

Montana MAST

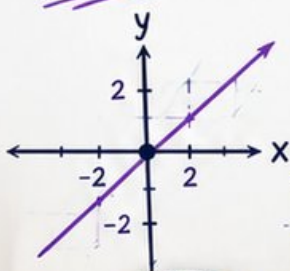
GRADE 8

MATH

PRACTICE TESTS

Standards Aligned Problem Solving
For Comprehensive Assessment Programs

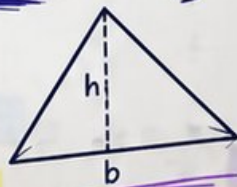
$$y = mx + b$$



**BUILD
CONFIDENCE.
SHARPEN SKILLS.
ACE YOUR
EXAM!**

Practice
Today
Succeed
Tomorrow!

$$A = \frac{1}{2}bh$$



7 PRINTED
TESTS



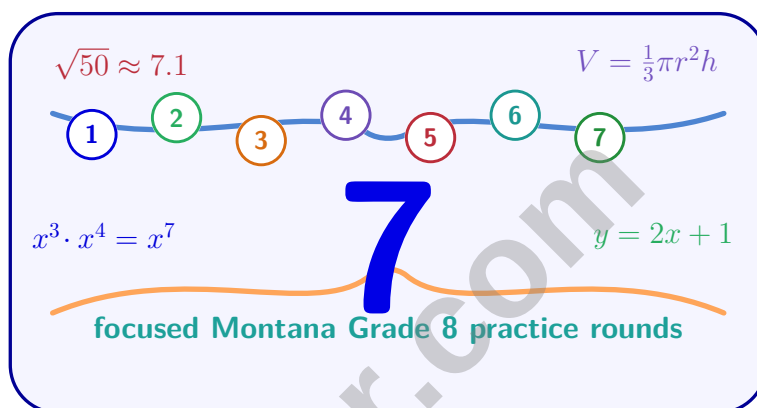
2 ONLINE
TESTS



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

7 Montana MAST Grade 8 Math Practice Tests

Grade 8 MAST Rounds for Functions, Geometry, and Data Fluency



Seven 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!

Seven focused rounds for sharper MAST math thinking

This book gives you seven 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 seven-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?

Seven MAST tests, 280 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.
Test 7	Pythagorean reasoning, volume, data analysis, linear models, probability, mixed review, and stamina.
Answer Pages	Compact keys and explanations that show why each answer works.

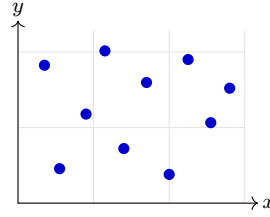
The tests are mixed on purpose. Grade 8 success means recognizing which idea is being tested even when the next question changes format.



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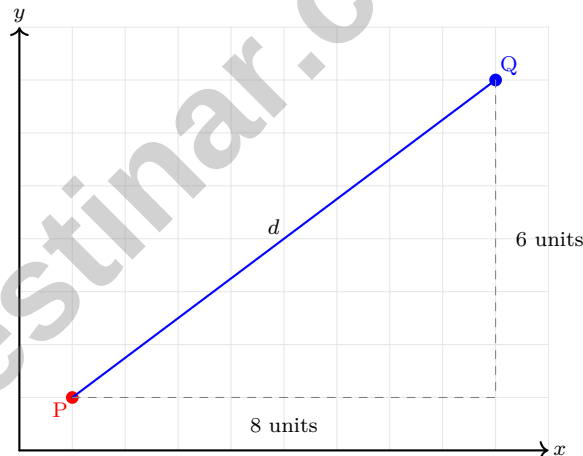


1)

A scatter plot shows two variables with points scattered randomly in all directions with absolutely no visible trend or pattern. What does this indicate about the relationship between the variables?

