

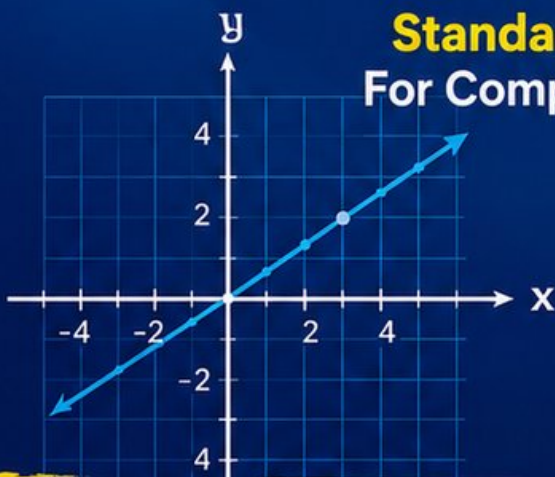
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Idaho
ISAT

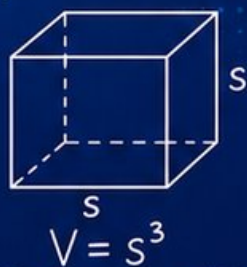
Grade 8

MATH

PRACTICE TESTS

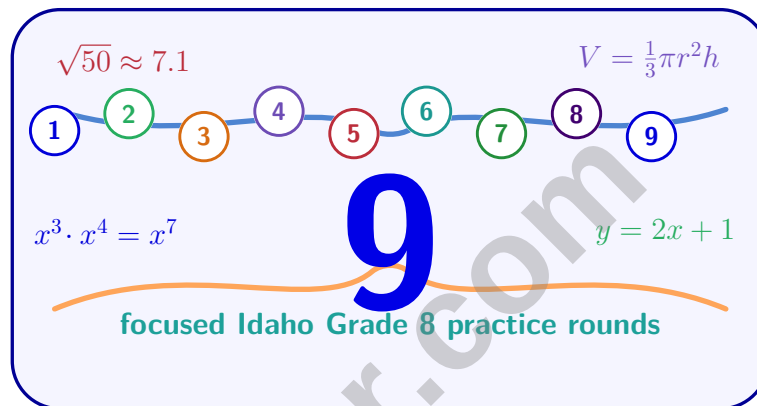
Standards Aligned Problem Solving
For Comprehensive Assessment Programs

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

9 PRINTED
TESTS2 ONLINE
TESTSUse these **two additional online practice tests** for extra review after the printed tests in this book.

9 Idaho ISAT Grade 8 Math Practice Tests

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



Nine complete 40-question Grade 8 ISAT 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, Idaho Grade 8 Problem Solver!

Nine focused rounds for sharper ISAT math thinking

This book gives you nine full Grade 8 ISAT 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 Idaho 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.

Idaho 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 ISAT 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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- 1) A two-way table of 250 survey respondents:

	Coffee	Tea	Total
Morning	100	50	150
Afternoon	60	40	100
Total	160	90	250

Among tea drinkers, what is the relative frequency of afternoon consumers, as a decimal?

- ☐ A. ≈ 0.44
☐ C. ≈ 0.36
☐ B. ≈ 0.40
☐ D. ≈ 0.32
- 2) A figure is first rotated 90° counterclockwise about the origin, then translated 3 units right. Which rule describes the image of the point (x, y) after both transformations?
- ☐ A. $(x, y) \rightarrow (-y + 3, x)$
☐ C. $(x, y) \rightarrow (x + 3, -y)$
☐ B. $(x, y) \rightarrow (-y, x + 3)$
☐ D. $(x, y) \rightarrow (-y - 3, x)$
- 3) The line $y = \frac{1}{3}x + k$ passes through the point $(3, 5)$. What is the value of k ?
- ☐ A. 1
 ☐ C. 3
☐ B. 2
 ☐ D. 4
- 4) Solve for y : $\frac{y-3}{2} = 5$
- ☐ A. $y = 13$
☐ C. $y = 4$
☐ B. $y = 7$
☐ D. $y = 10$



