

10

South Dakota

Smarter Balanced

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

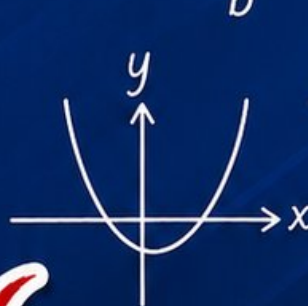
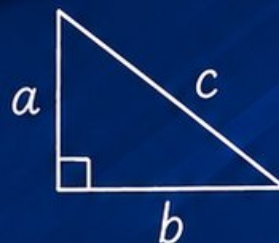


Answer Explanations for
Every Question



Test-Taking Strategies
That Work

$$y = mx + b$$



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

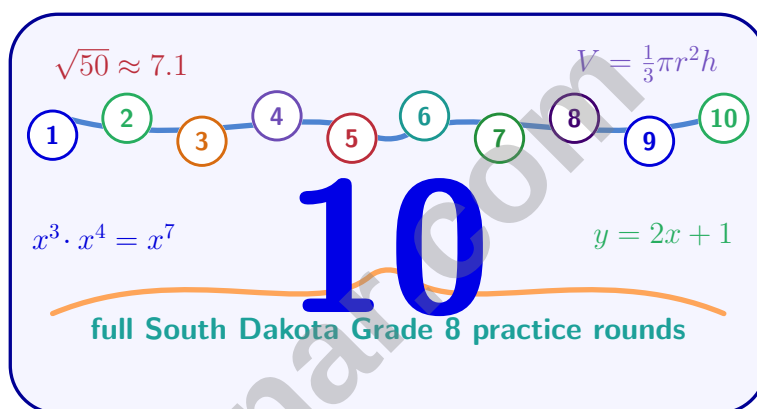


USE THESE TWO
ADDITIONAL ONLINE
PRACTICE TESTS

FOR EXTRA REVIEW AFTER
THE PRINTED TESTS
IN THIS BOOK.

10 South Dakota Smarter Balanced Grade 8 Math Practice Tests

South Dakota Grade 8 Smarter Balanced Practice for landmark-clear practice in functions, rate of change, expressions, geometry, data analysis, and probability



Ten complete 40-question Grade 8 Smarter Balanced 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



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Welcome, South Dakota Grade 8 Problem Solver!

Ten focused rounds for sharper South Dakota Smarter Balanced math thinking

This book gives you ten full Grade 8 Smarter Balanced 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 **Slope and the Equations of a Line** (8.EE.6): Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line. Derive $y = mx$ and $y = \dots$. A second useful connection is **Estimating Expressions with Irrational Numbers** (8.EE): Estimate the value of expressions involving irrational numbers (e.g., π^2).

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 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 **Solving Real Problems with Systems** (8.EE.7): Solve real-world and mathematical problems leading to two linear equations in two variables. It also prepares you for **Graphing Proportional Relationships** (8.EE.5): Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

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?

Ten South Dakota Smarter Balanced 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 South 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 **Comparing Two Functions** (8.F.2): Compare properties of two functions each represented in a different way (algebraically, graphically, numerically, or verbally). Another recurring target is **Solving Real Problems with Systems** (8.EE.7): Solve real-world and mathematical problems leading to two linear equations in two variables.



Scan me!
For more practice
& answers

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1) Which system represents two lines that intersect at exactly one point?

☐ A. $x = 2$ and $x = 2$

☐ C. $y = x + 1$ and $y = x + 3$

☐ B. $y = 4$ and $y = 4$

☐ D. $y = 2x + 1$ and $y = -x + 7$

2) A student calculates the surface area of a rectangular prism with dimensions 4 m $\times$ 3 m $\times$ 2 m as $SA = 4 \times 3 + 4 \times 2 + 3 \times 2 = 12 + 8 + 6 = 26 \text{ m}^2$. What is the student's error?

☐ A. Forgot to multiply by 2

☐ D. Added instead of multiplied all terms

☐ B. Calculated volume instead

☐ C. Used the wrong formula

3) If $x^2 = 225$, what are all possible values of x ?

☐ A. 15 only

☐ C. 15 or -15

☐ B. -15 only

☐ D. 7.5 or -7.5

4) Two stores sell notebooks. Store A: 4 notebooks for \$8. Store B: 5 notebooks for \$12. Which has the lower unit price?

☐ A. Store A (\$2.40 each)

☐ C. Store A (\$2 each)

☐ B. Store B (\$2.40 each)

☐ D. Same price

5) Factor completely: $5x^2 + 35x + 50$.

