

8

Alaska

AK STAR

GRADE 7

MATH

PRACTICE TESTS



Standards Aligned
Problem Solving

For Comprehensive
Assessment Programs



8 PRINTED TESTS



2 ONLINE TESTS



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



BUILD CONFIDENCE



STRENGTHEN SKILLS



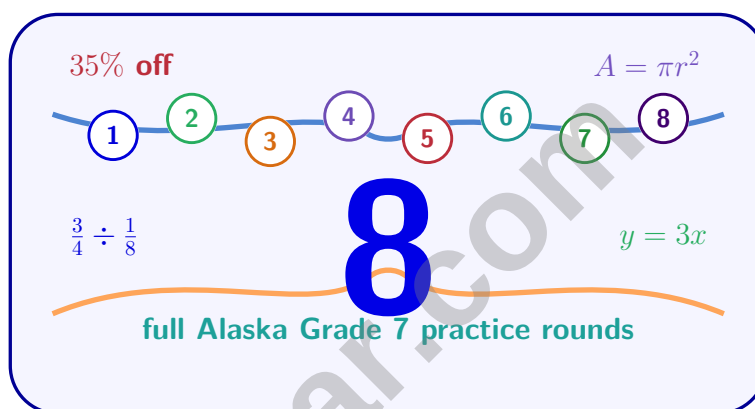
THINK SMARTER



BE TEST-READY

8 Alaska AK STAR Grade 7 Math Practice Tests

Focused readiness for Alaska Grade 7 ratios, percents, equations, geometry, statistics, and probability



Eight complete 40-question Grade 7 AK STAR practice rounds with proportional relationships, percents, rational numbers, expressions, equations, geometry, statistics, probability, answer keys, and clear explanations for every item.

Jay Daie and Reza Nazari



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Welcome, Alaska Grade 7 Problem Solver!

Eight focused rounds for sharper AK STAR math thinking

This book gives you eight full Grade 7 AK STAR math practice tests. Each round is built to help you notice structure, compare quantities, use proportional reasoning, handle rational numbers, and explain your thinking with care.

Your Alaska 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

An eight-session plan for confident Grade 7 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 a proportion, equation, diagram, number line, 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.

Alaska 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 AK STAR tests, 320 questions, and a complete review path

Part	What You Will Practice
Tests 1–3	Proportional relationships, unit rates, percents, rational-number operations, and careful reading.
Tests 4–6	Expressions, equations, inequalities, scale drawings, geometry, and multi-step problem solving.
Tests 7–8	Statistics, probability, mixed review, stamina, and choosing efficient strategies.
Answer Pages	Compact keys and explanations that show why each answer works.

The tests are mixed on purpose. Grade 7 success means recognizing which idea is being tested even when the next question changes format.



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1) What is $-9 - (-3)$?

☐ A. -12

☐ C. 6

☐ B. 12

☐ D. -6

2) For the inequality $x - 4 \geq 3$, which value is **not** a solution?

☐ A. $x = 7$

☐ C. $x = 6$

☐ B. $x = 10$

☐ D. $x = 100$

3) A virus has a diameter of 0.0000001 cm. Express this in scientific notation.

☐ A. 1×10^{-6}

☐ C. 10×10^{-8}

☐ B. 1×10^{-7}

☐ D. 0.1×10^{-6}

4) Evaluate $2x^2 + 3$ when $x = 4$.

☐ A. 19

☐ C. 44

☐ B. 32

☐ D. 35

5) Simplify: $(-5w - 4) - (2w - 9)$

☐ A. $-7w + 5$

☐ C. $-3w + 5$

☐ B. $-7w - 13$

☐ D. $-3w - 13$

6) Which expression is equivalent to $x^2 \cdot x^7 \cdot x^3$?

☐ A. x^5

☐ C. x^{13}

☐ B. x^{12}

☐ D. x^{42}



- 7) What is the solution to $7x + 4 = 32$? (Check by substitution.)

$$7x + 4 = 32$$



Subtract 4

$$7x = 28$$



Divide by 7

$$x = 4 \checkmark$$

- ☐ A. $x = 3$ ☐ C. $x = 5$
☐ B. $x = 4$ ☐ D. $x = 6$
- 8) Solve for y : $2y - 8 = -14$ and check your answer makes sense.
- ☐ A. $y = -3$ ☐ C. $y = 3$
☐ B. $y = 0$ ☐ D. $y = 11$
- 9) A blueprint uses a scale of $\frac{1}{4}$ inch : 1 foot. A door in the blueprint is $\frac{3}{4}$ inch tall. What is the actual height of the door?
- ☐ A. 1 foot ☐ C. 3 feet
☐ B. 2 feet ☐ D. 4 feet
- 10) Which of the following does NOT represent a proportional relationship?
- ☐ A. $y = 6x$ ☐ C. $y = x + 2$
☐ B. $y = 0.5x$ ☐ D. $y = \frac{3}{4}x$

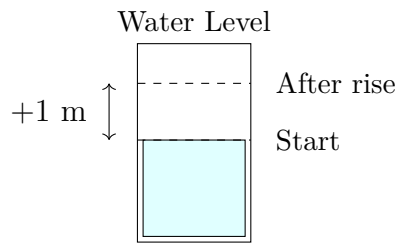


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11) If $a \div (-3) = 4$, what is a ?

