

# Alaska AK STAR Grade 6 Math in 30 Days

*Day by Day Study Plan for Test Prep*

**Dr. A. Nazari**

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YOUR 30-DAY MATH PLAN

# Grade 6 Math in 30 Days

One Topic a Day • Clear Explanations • Daily Practice

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*Thirty days. That's all you need to build a solid foundation in Grade 6 math — or review everything before a big test.*

*Each day covers one focused topic with a clear explanation and practice problems. The schedule is designed so you learn ideas in the right order, with each day building on the one before.*

*Stick to the plan. One topic a day, 20–30 minutes of focused work. By day 30, you'll have covered every major concept.*



## **Follow the Plan**

*One topic each day,  
in order*



## **Do the Practice**

*Solve every problem  
and check answers*



## **Track Your Days**

*Check off each day  
on the tracker*

# How to Use This Book

Same routine every day — simple and effective.

---

1

## Read today's topic

Each day starts with a clear explanation of one concept. Read it carefully — don't just skim.

2

## Study the example

A worked example shows you how it's done. Cover the solution and try it yourself before looking.

3

## Solve the practice problems

Do every problem. Write out your steps. Then check the answers at the back of the book.

4

## Mark your progress

Check off the day on the 30-Day Plan. Tomorrow, move to the next topic.

 **Daily time:** About **20–30 minutes**. That's it. Short, focused sessions work better than long, scattered ones.

 **Missed a day?** No problem. Just pick up where you left off. The order matters more than the calendar.

# Your 30-Day Plan

Check off each day as you go. Stay on track!

Day	Topic	✓
1	What Is a Ratio?	<input type="checkbox"/>
2	Using Ratio Language	<input type="checkbox"/>
3	What Is a Rate?	<input type="checkbox"/>
4	Finding the Unit Rate	<input type="checkbox"/>
5	Tables of Equivalent Ratios	<input type="checkbox"/>
6	Graphing Ratios	<input type="checkbox"/>
7	What Is a Percent?	<input type="checkbox"/>
8	Solving Percent Problems	<input type="checkbox"/>
9	Rate & Ratio Word Problems	<input type="checkbox"/>
10	Converting Measurement Units	<input type="checkbox"/>
11	Dividing Fractions by Fractions	<input type="checkbox"/>
12	Multi-Digit Division	<input type="checkbox"/>
13	Decimal Operations	<input type="checkbox"/>
14	GCF and LCM	<input type="checkbox"/>
15	The Distributive Property	<input type="checkbox"/>

Day	Topic	✓
16	Positive & Negative Numbers	<input type="checkbox"/>
17	Absolute Value & Ordering	<input type="checkbox"/>
18	The Coordinate Plane	<input type="checkbox"/>
19	Exponents & Powers	<input type="checkbox"/>
20	Order of Operations	<input type="checkbox"/>
21	Algebraic Expressions	<input type="checkbox"/>
22	One-Step Equations	<input type="checkbox"/>
23	Inequalities	<input type="checkbox"/>
24	Area of Triangles	<input type="checkbox"/>
25	Area of Parallelograms	<input type="checkbox"/>
26	Volume of Rectangular Prisms	<input type="checkbox"/>
27	Nets & Surface Area	<input type="checkbox"/>
28	Mean, Median, and Range	<input type="checkbox"/>
29	Dot Plots, Histograms, Box Plots	<input type="checkbox"/>
30	Review & Final Practice	<input type="checkbox"/>

 My start date: \_\_\_\_\_

Target finish date: \_\_\_\_\_

You don't have to be perfect every day. Just show up and do the work.

# Progress Tracker

Color in each day as you complete it. Watch the grid fill up!

---

Day 1	Day 2	Day 3	Day 4	Day 5
Day 6	Day 7	Day 8	Day 9	Day 10
Day 11	Day 12	Day 13	Day 14	Day 15
Day 16	Day 17	Day 18	Day 19	Day 20
Day 21	Day 22	Day 23	Day 24	Day 25
Day 26	Day 27	Day 28	Day 29	Day 30

10

done!

