

South Dakota

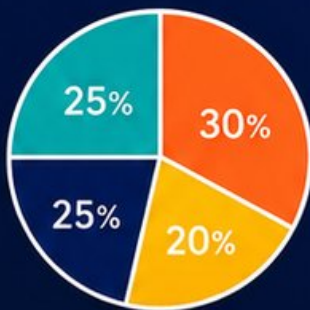
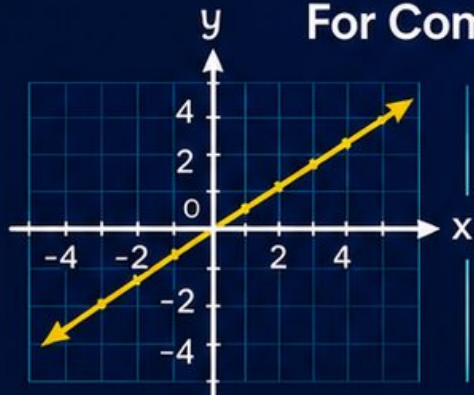
Smarter Balanced

GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

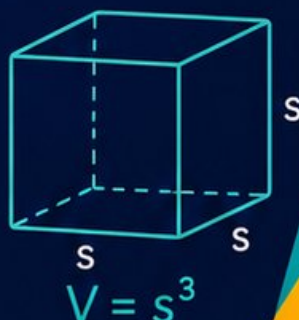


$$y = mx + b$$

$$2x - 3y = 6$$

$$\sqrt{x^2 + y^2}$$

$$A = bh$$



4 PRINTED TESTS



2 ONLINE TESTS

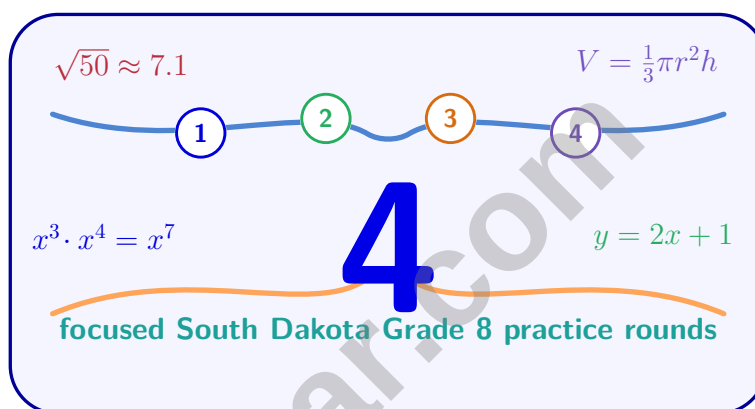


Use these **two additional online practice tests** for extra review after the printed tests in this book.



4 South Dakota Smarter Balanced Grade 8 Math Practice Tests

Grade 8 Smarter Balanced Practice for Equations, Graphs, Geometry, and Data



Four 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!

Four focused rounds for sharper Smarter Balanced math thinking

This book gives you four 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 four-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?

Four Smarter Balanced tests, 160 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–4	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.

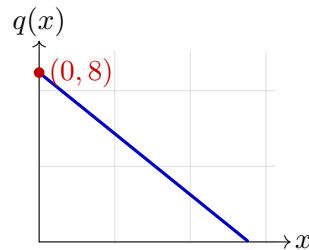


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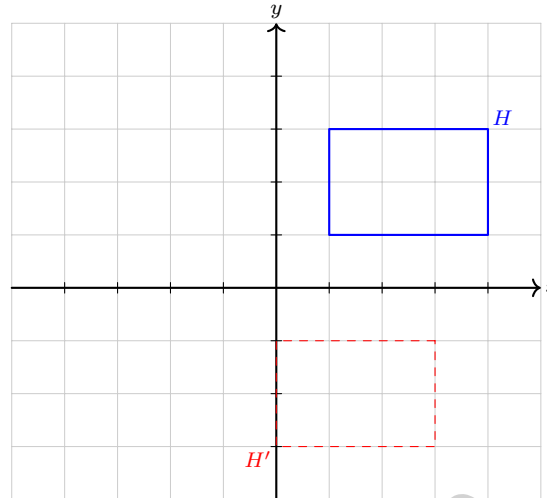
★ Practice Test 1	_____	14
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- 1) Two linear functions: $p(x) = -x + 10$ (verbal: “starts at 10, decreases by 1 each step”). Function q shown in graph through $(0, 8)$ with slope -1.5 . Which has more negative slope?



