

6 Iowa ISASP

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



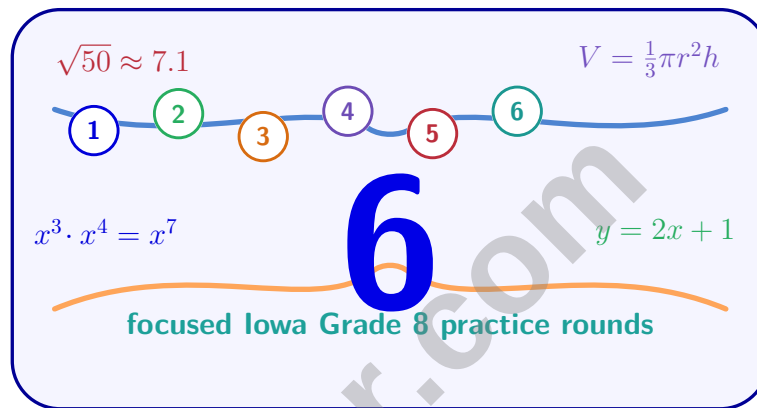
2 ONLINE
TESTS



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

6 Iowa ISASP Grade 8 Math Practice Tests

Standards-Aligned Grade 8 Practice for Real Test Readiness



Six complete 40-question Grade 8 ISASP practice rounds with real numbers, exponents, scientific notation, equations, functions, transformations, geometry, data analysis, probability, answer keys, and clear explanations for every item.

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Welcome, Iowa Grade 8 Problem Solver!

Six focused rounds for sharper ISASP math thinking

This book gives you six full Grade 8 ISASP 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 Iowa 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.

Iowa 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 ISASP 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.

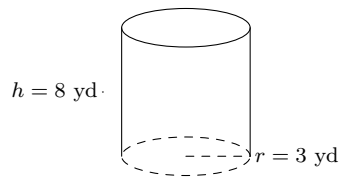
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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For more practice
& answers

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1)

A water storage tank shaped like a cylinder with radius 3 yd and height 8 yd is shown. What is its volume capacity in cubic yards? (Use $\pi \approx 3.14$.)

☐ A. 72.96 yd³☐ C. 226.08 yd³☐ B. 150.72 yd³☐ D. 452.16 yd³

2) Which statement is false?

☐ A. Every whole number is rational☐ C. $\sqrt{9}$ is rational☐ B. No irrational number can be written as a fraction☐ D. π is rational3) $\sqrt{89}$ is between 9 and 10. Which decimal is the better approximation?☐ A. 9.7☐ C. 9.6☐ B. 9.5☐ D. 9.44) Is the product $\sqrt{3} \times \sqrt{12}$ closer to 5 or 6?☐ A. Closer to 5☐ C. Exactly 5☐ B. Exactly 7☐ D. Closer to 6

- 5) A freelancer's gross income is \$5,000/month. After federal tax (15%), state tax (5%), and self-employment tax (15%), what is the net income?

Gross Income \$5,000
Total Taxes 35%
Net Income ?

- ☐ A. \$4,250 ☐ C. \$4,000
☐ B. \$3,500 ☐ D. \$3,250
- 6) A data point is at (3, 8) and the trend line at $x = 3$ predicts $y = 6$. What is the residual?

- 7) 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.



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8) Which expression cannot be simplified using exponent laws?

☐ A. $a^3 \cdot a^2$
☐ B. $\frac{a^3}{b^2}$

☐ C. $a^3 + a^2$
☐ D. $(c^2)^3$

9) What is $\sqrt[3]{1000}$?

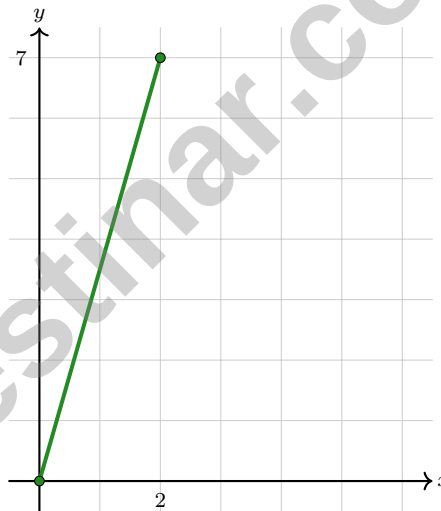
☐ A. 8
☐ B. 9

☐ C. 10
☐ D. 11

10) Compare 9.9×10^2 and 1.0×10^3 . Which is true?

