

9

Nebraska

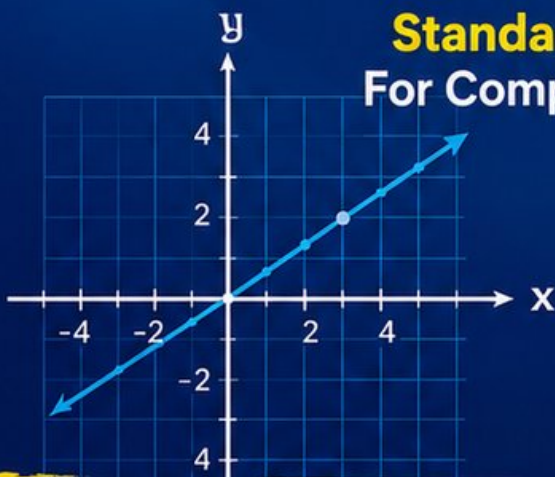
NSCAS Growth

Grade 8

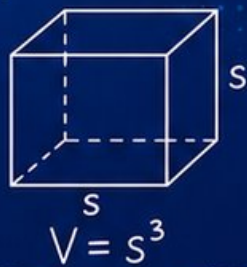
MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



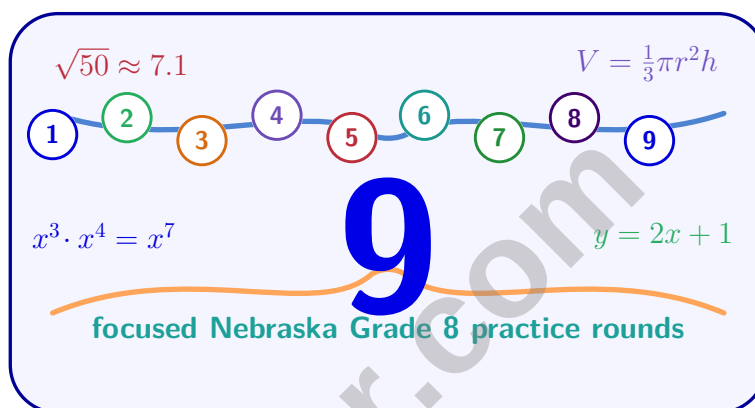
$$2x + 3y = 12$$
$$y = mx + b$$

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

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

9 Nebraska NSCAS Growth Grade 8 Math Practice Tests

Student-Friendly Nebraska Review for Grade 8 Algebra, Geometry, and Statistics



Nine complete 40-question Grade 8 NSCAS Growth 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, Nebraska Grade 8 Problem Solver!

Nine focused rounds for sharper NSCAS Growth math thinking

This book gives you nine full Grade 8 NSCAS Growth 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 Nebraska 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.

Nebraska 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 NSCAS Growth 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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& answers

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- 1) An error was made: a student calculated that if legs are 10 and 10, the hypotenuse is 20. What is the correct hypotenuse?

☐ A. $10\sqrt{2}$

☐ B. $\sqrt{200}$

☐ C. 20

☐ D. 14 (approx)

- 2) When a point is reflected across the y -axis, which coordinate(s) change?

☐ A. Only the x -coordinate

☐ B. Only the y -coordinate

☐ C. Both x and y change

☐ D. Neither coordinate changes

- 3) Explain why 10^5 is 100 times greater than 10^3 . Use exponents in your reasoning.

- 4) Solve for x : $-5x + 12 = -2x - 6$

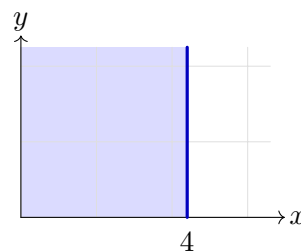
☐ A. $x = -6$

☐ B. $x = 2$

☐ C. $x = -2$

☐ D. $x = 6$

- 5) A student sees a graph with a SOLID vertical line at $x = 4$. The left side is shaded. What does this represent?



☐ A. $x < 4$

☐ B. $x \leq 4$

☐ C. $x > 4$

☐ D. $x \geq 4$



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6) Which is the best estimate of $\sqrt{18}$?

☐ A. 3.0

☐ C. 4.2

☐ B. 4.0

☐ D. 9.0

7) A credit card statement shows a beginning balance of \$500, new purchases of \$300, a payment of \$200, and interest of \$15. What is the ending balance?

☐ A. \$500

☐ C. \$615

☐ B. \$600

☐ D. \$800

8) If $x^2 = 81$, what are the possible values of x ?

☐ A. 9 only

☐ C. 9 or -9

☐ B. -9 only

☐ D. 3 or -3

9) Convert $0.454545\ldots$ to a fraction in simplest form.

