

6 Montana MAST

GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving For
Comprehensive Assessment Programs



6 PRINTED
TESTS



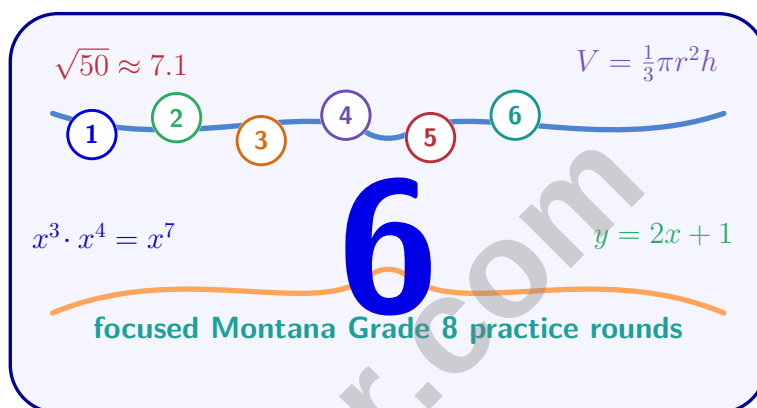
2 ONLINE
TESTS



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

6 Montana MAST Grade 8 Math Practice Tests

Grade 8 Math Practice for Algebra, Geometry, Statistics, and Review



Six complete 40-question Grade 8 MAST 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, Montana Grade 8 Problem Solver!

Six focused rounds for sharper MAST math thinking

This book gives you six full Grade 8 MAST 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 Montana 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.

Montana 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 MAST 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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Table of Contents

★ Practice Test 1	_____	14
★ Practice Test 2	_____	30
★ Practice Test 3	_____	45
★ Practice Test 4	_____	62
★ Practice Test 5	_____	77
★ Practice Test 6	_____	93
Practice Test Answer Keys	_____	109
Practice Test Answers and Explanations	_____	113

1) Convert $0.1\overline{35}$ to a fraction in simplest form.

☐ A. $\frac{1}{135}$

☐ B. $\frac{135}{1000}$

☐ C. $\frac{135}{999}$

☐ D. $\frac{134}{990} = \frac{67}{495}$

Numbers	
Rational	Irrational
$\frac{1}{2}, 0.5$	$\sqrt{2}, \pi$

2)

Which number should be placed in the Rational section?

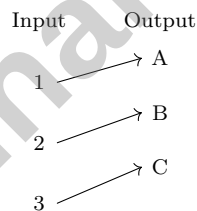
☐ A. $\sqrt{13}$

☐ B. $2 + \sqrt{5}$

☐ C. $-\frac{9}{2}$

☐ D. $\sqrt{\pi}$

3) Analyze this mapping and determine if it is a function:


☐ A. Yes, this is a function.

☐ B. No, because inputs are numbers and outputs are letters.

☐ C. No, because there are three inputs and three outputs.

☐ D. Yes, but only if each input is positive.


4) Which product is irrational?

☐ A. $\sqrt{9} \times \sqrt{4}$

☐ B. $\sqrt{2} \times \sqrt{8}$

☐ C. $2 \times \sqrt{3}$

☐ D. $\sqrt{16} \times \sqrt{25}$

5) A right triangle has legs of 3 and 4 units. The hypotenuse is $\sqrt{25}$ units. What is the hypotenuse?

☐ A. 25 units

☐ B. 7 units

☐ C. 12 units

☐ D. 5 units

6) Simplify $(p^{-2})^3$.

☐ A. p^1

☐ B. p^6

☐ C. p^{-5}

☐ D. p^{-6}

7) What is $\sqrt{324}$?

☐ A. 16

☐ B. 17

☐ C. 18

☐ D. 19

8) A data point is at (3, 8) and the trend line at $x = 3$ predicts $y = 6$. What is the residual?



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9) Which expression equals 4.25×10^{-1} ?

