

$\frac{2}{3}$

0,25



%

**FULL-LENGTH**

**Alaska**

★★★★★  
Aligned to State Standards

**AK STAR**

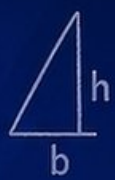
**MATH**

Grade

**5**

$\frac{2}{4}$

$7 \times 8 =$



$7 \times 8$

$56 \div 7$

$(a+b)^2$

**PRACTICE TESTS**

**Complete State Standards Review  
with Answer Key and  
Essential Math Skills Practice**



**3 Full-Length Practice Tests**  
Aligned to State Standards



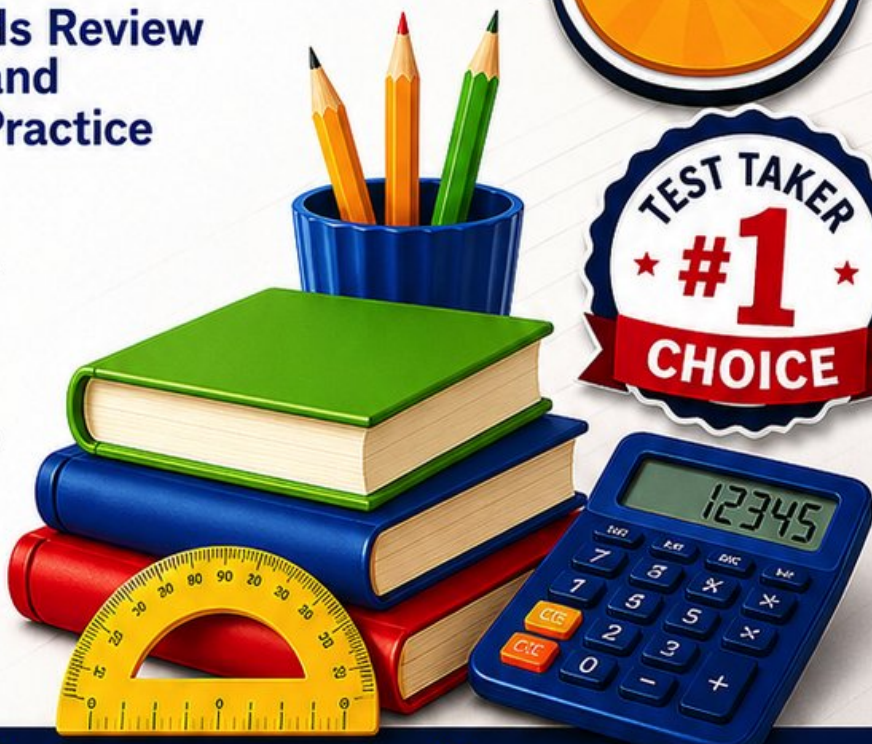
**Covers All Grade 5 Math Topics**  
Numbers & Operations, Fractions,  
Decimals, Geometry, Measurement,  
Data & Problem Solving



**Build Confidence**  
Strengthen Skills • Improve Accuracy  
• Boost Test Readiness



**Detailed Answer Key**  
Step-by-Step Explanations  
for All Questions



**WRITTEN FOR  
GRADE 5 STUDENTS**



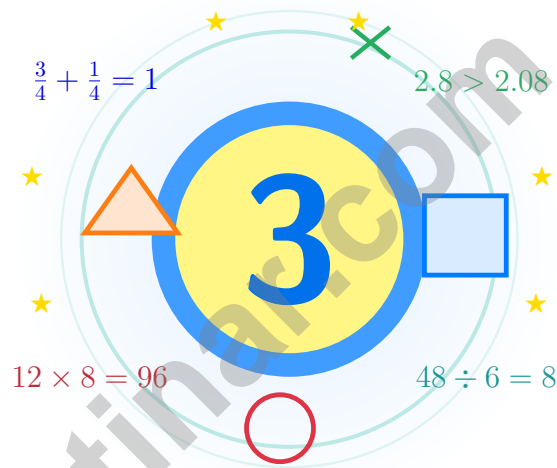
**PERFECT FOR  
TEST PREP & REVIEW**



**CLASSROOM, HOME,  
OR SELF-STUDY USE**

# 3 Alaska AK STAR Grade 5 Math Practice Tests

*Built for big thinking under big skies*



Three full tests, a friendly quick review, smart strategy pages, and student-tested support that help Grade 5 mathematicians from The Last Frontier walk in ready to think.