☐ A. $5(x^2 + 7x + 10)$

☐ C. $5(x + 2)(x + 5)$

☐ B. $(5x + 5)(x + 10)$

☐ D. $5(x + 10)(x + 1)$



6) A taxi charges \$3 per mile plus a \$5 base fare. If m is the number of miles, which expression represents the total charge?

☐ A. $5m + 3$

☐ C. $3m - 5$

☐ B. $3m + 5$

☐ D. $\frac{3m}{5}$

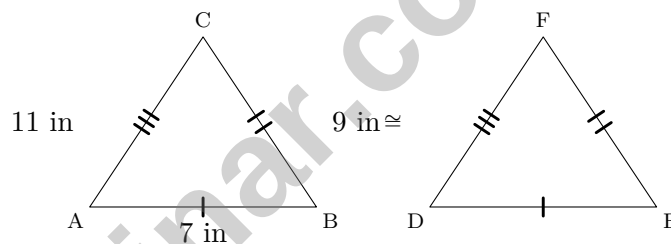
7) A student claims the line through $(1, 3)$ and $(3, 6)$ has slope $\frac{2}{3}$. What error did the student make?

☐ A. Inverted the slope as $\frac{\Delta x}{\Delta y}$
☐ C. Used $(1, 3)$ twice

☐ B. Subtracted incorrectly

☐ D. Used the y -intercept as the slope

8) Triangle ABC is congruent to triangle DEF. In triangle ABC: $AB = 7$ in, $BC = 9$ in, $AC = 11$ in. In triangle DEF, which side corresponds to side AC ?


☐ A. Side DE
☐ D. Cannot be determined from the diagram

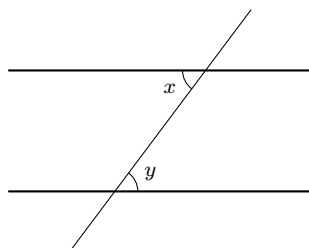
☐ B. Side EF
☐ C. Side DF

9) Evaluate 2^{-3} and express it as a decimal.



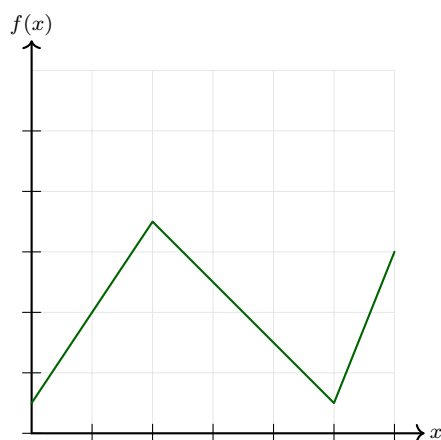
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- 10) In the diagram, angles x and y are formed by a transversal cutting parallel lines. If $x = 84^\circ$, what is y ?



- ☐ A. 84° ☐ C. 180°
☐ B. 96° ☐ D. 264°
- 11) A right triangle has legs of $\sqrt{2}$ and $\sqrt{6}$. Simplify the hypotenuse.
- ☐ A. $\sqrt{8}$ (which is $2\sqrt{2}$) ☐ C. $\sqrt{3}$
☐ B. $\sqrt{4}$ (which is 2) ☐ D. 4
- 12) A museum's skylight is a square pyramid frame with a base side of 5 m and height 3 m. What is the volume of air enclosed by this pyramidal structure?
- ☐ A. 15 m^3 ☐ C. 75 m^3
☐ B. 25 m^3 ☐ D. 225 m^3

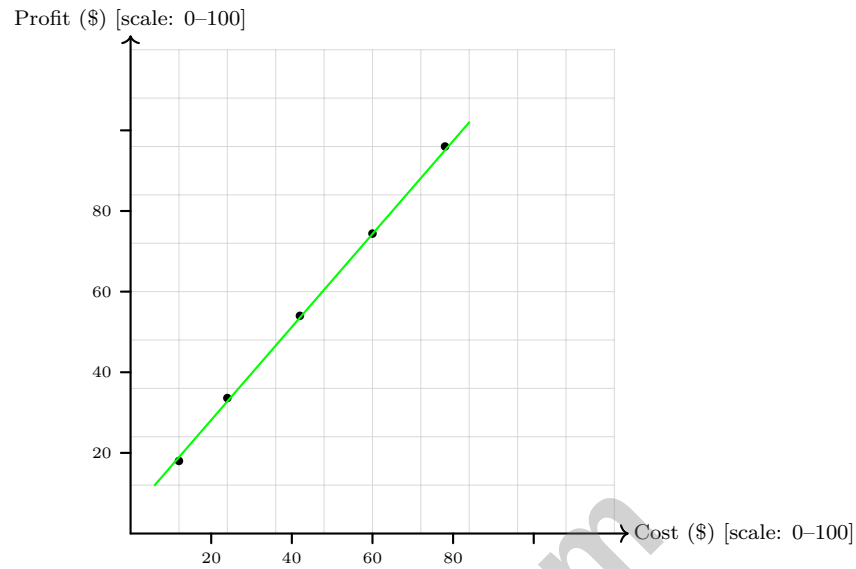




1)

At which x -value does the graph reach its maximum?