10) What is $(5 \times 10^7) \times (4 \times 10^3)$?

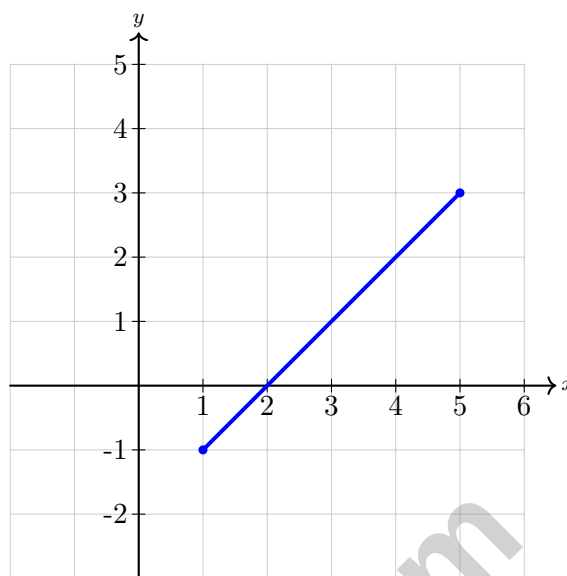
☐ A. 2×10^{10}

☐ C. 9×10^{10}

☐ B. 20×10^4

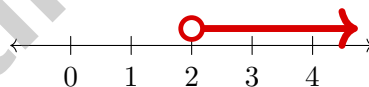
☐ D. 2×10^{11}





11)

What is the slope of the line shown?

☐ A. 1☐ C. 3☐ B. 2☐ D. 412) Solve and graph: $-2x + 3 < -1$. Which describes the graph?☐ A. $x \geq 2$ with closed circle☐ C. $x \leq 2$ with closed circle☐ B. $x < 2$ with open circle☐ D. $x > 2$ with open circle13) Factor $x^2 - 25$.☐ A. $(x - 5)^2$ ☐ C. $(x + 5)(x - 5)$ ☐ B. $(x + 5)^2$ ☐ D. $(x - 25)(x + 1)$ 

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1) In a study, the relationship between calories burned and exercise minutes is $B = 4m + 50$. Is predicting calories burned after 25 minutes of exercise interpolation or extrapolation, given that the data was collected for exercises lasting 5 to 20 minutes?

- ☐ A. Interpolation, because 25 is between 5 and 20
- ☐ B. Extrapolation, because 25 is outside the data range
- ☐ C. Neither; the model does not apply
- ☐ D. Interpolation, because 25 is close to 20

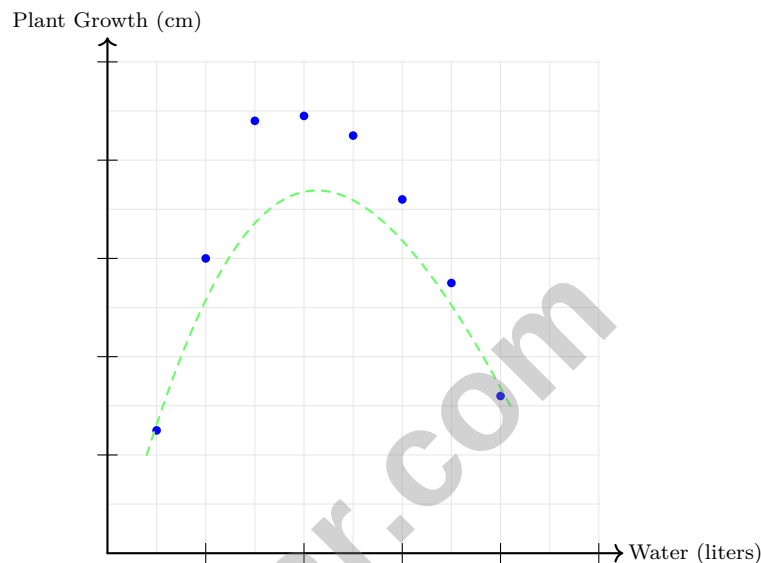
2) The height of a ball (in meters) t seconds after being thrown is $h(t) = 20t - 5t^2$. Find $h(2)$.

3) A square pyramid has a height of 8 inches and a volume of 128 in^3 . What is the length of each base edge?

- ☐ A. 4 in
- ☐ B. $4\sqrt{3}$ in
- ☐ C. 8 in
- ☐ D. 12 in



- 4) A scatter plot shows plant growth (cm) versus amount of water given (liters) over 8 weeks. The first 3 liters produce rapid growth; beyond 3 liters, additional water causes little additional growth, then declining growth past 5 liters (from overwatering). This pattern is best described as:



- ☐ A. Negative linear correlation
- ☐ B. Perfect positive correlation
- ☐ C. Nonlinear: increasing then decreasing (inverted parabola)
- ☐ D. No correlation
- 5) A data set has values $\{1, 2, 3\}$ and mean = 2. After adding one more data point, the new mean is still 2. What is the new MAD?

