

REAL NUMBERS

The Comprehensive Classification Guide

Rational Numbers ($\mathbb{Q}$)

Numbers that can be expressed as a fraction p/q where $q \neq 0$.

- **Integers ($\mathbb{Z}$)** $\dots, -2, -1, 0, 1, 2, \dots$
 - **Whole Numbers ($\mathbb{W}$)** $0, 1, 2, 3, \dots$
 - **Natural Numbers ($\mathbb{N}$)** $1, 2, 3, \dots$
- **Terminating Decimals** $0.25, 0.5, 0.875$
- **Repeating Decimals** $0.333\dots, 0.142857\dots$

Irrational Numbers ($\mathbb{P}$)

Numbers that cannot be expressed as simple fractions. Their decimals go on forever without repeating.

- **Non-Repeating Decimals** π (3.14159...), e (2.71828...)
- **Non-Perfect Squares** $\sqrt{2}, \sqrt{3}, \sqrt{5}$
- **Transcendental Numbers** ϕ (Golden Ratio)

Definition Summary

Real Numbers ($\mathbb{R}$): The set of all rational and irrational numbers. They represent any point along an infinite number line.