

IOWA ISASP

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.



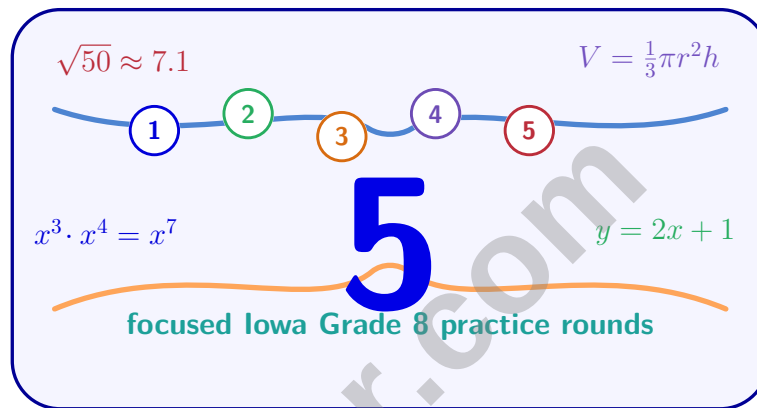
$$a^2 + b^2 = c^2$$



$$y = mx + b$$

5 Iowa ISASP Grade 8 Math Practice Tests

Steady ISASP Review for Expressions, Functions, and Data



Five 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.

Jay Daie and Reza Nazari



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Welcome, Iowa Grade 8 Problem Solver!

Five focused rounds for sharper ISASP math thinking

This book gives you five 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 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.

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?

Five ISASP 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) Which equation is LINEAR?

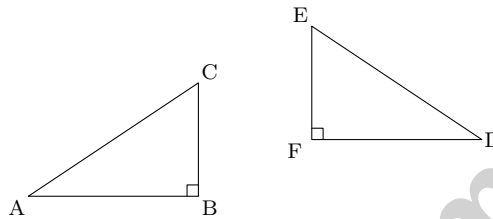
☐ A. $y = \frac{7}{2}x - 6$

☐ C. $y = 2^x$

☐ B. $y = x(x - 1)$

☐ D. $y = \frac{4}{x-1}$

2) Two congruent right triangles are positioned differently. Triangle 1 has a right angle at vertex B. Triangle 2 has a right angle at vertex F. What can you conclude?


☐ A. The hypotenuses are different lengths
 ☐ C. Triangle 1 is larger than Triangle 2

☐ B. The triangles have the same side lengths
 ☐ D. The angles are all different

3) A temperature drops 4 degrees every 2 hours. What is the slope?

☐ A. $\frac{1}{2}$ degrees per hour

☐ C. 2 degrees per hour

☐ B. 4 degrees per hour

☐ D. -2 degrees per hour

4) A river flows at 3 mph. A boat travels 4 hours downstream and 6 hours upstream for the same distance. What is the boat's speed in still water?

☐ A. 10 mph

☐ C. 15 mph

☐ B. 12 mph

☐ D. 18 mph


- 5) Solve the system $\begin{cases} y = 2x \\ x + y = 9 \end{cases}$ by substitution.

- 6) A phone plan charges based on minutes used. The table shows the cost $C(m)$ for m minutes.

Minutes (m)	100	200	300	400
Cost ($C(m)$)	\$20	\$30	\$40	\$50

What is $C(200)$?

- ☐ A. \$20 ☐ C. \$30
☐ B. \$40 ☐ D. \$50
- 7) Function $p(x) = \frac{3}{2}x - 4$ and the table for function q : $(0, 2)$, $(2, 5)$, $(4, 8)$. Which has a steeper slope?

x	0	2	4
$q(x)$	2	5	8

- ☐ A. $p(x)$ ☐ C. Both have equal slopes.
☐ B. $q(x)$ ☐ D. Cannot be determined.
- 8) What two positive integers multiply to 12 and add to 7?



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- 9) A snowpile melts at a rate of 4 inches per day. If it starts at 60 inches, which equation models the height h after d days?

