

IDAHO ISAT

GRADE 8 MATH

PRACTICE TESTS

5

PRINTED
TESTS



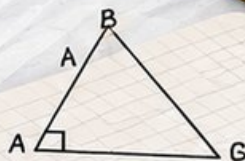
2

ONLINE
TESTS

**Standards Aligned
Problem Solving For
Comprehensive Assessment Programs**



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



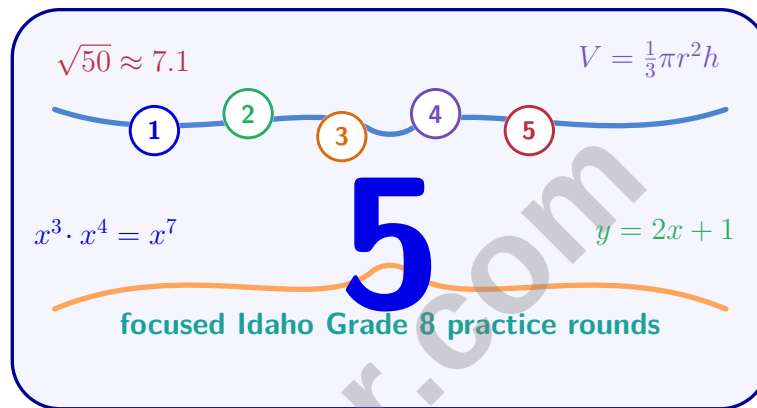
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

5 Idaho ISAT Grade 8 Math Practice Tests

Five ISAT Tests for Confident Grade 8 Math Review



Five 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!

Five focused rounds for sharper ISAT math thinking

This book gives you five 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 five-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?

Five ISAT tests, 200 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Real numbers, exponents, scientific notation, equations, and careful reading.
Tests 3–5	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) How many ways can a teacher select and arrange 3 students from a class of 8 to sit in the front row?

☐ A. $\binom{8}{3} = 56$

☐ B. $8 \times 7 \times 6 = 336$

☐ C. $8^3 = 512$

☐ D. $8! = 40,320$

2) Expand $(2x + 3)^2$.

☐ A. $4x^2 + 9$

☐ B. $4x^2 + 6x + 9$

☐ C. $4x^2 + 12x + 9$

☐ D. $2x^2 + 12x + 9$

3) A shape is reflected across a vertical line and then translated 5 units to the right. If the original shape has area 24 square units, what is the area of the final shape?

☐ A. 12 square units

☐ B. 24 square units

☐ C. 48 square units

☐ D. 120 square units

4) Three points lie on the same line: $(1, 5)$, $(3, 9)$, and $(x, 13)$. What is the value of x ?

☐ A. 4

☐ B. 7

☐ C. 6

☐ D. 5

5) A father is currently 32 years older than his son. In 8 years, the father will be twice as old as the son. What is the son's current age?

☐ A. 16

☐ B. 20

☐ C. 24

☐ D. 28

6) If $h(x) = -x + 4$, what is $h(1)$?

☐ A. 3

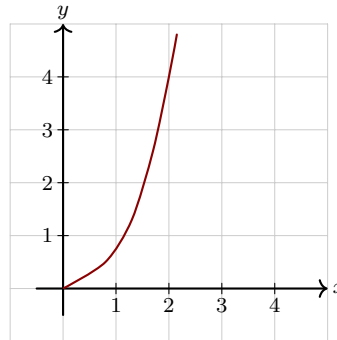
☐ B. 5

☐ C. -3

☐ D. 4



7) Which graph represents a NONLINEAR function?



☐ A. Yes, the curve is parabolic

☐ C. Yes, it only has positive y -values

☐ B. No, it starts at the origin

☐ D. No, the points are integers

8) A table shows that when $x = 1$, $y = 7$ and when $x = 5$, $y = 23$. What is the slope?