- ☐ A. 12
☐ B. -12

- ☐ C. $1\frac{1}{3}$
☐ D. $-1\frac{1}{3}$



12)

A water reservoir is at level -3 m (below ground level). After heavy rain, it rises 1 m. What is the new water level?

- ☐ A. -4 m
☐ B. -2 m

- ☐ C. 2 m
☐ D. 4 m

13) A student rents a bike for \$8 per hour plus a \$5 flat rental fee. If they ride for h hours and pay \$45 total, how many hours did they ride?

- ☐ A. 3 hours
☐ B. 5 hours

- ☐ C. 6 hours
☐ D. 8 hours

14) A die is rolled. It has six faces: three labeled 2, two labeled 5, and one labeled 8. What is $P(\text{even})$?

- ☐ A. $\frac{1}{6}$
☐ B. $\frac{2}{3}$

- ☐ C. $\frac{1}{3}$
☐ D. $\frac{1}{2}$



- 1) A triangle has one side of length 11 cm. If the other two sides each have length x cm, for which values of x can a valid triangle be formed?
- ☐ A. Any positive value of x ☐ C. $5.5 < x$
☐ B. $0 < x \leq 11$ ☐ D. $x \geq 11$
- 2) Solve for x : $6(x + 2) = 30$
- ☐ A. $x = 1$ ☐ C. $x = 5$
☐ B. $x = 3$ ☐ D. $x = 7$
- 3) A rectangular patio in a landscape design is 4 inches by 5 inches at scale 1 in : 3 ft. What is the perimeter of the actual patio in feet?
- ☐ A. 18 ft ☐ C. 54 ft
☐ B. 27 ft ☐ D. 30 ft
- 4) A book originally costs \$30. Which form best shows the factored structure of a 10% discount (that you keep 90% of the price)?
- ☐ A. $30 - 0.1(30)$ ☐ C. 0.9×30
☐ B. $30(1 - 0.1)$ ☐ D. $30 + 10$
- 5) If a number is positive, its opposite is:
- ☐ A. Negative ☐ C. Zero
☐ B. Positive ☐ D. The same magnitude doubled
- 6) A coin is flipped and a die showing 1, 2, or 3 is rolled. How many favorable outcomes involve Tails and a number less than 3?
- ☐ A. 1 ☐ C. 3
☐ B. 2 ☐ D. 4



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- 7) A container holds 25 beads: 10 red, 8 blue, and 7 green. A bead is selected at random. What is the probability of selecting a blue bead?
- ☐ A. $\frac{8}{25}$ ☐ C. $\frac{10}{25}$
☐ B. $\frac{8}{17}$ ☐ D. $\frac{7}{25}$
- 8) A quality control test found that out of 750 items produced, 12 were defective. What is the experimental probability that an item is defective?
- ☐ A. $\frac{12}{750}$ ☐ C. 0.12
☐ B. $\frac{3}{125}$ ☐ D. $\frac{1}{12}$
- 9) A number cube is rolled and a coin is flipped. What is $P(\text{rolling a 4 and flipping tails})$?
- ☐ A. $\frac{1}{12}$ ☐ C. $\frac{1}{6}$
☐ B. $\frac{1}{8}$ ☐ D. $\frac{7}{12}$
- 10) A probability is $\frac{3}{5}$. Which of the following is NOT equivalent to this probability?
- ☐ A. 0.6 ☐ C. $\frac{6}{10}$
☐ B. 60% ☐ D. 65%
- 11) Leo predicted that he would run a race in 45 seconds, but he actually completed it in 50 seconds. What is the percent error in his prediction?
- ☐ A. 90% ☐ C. 5%
☐ B. 11.1% ☐ D. 10%



1) A probability of $\frac{1}{4}$ is what percent?

☐ A. 4%

☐ C. 25%

☐ B. 14%

☐ D. 75%

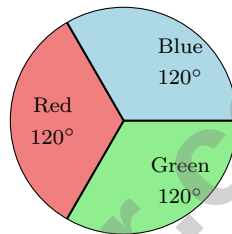
2) A triangular pyramid has an equilateral triangular base. A plane parallel to the base cuts the pyramid. What is always true about the cross-section?

