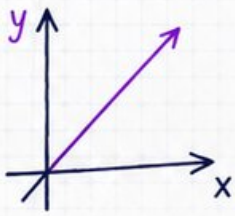
3 Alaska AK STAR

GRADE 7 MATH

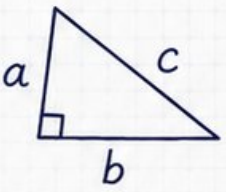
PRACTICE TESTS

- Standards Aligned
- Problem Solving
- For Comprehensive Assessment Programs



$y = mx + b$

$\frac{2}{3}x - \frac{4}{5} = \frac{1}{2}$



$3(x - 2) = 2x + 5$

3 PRINTED TESTS

2 ONLINE TESTS

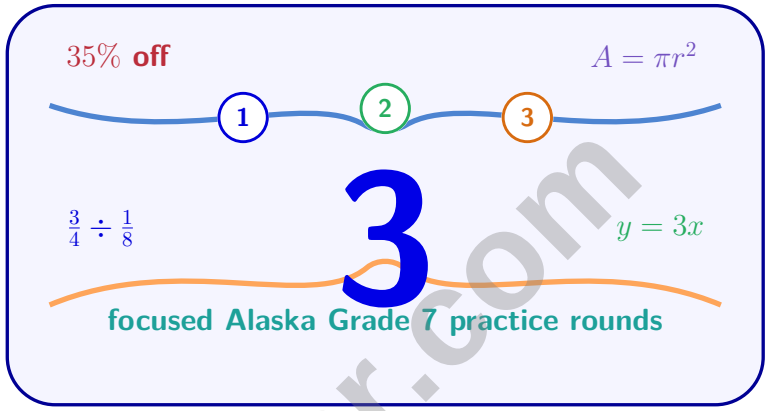
USE THESE TWO ADDITIONAL ONLINE PRACTICE TESTS

FOR EXTRA REVIEW AFTER THE PRINTED TESTS IN THIS BOOK.

- Build Confidence
- Strengthen Math Skills
- Detailed Answers & Explanations
- Improve Test Performance

3 Alaska AK STAR Grade 7 Math Practice Tests

Alaska AK STAR Practice with Keys, Review, and Explanations



Three 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!

Three focused rounds for sharper AK STAR math thinking

This book gives you three 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.

How to Use This Book

A three-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?

Three AK STAR tests, 120 questions, and a focused review path

Part	What You Will Practice
Tests 1–2	Proportional relationships, unit rates, percents, rational-number operations, and careful reading.
Test 3	Expressions, equations, inequalities, scale drawings, geometry, data, probability, and multi-step problem solving.
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.

Table of Contents

1) Internet Plan A offers $\frac{3}{4}$ gigabyte for \$15. Plan B offers $\frac{1}{2}$ gigabyte for \$10. Which plan is the better value?

☐ A. Plan A at \$20/GB
☐ B. Plan B at \$20/GB
☐ C. Plan A at \$15/GB
☐ D. They are equally good

2) **Rainfall Estimate vs. Actual (Inches)**

Month	Estimated	Actual
January	2.0	2.5

What is the percent error for the January rainfall estimate?

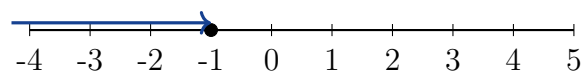
☐ A. 25%
☐ B. 80%
☐ C. 5%
☐ D. 20%

3) The diagram below shows the steps to expand $3(x+2)$. What should replace the question mark?

$$3(x+2)$$
$$\downarrow$$
$$3 \cdot x \quad + \quad 3 \cdot 2$$
$$\downarrow$$
$$3x \quad + \quad ?$$

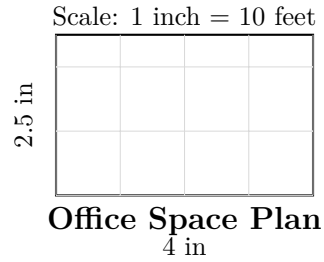
☐ A. 2
☐ B. 3
☐ C. 5
☐ D. 6

4) Which inequality symbol correctly completes: "A closed circle pointing left on a number line represents ____ (less than, greater than, less than or equal to, or greater than or equal to)?"



☐ A. $<$ only
☐ B. $\leq$ only
☐ C. $<$ or $\leq$ (depending on context)
☐ D. $>$ or $\geq$ (depending on context)

5)



Office Space Plan

Based on the scale, what is the perimeter of the office space in feet?

