showing a positive correlation. Perfect would mean all points lie exactly on a line.
- 28) **Choice B is correct.** **(8.DPS.D.2)** Original data has $\text{MAD} = 0$ (all identical). Adding a value equal to the mean keeps all deviations at 0. New $\text{MAD} = 0$.



Scan me!

For more practice
& answers

Hi, Math Hero!

◇ This full-length book gave you ten complete Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. You showed up for Grade 8 practice again and again. That is what real growth looks like: steady effort, honest review, and a willingness to try. ◇

★ **Remember this:** A math hero is not someone who never misses a question. A math hero learns from the miss and comes back stronger. ★

Hero Habits

- **Courage:** You try problems that are not automatic.
- **Honesty:** You review what needs work.
- **Patience:** You let skills grow over time.
- **Pride:** You recognize the effort you gave.

Grade 8 test-day tip: Save one solved problem you are proud of. Looking back at progress helps motivation stay strong.

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

Jay Daie

Your Math Hero Guide

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