☐ A. It is an equilateral triangle

☐ D. Its shape depends on the height of the cut

☐ B. It is an isosceles triangle

☐ C. It is a rectangle



3)

This spinner has three equal 120° sectors. What is $P(\text{Blue})$?

☐ A. $\frac{1}{3}$

☐ C. $\frac{120}{180}$

☐ B. $\frac{1}{4}$

☐ D. $\frac{2}{5}$

4) A fruit stand sells apples and oranges in the ratio 12 : 8. In simplest form, what is the ratio?

☐ A. 6 : 4

☐ C. 2 : 3

☐ B. 4 : 3

☐ D. 3 : 2



5) If you double the principal but keep the rate and time the same, by how much does the simple interest increase?

☐ A. The interest stays the same

☐ C. The interest is cut in half

☐ B. The interest triples

☐ D. The interest doubles

6) A cube has surface area 600 cm^2 . What is its edge length?

☐ A. 5 cm

☐ C. 100 cm

☐ B. 10 cm

☐ D. 3600 cm

7) A school had 360 students. If $\frac{1}{3}$ of them attend the science club, what percent is that?

8) A teenager receives \$200 per month. Their budget allocates 40% to savings, 35% to entertainment, 20% to clothing, and the rest to charitable donations. How much money do they allocate to charitable donations each month?



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Alaska AK STAR Grade 7 Practice Test Answer Keys**How to use this section with a Grade 7 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 Alaska AK STAR practice test.

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Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

- 1) **Choice D is correct.** (7.NS.1-7.NS.3) $-9 - (-3) = -9 + 3 = -6$.
- 2) **Choice C is correct.** (7.EE.4b) Check $x = 6$: $6 - 4 = 2 \geq 3$. The other values give 3, 6, and 96, all ≥ 3 .
- 3) **Choice B is correct.** (7.NS.1-7.NS.3) Move decimal 7 places right to get 1. Exponent is -7 .
- 4) **Choice D is correct.** (7.EE.1-7.EE.2) Substitute: $2(4)^2 + 3 = 2(16) + 3 = 32 + 3 = 35$.
- 5) **Choice A is correct.** (7.EE.1-7.EE.2) Distribute the negative: $-5w - 4 - 2w + 9 = (-5w - 2w) + (-4 + 9) = -7w + 5$.
- 6) **Choice B is correct.** (7.EE.1-7.EE.2) Add all exponents: $x^2 \cdot x^7 \cdot x^3 = x^{2+7+3} = x^{12}$.
- 7) **Choice B is correct.** (7.EE.3-7.EE.4) Subtract 4: $7x = 28$. Divide by 7: $x = 4$. Check: $7(4) + 4 = 28 + 4 = 32$ ✓.
- 8) **Choice A is correct.** (7.EE.3-7.EE.4) Add 8: $2y = -6$. Divide by 2: $y = -3$. Check: $2(-3) - 8 = -6 - 8 = -14$ ✓. Reasonable: negative answer expected (result is negative).
- 9) **Choice C is correct.** (7.G.1-7.G.5) If $\frac{1}{4}$ inch represents 1 foot, then $\frac{3}{4}$ inch represents 3 feet: $\frac{3}{4} \div \frac{1}{4} = 3$.
- 10) **Choice C is correct.** (7.RP.1-7.RP.3) Proportional relationships have the form $y = kx$ (passing through the origin). Option C has a $+2$ term, so it does not pass through $(0, 0)$ and is not proportional.
- 11) **Choice B is correct.** (7.NS.1-7.NS.3) Using multiplication as the inverse: $a = 4 \times (-3) = -12$.
- 12) **Choice B is correct.** (7.NS.1-7.NS.3) New level: $-3 + 1 = -2$ meters.
- 13) **Choice B is correct.** (7.EE.4a) Equation: $8h + 5 = 45$. Subtract 5: $8h = 40$. Divide by 8: $h = 5$ hours.
- 14) **Choice D is correct.** (7.SP.5-7.SP.8) Even faces are: two 2's and one 8 = three even faces. Total is six faces, so $P(\text{even}) = \frac{3}{6} = \frac{1}{2}$.
- 15) **Choice A is correct.** (7.NS.2) The associative property allows regrouping factors without changing the product. A shows this: $(-6) \times 4 = (-3) \times 8 = -24$. B is commutative; C is commutative; D is distributive.
- 16) **Choice B is correct.** (7.EE.1-7.EE.2) Distribute the 2 and distribute the negative: $10x - 4 - (3x - 4) = 10x - 4 - 3x + 4$. Combine like terms: $(10x - 3x) + (-4 + 4) = 7x + 0 = 7x$. The simplified form shows that the constants cancel, leaving only $7x$.
- 17) **The correct answer is \$1102.50.** (7.RP.3) Year 1: $1000 \times 1.05 = 1050$. Year 2: $1050 \times 1.05 = 1102.50$.
- 18) **The correct answer is A,B.** (7.RP.3) Methods A and B are mathematically valid ways to find 32% of 500. Method C incorrectly inverts the fraction. Method D uses division instead of multiplication and gives an incorrect equation.
- 19) **Choice A is correct.** (7.SP.3) Site X's IQR = $100 - 50 = 50$; Site Y's IQR = $110 - 40 = 70$. Smaller IQR indicates tighter middle-50% spread, so Site X is more consistent.
- 20) **Choice C is correct.** (7.RP.3) Usage fee = $0.05 \times 10000 = \$500$. Total = $300 + 500 = \$1,300$.
- 21) **Choice B is correct.** (7.RP.1-7.RP.3) Ratio 2 : 8 simplifies to 1 : 4 (divide both by 2). Option D incorrectly states 3 : 1 instead of 4 : 1.
- 22) **Choice B is correct.** (7.G.4-7.G.6) Decompose into a rectangle and a triangle. Rectangle: $8 \times 5 = 40$ sq units. Triangle: $\frac{1}{2} \times 2 \times 5 = 5$ sq units. Add: $40 + 5 = 45$ sq units.
- 23) **Choice C is correct.** (7.G.4-7.G.6) $h = \frac{V}{B} = \frac{252}{42} = 6$ mm.
- 24) **The correct answer is 13.** (7.NS.1-7.NS.3) Since the area is 169, the side length is $\sqrt{169} = 13$ units.
- 25) **Choice C is correct.** (7.G.1-7.G.5) The angles in a quadrilateral sum to 360° . Since $28 + 76 + 108 = 212$, the missing angle is $360 - 212 = 148^\circ$.
- 26) **Choice B is correct.** (7.G.4-7.G.6) A radius has one endpoint at the center and one on the circle, not both on the circle, so it is not a chord.
- 27) **Choice C is correct.** (7.G.1-7.G.5) With one side and one angle, we have insufficient information. Adding a second side gives SAS; adding a second angle gives ASA. Either approach uniquely determines the triangle.
- 28) **Choice C is correct.** (7.SP.1-7.SP.4) $\frac{42}{150} = \frac{x}{500}$. Simplify: $\frac{7}{25} = \frac{x}{500} \Rightarrow x = 140$.
- 29) **Choice D is correct.** (7.NS.1-7.NS.3) For $5 + (-5) = 0$, we need exactly 5 positive (red) chips and 5 negative (blue) chips, where each pair cancels out. Model A has 5 red but only 2 blue (incorrect). Model B has 5 red and 5 blue (correct).