☐ A. 9.9×10^2 is larger
☐ B. Cannot be determined

☐ C. They are equal
☐ D. 1.0×10^3 is larger



11)

The constant of proportionality is:

☐ A. $\frac{2}{7}$
☐ B. 7

☐ C. 2
☐ D. $\frac{7}{2}$



- 1) A square pyramid-shaped water tank has a base edge of 2 m and a height of 3 m. What is its volume in cubic meters? (If $1 \text{ m}^3 = 1000 \text{ L}$, what is the capacity in liters?)

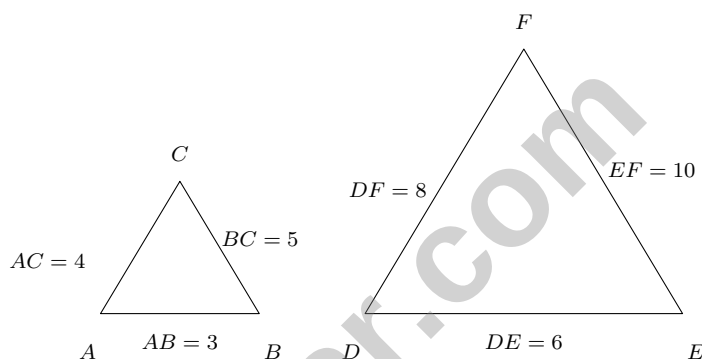
☐ A. $4 \text{ m}^3 / 4000 \text{ L}$

☐ B. $6 \text{ m}^3 / 6000 \text{ L}$

☐ C. $8 \text{ m}^3 / 8000 \text{ L}$

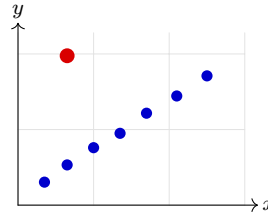
☐ D. $12 \text{ m}^3 / 12000 \text{ L}$

- 2) Two triangles are shown below. Triangle ABC has sides 3, 4, 5. Triangle DEF has sides 6, 8, 10. Are these triangles similar?



- ☐ A. No, because the sides are different lengths
- ☐ B. Yes, each side of DEF is twice the corresponding side of ABC
- ☐ C. No, the angles are not equal
- ☐ D. Cannot be determined





3)

A medical study plots patient age (years) versus cholesterol level (mg/dL). The scatter plot shows a moderate positive correlation with most points clustered near a trend line. However, one 35-year-old has a cholesterol level of 280 mg/dL, while most 35-year-olds in the study have levels near 200 mg/dL. A doctor should:

- ☐ A. Investigate this outlier for potential health risks or data errors
 ☐ C. Remove it to improve the correlation coefficient
- ☐ B. Ignore it because the overall trend is clear
 ☐ D. Use it to predict all 35-year-olds' cholesterol levels

4) A two-way table shows 360 employees:

	Day Shift	Night Shift	Total
Salaried	144	96	240
Hourly	72	48	120
Total	216	144	360

What is the joint relative frequency of hourly night-shift workers?

- ☐ A. $\frac{48}{120}$
☐ C. $\frac{48}{360}$
- ☐ B. $\frac{48}{144}$
☐ D. $\frac{48}{360}$

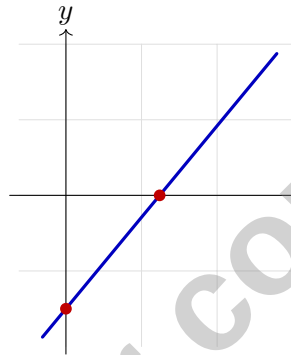


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- 1) A plant grows at a constant rate. After 2 weeks it is 8 inches tall. After 6 weeks it is 14 inches tall. What is the rate of growth per week (slope)?

