

7 Alaska AK STAR Grade 7 Math Practice Tests

Comprehensive Test Prep with Detailed Answers

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THE FORGE

7 Practice Tests

 Grade 7 Math — Forged in Practice 

Welcome to *The Forge*.

Seven tests. Seven chances to hammer your skills into something unbreakable. Each test is a piece of raw material — and you are the blacksmith.

 *Heat 1–2: Warm the metal — learn the form*

 *Heat 3–5: Shape with precision — build power*

 *Heat 6–7: Temper and finish — prove your craft*

Great skill isn't found. It's forged.

“ A sword isn't made with one strike. Seven rounds of hammering — that's how you forge something strong. ”



The Blueprint

Your 3-heat forging plan for Grade 7 mastery

What's in The Forge

- **7 Full-Length Practice Tests** — every test spans all 9 Grade 7 domains: proportional reasoning, percents, rational numbers, algebraic expressions, equations, geometry, measurement, statistics, and probability.
- **Complete Answer Explanations** — learn the craft behind every solution, not just the result.
- **Forge Record** — track your progress heat by heat and see your skills harden into mastery.

Heat I: Warm the Metal (Tests 1–2)

No timer. No pressure. Feel the material — discover the question types, learn the format, and identify which topics are solid and which need shaping.

Heat II: Shape with Precision (Tests 3–5)

Add a timer (60–75 min). Show every step of your work. After each test, study the problems you missed and practice those topics before the next heat.

Heat III: Temper & Finish (Tests 6–7)

Full test conditions: timed, quiet, independent. These final two heats prove your craft. Compare your scores with Heat I — see how far you've come.

Materials in Every Test

- | | |
|---|---|
| ● Multiple Choice — select the best answer | ● Multi-Select — choose ALL that apply |
| ● Short Answer — show your work | ● Open Response — explain your reasoning |

Master Techniques

The techniques every skilled crafter needs at the anvil

The S.T.R.I.K.E. Method

- S** **Scan** *Read the whole problem. What is given? What is asked?*
- T** **Tag** *Underline key values. Circle the operation clue words.*
- R** **Reason** *Choose a strategy: proportion, equation, diagram, or estimation.*
- I** **Implement** *Solve step by step. Write every calculation. Label units.*
- K** **Know** *Check: does the answer make sense in context?*
- E** **Evaluate** *Re-read the question. Did you answer what was actually asked?*

Forging Techniques

Technique 1: Convert between fractions, decimals, and percents freely. Many Grade 7 problems become easier in a different form.

Technique 2: When solving proportions, cross-multiply carefully. Keep track of which quantity is in the numerator and which is in the denominator.

Technique 3: For integer operations, use the number line mentally. Subtracting a negative? That's adding. Don't let sign rules trip you up.

Technique 4: On geometry questions, draw a diagram if one isn't given. Label all known measurements before computing.

Technique 5: Estimation is your ally. Before computing an exact answer, estimate. If your answer is far from the estimate, recheck your work.

Technique 6: Never leave a blank. On constructed response, even writing the equation you'd use can earn partial credit.

 **Night Before Practice:** Sleep 8+ hours. Eat a solid meal. Gather your tools (pencils, eraser, scratch paper). Tell yourself: "Every strike makes me stronger."



The Forgemaster says: "The greatest crafters don't avoid the hardest pieces — they lean into them. Review every mistake. That's where the real tempering happens."



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Math Reference Sheet

You may use this page during your practice tests!

Symbol	Name	What It Means
$()$	Parentheses	Do this part first. $(3 + 4) \times 2 = 14$
10^3	Exponent	Multiply the base by itself that many times. $10^3 = 1,000$
$\frac{a}{b}$	Fraction	a parts out of b equal parts; also means $a \div b$.
$\frac{7}{3}$	Improper Fraction	Numerator $\geq$ denominator. $\frac{7}{3} = 2\frac{1}{3}$
0.45	Decimal	A number with a decimal point. $0.45 = \frac{45}{100}$
$> < =$	Comparison	Greater than, less than, equal to. $0.5 > 0.35$
$(3,5)$	Ordered Pair	A point on the coordinate plane: (x, y) .

