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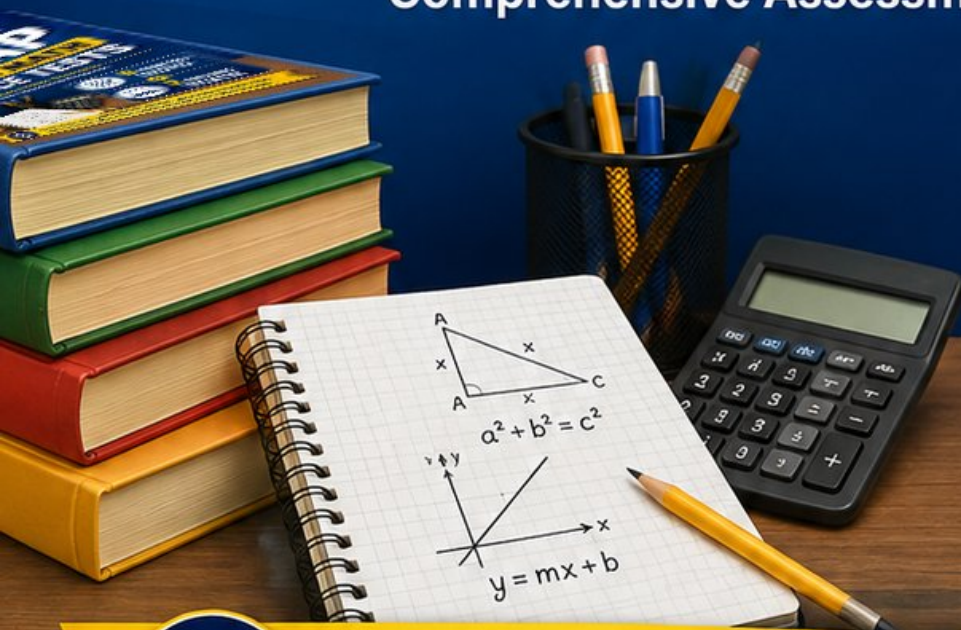
South Dakota

Smarter Balanced

GRADE 8 MATH

PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



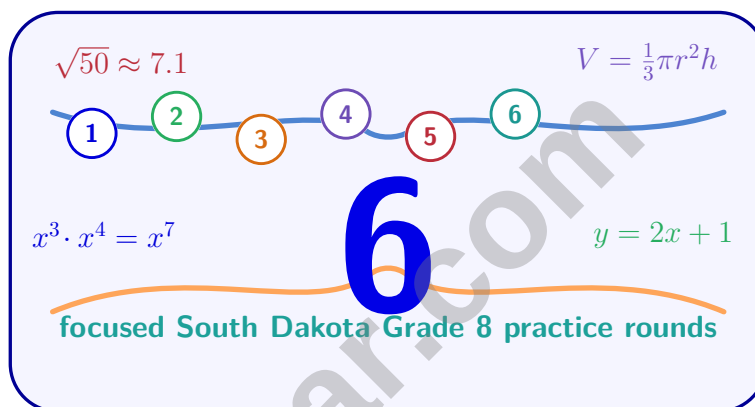
2 ONLINE
TESTS



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

6 South Dakota Smarter Balanced Grade 8 Math Practice Tests

Focused Grade 8 Review for Algebra, Functions, Geometry, and Statistics



Six complete 40-question Grade 8 Smarter Balanced 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, South Dakota Grade 8 Problem Solver!

Six focused rounds for sharper Smarter Balanced math thinking

This book gives you six full Grade 8 Smarter Balanced 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 South 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 six-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.

South 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?

Six Smarter Balanced tests, 240 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 4–6	Functions, systems, transformations, geometry, data analysis, and multi-step problem solving.
Answer Pages	Compact keys and explanations that show why each answer works.

