

# Colorado CMAS Grade 8 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.

WEEK

1

*Irrational Numbers*

 *This Week's Days* 

**1.1 Rational and Irrational Numbers** ..... 1

Day 1: Rational and Irrational Numbers<sup>3</sup>



★ 1.1 Rational and Irrational Numbers ★

PREVIEW



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DAY

1

## *Rational and Irrational Numbers*

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 *Today You Will Learn* 

- ✓ *Classify numbers as rational or irrational*
- ✓ *Convert repeating decimals into fractions*

 *Your Progress: Day 1 of 30*



*Ready to begin?* →

## Classifying Rational and Irrational Numbers

### Key Concept

What Makes a Number Rational? A **rational number** is any number that can be written as  $\frac{a}{b}$ , where  $a$  and  $b$  are integers and  $b \neq 0$ . This includes integers, terminating decimals, and repeating decimals. An **irrational number** cannot be written as a fraction of integers. Its decimal form goes on forever without repeating.

**Rational:**  $\frac{3}{4} = 0.75$ ,  $\frac{1}{3} = 0.\overline{3}$ ,  $-7$ ,  $0$

**Irrational:**  $\sqrt{2} \approx 1.41421\dots$ ,  $\pi \approx 3.14159\dots$

**Watch out:**  $\sqrt{4} = 2$ , which is rational. Only square roots of non-perfect squares are irrational.

### Is It Rational or Irrational?

Classify each number: (a)  $\sqrt{9}$  (b)  $\sqrt{5}$  (c)  $0.1234\dots$  (non-repeating)

**Solution:**

- $\sqrt{9} = 3 = \frac{3}{1}$   $\boxtimes$  **rational**
- 5 is not a perfect square, so  $\sqrt{5}$  is a non-terminating, non-repeating decimal  $\boxtimes$  **irrational**
- A decimal that never terminates and never repeats  $\boxtimes$  **irrational**

## Turning Repeating Decimals into Fractions



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 **Key Concept**

The Algebraic Method To convert a repeating decimal to a fraction, let  $x$  equal the decimal, multiply both sides by a power of 10 that shifts the repeating block, then subtract to eliminate the repeating part.

**Quick example:** Convert  $0.\overline{36}$  to a fraction.

$$x = 0.\overline{36} \quad \Rightarrow \quad 100x = 36.\overline{36}$$

Subtract:  $100x - x = 36.\overline{36} - 0.\overline{36}$ , so  $99x = 36$ , giving  $x = \frac{36}{99} = \frac{4}{11}$ .

 **Converting  $0.8\overline{3}$  to a Fraction**

Let  $x = 0.8333\dots$

Multiply by 10:  $10x = 8.333\dots$

Multiply by 100:  $100x = 83.333\dots$

Subtract:  $100x - 10x = 83.333\dots - 8.333\dots$

$$90x = 75, \text{ so } x = \frac{75}{90} = \frac{5}{6}$$



“ Every repeating decimal is a fraction in disguise — algebra reveals its true identity! ”

 **Practice**
**Classifying Numbers**

1. Classify  $\sqrt{16}$  as rational or irrational. Explain.
2. Is  $\sqrt{10}$  rational or irrational?



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3. True or false: Every integer is a rational number.
4. Which of the following is irrational? (A)  $\frac{22}{7}$  (B)  $\pi$  (C)  $0.\overline{142857}$  (D)  $-3$

### Repeating Decimals to Fractions

5. Convert  $0.\overline{7}$  to a fraction.
6. Convert  $0.\overline{45}$  to a fraction in lowest terms.
7. Convert  $0.1\overline{6}$  to a fraction.
8. A student says  $0.\overline{9} = 0.999\dots$  is less than 1. Show algebraically that  $0.\overline{9} = 1$ .

### Daily Challenge

9. The number  $\sqrt{n}$  is rational only when  $n$  is a **perfect square**. Find all integers  $n$  with  $1 \leq n \leq 50$  for which  $\sqrt{n}$  is rational, and state how many there are.

 **Key Takeaway:** Rational numbers can be written as  $\frac{a}{b}$  (integers); irrational numbers have non-terminating, non-repeating decimals — and the algebraic method proves every repeating decimal is rational.

 **Day Complete** 

I understand today's lesson     I finished the practice



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WEEK

2

*Lines and Linear Equations*

 *This Week's Days* 

**2.1 Slope as Rate of Change** ..... 7

Day 9: Slope as Rate of Change<sup>9</sup>



★ 2.1 Slope as Rate of Change ★

PREVIEW



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DAY

9

## Slope as Rate of Change

📖 Today You Will Learn 📖

- ✓ Calculate slope from two points using rise over run
- ✓ Interpret slope as a real-world rate of change

📊 Your Progress: Day 9 of 30

10%

Ready to begin? →

 **Key Concept**

What Is Slope? The **slope** of a line measures how steep it is:

$$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

- **Positive slope** — the line rises from left to right.
- **Negative slope** — the line falls from left to right.
- **Zero slope** — the line is horizontal ( $y$  doesn't change).
- **Undefined slope** — the line is vertical ( $x$  doesn't change; division by zero).

In context, slope tells you: "For every 1-unit increase in  $x$ ,  $y$  changes by  $m$  units."