**Jay Daie and Reza Nazari**



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# Welcome, Alaska Math Explorer

Built for big thinking under big skies

## A Note to Grade 5 Mathematicians of Alaska

Mathematicians in the Last Frontier solve like explorers crossing Denali: one careful step at a time, watching the details and never rushing past a tricky bend.

Some questions will feel easy. Others will ask you to pause, sketch, estimate, or try again. That is practice doing its job. Every honest attempt makes your math stronger.

### Notice

Look closely at what the problem says, shows, and asks.

### Try

Pick a plan and step through it carefully.

### Grow

Use every correction as a clue for what to master next.

**An Alaska promise to yourself:** I will read like a tracker, plan like a pilot, and check like a glacier guide – because in Alaska, every careful step matters.

# How to Use This Book

A simple game plan that turns practice into real progress

## Step 1: Preview

**Begin with the quick review.**

Wake up the big Grade 5 ideas before the test starts so your brain is already warmed up.

## Step 2: Practice

**Take one full practice test.**

Find a calm corner, settle in, and aim for careful, honest choices before quick ones.

## Step 3: Reflect

**Check your work honestly.**

Circle missed questions, sort out what went sideways, and notice which skills are calling for more attention.

## Step 4: Level Up

**Repair and retry.**

Read the explanation, fix the work, and carry that lesson forward into the next test.

## A Strong 3-Week Alaska Routine

<b>Week 1</b>	Take Test 1 to learn your starting strengths – not just your starting score.
<b>Week 2</b>	Take Test 2 and give extra attention to the spots where reading carefully or showing work can lift your score.
<b>Week 3</b>	Take Test 3 and bring everything forward: calm focus, smart checking, stronger habits.



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## Test Overview

### What these practice tests help Grade 5 students build

These three practice tests prepare Grade 5 students for the careful thinking the Alaska AK STAR expects. The goal is bigger than getting answers right: students practice reading carefully, choosing a strategy, solving step by step, and explaining their reasoning clearly.

#### Selected-Response Questions

Students solve the problem and choose the best answer. Estimating first, ruling out weak choices, and checking for reasonableness can save both time and points.

#### Constructed-Response Questions

Students show their steps, explain a method, or back up an answer with clear math. Clean reasoning matters because it shows how the answer was actually found.

#### Grade 5 Ideas That Show Up Again and Again

- place value, comparing numbers, and rounding
- multi-digit addition, subtraction, multiplication, and division
- fractions, mixed numbers, and decimals
- perimeter, area, volume, and measurement conversions
- line plots, tables, numerical patterns, and coordinate points
- geometry and multi-step real-world problems

**What strong work looks like on the AK STAR:** the math is correct, the steps are readable, the labels and units match the problem, and the final answer truly answers the question being asked.



# Table of Contents

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Practice Test Answers and Explanations	_____	63

## Grade 5 Mathematics Reference Materials

### PERIMETER AND AREA

Perimeter of Rectangle  $P = 2l + 2w$  or  $P = 2(l + w)$

Area of Rectangle  $A = l \times w$

Area of Triangle  $A = \frac{1}{2} \times b \times h$

Volume of Rectangular Prism  $V = l \times w \times h$

### LENGTH

#### Customary

1 foot (ft) = 12 inches (in.)

1 yard (yd) = 3 feet (ft)

1 yard (yd) = 36 inches (in.)

#### Metric

1 meter (m) = 100 centimeters (cm)

1 centimeter (cm) = 10 millimeters (mm)

1 kilometer (km) = 1,000 meters (m)

### CAPACITY

#### Customary

1 cup (c) = 8 fluid ounces (fl oz)

1 pint (pt) = 2 cups (c)

1 quart (qt) = 2 pints (pt)

1 gallon (gal) = 4 quarts (qt)

#### Metric

1 liter (L) = 1,000 milliliters (mL)

### WEIGHT AND MASS

#### Customary

1 pound (lb) = 16 ounces (oz)

#### Metric

1 kilogram (kg) = 1,000 grams (g)

1 gram (g) = 1,000 milligrams (mg)

### TIME

1 minute (min) = 60 seconds (sec)    1 week = 7 days

1 hour (hr) = 60 minutes (min)    1 year = 12 months

1 day = 24 hours (hr)    1 year = 52 weeks





6) A model shows 4 wholes cut into halves. Which equation gives the number of half pieces?

