

# North Dakota NDSA Grade 7 Math in 30 Days

*Day by Day Study Plan for Test Prep*

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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.

WEEK

1

*Ratios and Proportional Relationships*

 *This Week's Days* 

**1.1 Unit Rates and Proportional Relationships** ..... 1

*Day 1: Unit Rates and Proportional Relationships*3



★ 1.1 Unit Rates and Proportional Relationships ★

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DAY

1

## Unit Rates and Proportional Relationships

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 Today You Will Learn 

- ✓ Compute unit rates involving fractions (complex fractions)
- ✓ Determine whether a relationship is proportional

 Your Progress: Day 1 of 30



Ready to begin? →

## Unit Rates with Fractions

### Key Concept

**Complex Fraction Unit Rates** A **unit rate** compares a quantity to one unit of another quantity. In Grade 7, the tricky part is that the quantities can be fractions!

To find a unit rate from a **complex fraction** like  $\frac{\frac{1}{2} \text{ mile}}{\frac{1}{4} \text{ hour}}$ , divide the numerator by the denominator:

$$\frac{1}{2} \div \frac{1}{4} = \frac{1}{2} \times \frac{4}{1} = 2 \text{ miles per hour.}$$

**Rule:**  $\frac{a/b}{c/d} = \frac{a}{b} \times \frac{d}{c}$  — multiply by the reciprocal of the denominator.

### Finding a Unit Rate

A recipe uses  $\frac{3}{4}$  cup of sugar for every  $\frac{1}{2}$  batch. How much sugar per batch?

**Solution:**  $\frac{\frac{3}{4}}{\frac{1}{2}} = \frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = \frac{3}{2} = 1\frac{1}{2}$  cups per batch.

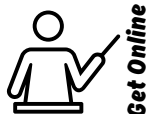
## Recognizing Proportional Relationships

### Key Concept

**Is It Proportional?** A relationship between  $x$  and  $y$  is **proportional** if:

- The ratio  $\frac{y}{x}$  is the same for every pair in a table, OR
- The graph is a straight line through the origin  $(0, 0)$ .

A straight line that does NOT pass through  $(0, 0)$  is **not** proportional — don't forget to check!



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 **Testing a Table**

$x$	$y$	$y \div x$
2	6	3
5	15	3
8	24	3

Every ratio equals 3, so the relationship is **proportional**.



“ A proportional relationship always starts at zero — if the line misses the origin, it’s a no-go! ”

 **Practice**
**Unit Rates with Fractions**

- Find the unit rate:  $\frac{\frac{2}{3} \text{ mile}}{\frac{1}{6} \text{ hour}}$ .
- A painter uses  $\frac{3}{5}$  gallon of paint for  $\frac{1}{3}$  of a wall. How many gallons per wall?
- Find the unit rate:  $\frac{\frac{7}{8} \text{ pound}}{\frac{1}{4} \text{ bag}}$ .
- Maria jogs  $\frac{3}{4}$  mile in  $\frac{3}{8}$  hour. What is her speed in miles per hour?

**Recognizing Proportional Relationships**

- Does the table show a proportional relationship?

$x$	1	3	5	7
$y$	4	12	20	28



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6. Does the table show a proportional relationship?

$x$	2	4	6	8
$y$	5	9	13	17

7. A graph shows a straight line passing through  $(0,0)$  and  $(3,9)$ . Is the relationship proportional?

8. A graph shows a straight line passing through  $(1,3)$  and  $(2,6)$ , but it crosses the  $y$ -axis at  $(0,1)$ . Is it proportional?

### Daily Challenge

9. A car travels  $\frac{7}{8}$  mile in  $\frac{1}{3}$  minute. A bike travels  $\frac{2}{5}$  mile in  $\frac{1}{6}$  minute. Which is faster, and by how many miles per minute?

 **Key Takeaway:** To find a unit rate with fractions, multiply by the reciprocal; a relationship is proportional only if every  $\frac{y}{x}$  ratio is the same and the graph passes through  $(0,0)$ .

 **Day Complete** 

I understand today's lesson     I finished the practice



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WEEK

2

*Operations with Rational Numbers*

 *This Week's Days* 

**2.1 Subtracting Integers and Rational Numbers** ..... 7

*Day 9: Subtracting Integers and Rational Numbers*9



★ *2.1 Subtracting Integers  
and Rational Numbers* ★

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DAY

9

## *Subtracting Integers and Rational Numbers*

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 *Today You Will Learn* 

- ✓ *Subtract integers by adding the opposite*
- ✓ *Add and subtract rational numbers (fractions and decimals)*

 *Your Progress: Day 9 of 30*

0%

*Ready to begin? →*

## Subtracting Integers

### Key Concept

*Subtract = Add the Opposite* The key rule for subtracting integers:

$$p - q = p + (-q)$$

Change the subtraction sign to addition and flip the sign of the second number. Then use the addition rules from Day 8.

**Distance between two numbers:**  $|a - b|$  gives the distance between  $a$  and  $b$  on the number line — always positive.

**Common error:** Forgetting to change both the operation and the sign. For example,  $5 - (-3)$  becomes  $5 + 3 = 8$ , not  $5 - 3 = 2$ .

### Subtracting a Negative Integer

Find  $4 - (-7)$ .

**Step 1:** Rewrite as addition:  $4 - (-7) = 4 + 7$ .

**Step 2:** Add:  $4 + 7 = 11$ .

## Adding and Subtracting Rational Numbers



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 **Key Concept**

*Extending to Fractions and Decimals* The same sign rules apply to all **rational numbers** — fractions and decimals, not just integers.