☐ A. 325 feet
☐ B. 65 feet
☐ C. 6.5 feet
☐ D. 130 feet

6) A student calculated 25% of 80 and got 15. Is this correct? If not, what is the correct answer?

☐ A. Yes, 15 is correct.
☐ B. No; the correct answer is 32.
☐ C. No; the correct answer is 24.
☐ D. No; the correct answer is 20.

7) A bank account has a balance of -45 dollars (overdrawn). After a deposit and withdrawal, the balance becomes -20 dollars. What was the net change in the account (deposit minus withdrawal)? Write your answer as an integer with the appropriate sign.

8) The table shows hours worked and pay. Find the hourly wage and determine the constant of proportionality.

Hours	2	4	6
Pay ($)	30	60	90

9) A school fundraiser invests $5000 to earn money for field trips. At 3.6% simple interest per year, how long (in months) will it take to earn $180?

☐ A. 6 months
☐ B. 9 months
☐ C. 12 months
☐ D. 18 months

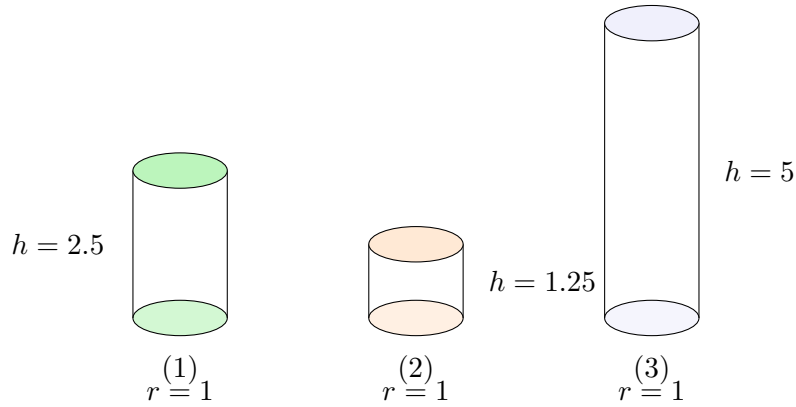
10) A student calculates the surface area of a rectangular prism with dimensions 5 cm, 3 cm, and 4 cm. They compute $5 \times 3 + 5 \times 4 + 3 \times 4 = 47$ cm^2 and forget to multiply by 2. What error did they make?

☐ A. They calculated only one pair of faces instead of all pairs.
☐ B. They forgot to square each dimension.
☐ C. They used subtraction instead of addition.
☐ D. They included a face that doesn't exist.

11) A retailer marks items up by 45% from their cost of $60. What is the selling price?

☐ A. $105
☐ B. $270
☐ C. $33
☐ D. $87

1)



Three cylinders all have $r = 1$ cm and different heights: $h = 2.5, 1.25, 5$ cm. If you order them by volume from smallest to largest, which is correct? Use $\pi \approx 3.14$.

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

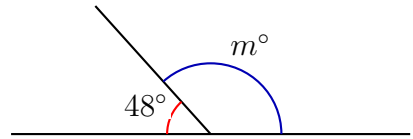
2) A model of a rectangular soccer field is 15 cm long at a scale of 1 cm : 2 m. What is the length of the actual field?

☐ A. 2 m
☐ B. 7.5 m
☐ C. 15 m
☐ D. 30 m

3) A square pyramid with base side 8 cm and height 10 cm is sliced perpendicular to its base, passing through the apex and the center of the base. What is the shape of the cross-section?

☐ A. Equilateral triangle
☐ B. Isosceles triangle
☐ C. Right triangle
☐ D. Scalene triangle

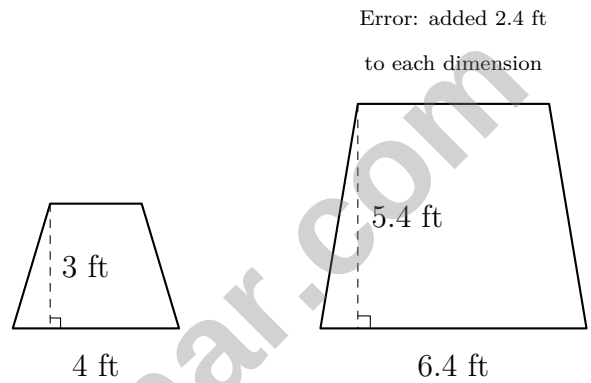
4)



Two rays extend from a point on a line. The angle on the left is 48° and on the right is m. These form a linear pair. Find m.