- ☐ A. No correlation ☐ C. Strong negative correlation
☐ B. Strong positive correlation ☐ D. Perfect linear relationship

2) Two points on a map are separated by a horizontal distance of 8 units and a vertical distance of 6 units. What is the straight-line distance between them?

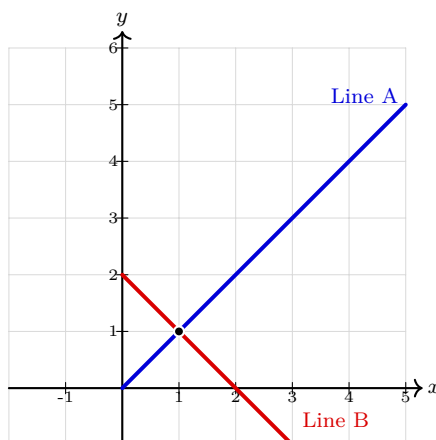


- ☐ A. 10 units ☐ C. $\sqrt{90}$ units
☐ B. 14 units ☐ D. 2 units



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3) Use the graph below to solve the system.



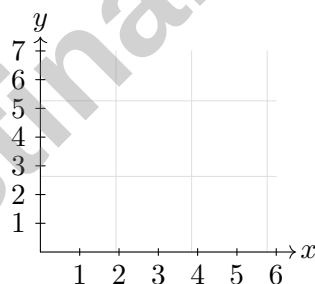
☐ A. (0, 0)

☐ C. (1, 1)

☐ B. (2, 2)

☐ D. (3, 3)

4) Graph the proportional relationship $y = \frac{3}{2}x$ by finding three points and identifying the slope. What is the slope?



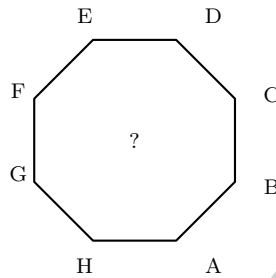
- 5) A store sells items for \$8 each and charges a flat shipping fee of \$12. The total cost C for n items is represented by which function?

☐ A. $C = 8n + 12$

☐ C. $C = 20n$

☐ B. $C = 12n + 8$

☐ D. $C = 8n - 12$



6)

A regular octagon $ABCDEFGH$ is shown. Each interior angle measures:

☐ A. 120°

☐ C. 135°

☐ B. 125°

☐ D. 140°

- 7) Pentagons $ABCDE$ and $FGHIJ$ are similar. Side $AB = 7$ cm and the corresponding side $FG = 14$ cm. If $BC = 9$ cm, what is the length of GH ?

☐ A. 4.5 cm

☐ C. 9 cm

☐ B. 18 cm

☐ D. 11.5 cm

- 8) A student solves $-5x \leq 15$ and gets $x \leq -3$. Which explains the error?

☐ A. Did not flip inequality

☐ C. Did not subtract first

☐ B. Divided incorrectly

☐ D. No error



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1) Which equation is LINEAR?

☐ A. $y = 5 - 3x^2$

☐ C. $y = 7 + 2x$

☐ B. $y = \sqrt{x + 4}$

☐ D. $y = \frac{10}{x}$

2) A line has y -intercept -2 and is perpendicular to $y = 4x + 3$. What is its equation?

☐ A. $y = -4x - 2$

☐ C. $y = \frac{1}{4}x - 2$

☐ B. $y = 4x - 2$

☐ D. $y = -\frac{1}{4}x - 2$

3) Which value of x satisfies $2x + 6 = x + 12$?

