

3 Alaska AK STAR Grade 7 Math Practice Tests

Full-Length Test Prep with Detailed Answer Explanations

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MISSION LAUNCHPAD

3 Practice Tests

 Grade 7 Math — Launch Sequence 

Calling all future mathematicians!

You're about to launch into **3 full-length practice missions** covering every Grade 7 math topic — from proportional relationships to probability.

 **Mission 1:** Explore the terrain

 **Mission 2:** Navigate with precision

 **Mission 3:** Achieve orbit

Three missions. One launchpad. Infinite potential.

“ Three missions is the perfect count for a focused launch. You'll cover the whole course and still have fuel to review! ”



Mission Briefing

Your 3-mission flight plan for Grade 7 math mastery

Mission Payload

- **3 Full-Length Practice Tests** — each covering all 9 chapters of Grade 7 math: ratios, percents, rational numbers, expressions, equations, geometry, circles & volume, statistics, and probability.
- **Detailed Answer Explanations** — not just the correct answer, but the reasoning behind every solution.
- **Mission Log** — record your scores, spot patterns, and track your trajectory toward mastery.

Flight Plan

-  **Mission 1 Survey Orbit.** Take this test without a timer. Get a clear read on the question types and discover which topics are your strongest — and which need fuel.
-  **Mission 2 Guided Re-entry.** Review your Mission 1 results, study your weak spots, then launch Mission 2 with a soft timer (70 minutes). Focus on showing full work for every multi-step problem.
-  **Mission 3 Full Launch.** Simulate test-day conditions: timed, quiet, independent. Compare your score with Mission 1 and celebrate your growth!

Multiple Choice

Select the **single best answer** from A–D. Eliminate clearly wrong options first, then reason through what’s left. Show scratch work even when it’s not required — it sharpens your thinking.

Constructed Response

Show every step of your solution. In Grade 7, partial credit often comes from demonstrating the **process** — setting up proportions, writing equations, and justifying your reasoning — not just the final number.



Mission Control says: Space your 3 missions at least a week apart. Use the days between to review mistakes and study the topics that tripped you up. By Mission 3, you’ll be flying.

Navigation Protocols

Smart strategies to stay on course during every mission

The S.C.A.N. Protocol

- S** **Study the question** *Read it fully. Identify what is given and what is being asked.*
- C** **Choose a strategy** *Proportion? Equation? Estimation? Pick your tool before computing.*
- A** **Apply and solve** *Show every step. Label units. Write the equation before plugging in.*
- N** **Navigate back** *Re-read the question. Does your answer match what was asked?*

Pre-Launch Checklist

-  *Get a full night's sleep — your brain processes what you studied while you rest.*
-  *Clear your workspace and gather supplies before you begin.*
-  *Set a goal: "I'll show my work on every problem today."*

Green-Light Moves

-  *Read the entire question before glancing at choices*
-  *Circle key numbers; underline what is asked*
-  *Convert fractions, decimals, and percents when it helps*
-  *Use estimation to check reasonableness*
-  *Skip tough problems and return with fresh eyes*

✖ Red-Alert Traps

- Rushing through word problems
- Forgetting negative signs (rational numbers!)
- Confusing “percent of” with “percent increase”
- Choosing an answer that solves only part of the problem
- Leaving constructed-response blank instead of attempting it



“ Every astronaut debriefs after a mission. After each test, review every wrong answer and ask yourself “What would I do differently next time?” That single habit will launch your score. ”



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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 runner covers $\frac{3}{4}$ mile in $\frac{1}{4}$ hour at a constant rate. What is k in miles per hour?

Your Answer:

2. Line A passes through $(4, 20)$ and Line B passes through $(5, 20)$. Both pass through $(0, 0)$. Which line is steeper?

Your Answer:

3. On a map, 4.5 cm represents 36 km. Two parks are 54 km apart. How far apart are they on the map?

Your Answer:

4. 48 is what percent of 320?