**Watch out:** Keep the order of the points consistent. If you start with  $y_2$  on top, use  $x_2$  on the bottom — never mix them.

 **Finding Slope from Two Points**

Find the slope of the line through  $(-1, 2)$  and  $(3, 10)$ .

**Step 1:** Label the points:  $(x_1, y_1) = (-1, 2)$  and  $(x_2, y_2) = (3, 10)$ .

**Step 2:** Substitute into the formula:

$$m = \frac{10 - 2}{3 - (-1)} = \frac{8}{4} = 2$$

The slope is 2, meaning  $y$  increases by 2 for every 1-unit increase in  $x$ .



“Slope is like a staircase — rise tells you how high each step is, run tells you how far forward you go!”



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 Practice

1. Find the slope of the line through (2, 5) and (6, 13).
2. Find the slope of the line through (0, 7) and (4, 3).
3. A line passes through (5, 9) and (5, -2). What is the slope?
4. A hiker climbs a trail that rises 300 feet over a horizontal distance of 1,200 feet. What is the slope of the trail?
5. A table shows a plant's height over time: (1, 3), (3, 7), (5, 11) where  $x$  is weeks and  $y$  is height in cm. Find the rate of change and interpret it.
6. The temperature at 6:00 AM was  $58^{\circ}\text{F}$  and at 2:00 PM it was  $82^{\circ}\text{F}$ . What is the average rate of change in temperature per hour?

 Daily Challenge

7. A phone battery is at 95% at 8:00 AM and at 40% at 2:00 PM. At 5:00 PM the battery is at 10%. Find the rate of change for each time interval. Was the battery draining at a constant rate all day? Explain.

 **Key Takeaway:** Slope =  $\frac{y_2 - y_1}{x_2 - x_1}$  measures steepness and tells you the rate at which  $y$  changes for each unit of  $x$ .

 Day Complete 

I understand today's lesson     I finished the practice



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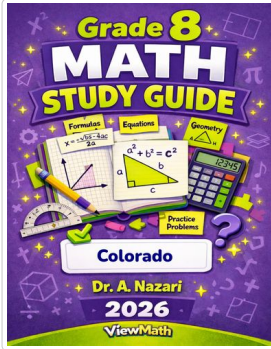


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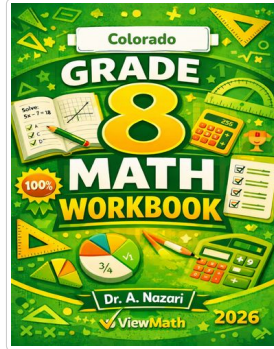
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Study Guide



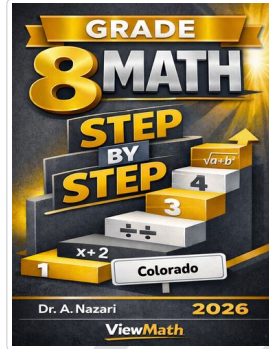
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Workbook



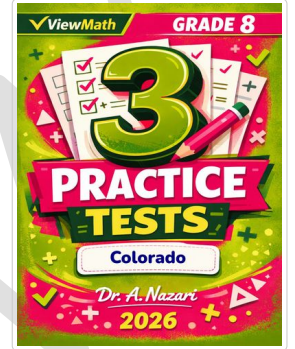
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Step-by-Step



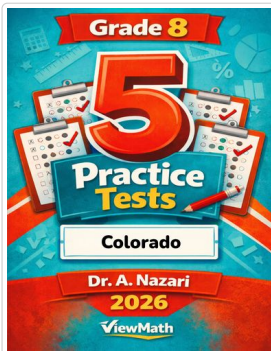
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3 Practice Tests



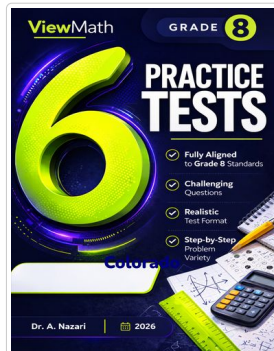
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5 Practice Tests



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6 Practice Tests



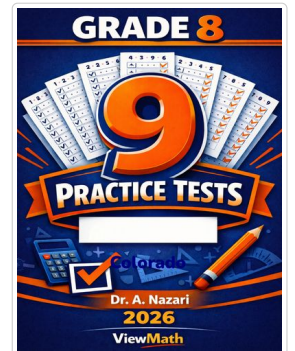
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7 Practice Tests



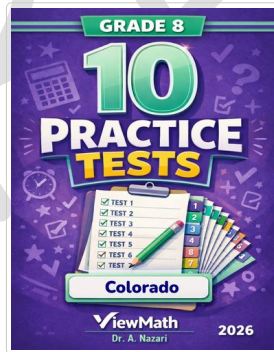
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9 Practice Tests



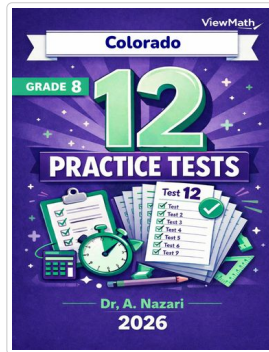
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10 Practice Tests



Scan Me



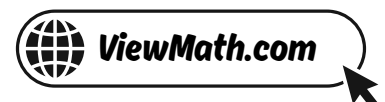
12 Practice Tests



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