☐ A. $x = 0$ ☐ C. $x = 5$ ☐ B. $x = 2$ ☐ D. $x = 6$ 



2)

Looking at the scatter plot above, approximately what is the profit when the cost is \$60?

☐ A. \$80☐ C. \$40☐ B. \$60☐ D. \$20

3) A piggy bank has nickels and dimes totaling \$2.75. There are twice as many dimes as nickels. How many nickels are in the bank?



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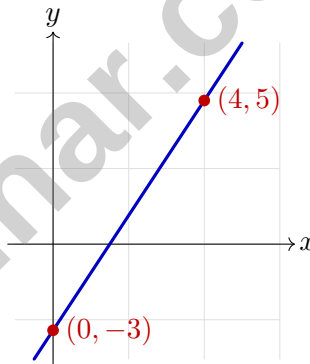
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- 1) Two angles form a linear pair. One angle is twice the other. What is the measure of the larger angle?

☐ A. 60° ☐ C. 120° ☐ B. 90° ☐ D. 150°

- 2) A phone company charges \$25 per month plus \$0.10 per text message. What is the total monthly cost for 100 texts?

- 3) The graph shows a line through $(0, -3)$ and $(4, 5)$. Find the slope of the line.



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& answers

4) $(3 \times 10^8) + (5 \times 10^6) = ?$

☐ A. 8×10^{14}

☐ C. 8×10^6

☐ B. 30.5×10^6

☐ D. 3.05×10^8

- 5) A card is randomly selected from a standard deck of 52 cards. What is the probability of drawing a spade? Express your answer as a fraction in simplest form.

- 6) Comparison of graphs: Line A passes through origin with slope 2. Line B crosses y -axis at -3 with slope 1. At $x = 4$, which is higher?

☐ A. Line A

☐ C. Both equal

☐ B. Line B

☐ D. Cannot determine

- 7) Which table represents a LINEAR function?

x	1	2	3	4
y	3	7	11	15

☐ A. Yes, the first differences are constant

☐ C. Yes, all y -values are positive

☐ D. No, the x -values increase

☐ B. No, the y -values are not all even

- 8) A rope's length decreases at a constant rate. After 10 hours, it is 40 meters long. After 30 hours, it is 20 meters long. At what hour will the rope be 0 meters?

