North Carolina NC EOG Grade 8 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

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

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

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

DAY

1

Rational and Irrational Numbers

Today You Will Learn

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

Your Progress: Day 1 of 30

0%

Ready to begin? →

About 20 minutes

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

Irrational: $\sqrt{2} \approx 1.41421\ldots, \quad \pi \approx 3.14159\ldots$

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) $0.1234\ldots$ *(non-repeating)*

Solution:

1. $\sqrt{9} = 3 = \frac{3}{1}$ ☒ ***rational***
2. 5 *is not a perfect square, so* $\sqrt{5}$ *is a non-terminating, non-repeating decimal* ☒ ***irrational***
3. *A decimal that never terminates and never repeats* ☒ ***irrational***

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 $x = 0.8333\ldots$

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

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

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

$90x = 75$, *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?*

3. *True or false: Every integer is a rational number.*

4. *Which of the following is irrational?* (A) $\frac{22}{7}$ (B) π (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 $0.\overline{9} = 0.999\ldots$ 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 $1 \le n \le 50$ 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

WEEK 2

Lines and Linear Equations

This Week's Days

★ 2.1 Slope as Rate of Change ★

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

0%

Ready to begin? →

About 20 minutes

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!"*

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 $58°$F and at $2{:}00$ PM it was $82°$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 $= \dfrac{y_2 - y_1}{x_2 - x_1}$ 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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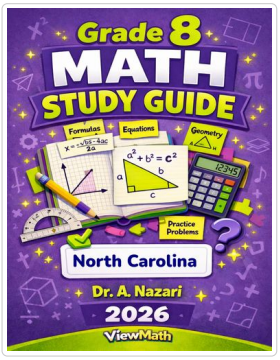
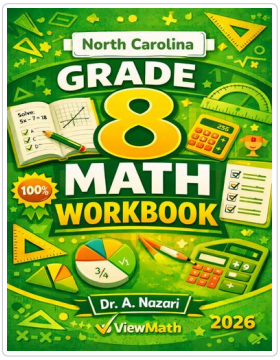


Study Guide

Scan Me



Workbook

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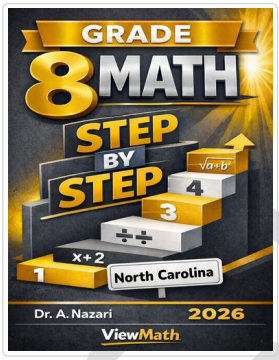

Step-by-Step

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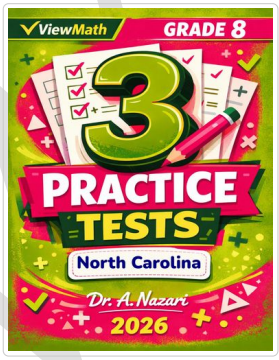

3 Practice Tests

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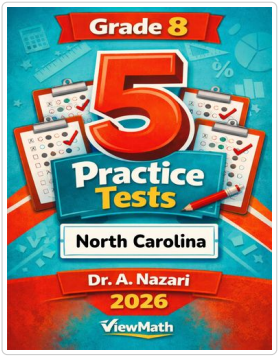

5 Practice Tests

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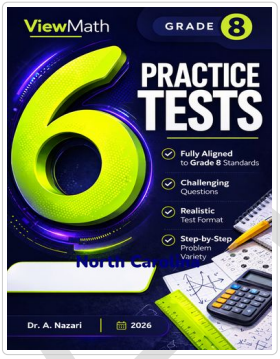

6 Practice Tests

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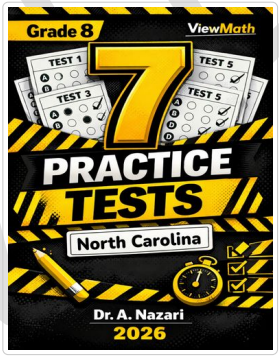

7 Practice Tests

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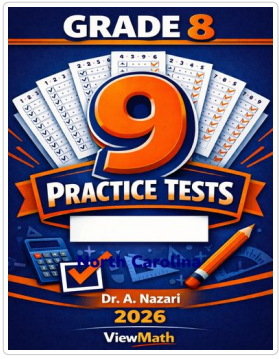

9 Practice Tests

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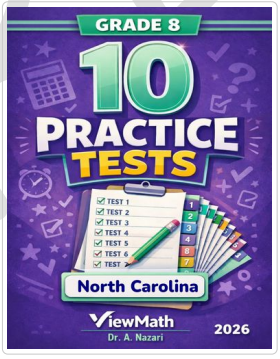

10 Practice Tests

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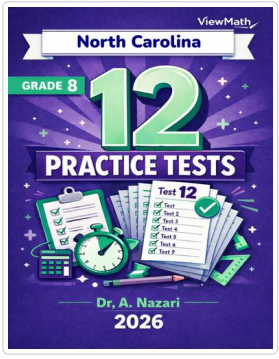

12 Practice Tests

Scan Me

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