☐ A. 48°
☐ B. 90°
☐ C. 132°
☐ D. 228°

5)



A student was supposed to scale the left trapezoid by factor 1.6. Instead, they added 2.4 ft to each dimension to get the right trapezoid. How many dimensions are incorrect?

☐ A. 0 (both dimensions are correct by coincidence)
☐ B. 1 dimension is incorrect
☐ C. 2 dimensions are incorrect
☐ D. Cannot determine without more info

1) Simplify: $(d^2)^5$

☐ A. d^{10}
☐ B. d^7
☐ C. d^{32}
☐ D. $2d^{10}$

2) A jar contains colored beads: 12 red, 8 blue, 5 green. A bead is drawn. Which is closest to $P(\text{blue})$?

☐ A. $\frac{1}{25}$
☐ B. $\frac{8}{25}$
☐ C. $\frac{1}{3}$
☐ D. $\frac{2}{5}$

3) A concert ticket costs \$85, but the venue adds a 7% facility fee. What is the total cost per ticket?

☐ A. \$85.70
☐ B. \$92.95
☐ C. \$91.00
☐ D. \$90.95

4)

Monthly Budget Category	Percent of Income
Housing	40%
Food	15%
Transportation	10%
Savings	20%
Entertainment	15%

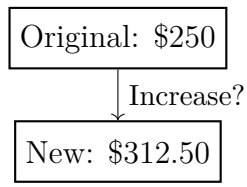
If your monthly income is \$3 000, how much should you budget for housing?

☐ A. \$900
☐ B. \$1 000
☐ C. \$1 200
☐ D. \$1 500

5) Marcus invests \$500 at 5% annual compound interest. What is the balance after 3 years?

☐ A. \$575
☐ C. \$579.13
☐ B. \$578.81
☐ D. \$625

6)



A diagram shows an original price of \$250 increased to \$312.50. What is the percent increase?

☐ A. 20%
☐ C. 30%
☐ B. 62.50%
☐ D. 25%

7) A cube's surface area is 294 cm^2. A second cube has edge length twice as long. What is the surface area of the larger cube?

☐ A. 588 cm^2
☐ C. 1764 cm^2
☐ B. 1176 cm^2
☐ D. 2352 cm^2

8) A proportional relationship has an equation $y = 2.2x$. What is the value of y when $x = 5$?

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.

Practice Test Answers and Explanations

Practice Test 1 Answers and Explanations

1) **Choice D is correct.** 7.RP.1-7.RP.3 Plan A: $\frac{15}{3/4} = 15 \times \frac{4}{3} = 20$ \$/GB. Plan B: $\frac{10}{1/2} = 10 \times 2 = 20$ \$/GB. Same rate.

2) **Choice D is correct.** 7.RP.3 Percent error $= \frac{|2.0-2.5|}{2.5} \times 100\% = \frac{0.5}{2.5} \times 100\% = 20\%$.

3) **Choice D is correct.** 7.EE.1-7.EE.2 The diagram shows $3(x) + 3(2) = 3x + 6$. The missing value is 6.

4) **Choice C is correct.** 7.EE.4b A closed circle with a left arrow means the boundary is included ($\leq$) and all values to the left are solutions. The circle type (closed vs. open) determines the inequality symbol: closed $\rightarrow \leq$; open $\rightarrow <$.

5) **Choice D is correct.** 7.RP.1-7.RP.3 Actual dimensions: $4 \times 10 = 40$ feet; $2.5 \times 10 = 25$ feet. Perimeter $= 2(40+25) = 130$ feet.

6) **Choice D is correct.** 7.RP.3 25% of 80 is $0.25 \times 80 = 20$, not 15. The student made an error.

7) **The correct answer is** 25 **.** 7.NS.1-7.NS.3 Net change = final balance − initial balance $= -20-(-45) = -20+45 = 25$ dollars. The account increased by 25 dollars (a net deposit of 25).

8) **The correct answer is** 15 **.** 7.RP.1-7.RP.3 Ratio: $30/2 = 15, 60/4 = 15, 90/6 = 15$. Hourly wage is \$15; constant of proportionality is $k = 15$.

9) **Choice C is correct.** 7.RP.3 $180 = 5000 \times 0.036 \times t \Rightarrow 180 = 180t \Rightarrow t = 1$ year. Convert to months: $1 \times 12 = 12$ months.