A.  $\frac{1}{2} \div 4 = n$

B.  $4 \times \frac{1}{2} = n$

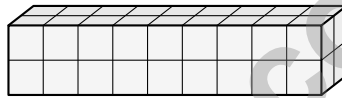
C.  $4 + \frac{1}{2} = n$

D.  $4 \div \frac{1}{2} = n$

7) A student says that  $85.4 \div 10 = 8.54$ . Is the student correct?

 A. Correct B. Incorrect; should be 854 C. Incorrect; should be 0.854 D. Incorrect; should be 8,540

8) How many unit cubes fit in a rectangular prism that is 9 units long, 2 units wide, and 2 units tall?

 A. 45 unit cubes B. 27 unit cubes C. 18 unit cubes D. 36 unit cubes

9) Which shows the correct place-value shift for  $42 \times 10$ ?

Hundreds	Tens	Ones	Result
4	2	0	420

 A. The 4 stays in hundreds, 2 moves to tens B. The 4 and 2 both move left one place, 0 fills ones C. The 4 stays in tens, 2 stays in ones, 0 fills hundreds D. All digits shift right by one place

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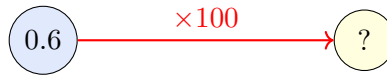
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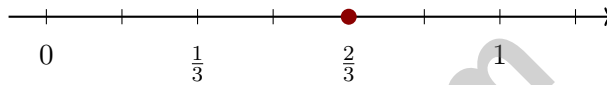


1) Arrow diagram: start at 0.6, multiply by 100. Where do you land?



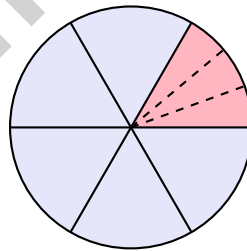
- |                                  |                                 |
|----------------------------------|---------------------------------|
| <input type="checkbox"/> A. 6    | <input type="checkbox"/> C. 600 |
| <input type="checkbox"/> B. 0.60 | <input type="checkbox"/> D. 60  |

2) Use the number line below. The dot is at  $\frac{2}{3}$ . Which fraction with denominator 6 is equivalent to the marked point?



- |   |   |
|---|---|
| <input type="checkbox"/> A. $\frac{5}{6}$ | <input type="checkbox"/> C. $\frac{3}{6}$ |
| <input type="checkbox"/> B. $\frac{2}{6}$ | <input type="checkbox"/> D. $\frac{4}{6}$ |

3) A circle is divided into 6 equal sectors. One sector is  $\frac{1}{6}$  of the circle. This sector is then divided into 3 equal parts. What fraction of the whole circle is each small part?



- |  |   |
|--|---|
| <input type="checkbox"/> A. $\frac{1}{18}$ | <input type="checkbox"/> C. $\frac{3}{6}$ |
| <input type="checkbox"/> B. $\frac{1}{9}$  | <input type="checkbox"/> D. $\frac{1}{3}$ |



## Grade 5 Mathematics Reference Materials

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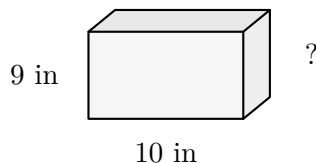
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- 1) A rectangular aquarium has a volume of 360 cubic inches. If the base is 10 inches by 9 inches, what is the height of the aquarium?



- A. 2 inches                       C. 6 inches  
 B. 8 inches                       D. 4 inches
- 2) What is the value of the exponent in:  $87500 = 875 \times 10^?$

Standard Form	Power-of-10 Form
87500	$875 \times 10^?$

- A. 1                                       C. 3  
 B. 2                                       D. 4
- 3) How many units up must you go from the origin to reach the point (3, 8)?
- A. 8 units                               C. 5 units  
 B. 3 units                               D. 11 units
- 4) Find:  $\frac{7}{8} \times \frac{2}{3}$ .