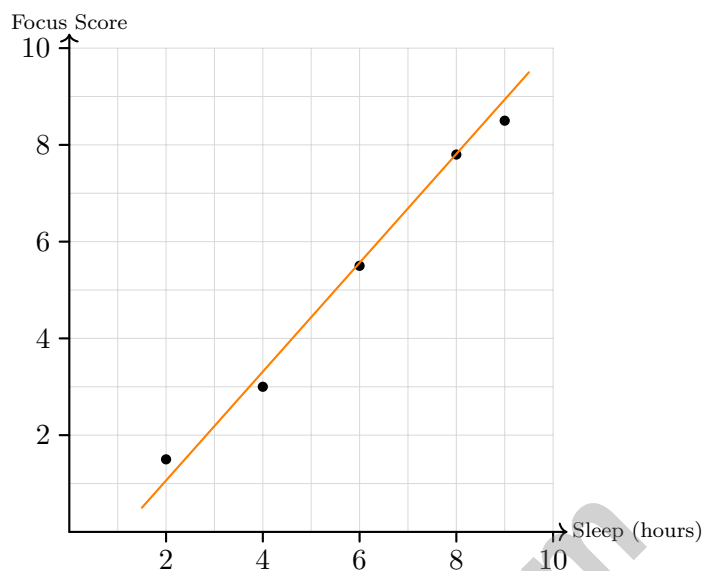
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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1)

Based on the trend line, if a student sleeps 7 hours, what is the predicted focus score?

☐ A. Approximately 5☐ C. Approximately 7☐ B. Approximately 6☐ D. Approximately 8

2) Which number can be expressed as a fraction?

☐ A. $\sqrt{11}$ ☐ C. $\frac{8}{3}$ ☐ B. 2π ☐ D. $\sqrt{2} + 1$ 3) A square tile has side length 5 cm. The diagonal is $5\sqrt{2}$ cm. What is the best estimate of the diagonal?☐ A. 5.5 cm☐ C. 7.1 cm☐ B. 6.5 cm☐ D. 10.0 cm

4) Is $\sqrt{10}$ greater than or less than 3.1?

☐ A. Cannot be determined

☐ B. Less than

☐ C. Equal to

☐ D. Greater than

5) Simplify $(2a)^3$.

☐ A. $2a^3$

☐ B. $2a \cdot 3$

☐ C. $6a$

☐ D. $8a^3$

6) A cube has an edge length of 4 units. What is its volume?

☐ A. 16 cubic units

☐ B. 24 cubic units

☐ C. 48 cubic units

☐ D. 64 cubic units

7) The mass of an electron is about 9.1×10^{-31} kg. In which range does this fall?

☐ A. Between 0.1 and 1 kg

☐ B. Equal to 9.1 kg

☐ C. Greater than 10^{-30} kg

☐ D. Between 10^{-32} and 10^{-30} kg

8) $\frac{(4 \times 10^6) \times (3 \times 10^2)}{6 \times 10^4} = ?$

☐ A. 2×10^2

☐ B. 12×10^8

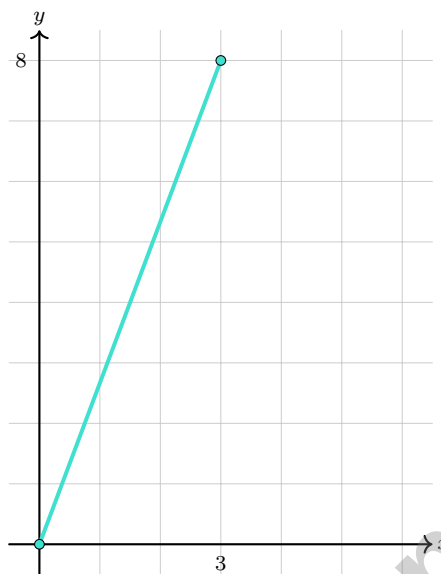
☐ C. 2×10^4

☐ D. 0.2×10^4

9) A jar contains 4 white tokens, 6 black tokens, and 5 red tokens. Two tokens are drawn without replacement. What is the probability that both tokens are black? Express your answer as a fraction in simplest form.



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10)

What is y when $x = 6$?☐ A. 12☐ C. 16☐ B. 14☐ D. 18

11) Company A: $A(d) = 40 + 0.15d$. Company B through $(100, 55)$ and $(200, 80)$. Which has higher rate?