☐ A. 425

☐ C. 42.5

☐ B. 4.25

☐ D. 0.425

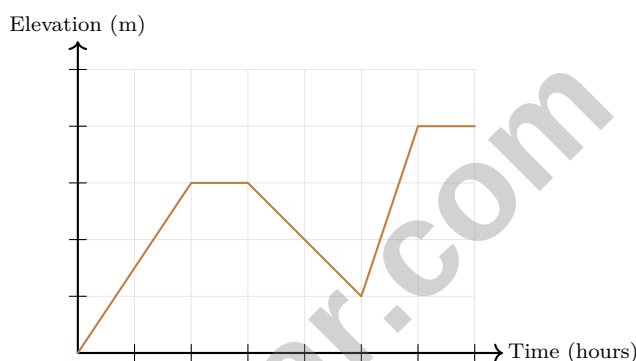
10) Compute $\frac{(9 \times 10^5) + (3.6 \times 10^5)}{4 \times 10^2}$. Express in scientific notation.

☐ A. 3.15×10^2

☐ C. 12.6×10^3

☐ B. 3.15×10^4

☐ D. 3.15×10^3



11)

A hiker starts at sea level. Which part of the journey involves going downhill?

☐ A. From 0 to 2 hours

☐ C. From 3 to 5 hours

☐ B. From 2 to 3 hours

☐ D. From 5 to 7 hours

12) A triangle with vertices at $(1, 0)$, $(3, 0)$, and $(2, 2)$ is reflected across the x -axis. What is the y -coordinate of the image of the vertex originally at $(2, 2)$?

☐ A. 2

☐ C. 0

☐ B. -2

☐ D. 4



1) A cone has radius r and height h . If the radius is doubled and the height stays the same, how does the new volume compare to the original?

- ☐ A. New volume = Original ☐ C. New volume = $4 \times$ Original
☐ B. New volume = $2 \times$ Original ☐ D. New volume = $8 \times$ Original

2) Triangle A has sides 5, 12, 13. Triangle B has sides 7.5, 18, 19.5. Triangle C has sides 10, 24, 26. Which triangles are similar to Triangle A ?

- ☐ A. Only Triangle B ☐ C. Both Triangle B and C
☐ B. Only Triangle C ☐ D. Neither Triangle B nor C

3) Four scatter plots are shown with different correlation patterns. Which plot would be most useful for predicting the value of one variable given the other?

- ☐ A. Weak positive correlation with many outliers ☐ C. No correlation with random scatter
☐ B. Strong positive correlation with minimal scatter ☐ D. Perfect nonlinear association

4) A two-way table shows 360 employees:

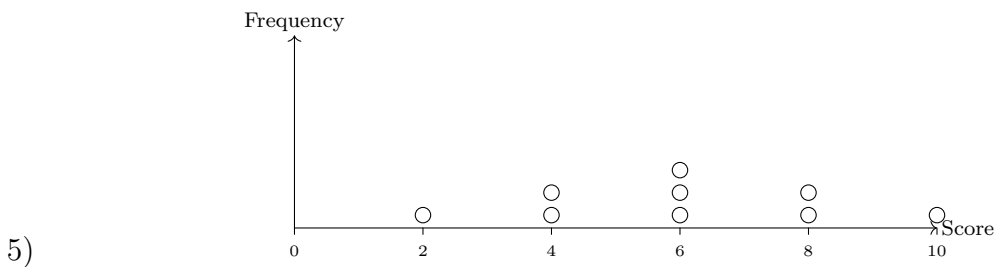
	Day Shift	Night Shift	Total
Salaried	144	96	240
Hourly	72	48	120
Total	216	144	360

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

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



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Data from dot plot: $\{2, 4, 4, 6, 6, 6, 6, 8, 8, 10\}$ with mean = 6. Find MAD.

- ☐ A. 1.5 ☐ C. 2
☐ B. 1.78 ☐ D. 2.2

6) When rolling two six-sided dice, what is the probability of rolling a sum of 7?

- ☐ A. $\frac{1}{5}$ ☐ C. $\frac{1}{12}$
☐ B. $\frac{1}{6}$ ☐ D. $\frac{7}{36}$

7) Which scenario requires permutation (order matters)?

