

Virginia SOL Grade 9 Math in 30 Days

Day by Day Study Plan for Test Prep

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YOUR 30-DAY ALGEBRA PLAN

Algebra 1 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 Algebra 1 — 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 — from real numbers and linear equations to quadratics and data analysis.



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.

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

1/3 done!

20

Almost there!

30

Complete!

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

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Classifying Real Numbers

Learning Goals

- Classify numbers into all applicable real number subsets
- Describe how the number subsets nest inside each other

The Real Number Subsets

Every number belongs to one or more subsets of the **real numbers**:

- **Natural numbers:** $1, 2, 3, \dots$ (counting numbers)
- **Whole numbers:** $0, 1, 2, 3, \dots$ (naturals plus zero)
- **Integers:** $\dots, -2, -1, 0, 1, 2, \dots$ (whole numbers and negatives)
- **Rational numbers:** any $\frac{a}{b}$ where a, b are integers and $b \neq 0$
- **Irrational numbers:** decimals that never end and never repeat ($\sqrt{2}, \pi$)

These sets nest like rings in a **Venn diagram**:

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

Irrational numbers sit beside Rational, inside Real. Every real number is either rational **or** irrational—never both.

Classify Into All Subsets

Place each number in **every** subset that applies.

1. 7: Natural, Whole, Integer, Rational, Real
2. 0: Whole, Integer, Rational ($\frac{0}{1}$), Real
3. -3 : Integer, Rational ($\frac{-3}{1}$), Real
4. $\frac{2}{3} = 0.\bar{6}$: Rational (repeats), Real
5. $0.75 = \frac{3}{4}$: Rational (terminates), Real
6. $\pi = 3.14159\dots$: Irrational, Real
7. $\sqrt{3} = 1.732\dots$: Irrational, Real



Rational Numbers	Irrational Numbers
<ul style="list-style-type: none"> • Written as $\frac{a}{b}$, $b \neq 0$ • Decimals terminate or repeat • Examples: $\frac{3}{4}$, -2, $0.\bar{6}$ 	<ul style="list-style-type: none"> • Cannot be written as $\frac{a}{b}$ • Decimals never terminate or repeat • Examples: $\sqrt{2}$, π, $\sqrt{10}$

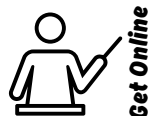


“ Every integer is rational! Write it over 1: $-5 = \frac{-5}{1}$, $0 = \frac{0}{1}$. ”

Classifying Real Numbers

1. Classify -7 into all applicable subsets.
2. Classify $\sqrt{3}$ into all applicable subsets.
3. Classify 0.75 into all applicable subsets.
4. List all subsets for $\sqrt{25}$.
5. Every whole number is also a rational number.

True False



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What Is a Function?

Learning Goals

- Decide whether a relation is a function using multiple representations
- Represent relations as ordered pairs, tables, mapping diagrams, and graphs

What Is a Function?

A **relation** is any set of ordered pairs (x, y) .

A **function** is a relation where every input (x) gives exactly one output (y) . No x -value may repeat with a different y -value.

Ways to represent a relation:

- **Set of ordered pairs:** $\{(1, 4), (2, 5), (3, 6)\}$
- **Table:** inputs in one row, outputs in another
- **Mapping diagram:** arrows from each input to its output
- **Graph:** points or curves on a coordinate plane

A relation is **discrete** if it has separate, countable points. A relation is **continuous** if it has a connected line or curve.

Checking Multiple Representations

Is the relation $\{(1, 5), (2, 8), (3, 10), (1, 7)\}$ a function?

Ordered pairs: $x = 1$ appears twice with outputs 5 and 7.

Mapping diagram: 1 has two arrows ($1 \rightarrow 5$ and $1 \rightarrow 7$).

One input gives two outputs, so this is **not a function**.



The Vertical Line Test

- 1 Draw or look at the graph of the relation.
- 2 Slide a vertical line across the graph from left to right.
- 3 If the line ever hits **two or more points**, it is **not** a function.
- 4 If every vertical line hits at most one point, it **is** a function.



“ A function is like a rule: one question, one answer. In a mapping diagram, each input gets exactly one arrow! ”



TIP

Two different inputs **can** share the same output and still be a function. Only repeated inputs with different outputs break the rule.

What Is a Function?

1. Is $\{(2, 4), (3, 6), (4, 8), (5, 10)\}$ a function?
2. Is $\{(1, 3), (2, 5), (1, 7)\}$ a function?
3. A mapping diagram shows $3 \rightarrow 9$, $4 \rightarrow 16$, $5 \rightarrow 9$. Is it a function?
4. Is the relation $\{(1, 2), (3, 4), (5, 6)\}$ discrete or continuous?
5. Every function is a relation.