- ☐ A. Function p ☐ C. Equal negative slopes
☐ B. Function q ☐ D. Not comparable
- 2) A movie theater offers two pricing schemes: Scheme A costs \$8 per ticket, Scheme B costs \$60 upfront plus \$3 per ticket. For how many tickets is Scheme A cheaper?
- ☐ A. Fewer than 12 tickets ☐ C. Fewer than 15 tickets
☐ B. Fewer than 10 tickets ☐ D. Fewer than 8 tickets





3)

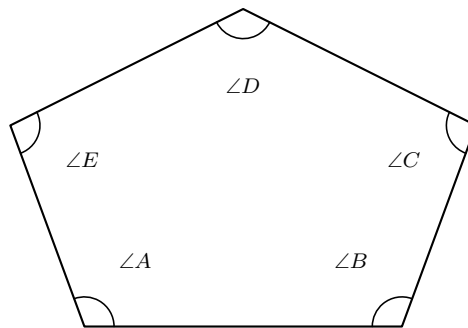
Rectangle H (blue) is transformed to rectangle H' (red). Which sequence of transformations applies?

- ☐ A. Reflect across y -axis, translate right 3
☐ B. Rotate 180° about the origin, translate right 3
☐ C. Reflect across x -axis, translate left 1
☐ D. Translate down 4, reflect across y -axis
- 4) Four angles are formed at the intersection of two lines. If one angle measures b° , which expression represents the sum of the measures of the other three angles?

- ☐ A. b
☐ B. $180 - b$
☐ C. $360 - b$
☐ D. $540 - b$



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5)

The figure shows a pentagon with interior angles. If $\angle A = 100^\circ$, $\angle B = 120^\circ$, $\angle C = 110^\circ$, and $\angle D = 130^\circ$, what is $\angle E$?

- ☐ A. 80°
☐ B. 100°

- ☐ C. 120°
☐ D. 140°



1) $(7.8 \times 10^7) - (2.3 \times 10^6) = ?$

☐ A. 5.5×10^7

☐ C. 5.5×10^6

☐ B. 5.5×10^1

☐ D. 7.57×10^7

2) A line has a slope of $-\frac{1}{2}$ and passes through $(4, 6)$. What is the y -coordinate when $x = 8$?

☐ A. 4

☐ C. 6

☐ B. 8

☐ D. 2

3) Function through $(1, 2)$ and $(4, 14)$. y -intercept?

4) A coffee shop has fixed costs of \$400 per day and variable costs of \$2 per cup sold. If cups sell for \$5 each, about how many cups must be sold to break even?

☐ A. 100 cups

☐ C. 134 cups

☐ B. 120 cups

☐ D. 160 cups

5) How many ways can 4 books be arranged on a shelf?

☐ A. $4 + 3 + 2 + 1 = 10$

☐ C. $4! = 24$

☐ B. $4^4 = 256$

☐ D. $\binom{4}{2} = 6$

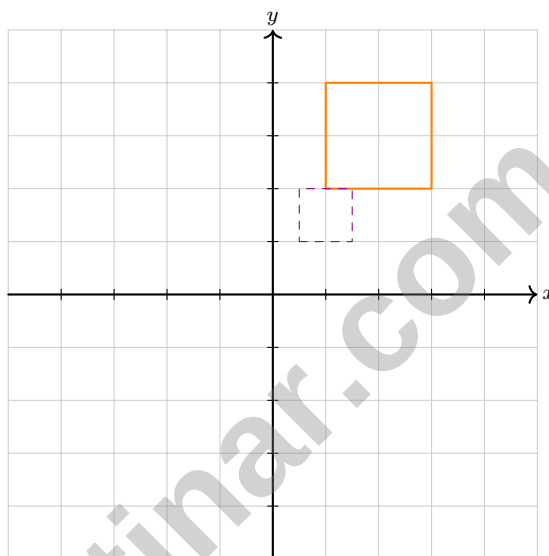


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6) Which table represents a LINEAR function?

x	0	2	4	6
y	10	16	22	28

- ☐ A. No, y is always greater than x
☐ C. No, because x increases by 2
☐ B. Yes, the first difference is constant (3 per unit change in x)
 ☐ D. Yes, because all points are positive



7)

The orange rectangle is dilated centered at the origin to produce the purple rectangle. What is the scale factor?