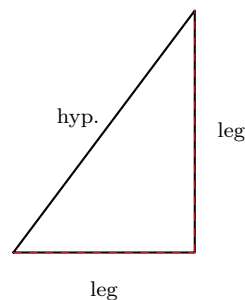
- ☐ A. 1.5 inches per week ☐ C. 2 inches per week
☐ B. 3.5 inches per week ☐ D. 7 inches per week

- 2) A function has a y -intercept of -3 and an x -intercept of 2 . On the graph, these appear at which points?



- ☐ A. $(0, -3)$ and $(2, 0)$ ☐ C. $(0, 2)$ and $(-3, 0)$
☐ B. $(-3, 0)$ and $(0, 2)$ ☐ D. $(2, 0)$ and $(0, 0)$

- 3) Which right triangle dimensions follow the Pythagorean Theorem?

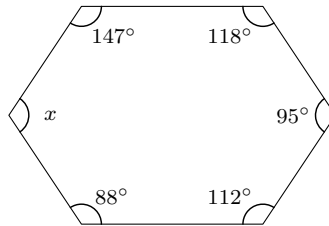


- ☐ A. 3, 4, 5 ☐ C. 2, 3, 4
☐ B. 5, 10, 12 ☐ D. 1, 2, 3



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& answers

- 4) Calculate $\frac{9.6 \times 10^8}{3.2 \times 10^5}$ and express in scientific notation.



5)

A hexagon has five interior angles: 88° , 112° , 95° , 118° , 147° . Find the sixth angle.

- ☐ A. 150° ☐ C. 170°
☐ B. 160° ☐ D. 180°
- 6) A triangle is dilated by a scale factor of 4. Which statement is true?
- ☐ A. Each angle is multiplied by 4 ☐ D. The shape becomes a different type of polygon
☐ B. The angles remain the same
☐ C. Each angle is divided by 4
- 7) Two supplementary angles are in the ratio 4 : 11. Find the measure of the smaller angle.