*Record your answer in the space provided.*



## Practice Test Answer Keys

### How to use this section:

1. check your answer
2. circle missed questions
3. rework them before reading the explanation

**Good correction habits build strong scores.**

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## Practice Test Answers and Explanations

### Practice Test 1 Answers and Explanations

- Choice D is correct.** **(5.G.3)** A rectangle has 4 right angles (one at each corner). All angles measure 90 degrees.
- Choice D is correct.** **(5.NBT.2)**  $10^1 = 10$ , so  $\frac{2,800}{10^1} = 2,800 \div 10 = 280$ .
- Choice B is correct.** **(5.MD.3)** Add the ribbon lengths shown:  $2\left(\frac{1}{4}\right) + 3\left(\frac{1}{2}\right) + 2\left(\frac{3}{4}\right) + 1 + 1\frac{1}{4} = 5\frac{3}{4}$  yards.
- Choice A is correct.** **(5.OA.3)** The pattern grows by 5 each time. Counting terms gives 5, 10, 15, 20, 25, 30, 35, 40, so the 8th term is 40.
- Choice D is correct.** **(5.MD.1)** 1 gallon = 4 quarts = 8 pints = 16 cups. So 3 gallons =  $3 \times 16 = 48$  cups.
- Choice D is correct.** **(5.NF.6)** The model counts half-size pieces in 4 wholes. So the matching equation is  $4 \div \frac{1}{2} = n$ .
- Choice A is correct.** **(5.NBT.2)** Dividing by 10 moves the decimal one place left, so 85.4 becomes 8.54. The student's result is correct.
- Choice D is correct.** **(5.MD.6)** Count by multiplying the dimensions.  $9 \times 2 = 18$  cubes per layer, and 2 layers make 36 unit cubes.
- Choice B is correct.** **(5.NBT.2)** When multiplying by 10, each digit shifts one place left: 4 (tens)  $\rightarrow$  4 (hundreds), 2 (ones)  $\rightarrow$  2 (tens), 0 fills the ones place.
- Choice D is correct.** **(5.G.2)** The top-right vertex has the greatest x-coordinate and the greatest y-coordinate among the rectangle's vertices, so it is (7, 4).
- Choice D is correct.** **(5.NBT.2)** Dividing by 100 moves the decimal 2 places left:  $0.3 \rightarrow 0.03 \rightarrow 0.003$ .
- The correct answer is 24.** **(5.NF.6)** Each cup contains 4 fourth-cup scoops, so 6 cups contain  $6 \times 4 = 24$  scoops.
- Choice C is correct.** **(5.MD.7)** Use the rectangular-prism volume formula:  $7 \times 3 \times 8 = 168$ . So the volume is 168 cubic feet.
- Choice D is correct.** **(5.NBT.1)** Multiplying 0.07 by 10 shifts the decimal point one place to the right:  $0.07 \times 10 = 0.7$ .
- Choice B is correct.** **(5.OA.3)** Revenue = Quantity  $\times$  Price. So Price =  $75 \div 5 = 15$  dollars per item.
- Choice A is correct.** **(5.OA.1)** The diagram helps you move step by step:  $10 - 8 = 2$ , then  $2 + 3 = 5$ , then  $6 \times 5 = 30$ . The final subtraction is  $30 - 15 = 15$ .
- Choice C is correct.** **(5.MD.1)** Multiply:  $4.5 \times 10 = 45$  meters of fencing needed.
- Choice B is correct.** **(5.G.2)** Compare each pair:  $1 \times 7 = 7$ ,  $2 \times 7 = 14$ ,  $3 \times 7 = 21$ , and  $4 \times 7 = 28$ .
- Choice A is correct.** **(5.OA.2)** The quotient of 20 and 4 is  $20 \div 4$ . The phrase asks for the sum of 7 and that quotient, so use  $7 + 20 \div 4$ .
- Choices A, B are correct.** **(5.MD.1)** A is true:  $2.5 \times 100 = 250$  cm. B is true:  $3 \times 1,000 = 3,000$  g. C is false: 500 mL = 0.5 L (not 5 L). D is false: 4 cm = 0.04 m (not 40 m).
- The correct answer is 6 ft.** **(5.MD.6)** The base area is  $7 \times 5 = 35$  square feet. Since  $210 \div 35 = 6$ , the height is 6 ft.
- Choice B is correct.** **(5.G.2)** The x-coordinate is the number of apples (8), and the y-coordinate is the cost in dollars (4). So 8 apples cost \$4.
- Choice B is correct.** **(5.MD.5)** Find each part first: Prism A is  $9 \times 4 \times 2 = 72$  cubic inches, and Prism B is  $6 \times 4 \times 1 = 24$  cubic inches. Because the parts do not overlap, add them:  $72 + 24 = 96$  cubic inches.
- Choice C is correct.** **(5.MD.7)** The base area is  $16 \times 4 = 64$  square centimeters. Since  $256 \div 64 = 4$ , the height is 4 cm.
- The correct answer is 2400.** **(5.MD.2)** Each kilogram has 1,000 grams. Two kilograms is 2,000 grams, and  $2,000 + 400 = 2,400$  grams.
- Choice A is correct.** **(5.NBT.7)** 0.3 covers 3 tenths of the grid; 0.03 covers 3 hundredths. Tenths are larger, so  $0.3 > 0.03$ .
- The correct answer is 36000.** **(5.NBT.2)** Move the decimal point four places right:  $3.6 \rightarrow 36,000$ .
- Choice C is correct.** **(5.NBT.6)**  $624 \div 24 = 26$ . Area model:  $624 = 24 \times 26$ . Check:  $24 \times 26 = 624$ .
- Choice A is correct.** **(5.NBT.7)**  $13.07 - 8.95 = 4.12$ . Requires borrowing from ones place.
- Choice D is correct.** **(5.NF.2)**  $2\frac{4}{9} \approx 2$  and  $3\frac{5}{6} \approx 4$ . So  $2\frac{4}{9} + 3\frac{5}{6} \approx 2 + 4 = 6$ .
- Choice B is correct.** **(5.NF.5)** Since  $\frac{2}{3} < 1$ , the product must be less than 9. Evan's answer of 18 is double 9, which is unreasonable. The correct answer is 6.