- ☐ A. Selecting 2 students from a group of 10 to form a study pair. ☐ C. Picking 2 toppings from a pizza menu.
☐ B. Arranging 2 students from a group of 10 in a line (first and second position). ☐ D. Choosing 2 books to bring home from a library shelf.

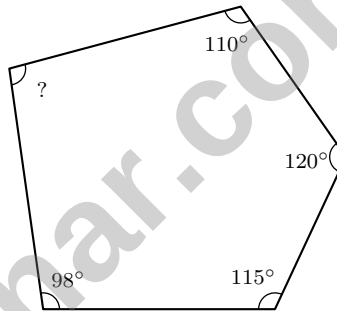


- 1) A scientist measures bacterial growth. At time $t = 0$ min, there are 100 bacteria. At $t = 5$ min, there are 300 bacteria. What is the rate of change (slope)?

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

- 2) A fitness gym charges only a flat \$50 monthly fee with no additional per-visit costs. If C is total monthly cost and m is the number of months, which equation represents this?

☐ A. $C = m + 50$ ☐ C. $C = 50$
☐ B. $C = 50m$ ☐ D. $C = m^2$



3)

A pentagon has four known angles: 98° , 115° , 120° , 110° . Find the fifth angle.

☐ A. 87° ☐ C. 107°
☐ B. 97° ☐ D. 117°

- 4) Triangle X is similar to Triangle Y . In Triangle X , one angle measures 60° . What is the measure of the corresponding angle in Triangle Y ?

☐ A. 30° ☐ C. 120°
☐ B. 60° ☐ D. Cannot be determined



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- 5) Solve the system $\begin{cases} 2x + y = 5 \\ x - y = 4 \end{cases}$ by elimination.

- 6) In a study of 240 employees, 144 are full-time and 96 are part-time. Among full-time employees, 108 have health insurance. What is the relative frequency of uninsured full-time employees?

☐ A. $\frac{36}{240}$

☐ B. $\frac{36}{144}$

☐ C. $\frac{108}{240}$

☐ D. $\frac{108}{144}$

- 7) An area model for $(x + 6)(x - 2)$ shows four rectangular regions. What is their total area?

	x	6
x	x^2	$6x$
-2	$-2x$	-12

☐ A. $x^2 + 4x - 12$

☐ B. $x^2 - 12$

☐ C. $x^2 + 8x - 12$

☐ D. $x^2 + 6x - 2$

- 8) Savings comparison: Teen saves \$25 first week, \$30 second week, \$35 third week. Matches which pattern?

☐ A. $S(w) = 20 + 5w$ (linear)

☐ B. $S(w) = 25w$ (linear)

☐ C. $S(w) = w^2 + 24$ (quadratic)

☐ D. $S(w) = 25 \cdot 2^{w-1}$ (exponential)



Montana MAST 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 Montana MAST practice test.