20

Almost there!

30

Complete!

Every day you complete makes the next one easier. Keep the streak alive!

# Formula Reference Sheet

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## Area Formulas

**Rectangle**  $A = l \times w$

**Parallelogram**  $A = b \times h$

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

**Trapezoid**  $A = \frac{1}{2}(b_1 + b_2) \times h$

## Volume

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

**Prism**

## Surface Area

Find the area of each face, then add them all up.

**Rectangular Prism:**

$$SA = 2lw + 2lh + 2wh$$

## Order of Operations

**P** Parentheses first

**E** Exponents

**M/D** Multiply & Divide (left to right)

**A/S** Add & Subtract (left to right)

## Ratios & Percents

**Ratio:**  $a : b$  or  $\frac{a}{b}$

**Unit rate:** amount per 1 unit

**Percent:** a ratio out of 100

$$\text{Part} = \text{Percent} \times \text{Whole}$$

## Integers & Absolute Value

**Integers:**

$\dots, -3, -2, -1, 0, 1, 2, 3, \dots$

$$|-5| = 5 \quad |5| = 5$$

**Absolute value** = distance from 0

## Expressions & Equations

**Exponent:**  $3^4 = 3 \times 3 \times 3 \times 3 = 81$

**Variable:** a letter that stands for a number

**Equation:** two expressions joined by =

**Inequality:** uses  $<$ ,  $>$ ,  $\leq$ ,  $\geq$

## Coordinate Plane

**Ordered pair:**  $(x, y)$

**x-axis:** horizontal    **y-axis:** vertical

**Origin:**  $(0, 0)$

**Four quadrants** (I, II, III, IV)

## Statistics

**Mean:** sum of values  $\div$  count

**Median:** middle value (sorted)

**Range:** max  $-$  min

# Key Math Vocabulary

Words you'll see again and again in Grade 6 math.