- 5) A phone plan charges \$20 base plus \$0.10 per text. If you budget at most \$35, which inequality shows max texts?
- ☐ A. $0.10t + 20 > 35$ ☐ C. $0.10 + 20t \geq 35$
☐ B. $20t + 0.10 \leq 35$ ☐ D. $0.10t + 20 \leq 35$
- 6) For a dashed boundary line, the inequality must use which symbol(s)?
- ☐ A. $\leq$ only ☐ C. $<$ or $>$
☐ B. $\geq$ only ☐ D. $\leq$ or $\geq$
- 7) A credit card offers 0% APR for 12 months on purchases, then 15% APR. If you buy \$800 during the promotional period and pay nothing, how much is owed after 12 months?
- ☐ A. \$1,400 ☐ C. \$1,200
☐ B. \$920 ☐ D. \$800
- 8) Simplify $((d^2)^2)^3$.
- ☐ A. d^7 ☐ C. d^6
☐ B. d^8 ☐ D. d^{12}
- 9) What is $\sqrt[3]{216}$?
- ☐ A. 5 ☐ C. 7
☐ B. 8 ☐ D. 6
- 10) $(8 \times 10^4) \times (9 \times 10^5) = ?$
- ☐ A. 72×10^7 ☐ C. 17×10^9
☐ B. 0.72×10^{10} ☐ D. 7.2×10^{10}



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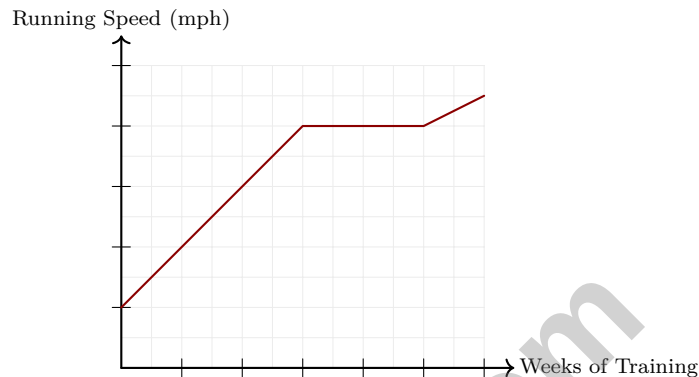
11) Which pair of points lies on a proportional relationship through the origin?

☐ A. (2, 5) and (4, 9)

☐ C. (1, 3) and (2, 5)

☐ B. (3, 12) and (5, 21)

☐ D. (2, 6) and (4, 12)



12)

A runner trains for 6 weeks. Speed increases for the first 3 weeks, stays constant for 2 weeks (maintenance phase), then improves slightly. During weeks 3–5, what is the runner's speed trend?

☐ A. Speed continues to increase

☐ C. Speed decreases

☐ B. Speed remains constant

☐ D. Speed fluctuates randomly

13) A segment from (0, 0) to (9, 12) is dilated by scale factor $\frac{2}{3}$ centered at the origin. What is the length of the dilated segment?

☐ A. 20 units

☐ C. 15 units

☐ B. 12 units

☐ D. 10 units



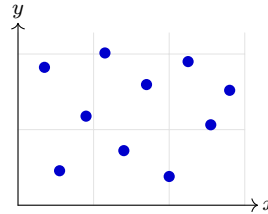
1) Which is the best estimate of $\sqrt{30}$?

☐ A. 4.5

☐ C. 6.0

☐ B. 15.0

☐ D. 5.5



2)

A scatter plot shows two variables with points scattered randomly in all directions with absolutely no visible trend or pattern. What does this indicate about the relationship between the variables?

☐ A. No correlation

☐ C. Strong negative correlation

☐ B. Strong positive correlation

☐ D. Perfect linear relationship

3) Three consecutive angles on a straight line measure x , $x + 15$, and $2x - 15$. Find x .

☐ A. 25°

☐ C. 45°

☐ B. 35°

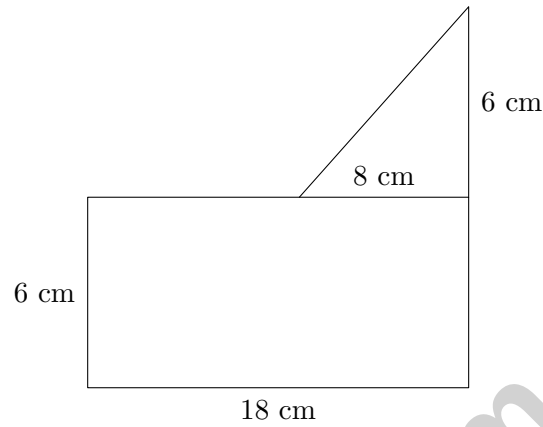
☐ D. 55°



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- 4) A composite figure has a rectangle (18 cm by 6 cm) with a right triangle (*legs* = 6 cm and 8 cm) placed on one of the longer sides. What is the total area?



- ☐ A. 24 cm^2 ☐ C. 84 cm^2
☐ B. 60 cm^2 ☐ D. 132 cm^2



1) Consider the set $\{(a, 1), (b, 2), (c, 1), (d, 3)\}$ where a, b, c, d are distinct. Is this a function?