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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** **(8.NS.1)** Let $x = 0.1\overline{35} = 0.13535\dots$. Then $10x = 1.\overline{35}$ and $1000x = 135.\overline{35}$. Subtracting: $990x = 134$, so $x = \frac{134}{990} = \frac{67}{495}$.
- 2) **Choice C is correct.** **(8.NS.2)** Only $-\frac{9}{2}$ is rational (a fraction of two integers). The others are irrational: $\sqrt{13}$ is a non-perfect-square root, $2 + \sqrt{5}$ is a sum involving an irrational, and $\sqrt{\pi}$ is the root of an irrational.
- 3) **Choice A is correct.** **(8.F.1)** Each input (1, 2, 3) maps to exactly one output (A, B, C). The fact that outputs are letters instead of numbers is irrelevant.
- 4) **Choice C is correct.** **(8.NS.2)** A: $3 \times 2 = 6$ (rational). B: $\sqrt{16} = 4$ (rational). C: $2\sqrt{3}$ is irrational. D: $4 \times 5 = 20$ (rational).
- 5) **Choice D is correct.** **(8.NS.2)** By the Pythagorean theorem, $\sqrt{3^2 + 4^2} = \sqrt{25} = 5$ units.
- 6) **Choice D is correct.** **(8.EE.1)** Multiply exponents: $(p^{-2})^3 = p^{-2 \cdot 3} = p^{-6}$.
- 7) **Choice C is correct.** **(8.EE.2)** $18 \times 18 = 324$, so $\sqrt{324} = 18$.
- 8) **The correct answer is 2.** **(8.SP.2)** Residual = actual - predicted = $8 - 6 = 2$.
- 9) **Choice D is correct.** **(8.EE.3)** A negative exponent moves the decimal left. $4.25 \times 10^{-1} = 0.425$.
- 10) **Choice D is correct.** **(8.EE.4)** Add first: $(9 + 3.6) \times 10^5 = 12.6 \times 10^5 = 1.26 \times 10^6$. Then divide: $\frac{1.26 \times 10^6}{4 \times 10^2} = 0.315 \times 10^4 = 3.15 \times 10^3$.
- 11) **Choice C is correct.** **(8.F.5)** From 3 to 5 hours, the elevation drops from 3m to 1m, indicating a downhill segment (decreasing function).
- 12) **Choice B is correct.** **(8.G.3)** Reflection across the x -axis maps $(x, y) \rightarrow (x, -y)$. So $(2, 2) \rightarrow (2, -2)$, giving y -coordinate -2 .
- 13) **Choice A is correct.** **(8.EE.8)** Using $(2, 60)$ and $(5, 150)$: slope = $\frac{150 - 60}{5 - 2} = \frac{90}{3} = \30 per session.
- 14) **Choice A is correct.** **(8.EE.7)** Let t = the number of years from now. Then $42 + t = 3(10 + t)$. This gives $42 + t = 30 + 3t$, so $12 = 2t$ and $t = 6$ years.
- 15) **The correct answer is $\frac{1}{4}$.** **(8.G.7)** There are 13 spades in a standard deck. $P(\text{spade}) = \frac{13}{52} = \frac{1}{4}$.
- 16) **The correct answer is 24.** **(8.NS.2)** Calculate the factorial: $4! = 4 \times 3 \times 2 \times 1 = 24$ different arrangements.
- 17) **Choice C is correct.** **(8.F.1)** At $x = 2$, the function passes through point C which is at $(2, 3)$, so $f(2) = 3$.
- 18) **Choice B is correct.** **(8.G.9)** $SA = 2\pi r^2 + 2\pi rh = 2\pi(2)^2 + 2\pi(2)(6) = 8\pi + 24\pi \text{ in}^2$.
- 19) **The correct answer is \$3,307.50.** **(8.G.7)** $A = 3000(1.05)^2 = 3000 \times 1.1025 = \$3,307.50$.
- 20) **The correct answer is A, C.** **(8.G.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.
- 21) **Choice D is correct.** **(8.G.1)** Both translation and rotation are rigid transformations that preserve the shape. The figure remains a hexagon with 6 sides.
- 22) **Choice A is correct.** **(8.EE.6)** Using points $(1, -1)$ and $(5, 3)$: slope = $\frac{3 - (-1)}{5 - 1} = \frac{4}{4} = 1$.
- 23) **Choice D is correct.** **(8.EE.7)** Perimeter = $2(\text{length}) + 2(\text{width}) = 2(w + 3) + 2w = 26$.
- 24) **Choice A is correct.** **(8.EE.7)** "Product of a number and -2 " is $-2x$; "greater than 8" is > 8 .
- 25) **Choice B is correct.** **(8.G.8)** DASHED line means strict inequality ($<$ or $>$). Shading BELOW means $y <$. Combined: $y < x - 2$.
- 26) **Choice B is correct.** **(8.G.9)** Sphere: $V = \frac{4}{3} \times 3.14 \times 8 = 33.49 \text{ cm}^3$. Cylinder: $V = 3.14 \times 4 \times 8 = 100.48 \text{ cm}^3$. Cylinder is larger.
- 27) **Choice A is correct.** **(8.SP.3)** The y -intercept (25) is the fixed cost when $m = 0$ miles.
- 28) **Choice D is correct.** **(8.EE.5)** Unit rate $k = \frac{45}{3} = 15$ dollars per hour.



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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 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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