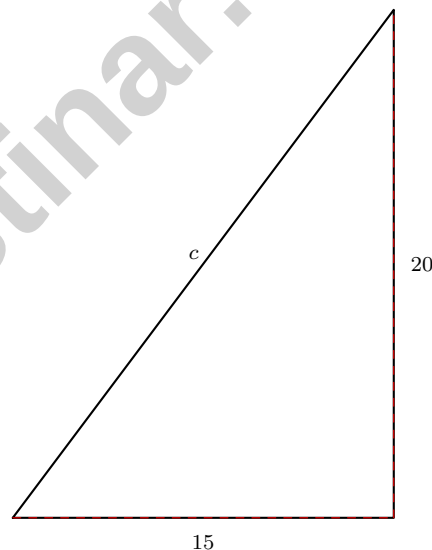
☐ A. $x = 6$

☐ C. $x = 18$

☐ B. $x = 4$

☐ D. $x = 2$

4) Does the set of numbers 15, 20, 25 form a Pythagorean triple? If yes, which is the hypotenuse?



☐ A. Yes; the hypotenuse is 25

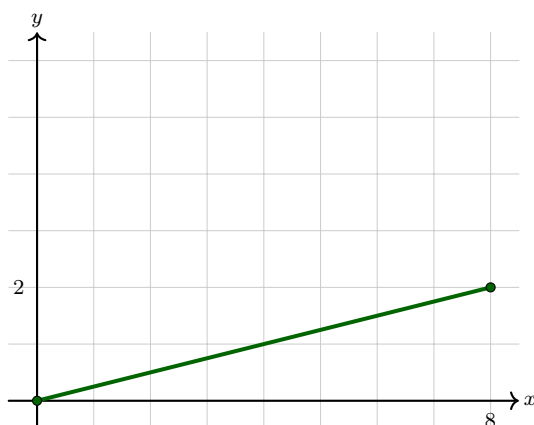
☐ C. No; it does not work

☐ B. Yes; the hypotenuse is 20

☐ D. Yes; the hypotenuse is 15



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5)

The constant of proportionality is:

☐ A. 4☐ C. 0.25☐ B. 2☐ D. 8

6) Solve by elimination: $\begin{cases} 2x + y = 7 \\ x - y = 2 \end{cases}$

☐ A. (2, 3)☐ C. (3, 1)☐ B. (1, 5)☐ D. (4, -1)

7) Calculate $(8.5 \times 10^4) - (3.7 \times 10^4)$ in scientific notation.



1) Which of these is rational?

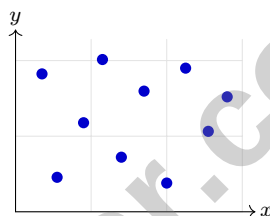
☐ A. $\sqrt{17}$

☐ C. $\sqrt{21}$

☐ B. $\sqrt{19}$

☐ D. $\sqrt{36}$

2) An angle is 12° less than three times its supplement. Write and solve an equation to find the angle's measure.



3)

A scatter plot shows no clear pattern or trend. Which line is the best fit?

☐ A. A line with the steepest possible slope

☐ C. A vertical line

☐ B. A line that bounces between all the points randomly

☐ D. A horizontal line near the mean of the y -values

4) A bag contains 7 red marbles and 3 blue marbles. If two marbles are drawn without replacement, what is the probability that the first is red AND the second is blue?

☐ A. $\frac{3}{10}$

☐ C. $\frac{21}{100}$

☐ B. $\frac{7}{30}$

☐ D. $\frac{7}{90}$



- 5) A security code consists of 3 digits, each from 0 to 9, with no repetition allowed. How many different codes are possible?
- ☐ A. $10^3 = 1,000$ ☐ C. $10!$
☐ B. $10 \times 9 \times 8 = 720$ ☐ D. $\binom{10}{3} = 120$
- 6) What is $\sqrt{121}$?
- ☐ A. 10 ☐ C. 12
☐ B. Irrational ☐ D. 11
- 7) Convert $0.4\overline{18}$ to a fraction in simplest form.
- ☐ A. $\frac{4}{18}$ ☐ C. $\frac{418}{999}$
☐ B. $\frac{418}{1000}$ ☐ D. $\frac{414}{990} = \frac{23}{55}$
- 8) A right triangle has legs of length 3 and 5 units. Which integer range contains the hypotenuse length?
- ☐ A. Between 8 and 9 ☐ C. Between 7 and 8
☐ B. Between 6 and 7 ☐ D. Between 5 and 6
- 9) A scientist measures a cell with diameter 5.3×10^{-6} mm. Convert this to standard form.
- ☐ A. 5,300 mm ☐ C. 5.3 mm
☐ B. 0.0053 mm ☐ D. 0.0000053 mm
- 10) If $x^3 = 125$, what is x ?
- ☐ A. 4 ☐ C. 6
☐ B. 7 ☐ D. 5