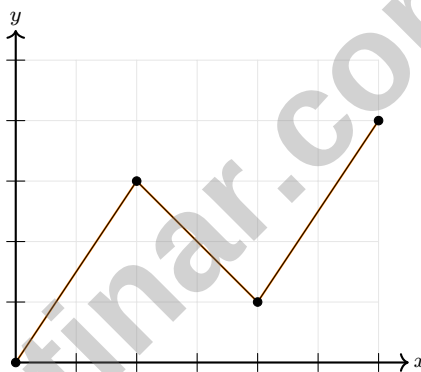
☐ A. $h = 60d - 4$

☐ C. $h = 4d + 60$

☐ B. $h = -4d + 60$

☐ D. $h = 60 - d$

- 10) For the inequality $y > 3$, what is the boundary value of y ?



11)

Over which interval is the function decreasing most rapidly?

☐ A. From $x = 0$ to $x = 2$

☐ C. From $x = 4$ to $x = 6$

☐ B. From $x = 2$ to $x = 4$

☐ D. The function never decreases

- 12) A point Q is at the origin and undergoes three transformations: first a translation right 2, then a rotation 90° counterclockwise about the origin, then a reflection across the x -axis. Where does the point end up?

☐ A. $(0, 2)$

☐ C. $(2, 0)$

☐ B. $(0, -2)$

☐ D. $(-2, 0)$



Decimal Classification	
Terminating	Repeating
0.25 0.5	$0.\overline{33}$ $0.\overline{142857}$

1)

Both categories shown contain rational numbers. Which is irrational?

☐ A. 0.1234567 (terminating)

☐ C. $\frac{22}{7}$
☐ B. 0.999... (repeating 9's)

☐ D. 0.3030030003... (non-repeating)

2) A parking meter charges \$0.50 per hour. The relation between hours h and cost c is (h, c) . Is this relation a function?

☐ A. No, because cost increases with time.

☐ C. No, because the cost depends on the time.

☐ B. Yes, each hour value gives exactly one cost value.

☐ D. Yes, only if the meter is working correctly.

3) For the equation $y = 3x - \frac{1}{5}$, identify the slope and y -intercept. Is it linear?

☐ A. Slope 3, intercept $\frac{1}{5}$; nonlinear

☐ D. Cannot determine without more data

☐ B. Slope 3, intercept $-\frac{1}{5}$; linear

☐ C. Slope $-\frac{1}{5}$, intercept 3; linear

4) Triangle XYZ has angle measures of $45^\circ, 60^\circ, 75^\circ$. Triangle ABC is congruent to triangle XYZ. What are the angle measures of triangle ABC?

☐ A. $30^\circ, 60^\circ, 90^\circ$
☐ C. $50^\circ, 65^\circ, 65^\circ$
☐ B. $45^\circ, 60^\circ, 75^\circ$
☐ D. $40^\circ, 60^\circ, 80^\circ$


5) A plane is descending. Its altitude decreases 2000 feet for every 5 minutes. What is the slope of altitude versus time?

- ☐ A. 400 feet per minute
☐ B. 2000 feet per minute

- ☐ C. $\frac{5}{2000}$ feet per minute
☐ D. -400 feet per minute

6) A chemist mixes a 30% acid solution with an 80% acid solution to make 100 mL of a 50% solution. Let x = volume of 30% solution (mL). Which equation represents the acid content?

- ☐ A. $0.3x + 0.8(100 - x) = 0.5(100)$
☐ B. $0.3(100 - x) + 0.8x = 50$

- ☐ C. $30x + 80x = 50 \cdot 100$
☐ D. $0.3x + 0.8x = 50$

7) The table shows $f(x)$. If $f(x) = 8$, what is x ?

x	1	2	3	4
$f(x)$	4	6	8	10

- ☐ A. 1
☐ B. 2

- ☐ C. 3
☐ D. 4

8) Solve: $\begin{cases} \frac{1}{4}x + y = 2 \\ x - y = 4 \end{cases}$

- ☐ A. $(\frac{24}{5}, \frac{4}{5})$
☐ B. $(\frac{20}{3}, \frac{8}{3})$

- ☐ C. $(5, -1)$
☐ D. $(3, -1)$

9) If $3^a \cdot 3^5 = 3^{12}$, what is the value of a ?