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## Ratios & Rates

**Ratio** — A comparison of two quantities.

**Equivalent ratios** — Ratios that represent the same relationship.

**Rate** — A ratio comparing two different units.

**Unit rate** — A rate with a denominator of 1.

**Percent** — A ratio that compares a number to 100.

## The Number System

**Integer** — A whole number or its opposite (...-2, -1, 0, 1, 2 ...).

**Rational number** — Any number that can be written as a fraction.

**Absolute value** — The distance of a number from zero on a number line.

**Opposite** — Two numbers the same distance from zero on opposite sides.

**Reciprocal** — Flip the numerator and denominator: the reciprocal of  $\frac{2}{3}$  is  $\frac{3}{2}$ .

**GCF** — Greatest Common Factor — the largest factor shared by two numbers.

**LCM** — Least Common Multiple — the smallest multiple shared by two numbers.

## Expressions & Equations

**Variable** — A letter that represents an unknown number.

**Coefficient** — The number multiplied by a variable (6 in  $6x$ ).

**Constant** — A fixed number with no variable (+3 in  $2x + 3$ ).

**Expression** — Numbers, variables, and operations combined (no = sign).

**Equation** — A statement that two expressions are equal.

**Inequality** — A statement that uses  $<$ ,  $>$ ,  $\leq$ , or  $\geq$ .

**Exponent** — Tells how many times to multiply a base by itself.

**Distributive property** —  $a(b + c) = ab + ac$ .

## Geometry

**Area** — The space inside a flat shape, in square units.

**Base** — The bottom side of a shape (or any side used for the formula).

**Height** — The perpendicular distance from the base to the top.

**Volume** — The space inside a 3-D shape, in cubic units.

**Surface area** — The total area of all faces of a 3-D shape.

**Net** — A flat pattern that folds into a 3-D shape.

**Face** — A flat surface of a solid figure.

**Edge** — The line segment where two faces meet.

**Vertex** — A point where edges meet.

### Coordinate Plane

**Ordered pair** — A pair  $(x, y)$  that names a location on the plane.

**Origin** — The point  $(0, 0)$  where the axes cross.

**Quadrant** — One of the four sections of the coordinate plane.

**$x$ -axis** — The horizontal number line.

**$y$ -axis** — The vertical number line.

### Statistics & Data

**Mean** — The average — sum of values divided by the count.

**Median** — The middle value when data is in order.

**Range** — The difference between the greatest and least values.

**Dot plot** — A number line with dots showing data frequency.

**Histogram** — A bar graph that shows data grouped in intervals.

**Box plot** — A diagram showing the five-number summary of data.

**IQR** — Interquartile Range — the spread of the middle 50% of data.

**MAD** — Mean Absolute Deviation — average distance from the mean.



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WEEK

1

*Ratios, Rates, and Percents*

 *This Week's Days* 

**1.1** *What Is a Ratio?* ..... **1**



## ★ 1.1 What Is a Ratio? ★

### What Is a Ratio?

#### 🎯 Learning Goals

- Understand that a ratio compares two quantities
- Write ratios in three different forms
- Identify and describe ratios in everyday situations

#### 🌍 Ratios Are Everywhere

Imagine you're making a fruit smoothie. The recipe says to use 2 cups of strawberries for every 3 cups of banana. That "2 for every 3" is a **ratio** — and you use ratios all the time, whether you realize it or not!

#### 🎓 What Is a Ratio?

A **ratio** is a comparison of two quantities. It tells you how much of one thing there is compared to another.

For example, if a bag has 5 red marbles and 3 blue marbles, you can compare them with a ratio:

- The ratio of red to blue is 5 to 3.
- The ratio of blue to red is 3 to 5.

**Order matters! The ratio 5 to 3 is NOT the same as 3 to 5.**



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“ Think of a ratio like a recipe — the order of the ingredients matters! “2 cups flour to 1 cup sugar” is very different from “1 cup flour to 2 cups sugar.” ”

### Three Ways to Write a Ratio

You can write the same ratio in three different forms:

Words	Colon	Fraction
5 to 3	5 : 3	$\frac{5}{3}$

All three mean the same thing: for every 5 of the first quantity, there are 3 of the second.



**TIP**

When you write a ratio as a fraction, it does NOT mean “5 divided by 3.” It’s still a comparison. The context tells you it’s a ratio, not a division problem.

### Writing Ratios from a Picture

A parking lot has 4 trucks and 7 cars.

Write the ratio of trucks to cars in three ways.

**Solution:**

1. Identify the two quantities: trucks = 4, cars = 7.
2. Write the ratio in order — trucks first, cars second.

Words	Colon	Fraction
4 to 7	4 : 7	$\frac{4}{7}$



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What about the ratio of cars to trucks?

✓ **Answer:** 7 to 4, 7 : 4,  $\frac{7}{4}$

### Part-to-Part vs. Part-to-Whole

A classroom has 12 boys and 18 girls.

#### **Part-to-Part:**

- Boys to girls: 12 : 18
- Girls to boys: 18 : 12

#### **Part-to-Whole:**

- Total students:  $12 + 18 = 30$
- Boys to total: 12 : 30
- Girls to total: 18 : 30

**Part-to-part** ratios compare one part of a group to another part.

**Part-to-whole** ratios compare one part to the entire group.

Always read the problem carefully to know which type is being asked for!

*The same situation can give you many different ratios depending on what you're comparing.*

### Identifying Ratios in Real Life

A pizza shop sells 3 cheese pizzas for every 2 pepperoni pizzas. On Saturday they sold 15 cheese pizzas. How many pepperoni pizzas did they sell?

**Solution:**



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1. The ratio of cheese to pepperoni is 3 : 2.
2. They sold 15 cheese pizzas. That's  $15 \div 3 = 5$  groups of 3.
3. So there must be 5 groups of 2 pepperoni pizzas:  $5 \times 2 = 10$ .

✔ **Answer:** They sold 10 pepperoni pizzas.