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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 A is correct.** (8.SP.1) Points scattered randomly with no visible trend or pattern indicate no correlation between the variables. There is no identifiable relationship.
- 2) **Choice A is correct.** (8.G.8) Using the Pythagorean Theorem: $c = \sqrt{8^2 + 6^2} = \sqrt{64 + 36} = \sqrt{100} = 10$ units.
- 3) **Choice C is correct.** (8.EE.8) The two lines intersect at the marked point, which is $(1, 1)$.
- 4) **The correct answer is $\frac{3}{2}$.** (8.EE.5) Three points: $(0, 0)$, $(2, 3)$, $(4, 6)$. Slope $= \frac{3}{2} = 1.5$.
- 5) **Choice A is correct.** (8.F.4) Cost per item is \$8 (slope), flat shipping is \$12 (intercept). Total: $C = 8n + 12$.
- 6) **Choice C is correct.** (8.G.5) Each interior angle of a regular octagon: $\frac{(8-2) \times 180}{8} = \frac{1080}{8} = 135^\circ$.
- 7) **Choice B is correct.** (8.G.4) Scale factor is $\frac{14}{7} = 2$. So $GH = BC \times 2 = 9 \times 2 = 18$ cm.
- 8) **Choice A is correct.** (8.EE.7) Dividing by -5 requires flipping: $x \geq -3$, not $x \leq -3$.
- 9) **Choice D is correct.** (8.G.8) SOLID line and shading BELOW the negatively-sloped line indicate $y \leq -\frac{2}{3}x + 2$.
- 10) **The correct answer is $x = 3$.** (8.EE.7) Distribute the 3: $3x + 6 - 5 = x + 7$. Simplify: $3x + 1 = x + 7$. Subtract x from both sides: $2x + 1 = 7$. Subtract 1 from both sides: $2x = 6$. Divide by 2: $x = 3$. Verify: $3(3+2) - 5 = 3(5) - 5 = 15 - 5 = 10$ and $3 + 7 = 10$ ✓.
- 11) **The correct answer is 4.** (8.G.1) Reflections preserve side lengths. The reflected side has the same length as the original, which is 4 units.
- 12) **Choice D is correct.** (8.SP.4) Marginal relative frequency for takeout: $\frac{325}{500} = 0.65$.
- 13) **Choice A is correct.** (8.EE.7) FOIL: $(x + 2)(x + 3) = x^2 + 3x + 2x + 6 = x^2 + 5x + 6$. The student correctly applied FOIL.
- 14) **Choice B is correct.** (8.F.2) $S(15) = 150 + 40(15) = 750$. Competitor slope: $(700 - 500)/5 = 40$ per day. From day 5 point: $C(d) = 500 + 40(d - 5) = 40d + 300$, so $C(15) = 40(15) + 300 = 900$. Since $900 > 750$, Competitor has more.
- 15) **Choice C is correct.** (8.F.3) $y = x^4 - 3$ contains an exponent of 4, making it nonlinear. Options A, B, and D all have the form $y = mx + b$, so they are linear.
- 16) **Choice A is correct.** (8.G.2) Since the pentagons are congruent, pentagon PQRST has the same properties as JKLMN: all sides are equal and all interior angles measure 108° . This makes it a regular pentagon.
- 17) **Choice A is correct.** (8.G.5) Angle 1 (63°) and angle 2 (95°) form a triangle with angle 3. The angle corresponding to angle 1 (by the parallel line property) is 63° . Then by triangle angle sum: angle 3 $= 180 - 63 - 95 = 22^\circ$.
- 18) **The correct answer is 523.33.** (8.G.9) $V = \frac{4}{3} \times 3.14 \times 5^3 = \frac{4}{3} \times 3.14 \times 125 = \frac{4}{3} \times 392.5 = 523.33 \text{ cm}^3$.
- 19) **Choice A is correct.** (8.G.6, 8.G.7) The ramp surface is the hypotenuse of a right triangle: $\sqrt{3^2 + 4^2} = \sqrt{9 + 16} = \sqrt{25} = 5$ feet (the 3-4-5 triple).