Key Formulas

- **Volume of a rectangular prism:**

$$V = l \times w \times h$$

- **Order of operations:**

Parentheses $\rightarrow$ Exponents $\rightarrow$ Multiply/Divide
 $\rightarrow$ Add/Subtract

- **Powers of 10:**

$$10^1 = 10 \quad 10^2 = 100$$

$$10^3 = 1,000 \quad 10^4 = 10,000$$

- **Fraction as division:**

$$\frac{a}{b} = a \div b$$

Place Value Chart

Millions	1,000,000
Hundred-Thousands	100,000
Ten-Thousands	10,000
Thousands	1,000
Hundreds	100
Tens	10
Ones	1

Decimals

Tenths	0.1
Hundredths	0.01
Thousandths	0.001

Each place is $10\times$ the place to its right, and $\frac{1}{10}$ of the place to its left.

Key Math Vocabulary

- **Sum** — the result of addition
- **Difference** — the result of subtraction
- **Product** — the result of multiplication
- **Quotient** — the result of division
- **Remainder** — what's left over after dividing
- **Factor** — a number you multiply
- **Expression** — numbers and operations without =
- **Equation** — a math sentence with =
- **Numerator** — the top number of a fraction
- **Denominator** — the bottom number of a fraction
- **Mixed number** — a whole number + a fraction
- **Equivalent fractions** — fractions with equal value
- **Decimal** — a number written with a decimal point
- **Volume** — the space inside a 3D shape
- **Coordinate plane** — a grid with x and y axes
- **Ordered pair** — (x, y) location on the plane

Word Problem Clue Words

- **Add (+)**: total, altogether, combined, sum, increase, more than
- **Subtract (−)**: difference, how many more, fewer, remain, decrease, left
- **Multiply (×)**: each, every, groups of, times, product, per, of (with fractions)
- **Divide (÷)**: share equally, split, each group, how many groups, quotient, per



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PREVIEW



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PREVIEW

PRACTICE TEST

1

Practice Test 1

 30 Questions

Before You Start

- ✓ *Read each question carefully before choosing your answer.*
- ✓ *Show your work on scratch paper when you need to.*
- ✓ *Skip hard questions and come back to them later.*
- ✓ *Check your answers when you're done.*
- ✓ *Take your time — there's no rush!*

★ *You've Got This!* ★

Do your best and show what you know!



1. A recipe uses cups of flour proportional to servings. If 12 servings need 9 cups, what is k in cups per serving?

(A) $\frac{3}{4}$

(B) $\frac{4}{3}$

(C) 3

(D) 9

2. A graph shows that 4 gallons of paint covers 600 square feet. The relationship is proportional. How many square feet does 1 gallon cover?

(A) 120 sq ft

(B) 150 sq ft

(C) 200 sq ft

(D) 600 sq ft

3. A garden hose fills a 60-gallon tank in 8 minutes. How long does it take to fill a 225-gallon tank?

Your Answer:

4. Use a proportion to find 35% of 120.

(A) 35

(B) 38

(C) 42

(D) 48

5. An art dealer charges 12% commission on each painting sold. If she sold a painting for \$1,500, what is the revenue for the artist (after the commission is taken)?

(A) \$180

(B) \$1,200

(C) \$1,320

(D) \$1,380



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6. Which list is in order from least to greatest?

(A) $-2, -5, 0, 3$

(B) $-5, -2, 0, 3$

(C) $3, 0, -2, -5$

(D) $0, -2, -5, 3$

7. A hiker starts at an elevation of -30 feet (below sea level). She climbs 45 feet. What is her new elevation?

Your Answer:

8. What is $(-15) - (-20)$?

(A) -35

(B) 35

(C) -5

(D) 5

9. A plane flies at 35,000 feet. It descends 8,500 feet, then climbs 3,200 feet. What is the altitude?

Your Answer:



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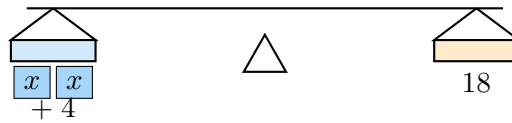
10. Look at the input-output table below.

Input	Rule: ?	Output
1		5
2		9
3		13
4		17

Which expression represents the rule?

- (A) $x + 4$ (B) $5x$
(C) $4x + 1$ (D) $3x + 2$

11. Look at the balance scale. Both sides are equal. What is the value of x ?



- (A) $x = 9$ (B) $x = 7$
(C) $x = 14$ (D) $x = 11$

12. What is the first step to solve $5(x + 2) = 35$ using the "divide first" method?

- (A) Subtract 2 from both sides (B) Distribute 5 to get $5x + 10 = 35$
(C) Divide both sides by 5 (D) Subtract 5 from both sides



13. Solve $\frac{x}{6} - \frac{2}{3} = \frac{1}{2}$.

(A) $x = 3$

(B) $x = 7$

(C) $x = -1$

(D) $x = 10$

14. A store sign shows the rule below. Which inequality represents the sign?

SALE!