**⚠ Watch the Order!**

If a problem says "the ratio of cats to dogs is 3 : 5," that means:

- Cats = 3, Dogs = 5   ✔
- Dogs = 3, Cats = 5   **WRONG!**

Always match the first number to the first thing named, and the second number to the second thing named.



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 **What Is a Ratio? – Practice** **Write the Ratio**

A bag contains 6 apples and 10 oranges. Write each ratio in all three forms (words, colon, fraction).

1. The ratio of apples to oranges.
2. The ratio of oranges to apples.
3. The ratio of apples to total fruit.

**Read and Write Ratios**

4. A recipe uses 3 eggs and 5 cups of flour. What is the ratio of eggs to flour?
5. In a class, there are 14 students who walk to school and 8 who ride the bus. Write the ratio of bus riders to walkers as a fraction.
6. A team won 9 games and lost 6 games. Write the ratio of wins to total games played.

**Apply It**

7. A store sells phones and tablets in a ratio of 5 : 2. If the store sold 20 phones, how many tablets did it sell?
8. At a concert, the ratio of adults to children is 7 : 3. If there are 21 adults, how many children are there?

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*You just learned ratios — one of  
the most useful ideas in all of math!*

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WEEK

2

*Expressions and Equations*

 *This Week's Days* 

**2.1** *Exponents and Order of Operations* ..... 8



## ★ 2.1 Exponents and Order of Operations ★

### 🎯 Learning Goals

- Write repeated multiplication using exponents
- Evaluate expressions with whole-number exponents
- Apply the order of operations (PEMDAS)

### 🎓 Exponents

An **exponent** tells you how many times to multiply the base by itself.

$$3^4 = 3 \times 3 \times 3 \times 3 = 81$$

- 3 is the **base** — the number being multiplied.
- 4 is the **exponent** — how many times.
- We say “3 to the fourth power.”

Any number to the power of 1 is itself:  $7^1 = 7$ . Any number to the power of 0 is 1:  $5^0 = 1$ .

### 📎 Order of Operations (PEMDAS)

Evaluate:  $5 + 2 \times 3^2$

**Solution:**

1. Exponents first:  $3^2 = 9$ .
2. Multiply:  $2 \times 9 = 18$ .
3. Add:  $5 + 18 = 23$ .



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✔ **Answer:** 23



“**PEMDAS:** *Parentheses, Exponents, Multiply/Divide (left to right), Add/Subtract (left to right).*”

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 *Exponents and Order of Operations Practice* *Write Using Exponents*

1.  $7 \times 7 \times 7$

2.  $2 \times 2 \times 2 \times 2 \times 2$

*Evaluate*

3.  $4^3$

4.  $10^2 - 6 \times 5$

*Apply PEMDAS*

5.  $(8 + 2)^2 \div 5$

6. *Maria says  $3 + 4 \times 2 = 14$ . Jake says the answer is 11. Who is correct?***Get Online**

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## Answer Key

Try each problem on your own first, then check your work here.

### Chapter 1

1 6 to 10,  $6 : 10$ ,  $\frac{6}{10}$

2 10 to 6,  $10 : 6$ ,  $\frac{10}{6}$

3 6 to 16,  $6 : 16$ ,  $\frac{6}{16}$

4  $3 : 5$

5  $\frac{8}{14}$

6  $9 : 15$

7 8 tablets

8 9 children

#### Explanations

1 Apples first, then oranges.

2 Oranges first, then apples.

3  $Total = 6 + 10 = 16$ . This is a part-to-whole ratio.

6  $Total\ games = 9 + 6 = 15$ .

7  $20 \div 5 = 4$  groups.  $4 \times 2 = 8$  tablets.

8  $21 \div 7 = 3$  groups.  $3 \times 3 = 9$  children.