- ☐ A. 20° ☐ C. 55°
☐ B. 40° ☐ D. 48°



Iowa ISASP 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 Iowa ISASP practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice C is correct.** (8.G.C.9) $V = \pi r^2 h = 3.14 \times 9 \times 8 = 3.14 \times 72 = 226.08 \text{ yd}^3$.
- 2) **Choice D is correct.** (8.NS.A.1) This is false. π is irrational; it cannot be written as a fraction of two integers and has a non-terminating, non-repeating decimal expansion. All other statements are true.
- 3) **Choice D is correct.** (8.NS.A.2) $9.4^2 = 88.36$ and $9.5^2 = 90.25$. Since 89 is closer to 88.36, $\sqrt{89} \approx 9.43 \approx 9.4$.
- 4) **Choice D is correct.** (8.NS.A.2) $\sqrt{3} \times \sqrt{12} = \sqrt{36} = 6$ exactly.
- 5) **Choice D is correct.** (8.G.C.9) Total tax rate: $15\% + 5\% + 15\% = 35\%$. Net income: $\$5,000 \times (1 - 0.35) = \$5,000 \times 0.65 = \$3,250$.
- 6) **The correct answer is 2.** (8.SP.A.2) Residual = actual - predicted = $8 - 6 = 2$.
- 7) **The correct answer is $\frac{1}{4}$.** (8.G.C.9) There are 13 spades in a standard deck. $P(\text{spade}) = \frac{13}{52} = \frac{1}{4}$.
- 8) **Choice C is correct.** (8.EE.A.1) Addition/subtraction of powers requires like terms with same base AND exponent. $a^3 + a^2$ are not like terms.
- 9) **Choice C is correct.** (8.EE.A.2) $10 \times 10 \times 10 = 1000$, so $\sqrt[3]{1000} = 10$.
- 10) **Choice D is correct.** (8.EE.A.3) $9.9 \times 10^2 = 990$ and $1.0 \times 10^3 = 1,000$. The exponent dominates when coefficients are close.
- 11) **Choice D is correct.** (8.EE.B.5) $k = \frac{y}{x} = \frac{7}{2} = 3.5$. The line passes through (0, 0) and (2, 7).
- 12) **Choice B is correct.** (8.F.A.1) Each input value (1, 2, 3, 4) corresponds to exactly one output value (3, 6, 9, 12). The relationship is $y = 3x$, making it a function.
- 13) **Choice C is correct.** (8.F.A.3) Absolute value functions are nonlinear. They produce a V-shaped graph, not a straight line.
- 14) **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.
- 15) **Choice A is correct.** (8.EE.B.5) In the form $y = mx + b$, the slope is $m = 5$. This means the rate of change is 5 points per hour. The constant term +60 is the y -intercept (starting score).
- 16) **Choice C is correct.** (8.G.C) The ratio flour:sugar is 2 : 1. So flour = $2x$ and sugar = x for some x . Total: $2x + x = 9$, so $3x = 9$, giving $x = 3$. Thus flour = $2(3) = 6$ cups.
- 17) **Choice B is correct.** (8.F.A.1) Substitute $x = 2$: $g(2) = 2 + 7 = 9$.
- 18) **Choice D is correct.** (8.G.C.9) Cylinder A: $SA = 2\pi(3)^2 + 2\pi(3)(10) = 18\pi + 60\pi = 78\pi \text{ cm}^2$. Cylinder B: $SA = 2\pi(6)^2 + 2\pi(6)(10) = 72\pi + 120\pi = 192\pi \text{ cm}^2$. Ratio: $192\pi/78\pi \approx 2.46 \neq 2$. So B is greater but not exactly twice.
- 19) **The correct answer is A, C.** (8.G.A.4) Correct: (A) Corresponding angles are congruent — definition of similarity. (C) Corresponding sides are proportional — they scale by a constant factor k . Incorrect: (B) Equal length is congruence, not similarity. (D) Congruence requires equality; similarity allows scaling. (E) Scale factor can be any positive number; $k < 1$ is a reduction, still similarity.
- 20) **Choice C is correct.** (8.G.A.1) A 90° CCW rotation uses $(x, y) \rightarrow (-y, x)$. So $(3, 2) \rightarrow (-2, 3)$.
- 21) **Choice C is correct.** (8.SP.A.3) The y -intercept (15) is the cost when $u = 0$, representing fixed storage costs.
- 22) **Choice C is correct.** (8.EE.B.6) Both points have the same x -coordinate, making this a vertical line. Vertical lines have undefined slope.
- 23) **Choice A is correct.** (8.EE.C.7) Substitution is the definitive test: $2(3) + 5 = 11$ ✓ and $2(4) + 5 = 13 \neq 11$ ✗. Student A is correct.
- 24) **Choice C is correct.** (8.EE.C.7) Solving $2x - 3 < 5$ gives $2x < 8$, so $x < 4$. Of the listed choices, only $x = 3$ satisfies the inequality.
- 25) **Choice A is correct.** (8.EE.C.7) Find two numbers that multiply to -15 and add to -2 : -5 and 3 . Verify: $(-5)(3) = -15$ and $-5 + 3 = -2$.
- 26) **The correct answer is 132.** (8.NS.A.2) Line leader: 12 choices. Helper: 11 remaining choices. Total: $12 \times 11 = 132$ ways.
- 27) **Choice D is correct.** (8.EE.B.6) SOLID line (includes boundary) and shading BELOW the line indicates $y \leq 2x$.



Hi, Persistent Problem Solver!

◇ Some Grade 8 questions ask you to hold several ideas in your mind at once. That can feel hard, and that is exactly why practice matters. ◇

★ **Remember this:** You showed persistence by continuing through the set. That habit is powerful because difficult problems often open after one more good attempt. You practiced across 6 full Grade 8 practice tests, and that repeated effort matters. ★

Persistence Tools

- **Try a Smaller Case:** Use an easier number to see the pattern.
- **Draw It:** Make the situation visible.
- **Restate It:** Say the question in your own words.
- **Check One Step:** Fix the first unclear place.

Grade 8 test-day tip: When stuck, do not restart everything. Find the first step you trust, then rebuild from there.

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

Jay Daie

Your Persistence 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! |



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2 ONLINE TESTS



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