x	1	5
y	7	23

☐ A. 4

☐ C. $\frac{1}{4}$

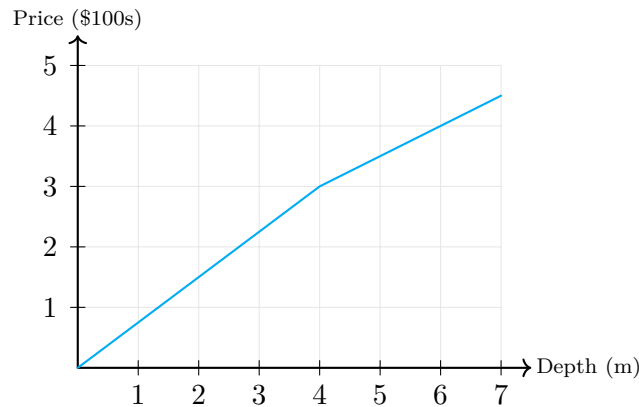
☐ B. 8

☐ D. 16

9) If 5 kilograms of rice cost \$15, what is the unit price (constant of proportionality) in dollars per kilogram?



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10)

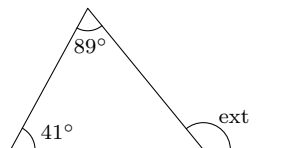
The graph shows well-drilling cost vs. depth. Why does the slope change at 4 meters depth?

- ☐ A. The drilling cost stays the same at all depths
☐ B. Different rock layers require different rates
☐ C. The drilling stops at 4 meters
☐ D. Cost actually decreases, shown by a negative slope

11) What is the pre-image of point $(4, -2)$ if it was produced by the translation $(x, y) \rightarrow (x + 3, y - 5)$?

- ☐ A. $(7, 3)$
☐ B. $(7, -7)$
☐ C. $(1, -7)$
☐ D. $(1, 3)$

12) A triangle has interior angles of 41° and 89° . What is the exterior angle adjacent to the third interior angle?



- ☐ A. 50°
☐ B. 100°
☐ C. 130°
☐ D. 180°



1) Which of the following would most likely show a nonlinear association?

- ☐ A. Study time versus test score ☐ C. Age versus income
☐ B. Temperature versus ice cream sales ☐ D. Dosage versus drug effectiveness

2) Factor $x^2 - 25$.

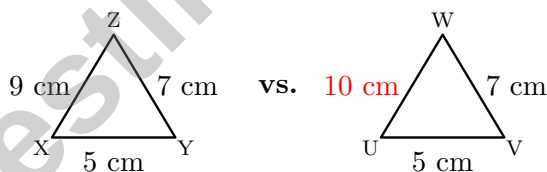
- ☐ A. $(x - 5)^2$ ☐ C. $(x + 5)(x - 5)$
☐ B. $(x + 5)^2$ ☐ D. $(x - 25)(x + 1)$

3) Table: $(0, 3), (1, 1), (2, -1), (3, -3)$. Rate of change is?

x	0	1	2	3
y	3	1	-1	-3

- ☐ A. -2 ☐ C. 1
☐ B. -1 ☐ D. 2

4) Triangle XYZ is congruent to triangle UVW. The sides of triangle XYZ are 5 cm, 7 cm, and 9 cm. A student claims triangle UVW must have sides 5 cm, 7 cm, and 10 cm. Why is the student incorrect?



- ☐ A. Congruent triangles have equal corresponding sides ☐ C. The side lengths don't need to match
☐ B. UVW must have sides 7, 5, 9 in a different order ☐ D. The student counted incorrectly



5) A scientist measures bacterial growth. At time $t = 0$ min, there are 100 bacteria. At $t = 5$ min, there are 300 bacteria. What is the rate of change (slope)?

- ☐ A. 40 bacteria per minute ☐ C. 60 bacteria per minute
☐ B. 200 bacteria per minute ☐ D. 20 bacteria per minute

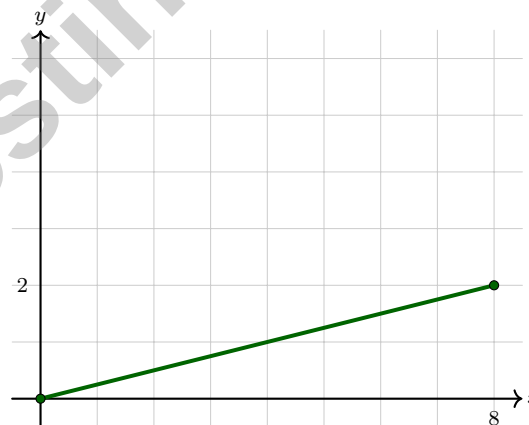
6) Two rectangles are considered separately. The first rectangle is x cm long and 5 cm wide. The second rectangle is y cm long and 5 cm wide. The sum of their perimeters is 56 cm, and the difference in their lengths is 2 cm. If $x > y$, what is x ?