**Fractions:** Find a common denominator, then add or subtract the numerators.

$$-\frac{3}{4} + \frac{1}{2} = -\frac{3}{4} + \frac{2}{4} = -\frac{1}{4}$$

**Decimals:** Line up the decimal points, then apply the sign rules.

$$-2.7 + 1.3 = -(2.7 - 1.3) = -1.4$$

 **Subtracting Mixed Numbers**

Find  $-1\frac{1}{3} - 2\frac{2}{3}$ .

**Step 1:** Rewrite subtraction as addition of the opposite:

$$-1\frac{1}{3} + \left(-2\frac{2}{3}\right)$$

**Step 2:** Both are negative, so add and keep the negative sign:

$$1\frac{1}{3} + 2\frac{2}{3} = \frac{4}{3} + \frac{8}{3} = \frac{12}{3} = 4$$

**Answer:**  $-4$ .



“Subtract” is just a disguise — underneath, it’s always adding the opposite!”

 **Practice**

Subtracting Integers



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1.  $10 - 15 =$
2.  $-6 - (-9) =$
3.  $-11 - 4 =$
4. Find the distance between  $-8$  and  $5$  on the number line.

#### Adding and Subtracting Rational Numbers

5.  $-\frac{2}{5} + \frac{4}{5} =$
6.  $3.2 - (-1.8) =$
7.  $-\frac{3}{4} - \frac{1}{2} =$
8. A diver is at  $-12.5$  meters. She descends another  $8.3$  meters. What is her new depth?

#### Daily Challenge

9. The overnight low temperature on Monday was  $-6\frac{1}{2}F$ . By Tuesday morning, it had dropped another  $3\frac{3}{4}F$ . Then by noon on Tuesday, it rose  $12\frac{1}{4}F$ . What was the temperature at noon on Tuesday?

 **Key Takeaway:** To subtract any number, add its opposite — this one rule works for integers, fractions, and decimals alike.

 Day Complete 

I understand today's lesson     I finished the practice



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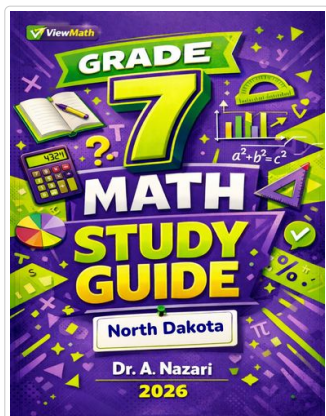


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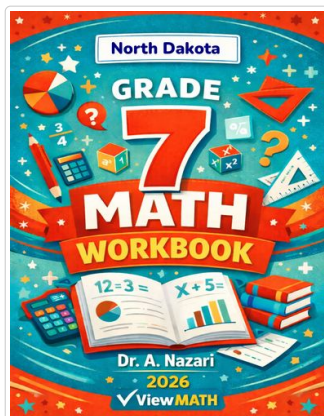
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Study Guide



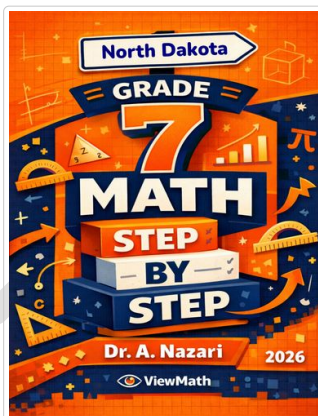
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Workbook



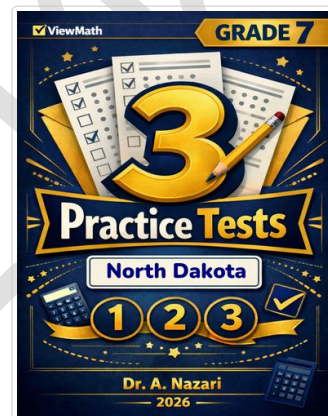
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Step-by-Step



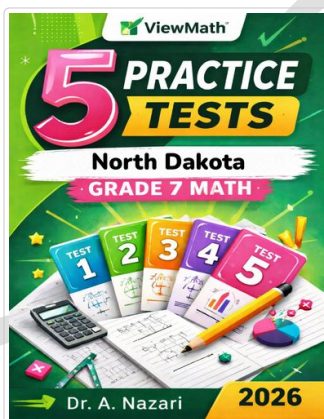
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3 Practice Tests



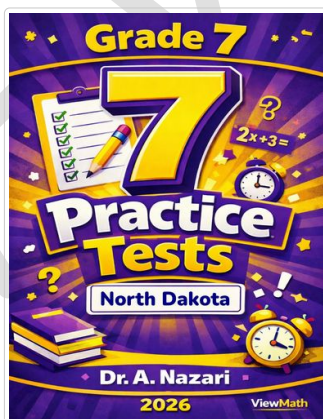
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5 Practice Tests



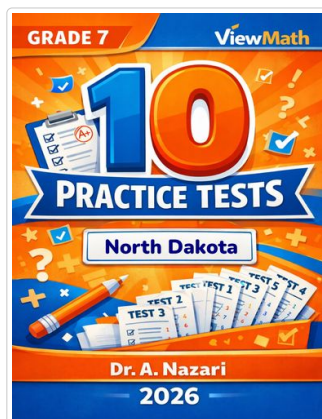
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7 Practice Tests



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10 Practice Tests



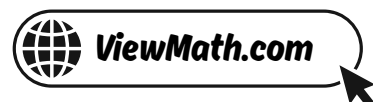
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