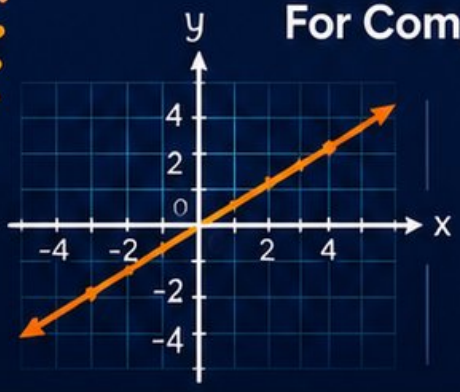
8 Montana MAST GRADE 8 MATH PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs



$A = \pi r^2$
$C = 2\pi r$
$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3} b^2 h$

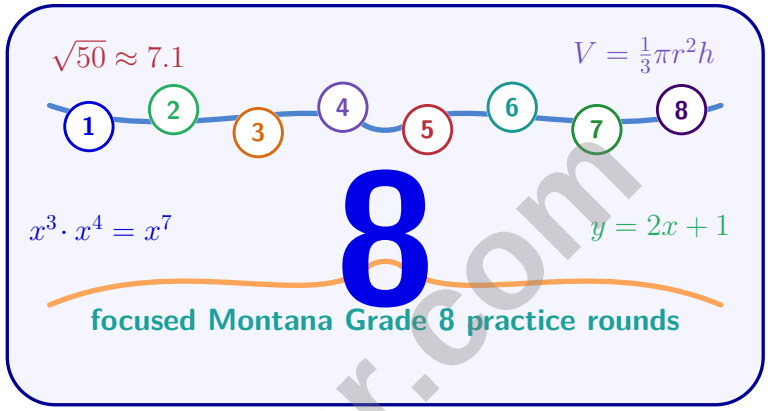
8 PRINTED TESTS

2 ONLINE TESTS

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

8 Montana MAST Grade 8 Math Practice Tests

Montana Grade 8 Practice for Functions, Geometry, and Quantitative Reasoning



Eight 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

Copyright ©

Testinar Inc

Published by Testinar Inc

Testinar.com

Welcome, Montana Grade 8 Problem Solver!

Eight focused rounds for sharper MAST math thinking

This book gives you eight 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.

How to Use This Book

An eight-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?

Eight MAST tests, 320 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 7–8	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.

Table of Contents

1) Factor $x^2 + 7x + 12$.

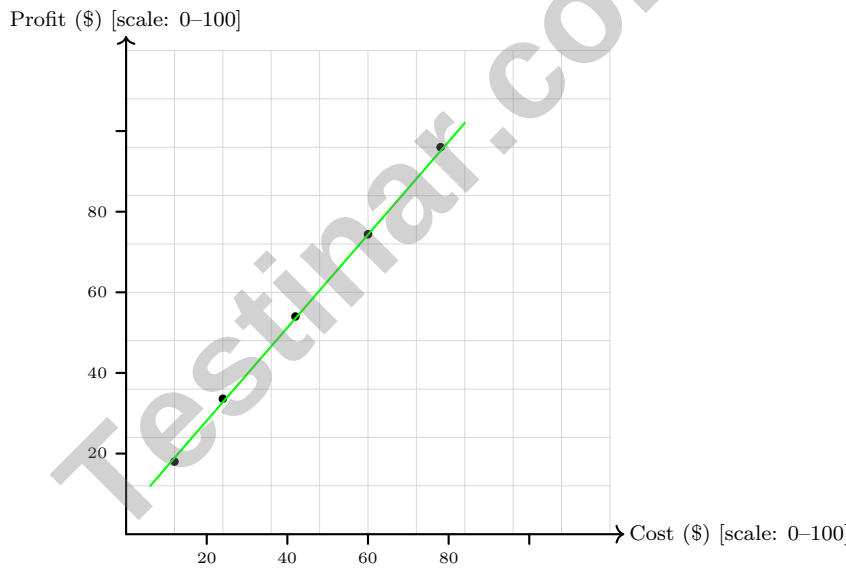
☐ A. $(x + 3)(x + 4)$
☐ B. $(x + 2)(x + 6)$
☐ C. $(x + 1)(x + 12)$
☐ D. $(x + 4)(x + 4)$

2) A student calculates the MAD and gets a negative value. What error did the student make?