### Case Closed: Success Ahead

---

### Greetings, Math Detective!

◇ Outstanding investigation! You've cracked the code on 3 complete practice tests, examining every clue and solving every mathematical mystery like a brilliant detective! Each problem was a puzzle, and you methodically gathered evidence, analyzed patterns, and reached accurate conclusions. That analytical thinking you've developed will serve you well on test day and beyond! ◇

★ **Here's what master detectives know:** not every case solves itself immediately. Sometimes you need to examine the evidence from different angles, try various approaches, and remain persistent until you crack the code. You've practiced exactly that through these 3 tests! Your investigative skills have sharpened considerably, and you're ready to solve any mathematical mystery that comes your way! ★

#### Detective's Case File: Your Skills

- **Clue Collection:** You gather all important information from problems before solving!
- **Pattern Recognition:** You identify mathematical patterns like a trained investigator!
- **Evidence Analysis:** You evaluate which strategies work best for each problem type!
- **Case Resolution:** You stay focused until you've found the correct solution!

**Detective wisdom:** the best investigators take notes about their methods so they can solve similar cases faster in the future. Your brain has been doing exactly that throughout these 3 tests, storing successful strategies in your mental filing cabinet. On test day, you'll be able to retrieve those proven methods instantly!

If you want to share a proud moment or ask a question, please email me at [jay@testinar.com](mailto:jay@testinar.com). I'd love to hear from you!

**Jay Daie**

Your Math Detective Coach

# Build Skills. Boost Confidence. Excel on the Grade 5 Math Test.

Help your child succeed with confidence! This book includes **3 full-length Grade 5 Math practice tests** aligned to state standards. With a focus on essential skills, problem solving, and test readiness, it's the perfect resource for classroom, home, or on-the-go practice.



## WHAT'S INSIDE:



### 3 Full-Length Grade 5 Math Practice Tests

Realistic test format to build familiarity and confidence.



### Covers All Essential Math Topics

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### Build Strong Math Skills

Strengthen understanding and problem-solving through varied question types.



### Detailed Answer Key

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### Track Progress & Improve

Use score trackers to identify strengths and focus on areas that need more practice.



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- ✓ Reinforce classroom learning
- ✓ Improve accuracy and speed
- ✓ Reduce test anxiety
- ✓ Achieve your best score!



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