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1) Multiply: $(3x + 4)(2x - 1)$

☐ A. $5x^2 + 5x - 4$

☐ C. $6x^2 + 5x - 4$

☐ B. $6x^2 + 11x - 4$

☐ D. $6x^2 - 3x - 4$

2) A student earns a gross income of \$1,200/month. Taxes and deductions total \$240. What is the net income?

☐ A. \$240

☐ C. \$1,440

☐ B. \$1,200

☐ D. \$960

3) Simplify $\frac{4x^5}{2x^3}$.

☐ A. $4x^2$

☐ C. x^2

☐ B. $2x^8$

☐ D. $2x^2$

4) What is $\sqrt{225}$?

☐ A. 13

☐ C. 15

☐ B. 14

☐ D. 16

5) The number of stars in the observable universe is estimated at 10^{24} . Which is closest to this value?

☐ A. 1 trillion

☐ C. 1 quadrillion

☐ B. 1 sextillion

☐ D. 1 septillion

6) An athlete drinks 8 ounces of water for every 10 minutes of exercise. After 45 minutes of exercise, how many ounces has the athlete drunk?

☐ A. 30 ounces

☐ C. 40 ounces

☐ B. 45 ounces

☐ D. 36 ounces



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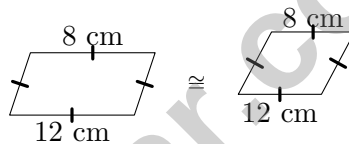
7) Which scenario can be modeled by a function?

- ☐ A. A student and all books they checked out this year.
- ☐ B. A positive number and its two square roots.
- ☐ C. Time of day and the temperature outside.
- ☐ D. A person and their email address (one person may have multiple emails).

8) Two points are $(2, 5)$ and $(4, 11)$. What is the slope of the line through them?

- ☐ A. 3
- ☐ B. $\frac{1}{3}$
- ☐ C. 6
- ☐ D. -3

9) Two congruent trapezoids are shown. One trapezoid has parallel sides of 8 cm and 12 cm. What are the parallel sides of the congruent trapezoid?



- ☐ A. 4 cm and 6 cm
- ☐ B. 8 cm and 12 cm
- ☐ C. 16 cm and 24 cm
- ☐ D. Cannot be determined