- ☐ A. 8 cm ☐ C. 10 cm
☐ B. 12 cm ☐ D. 14 cm

7) The table shows a function. Find $f(0)$.

x	-1	0	1	2
$f(x)$	2	3	4	5

- ☐ A. 3 ☐ C. 4
☐ B. 2 ☐ D. 0



8)

The constant of proportionality is:

- ☐ A. 4 ☐ C. 0.25
☐ B. 2 ☐ D. 8



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1) Which line is perpendicular to $y = \frac{1}{2}x - 3$?

☐ A. $y = \frac{1}{2}x + 4$

☐ C. $y = -2x + 5$

☐ B. $y = 2x + 1$

☐ D. $y = -\frac{1}{2}x - 2$

2) A bank loan of \$10,000 at 5% simple interest is repaid in 5 equal annual installments. The total simple interest over the full term is \$2,500. How much principal and interest remains owed after making the first \$2,500 payment?

☐ A. \$8,000

☐ C. \$10,000

☐ B. \$8,500

☐ D. \$9,500

3) Express $\left(\frac{1}{3}\right)^{-2}$ as a positive exponent.

☐ A. $\frac{1}{9}$

☐ C. $\frac{2}{3}$

☐ B. -9

☐ D. 9

4) If $x^2 = 81$, what are the possible values of x ?

☐ A. 9 only

☐ C. 9 or -9

☐ B. -9 only

☐ D. 3 or -3

5) $(5.8 \times 10^6) - (2.3 \times 10^5) = ?$

☐ A. 3.5×10^6

☐ C. 3.5×10^5

☐ B. 8.1×10^6

☐ D. 5.57×10^6

6) Factor $4x + 12$ completely.

☐ A. $4(x + 3)$

☐ C. $12(x + 1)$

☐ B. $2(2x + 6)$

☐ D. $x + 12$



- 7) Function f is given by $f(x) = 4x + 1$. Function g is given by the table: $g(0) = 2$, $g(1) = 5$, $g(2) = 8$. Which function has the greater rate of change?

x	0	1	2
$g(x)$	2	5	8

- ☐ A. $f(x)$
☐ C. Both are equal
☐ B. $g(x)$
☐ D. Cannot be determined
- 8) An equilateral triangle has sides of 6 cm. It is reflected across one of its altitudes. What is true about the resulting triangle?
- ☐ A. The resulting triangle has sides of 3 cm
 ☐ C. The resulting triangle is no longer equilateral
☐ B. The resulting triangle is congruent to the original
 ☐ D. The angles increase to 90°
- 9) 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
- 10) A vending machine contains 32 coins (dimes and quarters). The total value is \$5.30. How many dimes are there?
- ☐ A. 8
 ☐ C. 14
☐ B. 12
 ☐ D. 18



