

RATIONAL NUMBERS REFERENCE

Comprehensive Mathematical Classification & Properties

Formal Definition: A rational number is any number that can be expressed as the quotient or fraction p/q of two integers, where p is the numerator and q is a non-zero denominator.

Classification	Description	Examples
Integers	Whole numbers and their negative opposites. All integers are rational because they can be written as $n/1$.	-5 0 12
Terminating Decimals	Decimals that have a finite number of digits after the decimal point.	0.25 0.875 3.1
Repeating Decimals	Decimals with a digit or sequence of digits that repeat infinitely.	0.333... 0.142857...
Fractions	Proper, improper, and mixed numbers representing parts of a whole.	1/2 7/4 2 1/3
Perfect Squares (Roots)	Square roots of perfect squares result in integers, which are rational.	$\sqrt{4}$ $\sqrt{81}$ $\sqrt{0.25}$

Natural Numbers

1, 2, 3...

Whole Numbers

0, 1, 2...

Integers

...-1, 0, 1...

Rational Numbers

All of the above + Fractions

Note: Irrational numbers (like π or $\sqrt{2}$) cannot be written as simple fractions and are excluded from this chart.