

# Virginia SOL Grade 8 Math in 30 Days

*Day by Day Study Plan for Test Prep*

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Published by View Math Education

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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 ★

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DAY

1

## *Rational and Irrational Numbers*

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 *Today You Will Learn* 

- ✓ *Classify numbers within the real number system hierarchy*
- ✓ *Convert repeating decimals into fractions*

 *Your Progress: Day 1 of 30*

1%

*Ready to begin? →*

## 📌 Classifying Numbers in the Real Number System

### 💡 Key Concept

The **Real Number Hierarchy** Every number you've used so far belongs to the **real number** system. The subsets nest inside each other like a Venn diagram:

$$\text{Natural} \subset \text{Whole} \subset \text{Integer} \subset \text{Rational} \subset \text{Real}$$

Subset	Description	Examples
Natural	Counting numbers	1, 2, 3, ...
Whole	Natural numbers + 0	0, 1, 2, 3, ...
Integer	Whole numbers + negatives	..., -2, -1, 0, 1, 2, ...
Rational	Any $\frac{a}{b}$ with $a, b$ integers, $b \neq 0$	$\frac{3}{4}$ , $0.\bar{3}$ , -7, 0
Irrational	Non-terminating, non-repeating decimals	$\sqrt{2}$ , $\pi$

Both **rational** and **irrational** numbers are subsets of the reals, but they do NOT overlap — every real number is one or the other, never both.

**Watch out:**  $\sqrt{4} = 2$ , which is a natural number (and therefore also whole, integer, and rational). Only square roots of non-perfect squares are irrational.

### ✏️ Classify $-5$ , $\frac{2}{3}$ , $\sqrt{7}$ , and 0

- $-5$ : integer (also rational, real) — not whole or natural because it's negative.
- $\frac{2}{3} = 0.\bar{6}$ : rational (also real) — not an integer because it's between 0 and 1.
- $\sqrt{7} \approx 2.6457\dots$ : irrational (also real) — 7 is not a perfect square, so the decimal never terminates



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or repeats.

- 0: whole (also integer, rational, real) — not natural (natural numbers start at 1).

## Turning Repeating Decimals into Fractions

### 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! ”



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 Practice

**Real Number Classification**


1. Classify  $\sqrt{16}$  by listing ALL subsets of the real numbers it belongs to.
2. Is  $\sqrt{10}$  rational or irrational? Explain.
3. A student says  $-3$  is not rational because it is negative. Is this correct? Explain.
4. Place each number in the most specific subset:  $12$ ,  $-\frac{1}{2}$ ,  $\pi$ ,  $0$ .

**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. Determine whether each number is rational or irrational, and explain: (a)  $\sqrt{49} + \sqrt{2}$  (b)  $\sqrt{3} \times \sqrt{3}$   
 (c)  $\frac{\sqrt{50}}{\sqrt{2}}$

 **Key Takeaway:** Real numbers are organized as  $\text{Natural} \subset \text{Whole} \subset \text{Integer} \subset \text{Rational}$ , with irrational numbers alongside — and every repeating decimal is provably rational.



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✔ *Day Complete* ✔

- I understand today's lesson     I finished the practice

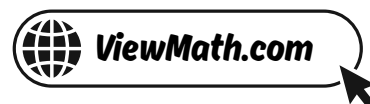
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WEEK

2

*Lines and Linear Equations*

 *This Week's Days* 

**2.1 Slope as Rate of Change** ..... 8

Day 9: Slope as Rate of Change 10



★ 2.1 Slope as Rate of Change ★

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DAY

9

## *Slope as Rate of Change*

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📖 *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*

0%

*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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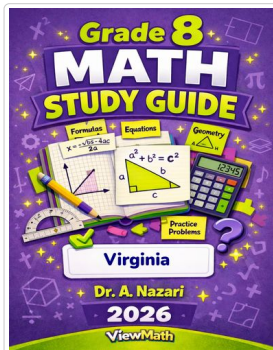
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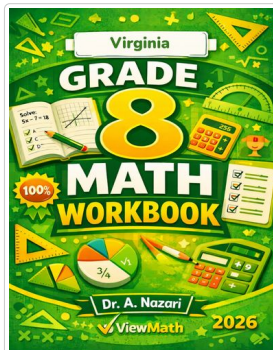
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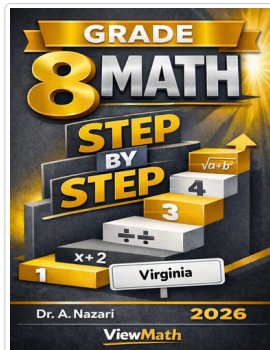
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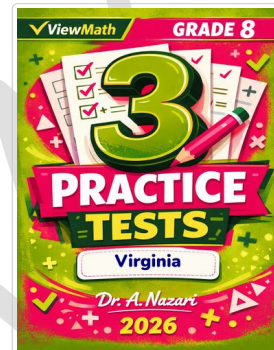
Study Guide



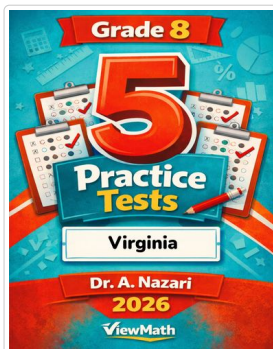
Workbook



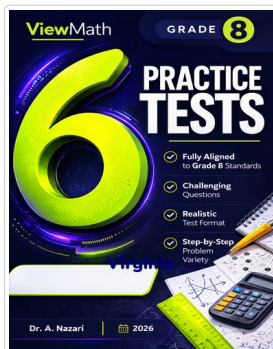
Step-by-Step



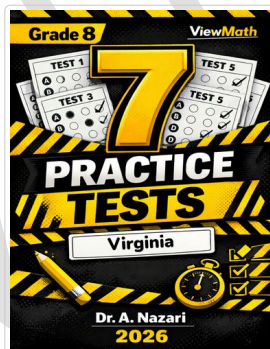
3 Practice Tests



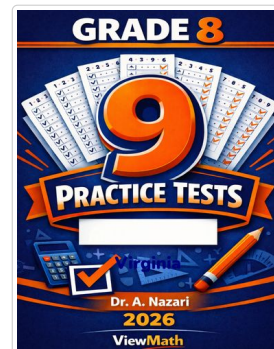
5 Practice Tests



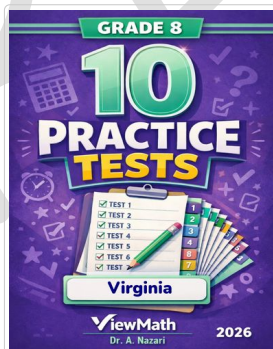
6 Practice Tests



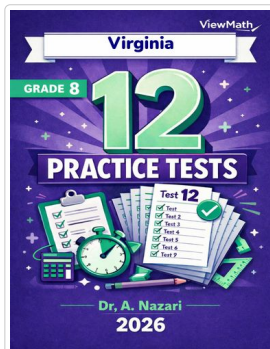
7 Practice Tests



9 Practice Tests



10 Practice Tests



12 Practice Tests



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THANK YOU

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