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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 B is correct.** (8.NS.A.2) Seat 1: 8 choices. Seat 2: 7 remaining. Seat 3: 6 remaining. Using permutation notation: $\frac{8!}{5!} = 8 \times 7 \times 6 = 336$.
- 2) **Choice C is correct.** (8.EE.C.7) $(2x + 3)^2 = (2x)^2 + 2(2x)(3) + 3^2 = 4x^2 + 12x + 9$.
- 3) **Choice B is correct.** (8.G.A.2) Both reflection and translation are rigid motions that preserve area. The final shape is congruent to the original, so it has the same area: 24 square units.
- 4) **Choice D is correct.** (8.EE.B.5) Slope from (1, 5) to (3, 9) is $\frac{9-5}{3-1} = 2$. From (3, 9) to (x, 13): $2 = \frac{13-9}{x-3}$, so $2 = \frac{4}{x-3}$, giving $x = 5$.
- 5) **Choice C is correct.** (8.G.C) Let s = son's current age. Then father's age = $s + 32$. In 8 years: $s + 32 + 8 = 2(s + 8)$, so $s + 40 = 2s + 16$, giving $s = 24$ years.
- 6) **Choice A is correct.** (8.F.A.1) Substitute $x = 1$: $h(1) = -(1) + 4 = -1 + 4 = 3$.
- 7) **Choice A is correct.** (8.F.A.3) A nonlinear function does not form a straight line. This graph shows a parabola (curved shape), characteristic of a quadratic or nonlinear function.
- 8) **Choice A is correct.** (8.F.B.4) Slope is $m = \frac{23-7}{5-1} = \frac{16}{4} = 4$.
- 9) **The correct answer is 3.** (8.EE.B.5) Unit price $k = \frac{15}{5} = 3$ dollars per kilogram.
- 10) **Choice B is correct.** (8.F.B.5) The change in slope (from $3/4$ to $(4.5-3)/(7-4) = 0.5$ per meter) indicates a change in the rate structure. Option B explains why: different geological layers can cost differently. A is wrong because the slope changes, C is wrong because the line continues, and D is wrong because the slope stays positive.
- 11) **Choice D is correct.** (8.G.A.3) Reverse the translation: $(x, y) \rightarrow (x-3, y+5)$. So $(4, -2) \rightarrow (4-3, -2+5) = (1, 3)$.
- 12) **Choice C is correct.** (8.G.A.5) The third interior angle is $180 - 41 - 89 = 50^\circ$. The exterior angle is $180 - 50 = 130^\circ$ (or sum of remote interior angles: $41 + 89 = 130^\circ$).
- 13) **Choice B is correct.** (8.G.B.6, 8.G.B.7) The 3-4-5 triple scaled by 10 is 30-40-50. The diagonal $d^2 = 30^2 + 40^2 = 900 + 1600 = 2500$, so $d = 50$ m.
- 14) **Choice B is correct.** (8.G.B.7) Alternate interior angles are congruent: $4x = 2x + 30$. Solving: $2x = 30$, so $x = 15^\circ$.
- 15) **Choice B is correct.** (8.G.C.9) Both have the same volume and height, so they must have the same base area. The rectangular pyramid's base area is also 60 cm^2 .
- 16) **The correct answer is (3, -1).** (8.EE.C) Add the equations: $(2x + y) + (x - y) = 5 + 4$, so $3x = 9$, giving $x = 3$. Substitute: $3 - y = 4$, so $y = -1$.
- 17) **Choice B is correct.** (8.G.B.7) Rectangle area is $11 \times 7 = 77 \text{ cm}^2$. The removed quarter-circle area is $\frac{1}{4} \times 3.14 \times 7^2 = 38.465 \text{ cm}^2$. Remaining area is $77 - 38.465 = 38.535 \text{ cm}^2$.
- 18) **The correct answer is A,B.** (8.EE.A.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.
- 19) **Choice B is correct.** (8.G.A.5) A polygon with n sides can be divided into $n - 2$ triangles. Since each triangle has interior angles summing to 180° , the total sum is $(n - 2) \times 180$.
- 20) **Choice C is correct.** (8.SP.A.4) Joint relative frequency is the cell count divided by the grand total: $\frac{48}{360} = \frac{2}{15} \approx 0.133$.
- 21) **Choice B is correct.** (8.G.B.8) Deviations: $|2 - 6| = 4$, $|4 - 6| = 2$ (twice), $|6 - 6| = 0$ (three times), $|8 - 6| = 2$ (twice), $|10 - 6| = 4$. Sum = $4 + 4 + 0 + 4 + 4 = 16$. MAD = $16/9 \approx 1.78$.
- 22) **Choice B is correct.** (8.G.B.7) $P = \frac{4}{9} \times \frac{3}{8} \times \frac{2}{7} = \frac{24}{504} = \frac{1}{21}$.
- 23) **Choice A is correct.** (8.G.B.8) $d = \sqrt{(7-1)^2 + (7-1)^2} = \sqrt{6^2 + 6^2} = \sqrt{36 + 36} = \sqrt{72} = 6\sqrt{2}$ units. (Equivalent: $\sqrt{72} = 6\sqrt{2}$.)
- 24) **Choice A is correct.** (8.SP.A.1) When points are scattered randomly with no visible trend or direction, there is no correlation. An upward trend, downward trend, or tight line all indicate some form of correlation.



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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 5 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. Succeed Tomorrow!

Give your child the confidence and skills they need with **5 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 |
| ✓ Measurement & Data | ✓ And More! |

5
PRINTED
TESTS



2 ONLINE
TESTS



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