Your Answer:

5. Mia earns a 5% commission on all sales. She wants to earn \$500 this week. How much does she need to sell?

- (A) \$2,500 (B) \$5,000
(C) \$10,000 (D) \$25,000

6. Which expression equals 0?

- (A) $7 + 7$ (B) $7 - 7$
(C) $7 \times 0 + 7$ (D) $|-7| - |7|$



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7. When you add two negative integers, the result is always:

- (A) Positive (B) Zero
(C) Negative (D) It depends on the numbers

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

- (A) -40 (B) 40
(C) 0 (D) -20

9. Evaluate: $-\frac{3}{8} \times 24 + 5$

Your Answer:

10. Evaluate $0.5n + 3.2$ when $n = 6$.

- (A) 6.2 (B) 6.7
(C) 9.2 (D) 3.7

11. Solve $-5k + 20 = -10$.

- (A) $k = 2$ (B) $k = -6$
(C) $k = 6$ (D) $k = -2$

12. Solve $10(x - 5) = 30$.

- (A) $x = 8$ (B) $x = 3$
(C) $x = -2$ (D) $x = 35$



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13. Solve $\frac{3n}{4} + 6 = 15$.

(A) $n = 28$

(B) $n = 12$

(C) $n = 7$

(D) $n = 36$

14. A student needs at least 70 points to pass a test. She earns 4 points per question and has 10 bonus points. Which inequality finds the minimum number of questions q she must answer?

(A) $4q + 10 > 70$

(B) $4q + 10 \geq 70$

(C) $4q - 10 \geq 70$

(D) $10q + 4 \geq 70$

15. Solve $4x + 3 \leq 19$ and describe the graph.

(A) Closed circle at 4, shade left

(B) Open circle at 4, shade left

(C) Closed circle at 4, shade right

(D) Closed circle at 5.5, shade left

16. Original scale: 1 cm = 10 m. New scale: 1 cm = 40 m. What is the scale ratio?

(A) $\frac{1}{4}$

(B) 4

(C) 30

(D) $\frac{1}{30}$

17. You know two sides of a triangle are 7 cm and 10 cm, and the angle between them is 45° . How many different triangles can you draw?

(A) None

(B) Exactly one

(C) Exactly two

(D) Infinitely many



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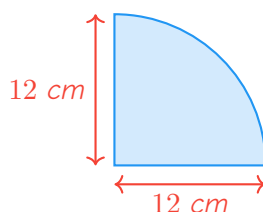
18. Given angles 30° and 110° and the included side 6 cm, how many triangles can be drawn?

- (A) None, because $30 + 110 > 180$ (B) None, because the third angle would be negative
(C) Exactly one (D) Infinitely many

19. You slice a rectangular prism with a cut parallel to its base. What shape is the cross-section?

- (A) Triangle (B) Circle
(C) Rectangle (D) Pentagon

20. The shaded region shows a quarter circle. What is the area of the shaded region? Use $\pi \approx 3.14$.



Your Answer:

21. A composite shape is made of a rectangle 7 m by 4 m with a semicircle of diameter 4 m on one short side. What is the total area? Use $\pi \approx 3.14$.

- (A) 28 m^2 (B) 34.28 m^2
(C) 40.56 m^2 (D) 53.12 m^2

22. A rectangular box is 10 in by 6 in by 4 in. What is the total surface area?

- (A) 120 in^2 (B) 240 in^2
(C) 248 in^2 (D) 148 in^2



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23. A pool is 10 m long, 5 m wide, and 2 m deep. How many cubic meters of water does it hold when full?

- (A) 17 m^3
- (B) 50 m^3
- (C) 100 m^3
- (D) 200 m^3

24. A website asks visitors to rate a product. Only 5% of visitors respond. This is a:

- (A) Random sample
- (B) Systematic sample
- (C) Voluntary response sample
- (D) Stratified sample

25. Which display is best for comparing the overall shapes of two large data sets?

- (A) A single dot plot
- (B) Two histograms
- (C) A circle graph
- (D) A frequency table with one column

26. Class P: mean 70, median 72, range 15, MAD 4. Class Q: mean 68, median 67, range 35, MAD 9. Which class has more consistent scores?

- (A) Class P
- (B) Class Q
- (C) Both are equally consistent
- (D) Cannot be determined

27. What is the main advantage of a line graph over a bar graph?

- (A) It can show more categories
- (B) It clearly shows trends and changes over time
- (C) It is easier to draw
- (D) It uses colors



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28. Is flipping a fair coin a uniform or non-uniform probability model?

Your Answer:

29. A spinner has 3 equal sections (A, B, C) and a coin is flipped. What is the probability of landing on B and getting heads?

(A) $\frac{1}{2}$

(B) $\frac{1}{3}$

(C) $\frac{1}{6}$

(D) $\frac{2}{3}$

30. A die is used to simulate an event. Rolling 1 or 2 represents "success." What is the probability of success in each trial?

(A) $\frac{1}{6}$

(B) $\frac{1}{3}$

(C) $\frac{1}{2}$

(D) $\frac{2}{3}$



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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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