 Chapter 21  $7^3$ 2  $2^5$ 

3 64

4 70

5 20

6 Jake

 Explanations

1 The base 7 is multiplied 3 times.

2 The base 2 is multiplied 5 times.

3  $4 \times 4 = 16$ , then  $16 \times 4 = 64$ .4 Exponent:  $10^2 = 100$ . Multiply:  $6 \times 5 = 30$ . Subtract:  $100 - 30 = 70$ .5 Parentheses:  $8 + 2 = 10$ . Exponent:  $10^2 = 100$ . Divide:  $100 \div 5 = 20$ .6 Multiply first:  $4 \times 2 = 8$ . Then add:  $3 + 8 = 11$ . Maria added before multiplying.

Well done checking your answers!

Keep practicing to strengthen your skills.



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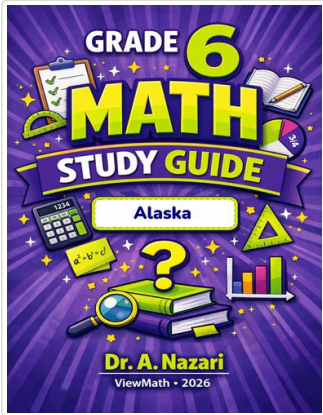


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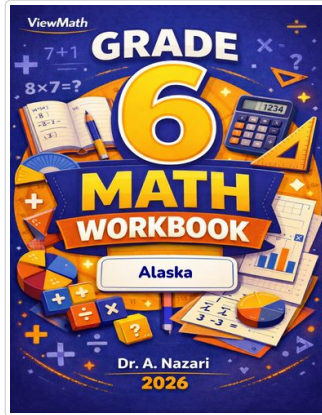
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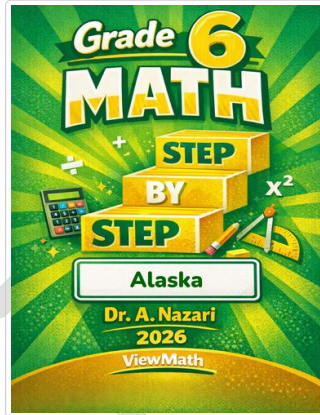
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Workbook



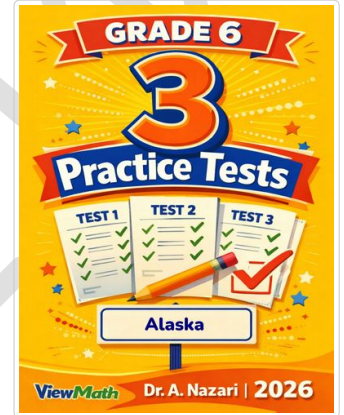
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Step-by-Step



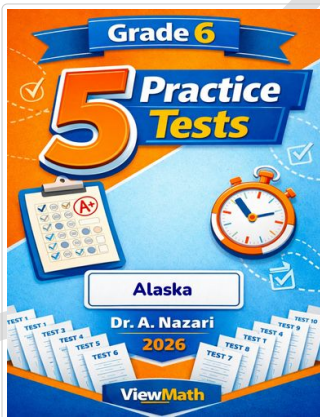
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3 Practice Tests



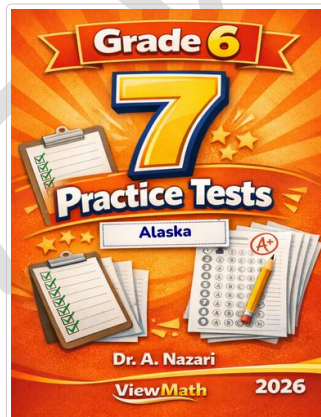
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5 Practice Tests



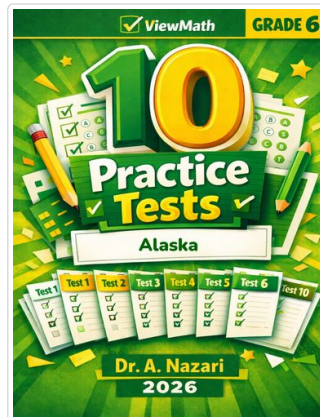
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7 Practice Tests



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10 Practice Tests



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