☐ A. Divided by the wrong number
☐ B. Forgot to use absolute values in deviations
☐ C. Used the median instead of the mean
☐ D. Calculated range instead of MAD

Explain: Why is a negative MAD impossible?

3)

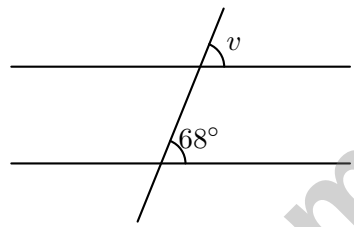


Looking at the scatter plot above, approximately what is the profit when the cost is $60?

☐ A. $80
☐ B. $60
☐ C. $40
☐ D. $20

4) Two congruent rectangles have a perimeter of 48 cm. If one side of the rectangle is 10 cm, find the length of an adjacent side.

5)



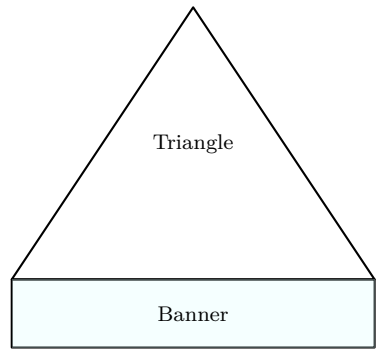
Two parallel lines are cut by a transversal. The angle 68° and angle v are corresponding angles. What is v?

☐ A. 22°
☐ B. 68°
☐ C. 112°
☐ D. 122°

6) A square pyramid has a volume of 192 m^3 and a height of 12 m. What is the side length of the square base?

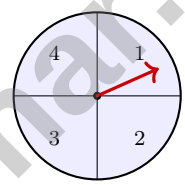
☐ A. 4 m
☐ B. 8 m
☐ C. $4\sqrt{3}$ m
☐ D. 24 m

7) A sign is triangular (base 8 ft, height 6 ft) with a rectangular banner (8 ft by 1.5 ft) attached to the base. What is the total area?



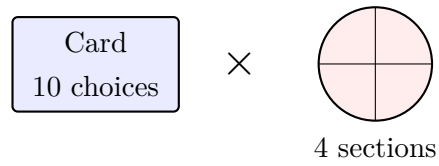
☐ A. 12 ft^2
☐ B. 24 ft^2
☐ C. 36 ft^2
☐ D. 42 ft^2

8) A spinner has 4 equal sections. If it is spun three times, what is the probability of landing on section 1 all three times?



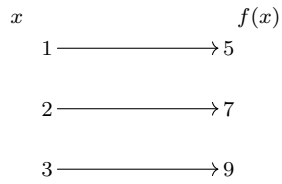
☐ A. $\frac{1}{16}$
☐ B. $\frac{1}{12}$
☐ C. $\frac{1}{64}$
☐ D. $\frac{3}{4}$

9) A game requires picking a card from a deck of 10 cards and then spinning a spinner with 4 sections. How many possible results are there?



☐ A. $10 + 4 = 14$
☐ B. $10 \times 4 = 40$
☐ C. $10 - 4 = 6$
☐ D. 4^{10}

1) The mapping diagram shows function f. What is $f(2)$?



☐ A. 5
☐ B. 7
☐ C. 9
☐ D. 2

2) Which is the solution to $2(x-1) \geq 4$?

☐ A. $x \geq 3$
☐ B. $x \leq 3$
☐ C. $x \geq 1$
☐ D. $x \leq 1$

3) Factor $4x + 12$ completely.

☐ A. $4(x+3)$
☐ B. $2(2x+6)$
☐ C. $12(x+1)$
☐ D. $x + 12$

4) Function r passes through $(1, 3)$ and $(3, 7)$. Function $s(x) = x + 3$. Which increases faster?