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



1) A polygon has an interior angle sum of 1260° . How many sides does it have?

☐ A. 9

☐ C. 7

☐ B. 8

☐ D. 10

2) A parking meter charges \$2.50 initial fee plus \$0.75 per hour. What is the hourly rate?

3) If $1.5 \times 10^4 = 15,000$, then $(1.5 \times 10^4) \times 10 = ?$

☐ A. 15×10^5

☐ C. 150,000

☐ B. 1.5×10^3

☐ D. 1.5×10^{40}

4) $S_1(w) = 20w$ and S_2 at $(0, 50)$, $(1, 56)$. After 4 weeks, which has more?

☐ A. S_1

☐ C. Both same.

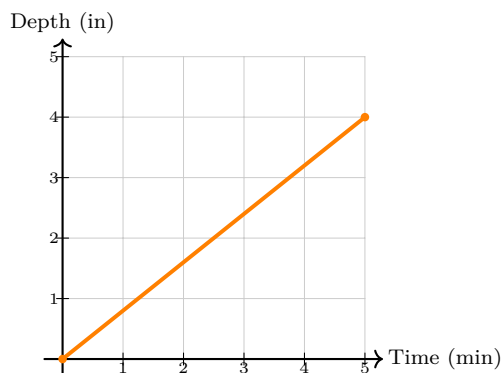
☐ B. S_2

☐ D. Cannot be determined.



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- 5) A graph shows depth of water versus time as a pool is filled.



What is the filling rate (slope)?

- ☐ A. $\frac{4}{5}$ inches per minute ☐ C. 4 inches per minute
☐ B. $\frac{5}{4}$ inches per minute ☐ D. 5 inches per minute
- 6) How much of a 100% alcohol solution must be mixed with 500 mL of 20% alcohol solution to create a 50% solution?
- ☐ A. 100 mL ☐ C. 300 mL
☐ B. 200 mL ☐ D. 400 mL
- 7) If $g(x) = 5x - 3$ and $g(x) = 12$, what is x ?
- ☐ A. 3 ☐ C. 4
☐ B. 2 ☐ D. 15
- 8) A right triangle has legs of 15 and 20. How much longer is the hypotenuse than the shorter leg?
- ☐ A. 10 ☐ C. 25
☐ B. 20 ☐ D. 35