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The Power of Showing Work

Hi, Organized Solver!

◇ You practiced Grade 7 skills that often require more than one step. That means your written work matters. ◇

★ **Remember this:** Showing work is not extra. It is how you track your thinking, find errors, and prove that your answer did not happen by luck. You practiced across 8 full Grade 7 practice tests, and that repeated effort matters. ★

Organized Work Habits

- **One Line Per Step:** Keep the path readable.
- **Box the Answer:** Make the final result easy to find.
- **Use Labels:** Tell what each value represents.
- **Check the Path:** Follow your steps backward if needed.

Grade 7 test-day tip: When a problem has several steps, write less on each line. Space makes checking easier.

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

Jay Daie

Your Organized-Work Coach

PRACTICE TODAY. SUCCEED TOMORROW!

This book includes **8** full-length Math practice tests and **2** online tests to help Grade 7 students build confidence, strengthen skills, and excel on standardized assessments.

Each practice test is carefully crafted to reflect the latest standards and includes a variety of question types, realistic test conditions, and detailed answer explanations.

Perfect for classroom use, homework, test preparation, and extra practice at home.



THIS BOOK INCLUDES:

8 Full-Length Printed Tests

2 Online Practice Tests

 Detailed Answer Explanations



MORE PRACTICE. GREATER RESULTS.

Give your child the tools to build strong math skills, confidence, and a positive attitude toward learning.

WHAT YOU'LL GAIN



Stronger Math Skills

Build a solid foundation through targeted practice and review.



Better Problem Solving

Develop logical thinking and effective solution strategies.



Deeper Understanding

Reinforce key concepts with clear explanations and meaningful practice.



Test Confidence

Familiarize with test formats and improve accuracy and speed.



Achieve Success

Build confidence and perform your best on test day.

TOPICS COVERED

- ✓ Ratios & Proportions
- ✓ The Number System
- ✓ Expressions & Equations
- ✓ Geometry
- ✓ Percents & Decimals
- ✓ Statistics & Probability
- ✓ Data Analysis
- ✓ Measurement & Conversions
- ✓ Algebraic Thinking
- ✓ And More!



2 ONLINE TESTS

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



2 EXTRA ONLINE TEST ACCESS CODE IS INSIDE THE BOOK!

Don't lose it—your extra practice and success start here!



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