- ☐ A. No, because output 1 appears twice. ☐ D. Yes, output can repeat; each input must be unique.
☐ B. Yes, because all inputs are distinct. ☐ C. No, because there are four pairs.

2) A square pyramid has a base with side length 8 cm and height 3 cm. Approximate the slant height and then calculate the surface area. (Use $\sqrt{25} = 5$.)

- ☐ A. Slant height ≈ 5 cm, SA ≈ 129 cm² ☐ C. Slant height ≈ 4 cm, SA ≈ 113 cm²
☐ B. Slant height ≈ 5 cm, SA ≈ 144 cm² ☐ D. Slant height ≈ 6 cm, SA ≈ 161 cm²

3) A cone has radius 9 cm and height 14 cm. Approximately, what is its volume? (Use $\pi \approx 3.14$.)

- ☐ A. 594.12 cm³ ☐ C. 2373.84 cm³
☐ B. 1186.92 cm³ ☐ D. 1782.36 cm³

4) A spring stretches when weights are attached. The table shows the length L (in cm) for a spring with w weights attached.

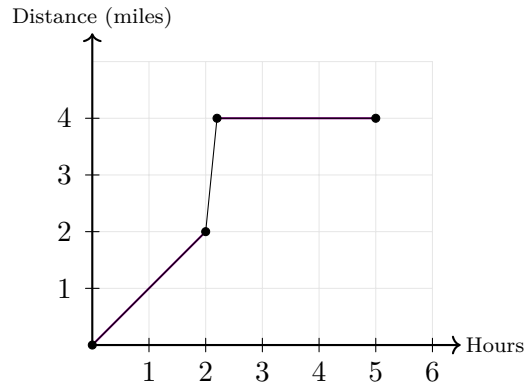
Number of Weights (w)	0	2	4	6
Length (L , cm)	10	14	18	22

Which equation describes the relationship?

- ☐ A. $L = 2w + 10$ ☐ C. $L = 4w + 10$
☐ B. $L = 10w + 2$ ☐ D. $L = w + 10$



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5)

A traveler's distance graph shows: 0 to 2 hours rising, then a jump, then flat. What does the jump represent?

- ☐ A. The traveler rested without moving ☐ C. This graph cannot represent a real physical scenario (discontinuity)
☐ B. The traveler waited at the same distance ☐ D. The traveler went backward in distance

6) Rectangle MNOP has length 15 cm and width 8 cm. Rectangle M'N'O'P' is congruent to MNOP. Which of the following is NOT a possible pair of dimensions for M'N'O'P'?

- ☐ A. Length 15 cm, width 8 cm ☐ C. Length 16 cm, width 8 cm
☐ B. Length 8 cm, width 15 cm ☐ D. Length 15 cm, width 8 cm (rotated)

7) What is the image of the point $(0, -7)$ after a reflection across the line $y = x$?

- ☐ A. $(0, 7)$ ☐ C. $(-7, 0)$
☐ B. $(7, 0)$ ☐ D. $(0, -7)$



Idaho ISAT 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 Idaho ISAT practice test.