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 B is correct.** **(8.F.2)** Slope of p : -1 . Slope of q : -1.5 . Since $-1.5 < -1$, function q is more negative.
- 2) **Choice A is correct.** **(8.EE.7)** Scheme A costs $8n$ for n tickets. Scheme B costs $60 + 3n$. Setting them equal: $8n = 60 + 3n$, so $5n = 60$, giving $n = 12$. For $n < 12$, Scheme A is cheaper.
- 3) **Choice C is correct.** **(8.G.3)** 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.
- 4) **Choice C is correct.** **(8.G.7)** Four angles around an intersection point sum to 360° . If one angle is b , the sum of the other three is $360 - b$.
- 5) **Choice A is correct.** **(8.G.5)** The sum of angles in a pentagon is 540° . So $\angle E = 540 - 100 - 120 - 110 - 130 = 80^\circ$.
- 6) **Choice B is correct.** **(8.SP.2)** A strong negative slope shows a strong inverse association: better efficiency correlates with fewer defects.
- 7) **Choice A is correct.** **(8.G.4)** If the new length is 12 and the scale factor is 1.5, then original $= \frac{12}{1.5} = 8$ cm. Distractor D adds the scale factor instead of dividing.
- 8) **The correct answer is 60.** **(8.EE.8)** Slope $= \frac{180 \text{ miles}}{3 \text{ hours}} = 60$ miles per hour.
- 9) **Choice A is correct.** **(8.F.2)** Substitute $x = 1$: $h(1) = -(1) + 4 = -1 + 4 = 3$.
- 10) **Choice C is correct.** **(8.NS.1)** The sum of an irrational number ($\sqrt{10}$) and a rational number (1) is always irrational. So $\sqrt{10} + 1$ is irrational. The others are rational: $0.5 + 0.25 = 0.75$, $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$, and $2^2 = 4$.
- 11) **Choice D is correct.** **(8.G.1)** Let $x = 0.36$. Then $100x = 36.\overline{36}$. Subtracting: $99x = 36$, so $x = \frac{36}{99} = \frac{4}{11}$.
- 12) **Choice D is correct.** **(8.NS.2)** $4^2 = 16$ and $5^2 = 25$. Since 21 is between them and closer to the midpoint, $\sqrt{21} \approx 4.58 \approx 4.5$.
- 13) **Choice D is correct.** **(8.EE.3)** Multiply coefficients and add exponents: $2 \times 3 = 6$ and $10^3 \times 10^2 = 10^5$, giving 6×10^5 .
- 14) **The correct answer is 2.** **(8.F.3)** The term x^2 has exponent 2.
- 15) **Choice C is correct.** **(8.G.7)** Avoiding 12% interest is better than earning 6% return. For the same \$1,500 over 5 years, paying down 12% debt avoids about \$900 of simple interest, while a 6% investment earns about \$450 of simple interest.
- 16) **Choice B is correct.** **(8.G.9)** Two triangular faces on the 5 m edges have total area $2 \times \frac{1}{2}(5)(8) = 40 \text{ m}^2$. Two triangular faces on the 3 m edges have total area $2 \times \frac{1}{2}(3)(7) = 21 \text{ m}^2$. Total lateral area is $40 + 21 = 61 \text{ m}^2$.
- 17) **Choice B is correct.** **(8.G.1)** The shape moves 4 units to the right and 0 units vertically. Shape X spans $x = 0$ -2; Shape Y spans $x = 4$ -6, confirming a 4-unit horizontal shift.
- 18) **Choice A is correct.** **(8.EE.6)** The line passes through $(0, 4)$ and $(3, 1)$, so slope $= -1$ and $y = -x + 4$. For $x = 1$, the equation gives $y = 3$, so $(1, 3)$ is on the line.
- 19) **Choice A is correct.** **(8.EE.7)** Subtract 8 from both sides: $2x = 12$. Divide by 2: $x = 6$. Check: $2(6) + 8 = 12 + 8 = 20$ ✓.
- 20) **Choice A is correct.** **(8.EE.7)** The open circle at 2 means 2 is not included. The ray points left to smaller values, so $x < 2$.
- 21) **Choice C is correct.** **(8.G.8)** Test: $4 \leq 2 + 1 \Rightarrow 4 \leq 3$ FALSE. So $(2, 4)$ is NOT in the solution region.
- 22) **The correct answer is A,B.** **(8.EE.4)** Division rule: divide coefficients ($6.4 \div 1.6 = 4$, choice A) and subtract exponents ($-3 - (-5) = 2$, choice B). This gives 4×10^2 . Choice C is wrong, choice D incorrectly adds exponents, and choice E has the wrong exponent sign.
- 23) **Choice A is correct.** **(8.G.9)** Since height is constant, volume depends on r^2 . $r_1^2 = 4 < r_2^2 = 9 < r_3^2 = 16$. Order: smallest to largest is r_1, r_2, r_3 .
- 24) **Choice B is correct.** **(8.SP.3)** The line passes through $(0, 1)$ and $(6, 6)$. Slope $= \frac{6-1}{6-0} = \frac{5}{6}$.
- 25) **Choice D is correct.** **(8.EE.1)** $(-3)^{-2} = \frac{1}{(-3)^2} = \frac{1}{9}$ (even exponent makes it positive).
- 26) **The correct answer is 132.** **(8.EE.5)** Line leader: 12 choices. Helper: 11 remaining choices. Total: $12 \times 11 = 132$ ways.



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One Last Encouragement

Hi, Determined Student!

◇ You did meaningful Grade 8 practice. That matters because confidence is built through action, not waiting until everything feels easy. This carefully paced book gave you four steady Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. ◇

★ **Remember this:** Carry this with you: you can learn hard things by breaking them into steps, asking good questions, and reviewing with honesty. ★

Take This With You

- **You Can Start:** Even when the problem looks big.
- **You Can Adjust:** When the first method is not enough.
- **You Can Learn:** From every corrected mistake.
- **You Can Improve:** One practice session at a time.

Grade 8 test-day tip: Walk into test day ready to think, not ready to be perfect. Thinking clearly is the goal.

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

Jay Daie

Your Grade 8 Math Friend

PRACTICE TODAY, ACHIEVE TOMORROW!

Give your child the confidence and skills they need with **4 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!

4



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
- ✓ 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!



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