- ☐ A. $\frac{1}{2}$
- ☐ B. $\frac{2}{3}$
- ☐ C. $\frac{3}{4}$
- ☐ D. 1



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1) A two-way table of 360 people and transportation:

	Car	Public Trans	Total
Commute	216	84	300
Leisure	36	24	60
Total	252	108	360

Among public-transit users, what is the relative frequency for commuting trips?

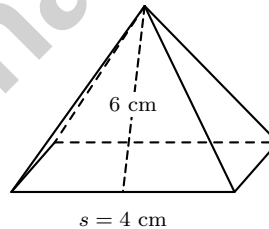
☐ A. $\frac{84}{108} \approx 0.78$

☐ B. $\frac{84}{300} \approx 0.28$

☐ C. $\frac{84}{360} \approx 0.23$

☐ D. $\frac{24}{108} \approx 0.22$

2) Simplify: $\sqrt{36} + \sqrt[3]{8}$



3)

A square pyramid has a square base with side length 4 cm and slant height 6 cm. What is its total surface area?

☐ A. 16 cm^2

☐ B. 64 cm^2

☐ C. 80 cm^2

☐ D. 96 cm^2



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- 4) A plant height model is $h = 3t + 8$, where h is height in inches and t is time in weeks. If the data only covers weeks 1 through 10, would predicting the height at week 15 be interpolation or extrapolation?

- ☐ A. Interpolation, because 15 is within the range
- ☐ B. Neither, because the model breaks down
- ☐ C. Interpolation, because we can always predict
- ☐ D. Extrapolation, because 15 is outside the data range

- 5) Table 1: $(0, 1), (2, 5), (4, 9)$. Table 2: $(0, -2), (1, -1), (2, 0)$. Which table represents a function with steeper rate of change?

x	0	2	4
Table 1	1	5	9

x	0	1	2
Table 2	-2	-1	0

- ☐ A. Table 1
- ☐ B. Table 2
- ☐ C. Both have same rate.
- ☐ D. Cannot be determined.
- 6) The table below shows a relationship. What is the slope of the linear function it represents?

x	-1	1	3	5
y	0	4	8	12

- ☐ A. 2
- ☐ B. 4
- ☐ C. -1
- ☐ D. $\frac{1}{2}$
- 7) A music streaming service charges \$8 for premium features plus \$12 per month for access. Which equation represents the total cost T for m months of service?

