

# UNDERSTANDING RATIONAL NUMBERS

A Quick Reference Guide for Students

**Definition:** A **Rational Number** is any number that can be expressed as a fraction  $p/q$ , where  $p$  and  $q$  are integers and  $q \neq 0$ .

## Integers

Whole numbers and their negative opposites.

$\dots, -3, -2, -1, 0, 1, 2, 3, \dots$

## Terminating Decimals

Decimals that have a specific end point.

$0.5, 0.75, 1.25, 8.125$

## Repeating Decimals

Decimals with a digit pattern that repeats infinitely.

$0.333\dots, 0.1414\dots, 0.666\dots$

## Perfect Square Roots

Square roots of numbers that result in integers.

$\sqrt{4} (2), \sqrt{16} (4), \sqrt{81} (9)$

| Number Type      | Example | As a Fraction (p/q) |
|------------------|---------|---------------------|
| Whole Number     | 5       | $5 / 1$             |
| Negative Integer | -12     | $-12 / 1$           |

| Number Type  | Example        | As a Fraction (p/q)             |
|--------------|----------------|---------------------------------|
| Mixed Number | $2\frac{1}{2}$ | $\frac{5}{2}$                   |
| Decimal      | 0.8            | $\frac{8}{10}$ or $\frac{4}{5}$ |

*Note: If a decimal does not end and does not repeat (like  $\pi$  or  $\sqrt{2}$ ), it is **Irrational**.*