All items plus \$5 tax
must be **under** \$50

Let p be the price of an item before tax.

(A) $p + 5 > 50$

(B) $p + 5 \leq 50$

(C) $p + 5 < 50$

(D) $p + 5 \geq 50$

15. Solve $x + 5 \geq 9$ and choose the correct graph description.

(A) Closed circle at 4, shade right

(B) Open circle at 4, shade right

(C) Closed circle at 4, shade left

(D) Open circle at 14, shade right

16. When you redraw a scale drawing at a smaller scale (more real units per cm), the new drawing is:

(A) Larger than the original drawing

(B) Smaller than the original drawing

(C) The same size as the original drawing

(D) A different shape than the original drawing



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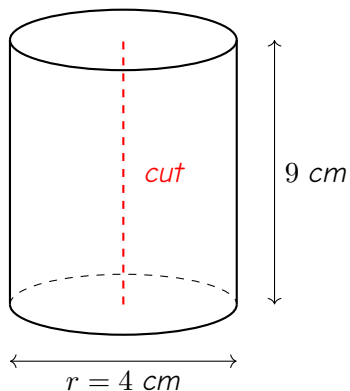
17. Can you draw a triangle with sides 5 cm, 5 cm, and 5 cm?

- (A) No, it is impossible (B) Yes, exactly one triangle
(C) Yes, more than one triangle (D) Yes, but only if one angle is 90°

18. A triangle has sides 11, 13, and 20. Does it satisfy the triangle inequality?

Your Answer:

19. The diagram shows a cylinder with radius 4 cm and height 9 cm. A vertical cut is made through the center. Describe the cross-section and give its dimensions.



Your Answer:

20. Which circle has the larger area: Circle A with radius 4 cm or Circle B with diameter 10 cm?

- (A) Circle A (B) Circle B
(C) They have the same area (D) Not enough information



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21. A shape is made of two rectangles. Rectangle A is 6 m by 3 m and Rectangle B is 4 m by 3 m. What is the total area?

(A) 18 m^2

(B) 24 m^2

(C) 30 m^2

(D) 72 m^2

22. A shipping box is 12 in by 8 in by 6 in. What is the total surface area?

Your Answer:

23. A planter box is 3 ft long, 1.5 ft wide, and 2 ft deep. How many cubic feet of soil are needed to fill it?

Your Answer:

24. A random sample of 80 out of 2,000 students found that 20 students ride the bus. Predict how many students in the school ride the bus.

Your Answer:

25. Group X has a median of 50 and a range of 10. Group Y has a median of 50 and a range of 30. Which statement is true?

(A) Group X has more data values

(B) Group Y has a higher center

(C) Group Y is more spread out than Group

(D) The groups are identical

X



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26. Data set A: 10, 12, 14, 16, 18. What is the mean?

- (A) 12 (B) 14
(C) 16 (D) 70

27. In a double bar graph, Team X scored 30, 45, 50 over three games and Team Y scored 35, 40, 55. What was Team Y's total?

- (A) 120 (B) 125
(C) 130 (D) 135

28. A probability model assigns $P(A) = 0.35$, $P(B) = 0.25$, $P(C) = 0.25$, and $P(D) = 0.20$. Is this a valid model? Explain.

Your Answer:

29. A bag has 4 green and 6 yellow marbles. You pick one marble without replacement and then pick another. What is the probability that the first is green and the second is yellow?

- (A) $\frac{24}{100}$ (B) $\frac{24}{90}$
(C) $\frac{4}{15}$ (D) $\frac{6}{10}$

30. Why are simulations useful?

- (A) They always give exact answers
(B) They can estimate probabilities when real experiments are too difficult or impractical
(C) They replace all mathematical calculations
(D) They only work for coin flips



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★ End of Practice Test 1 ★

Great job finishing the test!

My Score

I got _____ out of 30 questions right.

*Check your answers in the **Answer Key** at the back of the book.*

 *Review any questions you missed. That's how we learn!*

THANK YOU

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- ✓ *Hundreds of practice problems*
- ✓ *Complete answer key with explanations*
- ✓ *Colorful visuals and step-by-step examples*
- ✓ *Reference sheets and progress trackers*

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