☐ A. Company A☐ C. Both same.☐ B. Company B☐ D. Cannot be determined.

12) Which of these functions is LINEAR?

☐ A. $y = 4x^2 - 1$ ☐ C. $y = \frac{2}{x+3}$ ☐ B. $y = 10x - 6$ ☐ D. $y = 3^x$ 

1) Solve: $7 - 4x \leq -5$

☐ A. $x \geq 3$

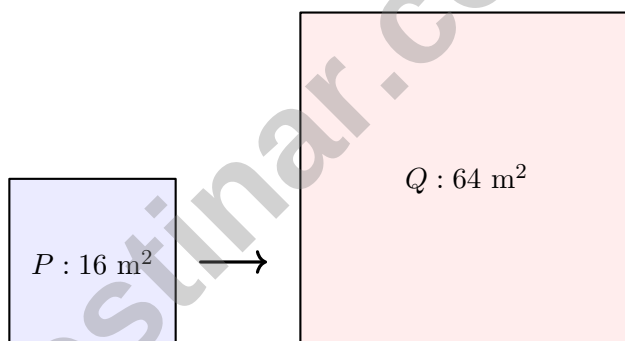
☐ C. $x \geq -3$

☐ B. $x \leq 3$

☐ D. $x \leq -3$

2) Two parallel lines are cut by a transversal. If a co-interior angle pair measures $(7a + 5)^\circ$ and $(2a + 85)^\circ$, find the value of a .

3) Figure P has area 16 m^2 and Figure Q (similar to P) has area 64 m^2 . What is the scale factor from P to Q ?



☐ A. 2

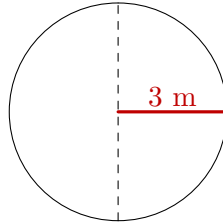
☐ C. 8

☐ B. 4

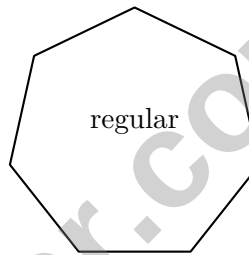
☐ D. 16



- 4) A composite figure is made from two semicircles (radius 3 m each) joined base-to-base forming an oval-like shape. What is the total area? Use $\pi \approx 3.14$.



- ☐ A. 9.42 m^2 ☐ C. 28.26 m^2
☐ B. 18.84 m^2 ☐ D. 37.68 m^2



5)

A regular heptagon is shown. What is the measure of each interior angle (to nearest whole degree)?

- ☐ A. $\approx 129^\circ$ ☐ C. $\approx 148^\circ$
☐ B. $\approx 138^\circ$ ☐ D. $\approx 158^\circ$

- 6) A box contains 6 pencils: 2 red, 3 blue, and 1 green. If you draw a pencil, replace it, then draw again, what is the probability of drawing blue both times?

- ☐ A. $\frac{9}{36}$ ☐ C. $\frac{3}{18}$
☐ B. $\frac{1}{3}$ ☐ D. $\frac{3}{6}$



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- 1) A fitness trainer charges a client based on the number of sessions attended. The data table shows:

Sessions	2	5	8
Cost (\$)	60	150	240

What is the slope (cost per session)?

- ☐ A. \$30 per session ☐ C. \$20 per session
☐ B. \$60 per session ☐ D. \$150 per session
- 2) Is $y = x^2$ a function?
- ☐ A. No, because it has an exponent. ☐ C. Yes, because every real number
☐ B. No, because negative inputs input produces exactly one output.
produce positive outputs. ☐ D. Yes, only when x is positive.
- 3) What is the pre-image of point $(4, -2)$ if it was produced by the translation $(x, y) \rightarrow (x + 3, y - 5)$?
- ☐ A. $(7, 3)$ ☐ C. $(1, -7)$
☐ B. $(7, -7)$ ☐ D. $(1, 3)$
- 4) A pyramid has a triangular base with area 18 cm^2 . If its height is doubled and the base area stays the same, the volume becomes 240 cm^3 . What was the original height?
- ☐ A. 10 cm ☐ C. 20 cm
☐ B. 15 cm ☐ D. 30 cm