- ☐ A. $T = 12m + 8$
- ☐ B. $T = 8m + 12$
- ☐ C. $T = 20m$
- ☐ D. $T = 8m - 12$



Nebraska NSCAS Growth 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 Nebraska NSCAS Growth practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** (8.G.3) Correct calculation: $10^2 + 10^2 = 100 + 100 = 200$, so $c = \sqrt{200} = \sqrt{100 \cdot 2} = 10\sqrt{2} \approx 14.14$. The student added the legs directly instead of using the Pythagorean Theorem.
- 2) **Choice A is correct.** (8.G.2) Reflection across the y -axis uses the rule $(x, y) \rightarrow (-x, y)$. Only the sign of x changes; the y -coordinate stays the same. (Coordinate swapping is reflection across $y = x$, not the y -axis.)
- 3) **The correct answer is 100.** (8.N.2) When dividing powers with the same base, subtract the exponents. $10^{5-3} = 10^2$, and $10^2 = 100$, so 10^5 is 100 times larger than 10^3 .
- 4) **Choice D is correct.** (8.N.1) Subtract $-2x$ (add $2x$) and subtract 12: $-3x = -18$. Divide by -3 : $x = 6$.
- 5) **Choice B is correct.** (8.G.2) SOLID line means the boundary is INCLUDED ($\leq$ or $\geq$). Shading to the LEFT means x values are at most 4, so $x \leq 4$.
- 6) **Choice C is correct.** (8.N.1) $\sqrt{18} = 3\sqrt{2} \approx 3 \times 1.41 = 4.23$.
- 7) **Choice C is correct.** (8.D.3) Ending balance = $\$500 + \$300 - \$200 + \$15 = \$615$.
- 8) **Choice C is correct.** (8.G.2) Both $9^2 = 81$ and $(-9)^2 = 81$, so both 9 and -9 are solutions.
- 9) **The correct answer is $\frac{5}{11}$.** (8.N.1) Let $x = 0.454545\dots$. Then $100x = 45.454545\dots$, so $99x = 45$ and $x = \frac{45}{99} = \frac{5}{11}$.
- 10) **Choice D is correct.** (8.D.2) Multiply coefficients: $5 \times 4 = 20$. Add exponents: $10^{7+3} = 10^{10}$. Rewrite $20 \times 10^{10} = 2 \times 10^{11}$.
- 11) **Choice A is correct.** (8.A.2) Using points $(1, -1)$ and $(5, 3)$: slope = $\frac{3 - (-1)}{5 - 1} = \frac{4}{4} = 1$.
- 12) **Choice D is correct.** (8.G.1) Subtract 3: $-2x < -4$. Divide by -2 (FLIP): $x > 2$. Open circle and right ray.
- 13) **Choice C is correct.** (8.A.1) Difference of squares: $x^2 - 25 = x^2 - 5^2 = (x + 5)(x - 5)$.
- 14) **Choice A is correct.** (8.A.2) Each vertical line at $x = a$ represents all points with that x -coordinate. If the line intersects the graph more than once, the input a has multiple outputs, violating the function definition.
- 15) **Choice A is correct.** (8.D.2) Both $y = 2x$ and $y = 2x + 5$ have slope $m = 2$. The y -intercepts differ (0 vs 5), but slopes are equal. Student is correct.
- 16) **Choice B is correct.** (8.D.2) $y = 3x - \frac{1}{5}$ is in the form $y = mx + b$ with $m = 3$ and $b = -\frac{1}{5}$, so it is linear.
- 17) **The correct answer is $\frac{2}{9}$.** (8.A.1) Set $x = 0.\overline{2}$, so $10x = 2.\overline{2}$. Subtracting: $10x - x = 2$, giving $9x = 2$ and $x = \frac{2}{9}$.
- 18) **Choice A is correct.** (8.G.1) Using $y = mx + b$ with $m = 3$ and point $(1, 7)$: $7 = 3(1) + b \Rightarrow b = 4$. Equation: $y = 3x + 4$.
- 19) **Choice A is correct.** (8.G.2) Since the pentagons are congruent, pentagon PQRST has the same properties as JKLMN: all sides are equal and all interior angles measure 108° . This makes it a regular pentagon.
- 20) **The correct answer is A, E.** (8.G.2) A is true because $V = 3.14(4^2)(10) = 502.4 \text{ cm}^3$. E is true because a cone's volume is one-third the volume of a cylinder with the same base and height. B is false because the sphere's volume is about 267.95 cm^3 , not the cylinder volume. C is false because the cone's volume with height 10 cm is about 167.47 cm^3 . D is false because a cylinder with height 6 cm has volume 301.44 cm^3 , which is greater than the sphere volume.
- 21) **Choice B is correct.** (8.G.2) The orange rectangle has width 2; the purple has width 1. Scale factor is $\frac{1}{2}$.
- 22) **Choice B is correct.** (8.G.1) Co-interior angles are supplementary; their sum is always 180° .
- 23) **Choice D is correct.** (8.N.2) $(-3)^{-2} = \frac{1}{(-3)^2} = \frac{1}{9}$ (even exponent makes it positive).
- 24) **Choice D is correct.** (8.G.1) Slope = $\frac{6}{5} = 1.2$. The line passes through $(0, 0)$ and $(5, 6)$.
- 25) **Choice A is correct.** (8.G.1) Check $(1, 3)$ in both equations: $3 = -2(1) + 5$ and $3(1) + 3 = 6$. So $(1, 3)$ is the solution.
- 26) **Choice C is correct.** (8.A.1) From 3 to 5 hours, the elevation drops from 3m to 1m, indicating a downhill segment (decreasing function).
- 27) **Choice A is correct.** (8.G.3) $d = \sqrt{(7-1)^2 + (7-1)^2} = \sqrt{6^2 + 6^2} = \sqrt{36 + 36} = \sqrt{72} = 6\sqrt{2}$ units. (Equivalent: $\sqrt{72} = 6\sqrt{2}$.)



A Note for a Careful Thinker

Hi, Careful Thinker!

◇ This high-stamina book gave you nine substantial Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. This book gave you room to practice the kind of thinking eighth graders need: modeling linear relationships, solving systems, connecting algebra and geometry, and interpreting data. ◇

★ **Remember this:** The goal was never just to finish pages. The goal was to become the kind of student who knows how to begin, how to adjust, and how to check. ★

Your Careful-Thinking Toolkit

- **Read Twice:** First for the story, second for the math.
- **Label Values:** Give each number a job.
- **Check Signs:** Negatives and inequalities deserve attention.
- **Use Evidence:** Let the work prove the answer.

Grade 8 test-day tip: On test day, underline the question before solving. It keeps your answer aimed at the right target.

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

Jay Daie

Your Math Practice 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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Better **Results.**