10) **Choice A is correct.** 7.G.4-7.G.6 The formula $SA = 2(lw+lh+wh)$ requires multiplying by 2 because each rectangle pair appears twice. The student calculated only one of each pair, missing half the surface area.

11) **Choice D is correct.** 7.RP.3 Markup $= 0.45 \times 60 = \$27$. Selling price $= 60 + 27 = \$87$.

12) **Choice C is correct.** 7.NS.1b Starting at -2 and jumping right to 6 means moving right by 8 units (from -2 to 0 is 2, then 0 to 6 is 6, total $2 + 6 = 8$). So $-2 + 8 = 6$.

13) **Choice A is correct.** 7.EE.1 Combine: $(10 - 3 + 7)m = 14m$.

14) **Choice A is correct.** 7.EE.1-7.EE.2 GCF of $24ab$ and $36b$ is $12b$. Factor: $24ab + 36b = 12b(2a + 3)$.

15) **Choice C is correct.** 7.SP.5-7.SP.8 Sample space: HH, HT, TH, TT (four equally likely outcomes). Outcomes with at least one heads: HH, HT, TH (three outcomes). So $P(\text{at least one heads}) = \frac{3}{4} = 0.75$.

16) **Choice C is correct.** 7.RP.3 Year 1: \$1,000 × 1.05 = \$1,050. Year 2: \$1,050 × 1.05 = \$1,102.50. Option A is simple interest for 1 year; B and D are incorrect calculations.

17) **Choice A is correct.** 7.NS.1-7.NS.3 First 9 minutes: $9 \div \frac{3}{4} = 12$ laps. Next 7 minutes: $7 \div \frac{7}{8} = 8$ laps. Total: $12 + 8 = 20$ laps.

18) **The correct answer is** 3 **.** 7.RP.1-7.RP.3 $k = y/x = 18/6 = 3$.

19) **Choice A is correct.** 7.NS.1-7.NS.3 $10^9 = 1$ billion. So $5.8 \times 10^9 = 5.8$ billion.

20) **The correct answer is C,D.** 7.SP.1-7.SP.4 The total amounts are not given, so A and B cannot be determined from the percentages alone. Region Y has 50% indoor and 50% outdoor use, so C is correct. Region Y's outdoor percentage (50%) is higher than Region X's outdoor percentage (40%), so D is correct.

21) **Choice C is correct.** 7.EE.1-7.EE.2 Substitute: $3(2 + (-3)) = 3(-1) = -3$.

22) **Choice A is correct.** 7.EE.4b "The sum of a number and 2" is $n + 2$; "is not equal to 7" is $\neq 7$.

23) **Choice A is correct.** 7.G.1-7.G.5 Figure 1 has width 3 and height 2. Figure 2 has width 2 and height 3 (rotated). This is a 90° counterclockwise rotation about the origin.

24) **Choice A is correct.** 7.G.4-7.G.6 From $50.24 = 3.14 \times r^2$, we get $r^2 = 16$, so $r = 4$ meters.

25) **Choice B is correct.** 7.SP.1-7.SP.4 Random selection from all students ensures the sample is representative because it includes diverse students: athletes and non-athletes, different grade levels, and different interests. Method 1 only surveys gym class students, who are more likely to favor sports, making that sample biased and unrepresentative of all students.

26) **Choice B is correct.** 7.SP.1-7.SP.4 The mode is 3 hours (appears 4 times), which best represents the typical week's practice. The mode is most useful for identifying the most common value.

27) **Choice D is correct.** 7.RP.1-7.RP.3 Calculate the unit rate from each data point: $\$450 \div 3 = \$150$ per month and $\$1200 \div 8 = \$150$ per month. Since both unit rates are \$150 per month, the relationship is proportional.

Author's Note

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 3 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 **3** 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:

- **3** Full-Length Printed Tests
- **2** Online Practice Tests
- Detailed Answers & 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

Build Confidence
Practice regularly to feel prepared and test-ready.

Strengthen Math Skills
Develop key math concepts and problem solving abilities.

Detailed Answers & Explanations
Learn from clear explanations and step-by-step solutions.

Improve Test Performance
Apply your knowledge and achieve your best score!

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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PRACTICE REGULARLY | STAY FOCUSED | SOLVE CONFIDENTLY | SUCCEED BRIGHTLY