- 20) **Choice C is correct.** (8.G.7) Alternate interior angles are congruent when a transversal cuts parallel lines. So $w = 95^\circ$.
- 21) **Choice B is correct.** (8.G.9) $B = 230^2 = 52900 \text{ m}^2$. $V = \frac{1}{3} \times 52900 \times 147 \approx \frac{7776300}{3} \approx 2.6 \times 10^6 \text{ m}^3$.
- 22) **The correct answer is A,B.** (8.EE.6) Options A and B both have slope 4, making them parallel. Option C has slope -4 , option D has slope $\frac{1}{4}$, and option E has slope 2, so none of these match.
- 23) **Choice B is correct.** (8.G.7) Trapezoid area $= \frac{1}{2}(b_1 + b_2) \times h = \frac{1}{2}(8 + 12) \times 6 = \frac{1}{2} \times 20 \times 6 = 60 \text{ cm}^2$.
- 24) **Choice D is correct.** (8.G.8) An outlier is far from the mean, adding a large absolute deviation. This increases the sum of deviations, which increases the average (MAD).
- 25) **Choice D is correct.** (8.G.7) Even: 2, 4, 6. Less than 3: 1, 2. Union: 1, 2, 4, 6. That's 4 outcomes. $P = \frac{4}{6} = \frac{2}{3}$.
- 26) **Choice A is correct.** (8.NS.2) Each letter has 26 choices and each digit has 10 choices. Multiply: $26 \times 26 \times 10 \times 10 \times 10 = 676,000$.
- 27) **Choice D is correct.** (8.SP.2) A negative slope means the line tilts downward from left to right. This represents a negative association: as one variable increases, the other tends to decrease.
- 28) **Choice D is correct.** (8.NS.2) $\sqrt{36} = 6$, which is an integer and therefore rational. The others are irrational: π is transcendental, $\sqrt{15}$ is a square root of a non-perfect square, and $0.101001000\dots$ is non-terminating and non-repeating.



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Hi, Smart Reviewer!

◇ The best learning often happens after the test, when you look back and notice what worked and what needs attention. This broad and demanding book gave you seven strong Grade 8 practice tests, so you had repeated chances to build accuracy, pacing, and confidence. ◇

★ **Remember this:** You can use these practice tests as a map. The questions you solved quickly show strengths; the questions you missed show where to train next. ★

Review Routine

- **Sort:** Group mistakes by skill.
- **Reread:** Check whether the question was misunderstood.
- **Resolve:** Do the problem again without looking.
- **Record:** Write the lesson in one sentence.

Grade 8 test-day tip: Review in short focused sessions. Ten careful minutes can be more useful than an hour of rushing.

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

Jay Daie

Your Review Coach

PRACTICE TODAY SUCCEED TOMORROW!

Give your child the confidence and skills they need with **7 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!

GRADE 8

Practice
Today
Succeed
Tomorrow!

Algebra

Geometry

Statistics

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 | ✓ 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! |



2 EXTRA ONLINE PRACTICE TESTS INCLUDED!

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BUILD CONFIDENCE. SHARPEN SKILLS. ACE YOUR EXAM!