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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice A is correct.** **(8.SP.A.4)** This is a column-conditional frequency. Among tea drinkers (90 total), afternoon drinkers are 40. Relative frequency: $\frac{40}{90} \approx 0.44$.
- 2) **Choice A is correct.** **(8.G.A.1)** Step 1: Rotate 90° CCW: $(x, y) \rightarrow (-y, x)$. Step 2: Translate 3 units right (add 3 to x-coordinate): $(-y, x) \rightarrow (-y + 3, x)$.
- 3) **Choice D is correct.** **(8.EE.B.6)** Substitute $(3, 5)$: $5 = \frac{1}{3}(3) + k$, so $5 = 1 + k$, thus $k = 4$.
- 4) **Choice A is correct.** **(8.EE.C.7)** Multiply by 2: $y - 3 = 10$. Add 3: $y = 13$.
- 5) **Choice D is correct.** **(8.EE.C.7)** Base (20) plus texts at 0.10 each $(0.10t)$, total at most 35.
- 6) **Choice C is correct.** **(8.G.B.8)** Dashed lines correspond to STRICT inequalities ($<$ and $>$), which do not include the boundary. The symbols $\leq$ and $\geq$ use solid lines.
- 7) **Choice D is correct.** **(8.G.B.7)** During promotional 0% APR, no interest accrues. Amount owed remains \$800 after 12 months.
- 8) **Choice D is correct.** **(8.EE.A.1)** Multiply exponents sequentially: $(d^2)^2 = d^{2 \cdot 2} = d^4$; then $(d^4)^3 = d^{4 \cdot 3} = d^{12}$. OR multiply all three: $2 \times 2 \times 3 = 12$, so d^{12} .
- 9) **Choice D is correct.** **(8.EE.A.2)** $6 \times 6 \times 6 = 216$, so $\sqrt[3]{216} = 6$.
- 10) **Choice D is correct.** **(8.EE.A.4)** Multiply coefficients: $8 \times 9 = 72 = 7.2 \times 10^1$. Add exponents: $10^{4+5} = 10^9$. Combine: $7.2 \times 10^1 \times 10^9 = 7.2 \times 10^{10}$.
- 11) **Choice D is correct.** **(8.EE.B.5)** Check ratio: $(2, 6) \rightarrow 6/2 = 3$ and $(4, 12) \rightarrow 12/4 = 3$. Same ratio means proportional. Choice D has $k = 3$.
- 12) **Choice B is correct.** **(8.F.B.5)** The graph shows a flat horizontal line from week 3 to week 5 at 4 mph, indicating no change in speed. This is the maintenance phase after rapid early gains.
- 13) **Choice D is correct.** **(8.G.A.3)** Original length: $\sqrt{9^2 + 12^2} = \sqrt{81 + 144} = \sqrt{225} = 15$. Dilated: $15 \times \frac{2}{3} = 10$.
- 14) **Choice A is correct.** **(8.G.A.5)** The sum of interior angles is $(n - 2) \times 180$. For a regular polygon, divide by n sides to get each angle.
- 15) **Choice B is correct.** **(8.G.B.7)** The table shows $2 \times 3 = 6$ outcomes total.
- 16) **Choice D is correct.** **(8.NS.A.2)** Since $1.4^2 = 1.96 \approx 2$ and $1.5^2 = 2.25$, we have $\sqrt{2} \approx 1.41$.
- 17) **Choice C is correct.** **(8.EE.C)** Add the equations: $(4x + 3y) + (2x - 3y) = 18 + 6$, so $6x = 24$, giving $x = 4$. Substitute: $4(4) + 3y = 18$, so $16 + 3y = 18$, and $y = 2/3$. Solution: $(4, 2/3)$.
- 18) **Choice C is correct.** **(8.EE.C.7)** FOIL: $(2x + 1)(x + 3) = 2x^2 + 6x + x + 3 = 2x^2 + 7x + 3$.
- 19) **Choice A is correct.** **(8.F.A.1)** Option A repeats input 2 with two different outputs, 3 and 5. That means it contains a repeated input with different outputs.
- 20) **Choice D is correct.** **(8.F.A.2)** First line starts at $(0, 1)$ (higher). If slopes are close, first stays above. If second has much steeper slope, it can overtake first in Q1. Answer depends on specific slopes.
- 21) **The correct answer is A,B.** **(8.G.A.5)** A is true because the interior angles of any triangle sum to 180° . B is true by the exterior angle theorem. C is false because right-triangle acute angles are complementary, not always congruent. D is false, and E is false because an exterior angle and its adjacent interior angle are supplementary, not complementary.
- 22) **Choice A is correct.** **(8.F.A.3)** For a linear function, the differences between consecutive y -values are constant. Here: $7 - 3 = 4$, $11 - 7 = 4$, $15 - 11 = 4$. A constant first difference indicates linearity.
- 23) **Choice C is correct.** **(8.F.B.4)** Line 1 slope: $\frac{5-1}{4-0} = 1$. Line 2 slope: $\frac{6-2}{4-0} = 1$. Same slope; different intercepts.
- 24) **Choice B is correct.** **(8.G.A.2)** Perimeter of Triangle 1 = $5 + 5 + 6 = 16$ cm. Even though Triangle 2 is oriented differently (rotated or reflected), congruent figures have equal corresponding sides. Therefore, Triangle 2 also has sides of 5 cm, 5 cm, and 6 cm, giving a perimeter of 16 cm.
- 25) **Choice C is correct.** **(8.G.B.8)** $d = \sqrt{24^2 + 7^2} = \sqrt{576 + 49} = \sqrt{625} = 25$ units. (This is a 7-24-25 Pythagorean triple.)
- 26) **The correct answer is 0.00047.** **(8.EE.A.3)** Move the decimal 4 places to the left: $4.7 \times 10^{-4} = 0.00047$.
- 27) **The correct answer is 4.41.** **(8.NS.A.1)** Compute $3 + 1.41 = 4.41$.



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- **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.

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Jay Daie

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GRADE

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