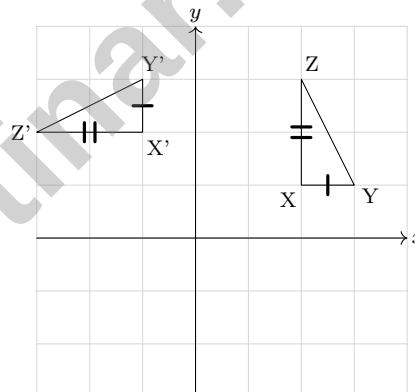


- 5) Solve the system $\begin{cases} x + y = 8 \\ x - y = 2 \end{cases}$ by elimination.

- 6) Rectangle X is similar to Rectangle Y . Rectangle X has perimeter 20 m. Rectangle Y has perimeter 50 m. What is the ratio of the side lengths (X to Y)?

- ☐ A. 2 : 5 ☐ C. 5 : 2
☐ B. 4 : 25 ☐ D. 25 : 4

- 7) Triangle XYZ is mapped onto triangle $X'Y'Z'$ by a 90-degree counterclockwise rotation about the origin. If the triangles are congruent, which of the following is true?



- ☐ A. Side XY has a different length than side $X'Y'$ ☐ C. Side $XZ =$ side $X'Z'$
☐ B. The angle at Z differs from the angle at Z' ☐ D. All angles are different after rotation



