

Virginia SOL Grade 9 Math Quizzes

Quick Topic Assessments with Answer Key

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Published by View Math Education

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QUICK QUIZZES FOR EVERY TOPIC

Algebra 1 Math Quizzes

Topic Quizzes • Chapter Reviews • Answer Key

Quick, focused quizzes are one of the best ways to find out what you really know — and what you still need to work on.

This book has a short quiz for every Algebra 1 topic. Each one takes about 10–15 minutes and covers the most important skills for that section. Take a quiz, score it, and see exactly where you stand.

Use it after studying a topic, the night before a test, or anytime you want a fast check-in on your algebra skills.



Take the Quiz

*10–15 minutes
per quiz*



Score It

*Check every answer
in the key*



Review & Retry

*Study what you missed
then quiz again*

How to Use This Book

1 *Pick a topic you've been studying*

Look through the table of contents and find the quiz that matches the topic you just covered in class or in your study guide.

2 *Set a timer for 10–15 minutes*

Give yourself a reasonable time limit. Working with a timer helps you build speed and stay focused — just like a real test.

3 *Answer every question*

Try each problem. If you get stuck, skip it and come back at the end. Don't leave any question blank — a good guess is better than no answer.

4 *Check your answers*

Use the answer key in the back. Mark each question right or wrong. Write your score on the quiz page and track your progress over time.

5 *Review what you missed*

Go back to the problems you got wrong. Read the topic explanation, study the method, then try the quiz again in a few days. Your score should improve every time.

Track Your Scores

Every quiz in this book has a **Name / Date / Score** bar at the top. After you finish a quiz, check your answers using the answer key in the back, then write your score on that bar.

★ How to Track Your Progress

- 1 Write your score on the quiz page right after you grade it.
- 2 Circle any quiz where you scored below 70 %.
- 3 Review the topic, then retake the quiz in a few days.
- 4 Compare your scores — you'll see improvement every time!

💡 *Tip: Your score should go up every time you retake a quiz. That's how you know you're learning!*

✎ Use the score bar on each quiz page to record your results.

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CHAPTER

1

Foundations of Algebra

★ What's Inside ★

1.1 Classifying Real Numbers	2
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★ 1.1 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



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6. $\pi = 3.14159\dots$: Irrational, Real

7. $\sqrt{3} = 1.732\dots$: Irrational, Real

Rational Numbers

- Written as $\frac{a}{b}$, $b \neq 0$
- Decimals terminate or repeat
- Examples: $\frac{3}{4}$, -2 , $0.\bar{6}$

Irrational Numbers

- 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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CHAPTER

2

Introduction to Functions

★ *What's Inside* ★

<i>2.1 What Is a Function?</i>	5
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★ 2.1 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**.



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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 & Explanations



Answer Key

First try each quiz on your own, then check your work here.

0 Integer, Rational, Real

0 Irrational, Real

0 Rational, Real

0 Nat, Whole, Int, Rat, Real

0 True

0 Yes

0 No

0 Yes

0 Discrete

0 True

Explanations

0 -7 is negative, so not natural or whole. It is an integer. Since $-7 = \frac{-7}{1}$, it is also rational.

0 3 is not a perfect square. $\sqrt{3}$ is a non-repeating, non-terminating decimal—irrational and real.

0 $0.75 = \frac{3}{4}$, a terminating decimal. Rational and real, but not an integer.

0 $\sqrt{25} = 5$. Since 5 is a counting number, it belongs to every subset except irrational.

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

0 $x = 1$ maps to both 3 and 7 . One input gives two outputs.

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

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



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Well done checking your answers!

Keep practicing to strengthen your skills.

PREVIEW



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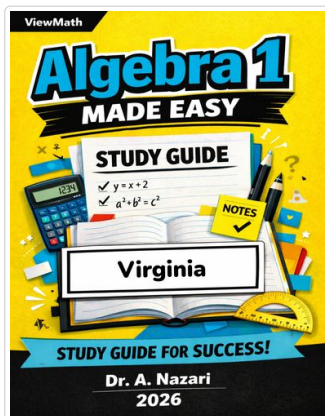


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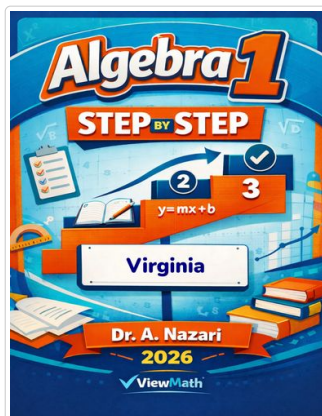
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Study Guide



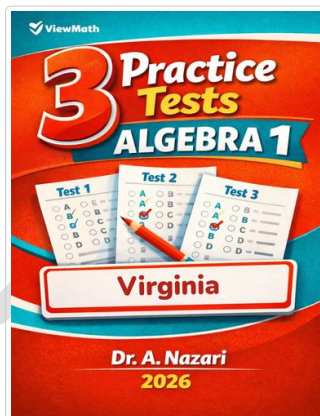
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Step-by-Step



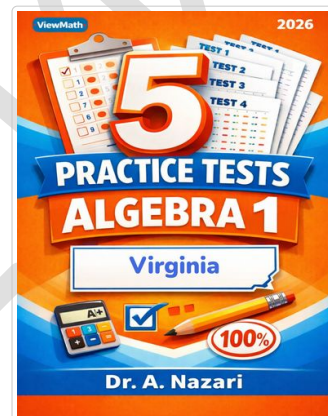
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3 Practice Tests



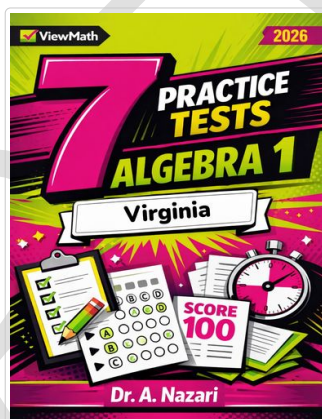
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5 Practice Tests



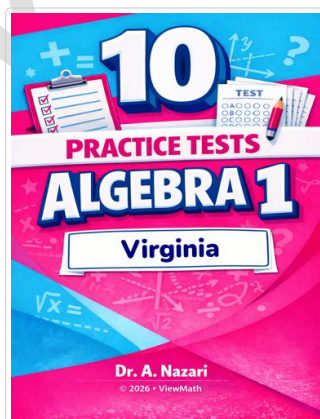
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7 Practice Tests



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10 Practice Tests



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