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 A is correct.** (8.F.A.3) $y = \frac{7}{2}x - 6$ is linear with slope $\frac{7}{2}$ and y -intercept -6 . Option B expands to $y = x^2 - x$ (nonlinear), and C and D are exponential and rational functions.
- 2) **Choice B is correct.** (8.G.A.2) Since the triangles are congruent, all corresponding sides and angles are equal. Both have a right angle and the same three side lengths.
- 3) **Choice D is correct.** (8.EE.B.5) The change is -4 degrees (dropping) over 2 hours. Slope = $\frac{-4}{2} = -2$ degrees per hour.
- 4) **Choice C is correct.** (8.G.C) Let b = boat's speed in still water. Downstream: $d = (b+3) \times 4$. Upstream: $d = (b-3) \times 6$. Setting them equal: $4(b+3) = 6(b-3)$, so $4b + 12 = 6b - 18$, giving $30 = 2b$, thus $b = 15$ mph.
- 5) **The correct answer is (3, 6).** (8.EE.C) Substitute $y = 2x$ into $x + y = 9$: $x + 2x = 9$, so $3x = 9$, giving $x = 3$. Then $y = 2(3) = 6$.
- 6) **Choice C is correct.** (8.F.A.1) Locate $m = 200$ in the table; the cost is \$30.
- 7) **Choice C is correct.** (8.F.A.2) Slope of p : $\frac{3}{2} = 1.5$. From table q : $(5-2)/(2-0) = 3/2 = 1.5$. Both have slope 1.5.
- 8) **The correct answer is (3, 4).** (8.EE.C.7) The integers 3 and 4 multiply to 12 and add to 7.
- 9) **Choice B is correct.** (8.F.B.4) Initial height is 60 inches (intercept). Melts (decreases) at 4 inches per day (negative slope). Equation: $h = -4d + 60$.
- 10) **The correct answer is 3.** (8.EE.B.6) The boundary line is $y = 3$.
- 11) **Choice B is correct.** (8.F.B.5) From $x = 2$ to $x = 4$: change is from 3 to 1, a drop of 2 over 2 units (slope = -1). From 0 to 2: rise of 3. From 4 to 6: rise of 3. The only decreasing segment is 2 to 4.
- 12) **Choice B is correct.** (8.G.A.3) Start at $(0, 0)$. After translation right 2: $(2, 0)$. After rotation 90° counterclockwise: $(-0, 2) = (0, 2)$. After reflection across x -axis: $(0, -2)$.
- 13) **Choice A is correct.** (8.G.A.5) Co-interior angles (same-side interior angles) are supplementary: $124 + y = 180$, so $y = 56^\circ$.
- 14) **Choice A is correct.** (8.G.B.6, 8.G.B.7) From $15^2 + 20^2 = 225 + 400 = 625$, we get $c = 25$. The difference is $25 - 15 = 10$ (scaled 3-4-5 triple).
- 15) **Choice A is correct.** (8.G.B.8) Correct method: $d = \sqrt{(3-0)^2 + (0-4)^2} = \sqrt{9+16} = \sqrt{25} = 5$ units. The student used addition instead of the Pythagorean Theorem.
- 16) **Choice C is correct.** (8.G.B.7) Angles on a straight line sum to 180° . So $x + (x + 15) + (2x - 15) = 180$, which gives $4x = 180$ and $x = 45^\circ$.
- 17) **Choice B is correct.** (8.G.C.9) $B = x \times 3x = 3x^2$. $500 = \frac{1}{3} \times 3x^2 \times 5 \Rightarrow 500 = 5x^2 \Rightarrow x^2 = 100 \Rightarrow x = 10$ m.
- 18) **Choice C is correct.** (8.EE.B.6) Rectangle area = $7 \times 5 = 35$ in². Triangle area = $\frac{1}{2} \times 7 \times 3 = 10.5$ in². Total = $35 + 10.5 = 45.5$ in².
- 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 B is correct.** (8.SP.A.1) A U-shaped (parabolic) curve is nonlinear. It cannot be well-approximated by a straight line. The relationship changes direction, which is incompatible with simple linear regression assumptions.
- 21) **Choice C is correct.** (8.SP.A.4) Relative frequency of streaming among broadband users: $\frac{126}{168} = 0.75$.
- 22) **The correct answer is A,D.** (8.EE.B.5) The line goes through $(0, 0)$ and $(8, 4)$, so the slope and constant of proportionality are $\frac{4}{8} = 0.5$. A point on the line must have $y = 0.5x$; when $x = 6$, $y = 3$, so $(6, 3)$ is on the line.
- 23) **Choice C is correct.** (8.G.B.8) Removing an outlier far from the mean removes a large deviation, lowering the overall average deviation (MAD).
- 24) **Choice D is correct.** (8.G.C.9) Numbers less than 4: 1, 2, 3. Rolling a 2 is already included in that set. So favorable outcomes: 1, 2, 3 = 3 outcomes. $P = \frac{3}{6} = \frac{1}{2}$.
- 25) **The correct answer is 14.** (8.F.A.1) Substitute $x = 5$ into the function: $y = 3(5) - 1 = 15 - 1 = 14$.



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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.