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South Dakota Smarter Balanced 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 South Dakota Smarter Balanced practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice C is correct.** **(8.SP.2)** Reading from the trend line at $x = 7$, the corresponding y -value is just under 7, so the best estimate is approximately 7.
- 2) **Choice C is correct.** **(8.NS.1)** $\frac{8}{3}$ is already expressed as a fraction, so it is rational. All other options are irrational: $\sqrt{11}$ is a non-perfect-square root, 2π is an irrational multiple of π , and $\sqrt{2} + 1$ is an irrational plus a rational (still irrational).
- 3) **Choice C is correct.** **(8.NS.2)** $5\sqrt{2} \approx 5 \times 1.41 = 7.05$ cm.
- 4) **Choice D is correct.** **(8.NS.2)** $(3.1)^2 = 9.61 < 10$, so $3.1 < \sqrt{10}$. Therefore $\sqrt{10} > 3.1$.
- 5) **Choice D is correct.** **(8.EE.1)** Apply power to both factors: $(2a)^3 = 2^3 \cdot a^3 = 8a^3$.
- 6) **Choice D is correct.** **(8.EE.2)** Volume of a cube $= e^3 = 4^3 = 64$ cubic units.
- 7) **Choice D is correct.** **(8.EE.3)** Since $-32 < -31 < -30$, we have $10^{-32} < 9.1 \times 10^{-31} < 10^{-30}$.
- 8) **Choice C is correct.** **(8.EE.4)** Numerator: $(4 \times 3) \times 10^{6+2} = 12 \times 10^8$. Then divide: $\frac{12 \times 10^8}{6 \times 10^4} = 2 \times 10^4$.
- 9) **The correct answer is $\frac{1}{7}$.** **(8.G.7)** Total: 15 tokens. $P(\text{black first}) = \frac{6}{15}$; $P(\text{black second} \mid \text{black first}) = \frac{5}{14}$. Product: $\frac{6}{15} \times \frac{5}{14} = \frac{1}{7}$.
- 10) **Choice C is correct.** **(8.EE.5)** Slope $k = \frac{8}{3}$. Equation: $y = \frac{8}{3}x$. At $x = 6$: $y = \frac{8}{3}(6) = 16$.
- 11) **Choice B is correct.** **(8.F.2)** A rate: 0.15. B rate: $(80 - 55)/(200 - 100) = 25/100 = 0.25$. Since $0.25 > 0.15$, B is higher.
- 12) **Choice B is correct.** **(8.F.3)** $y = 10x - 6$ is in the form $y = mx + b$ with $m = 10$ and $b = -6$, making it linear. The others involve exponents, fractions with x , or exponential bases.
- 13) **Choice A is correct.** **(8.EE.8)** Slope $= \frac{-1/2 \text{ foot}}{1/4 \text{ hour}} = \frac{-1/2}{1/4} = -\frac{1}{2} \times \frac{4}{1} = -2$ feet per hour.
- 14) **Choice C is correct.** **(8.EE.7)** Let a = liters of Juice A and b = liters of Juice B. Then $a + b = 40$ and $0.25a + 0.75b = 0.55(40) = 22$. Substitute $b = 40 - a$: $0.25a + 0.75(40 - a) = 22$, so $30 - 0.50a = 22$. Thus $a = 16$ and $b = 24$.
- 15) **Choice B is correct.** **(8.F.2)** Locate $x = -1$ and read the corresponding y -value from the graph: $y = 2$. So $f(-1) = 2$.
- 16) **Choice C is correct.** **(8.G.9)** Lateral surface area uses the slant height (not altitude). Each triangular face has base 6 and height (slant height) 5: area $= \frac{1}{2}(6)(5)$. Four triangles give $4 \times \frac{1}{2}(6)(5) = 60$ m². Options A and D incorrectly use altitude (4) instead of slant height.
- 17) **Choice D is correct.** **(8.G.1)** Both translation and rotation are rigid transformations that preserve the shape. The figure remains a hexagon with 6 sides.
- 18) **The correct answer is 210.** **(8.EE.5)** First digit: 7 choices. Second digit: 6 remaining. Third digit: 5 remaining. Total: $7 \times 6 \times 5 = 210$.
- 19) **The correct answer is A,C.** **(8.G.4)** Correct: (A) All linear measurements (sides, perimeter) are multiplied by 2.5. (C) Area is multiplied by $(2.5)^2 = 6.25$. Incorrect: (B) Angles are congruent in dilation, not scaled. (D) Perimeter is multiplied, not divided, by 2.5. (E) Dilation preserves shape; polygon type does not change.
- 20) **Choice A is correct.** **(8.EE.6)** Using points (0, 1) and (4, 5): slope $= \frac{5 - 1}{4 - 0} = \frac{4}{4} = 1$.
- 21) **Choice D is correct.** **(8.EE.7)** A: Identity (infinitely many). B: Subtract $3x$: $4 = 7$ (false, no solution). C and D: Unique solutions.
- 22) **Choice C is correct.** **(8.EE.7)** The inequality $x \geq -1$ includes -1 (closed circle) and all values greater (ray points right).
- 23) **Choice A is correct.** **(8.G.8)** Dashed horizontal line at $y = 1$ with shading ABOVE (in the positive y direction) means $y > 1$.
- 24) **Choice A is correct.** **(8.G.9)** $V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times 3.14 \times 1000 = 4186.67$ cm³.
- 25) **Choice D is correct.** **(8.SP.1)** Taller people generally wear larger shoe sizes, forming a clear upward trend. The relationship is positive (both increase together) and reasonably strong.



Hi, Brave Learner!

◇ No one gets stronger by only doing easy problems. The questions that slowed you down were part of the training. This deep and steady book gave you six full Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. ◇

★ **Remember this:** Mistakes are not proof that you cannot do math. They are directions. They show what to review, what to ask about, and what to practice next. ★

How to Use Mistakes

- **Name It:** Was it reading, setup, arithmetic, or checking?
- **Fix It:** Correct the work while the question is fresh.
- **Repeat It:** Try one similar problem soon.
- **Remember It:** Write the lesson in your own words.

Grade 8 test-day tip: Treat every corrected error as a point you are preparing to earn next time.

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

Jay Daie

Your Brave-Learning Coach

PRACTICE TODAY. ACHIEVE TOMORROW.

6

Give your child the confidence and skills they need with **6 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!

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.



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 |
| | ✓ And More! |



6 PRINTED TESTS



2 ONLINE TESTS



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