☐ A. Function r
☐ B. Function s
☐ C. Both increase equally.
☐ D. Cannot be determined.

5) Does a triangle with sides $6, 8, 9$ form a right triangle?

☐ A. Yes, because $6 + 8 > 9$
☐ B. No, because $6^2 + 8^2 \neq 9^2$
☐ C. Yes, because it is a Pythagorean triple
☐ D. No, because the sides are different lengths

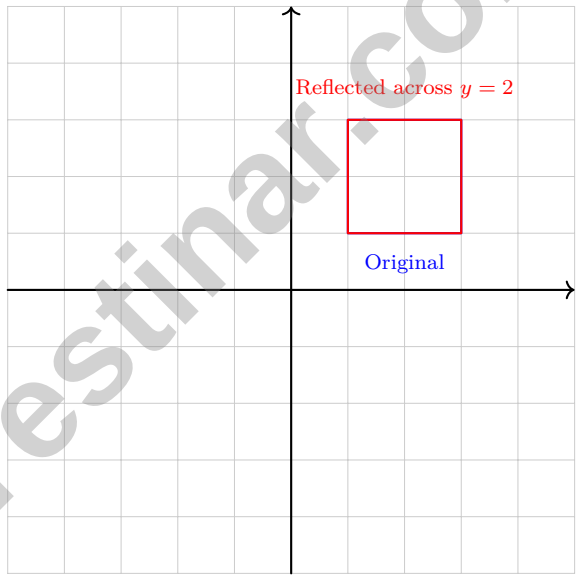
6) Which data set most likely has a MAD less than 1? (*Which set is most tightly clustered?*)

☐ A. $\{10, 11, 10, 11, 10\}$ (tightly clustered)
☐ B. $\{1, 2, 3, 4, 5, 6\}$ (moderate spread)
☐ C. $\{5, 10, 2, 15, 1\}$ (very spread out)
☐ D. $\{1, 3, 5, 7, 9\}$ (evenly spaced)

7) A data set has residuals: $-3, 2, -1, 4, -2$. Which statement is true?

☐ A. The sum of residuals is 5
☐ B. The mean absolute residual (MAD) is 2.4
☐ C. All points lie exactly on the trend line
☐ D. The trend line is a poor fit because some residuals are negative

8)

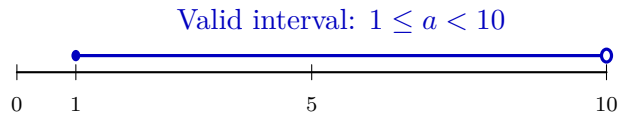


A square with vertices at $(1, 1)$, $(3, 1)$, $(3, 3)$, and $(1, 3)$ is reflected across the line $y = 2$. What are the coordinates of the image of the vertex originally at $(1, 1)$?

☐ A. $(1, 1)$
☐ B. $(1, 2)$
☐ C. $(1, 3)$
☐ D. $(1, 4)$

Coefficient range for scientific notation

1)



Which number is NOT in correct scientific notation form?

- ☐ A. 9.99×10^2
- ☐ B. 1.0×10^0
- ☐ C. 0.9×10^5
- ☐ D. 5.05×10^{-4}

2) A point P is at $(5, 3)$. After a translation of $(-2, 4)$, the point moves to P'. What is the distance from P to P'?

- ☐ A. $\sqrt{5}$ units
- ☐ B. $\sqrt{20}$ units
- ☐ C. 6 units
- ☐ D. $\sqrt{45}$ units

3) For the inequality $-2x + y < 3$, is the point $(-1, 1)$ on the boundary line?

- ☐ A. Yes, and it is in the solution region
- ☐ B. Yes, but it is NOT in the solution region
- ☐ C. No, and the point is in the solution region
- ☐ D. No, and the point is not in the solution region

4) A line passes through $(1, 3)$ and has slope -1. What is the y-intercept?