☐ A. 40 hours

☐ C. 60 hours

☐ B. 70 hours

☐ D. 50 hours



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 D is correct.** (8.EE.8) The first two systems are lines with different equations but the same form (both are $x = 2$ or $y = 4$, not two distinct lines). Option C has parallel lines (same slope, different intercepts). Option D has different slopes, so the lines intersect at exactly one point.
- 2) **Choice A is correct.** (8.G.9) The student calculated the sum of the three different face areas but forgot to double each (since there are two of each face). The correct calculation is $SA = 2(12 + 8 + 6) = 52 \text{ m}^2$.
- 3) **Choice C is correct.** (8.EE.2) Both $15^2 = 225$ and $(-15)^2 = 225$, so $x = 15$ or $x = -15$.
- 4) **Choice C is correct.** (8.EE.5) Store A: $8/4 = 2$ per notebook. Store B: $12/5 = 2.40$ per notebook. Store A is cheaper.
- 5) **Choice C is correct.** (8.EE.7) GCF is 5: $5x^2 + 35x + 50 = 5(x^2 + 7x + 10) = 5(x + 2)(x + 5)$.
- 6) **Choice B is correct.** (8.F.1) Base fare is \$5. Charge per mile is \$3. Total charge = $3m + 5$.
- 7) **Choice A is correct.** (8.F.4) Correct: $m = \frac{6-3}{3-1} = \frac{3}{2}$. The student used $\frac{\Delta x}{\Delta y} = \frac{2}{3}$ instead of $\frac{\Delta y}{\Delta x}$, so the rise and run were inverted.
- 8) **Choice C is correct.** (8.G.2) Side $AC = 11$ in is the longest side in triangle ABC. In congruent triangle DEF, side DF must be the longest side (11 in), so AC corresponds to DF .
- 9) **The correct answer is 0.125.** (8.EE.1) $2^{-3} = \frac{1}{2^3} = \frac{1}{8} = 0.125$.
- 10) **Choice A is correct.** (8.G.5) Angles x and y are alternate interior angles formed by parallel lines and a transversal, so they are congruent: $y = 84^\circ$.
- 11) **Choice A is correct.** (8.G.6, 8.G.7) From $(\sqrt{2})^2 + (\sqrt{6})^2 = c^2$, we get $2 + 6 = 8$, so $c = \sqrt{8} = \sqrt{4 \cdot 2} = 2\sqrt{2}$.
- 12) **Choice B is correct.** (8.G.9) $V = \frac{1}{3} \times (5 \times 5) \times 3 = \frac{1}{3} \times 25 \times 3 = 25 \text{ m}^3$.
- 13) **Choice C is correct.** (8.G.7) Rectangle = $9 \times 6 = 54 \text{ m}^2$. Triangle = $\frac{1}{2} \times 9 \times 5 = 22.5 \text{ m}^2$. Total = $54 + 22.5 = 76.5 \text{ m}^2$. Missing the triangle piece leads to undercounting.
- 14) **Choice C is correct.** (8.SP.1) Shoe size is determined by body size, while favorite color is a personal preference unrelated to shoe size. There is no logical connection.
- 15) **Choice D is correct.** (8.SP.3) Extrapolation means predicting outside the observed data range. Since data covers weeks 1–10, week 15 requires extrapolation.
- 16) **Choice B is correct.** (8.SP.3) Column-conditional frequency among action viewers (156 total): $\frac{72}{156} \approx 0.46$.
- 17) **Choice B is correct.** (8.G.8) Absolute deviations are $|5 - 10| = 5$, $|8 - 10| = 2$, $|12 - 10| = 2$, and $|15 - 10| = 5$. The sum is 14, so the MAD is $14 \div 4 = 3.5$.
- 18) **The correct answer is 5.** (8.EE.7) Solve $45 + 5q \geq 70$, giving $q \geq 5$. The minimum whole number is 5.
- 19) **The correct answer is B, E.** (8.G.7) There are 10 marbles total. B is true because $P(\text{blue}) = \frac{3}{10}$. E is true because $P(\text{red or blue}) = \frac{5+3}{10} = \frac{8}{10} = \frac{4}{5}$. A is false because $P(\text{red}) = \frac{1}{2}$. C is false because $P(\text{green}) = \frac{1}{5}$. D is false because $P(\text{yellow}) = 0$.
- 20) **Choice D is correct.** (8.G.7) Total installment cost: $45 \times 12 = \$540$. Interest: $540 - 500 = \$40$.
- 21) **Choice D is correct.** (8.EE.4) Multiply: $6 \times 3 = 18 = 1.8 \times 10^1$. Add exponents: $10^{2+4} = 10^6$. Combine: $1.8 \times 10^1 \times 10^6 = 1.8 \times 10^7$.
- 22) **Choice A is correct.** (8.F.2) Week 1: $20 + 5(1) = 25$. Week 2: $20 + 5(2) = 30$. Week 3: $20 + 5(3) = 35$. Constant difference of 5 per week indicates linear with slope 5.
- 23) **Choice B is correct.** (8.F.3) Only $y = -12x - 1$ is in the form $y = mx + b$ with $m = -12$ and $b = -1$. The others involve squares, square roots, and reciprocals.
- 24) **Choice A is correct.** (8.F.5) Rising segment = increasing speed (acceleration). Flat = constant speed. Falling = decreasing speed (braking).
- 25) **Choice A is correct.** (8.G.3) The rule for 270° counterclockwise rotation is $(x, y) \rightarrow (y, -x)$. So $(4, -3) \rightarrow (-3, -4)$.
- 26) **The correct answer is 2.** (8.G.8) The boundary line is $y = -\frac{1}{3}x + 2$, whose y -intercept is 2.
- 27) **Choice A is correct.** (8.G.7) Angles on a straight line sum to 180° . So $z = 180 - 38 - 71 = 71^\circ$.



Hi, Grade 8 Math Star!

◇ You finished this practice set with real effort. Grade 8 math asks you to connect ideas, explain your thinking, and stay steady through multi-step problems. ◇

★ **Remember this:** Every page you completed helped build stronger habits: reading carefully, choosing a method, showing work, and checking whether the answer makes sense. You practiced across 10 full Grade 8 practice tests, and that repeated effort matters. ★

What You Built

- **Focus:** You stayed with challenging questions.
- **Accuracy:** You learned to slow down when details matter.
- **Reasoning:** You practiced explaining why a method works.
- **Readiness:** You are more prepared than when you started.

Grade 8 test-day tip: Before test day, review the questions that made you pause. Those are the best teachers.

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. 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