True False



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Answer Key

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

1 Integer, Rational, Real

2 Irrational, Real

3 Rational, Real

4 Nat, Whole, Int, Rat, Real

5 True

1 Yes

2 No

3 Yes

4 Discrete

5 True

💡 Explanations

1 -7 is negative, so not natural or whole. It is an integer. Since $-7 = \frac{-7}{1}$, it is also rational.

2 3 is not a perfect square. $\sqrt{3}$ is a non-repeating, non-terminating decimal—irrational and real.

3 $0.75 = \frac{3}{4}$, a terminating decimal. Rational and real, but not an integer.

4 $\sqrt{25} = 5$. Since 5 is a counting number, it belongs to every subset except irrational.

1 Each input appears only once. Every x -value maps to exactly one y -value.

2 $x = 1$ maps to both 3 and 7 . One input gives two outputs.

3 Each input maps to one output. Two inputs may share an output—that is still a function.



4 The relation is a set of separate points. Discrete means individual, countable points.

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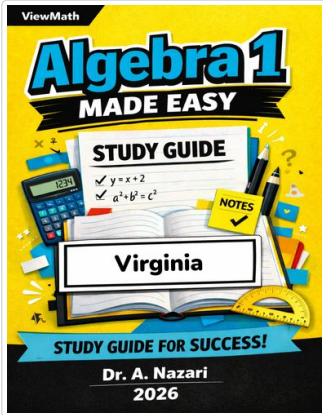


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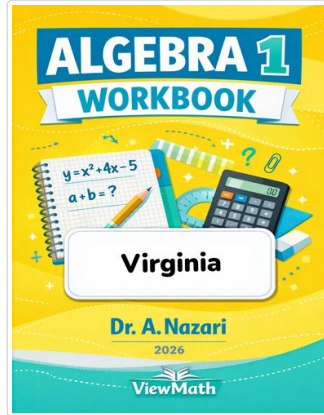
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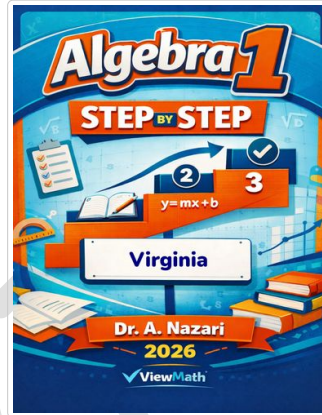
Study Guide



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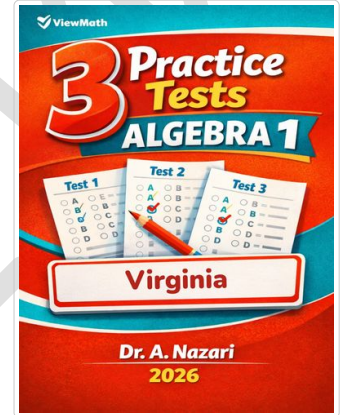
Workbook



Step-by-Step



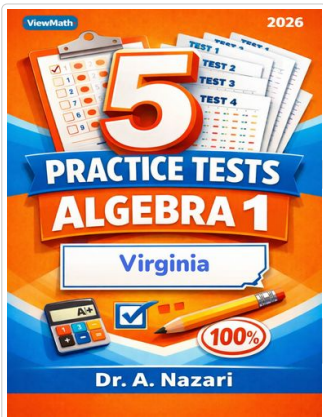
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3 Practice Tests



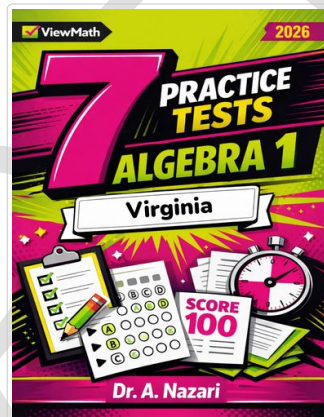
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5 Practice Tests



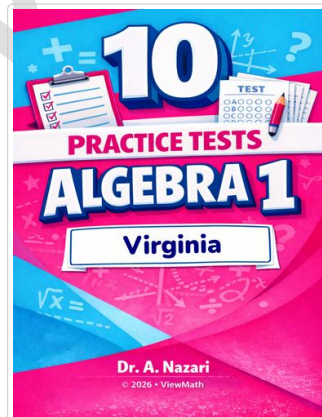
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7 Practice Tests



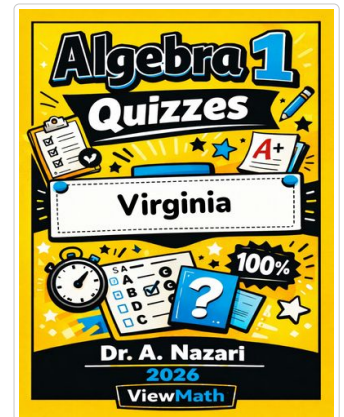
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10 Practice Tests



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Quizzes



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