- ☐ A. 2
- ☐ B. 3
- ☐ C. -1
- ☐ D. 4

5) Solve for x: $3(x+1) = 2(x+4)$

☐ A. $x = 2$
☐ B. $x = 8$
☐ C. $x = -1$
☐ D. $x = 5$

6) A square park has an area of 169 square yards. What is the length of one side of the park?

7) Solve: $\begin{cases} y = \frac{1}{3}x + 2 \\ y = -\frac{2}{3}x + 5 \end{cases}$

☐ A. $(2, 7/3)$
☐ B. $(4, 10/3)$
☐ C. $(1, 7/3)$
☐ D. $(3, 3)$

8) Which of the following satisfies $2x - 3 < 5$?

☐ A. $x = 5$
☐ B. $x = 10$
☐ C. $x = 3$
☐ D. $x = 8$

9) Multiply: $(3x - 2)(x - 4)$

☐ A. $3x^2 - 14x + 8$
☐ B. $3x^2 - 12x - 2x - 8$
☐ C. $3x^2 - 8$
☐ D. $3x^2 + 12x + 8$

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.

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

1) **Choice A is correct.** 8.EE.7 Find two numbers that multiply to 12 and add to 7: 3 and 4. So $x^2 + 7x + 12 = (x + 3)(x + 4)$.

2) **Choice B is correct.** 8.G.8 MAD must be non-negative because it uses absolute values: all deviations are $|x_i - \bar{x}| \geq 0$. A negative result indicates the student subtracted without taking absolute value, or did not apply the absolute-value operation correctly.

3) **Choice A is correct.** 8.SP.2 At cost \$60, the trend line is a little below the \$80 mark and clearly above \$60. The closest choice is about \$80.

4) **The correct answer is 14 .** 8.G.2 The perimeter formula is $P = 2l + 2w = 48$. If one side is 10 cm, then $2(10) + 2w = 48$, so $20 + 2w = 48$, which gives $2w = 28$ and $w = 14$ cm.

5) **Choice B is correct.** 8.G.7 Corresponding angles are congruent when a transversal cuts parallel lines. So $v = 68°$.

6) **Choice C is correct.** 8.G.9 Use $V = \frac{1}{3}Bh$: $192 = \frac{1}{3}B(12)$, so $B = 48$ m^2. For a square base, $s^2 = 48$, so $s = \sqrt{48} = 4\sqrt{3}$ m.

7) **Choice C is correct.** 8.G.7 Decompose: triangle and rectangle. Triangle area $= \frac{1}{2} \times 8 \times 6 = 24$ ft^2. Rectangle area $= 8 \times 1.5 = 12$ ft^2. Total $= 24 + 12 = 36$ ft^2.

8) **Choice C is correct.** 8.G.7 P(section 1 all three times) $= \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{1}{64}$.

9) **Choice B is correct.** 8.NS.2 Card pick (10 choices) times spinner section (4 choices): $10 \times 4 = 40$ possible results.

10) **Choice C is correct.** 8.NS.2 The sum of an irrational number ($\sqrt{10}$) and a rational number (1) is always irrational. So $\sqrt{10} + 1$ is irrational. The others are rational: $0.5 + 0.25 = 0.75$, $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$, and $2^2 = 4$.

11) **Choice D is correct.** 8.NS.1 Let $x = 0.9\overline{3} = 0.9333\ldots$. Then $10x = 9.\overline{3}$ and $100x = 93.\overline{3}$. Subtracting: $90x = 84$, so $x = \frac{84}{90} = \frac{14}{15}$.

12) **Choice D is correct.** 8.NS.2 $4.35^2 = 18.9225$ and $4.36^2 = 19.0096$. Since 19 is closer to 19.0096, $\sqrt{19} \approx 4.36$.

13) **The correct answer is 90 .** 8.G.5 Let the angles be x, $2x$, and $3x$. Sum: $x + 2x + 3x = 180 \implies 6x = 180 \implies x = 30°$. Largest angle: $3x = 90°$.

14) **The correct answer is 15 .** 8.G.6, 8.G.7 Using the Pythagorean Theorem: $8^2 + h^2 = 17^2$ gives $64 + h^2 = 289$, so $h = 15$ feet (part of the 8-15-17 triple).

15) **Choice C is correct.** 8.EE.3 In scientific notation, the coefficient must be at least 1 and less than 10. Only 1.23×10^5 satisfies this.

16) **Choice D is correct.** 8.NS.2 $\frac{\pi}{2} \approx \frac{3.14}{2} = 1.57$.

17) **Choice D is correct.** 8.EE.2 $4 \times 4 \times 4 = 64$, so $\sqrt[3]{64} = 4$.

18) **Choice A is correct.** 8.EE.6 The line passes through $(0, 4)$ and $(3, 1)$, so slope $= -1$ and $y = -x + 4$. For $x = 1$, the equation gives $y = 3$, so $(1, 3)$ is on the line.

19) **The correct answer is A,C.** 8.F.2 A is correct because the coefficient of x is $\frac{2}{3}$. C is correct because $\frac{9-5}{3-1} = 2$. B has slope $\frac{2}{3}$, D has slope $\frac{4}{5}$, and E has slope 2, so those statements are false.

20) **Choice D is correct.** 8.EE.7 Subtract $3x$ and add 4: $5x = 15$. Divide by 5: $x = 3$.

21) **Choice B is correct.** 8.F.1 The range is the set of all distinct y-values: $4, 1, 0, 1, 4$. As a set: $\{0, 1, 4\}$.

22) **Choice B is correct.** 8.F.5 The graph is defined from $x = 0$ to $x = 6$, so the domain is $[0, 6]$. The range would be $[1, 5]$, but the question asks for domain.

23) **Choice A is correct.** 8.G.8 $d = \sqrt{(4-0)^2 + (0-3)^2} = \sqrt{16 + 9} = \sqrt{25} = 5$.

24) **Choice C is correct.** 8.EE.1 Correct answer: $\dfrac{x^8}{x^2} = x^{8-2} = x^6$, not x^4. The student likely divided: $8 \div 2 = 4$.

25) **Choice C is correct.** 8.EE.4 $1.5 \times 10^4 \times 10 = 1.5 \times 10^{4+1} = 1.5 \times 10^5 = 150{,}000$.

26) **Choice C is correct.** 8.EE.5 Equation: $y = 20x$. For $x = 8$: $y = 20(8) = 160$ plants.

27) **Choice D is correct.** 8.EE.8 Substitute $y = 3x$ into $x + y = 12$: $x + 3x = 12$, so $4x = 12$, giving $x = 3$. Then $y = 3(3) = 9$. Solution: $(3, 9)$.

Hi, Detail Champion!

◇ In Grade 8, small details can change an entire answer: a negative sign, a decimal place, a unit, an exponent, or an inequality symbol. ◇

⋆ **Remember this:** You practiced noticing those details. That is a serious test skill, and it gets better with every careful review. This version gave you 8 opportunities to rehearse test-day habits. ⋆

Detail Checks

- **Signs:** Circle negatives before simplifying.
- **Symbols:** Read inequality signs carefully.
- **Decimals:** Line up place values.
- **Units:** Match the unit the question asks for.

Grade 8 test-day tip: Use the final minute on each section for a detail scan, not a full redo.

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

Jay Daie

Your Detail-Check Coach

PRACTICE TODAY, SUCCEED TOMORROW!

GRADE 8

Give your child the confidence and skills they need with **8 full-length Grade 8** Math practice tests that mirror 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.

BUILD SKILLS & BOOST CONFIDENCE
Strengthen understanding and feel prepared for test day.

COVERS ALL ESSENTIAL TOPICS

- The Number System
- Expressions & Equations
- Ratios & Proportional Relationships
- Linear Equations
- Functions
- Geometry
- Measurement & Data
- Statistics & Probability
- Pythagorean Theorem
- Volume & Surface Area
- Transformations
- Inequalities
- Data Analysis & Graphing
- And More!

2 EXTRA ONLINE PRACTICE TESTS INCLUDED!

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

testinar.com/math8

PRACTICE. PREPARE. SUCCEED.

Testinar | More Practice. More Confidence. Better Results.