The Real Number System

Type of Number	Definition	Examples	Counter Examples
Real Numbers	All the numbers that can be associated with points on a number line.	-1, -1/2, 1/2, 1, $\sqrt{3}$, 0, 5, $\sqrt[3]{-8}$, π, e	5 + 3í, -í
Rational numbers	The subset of real numbers which can be written as a quotient p/q of two integers, where $q \neq 0$.	2/3, -3/4, 7/8 9 = 9/1 0.125 = 1/8	$\sqrt{2}$, π, e
Irrational Numbers	The subset of real numbers whose decimal representation neither repeats nor terminates, i.e., or the subset of real numbers that are not rational.	$\sqrt{2}$ or 1.41413562 e or 2.718281828 π or 3.141592654	2/3
Natural Numbers	The set of counting numbers: 1, 2, 3, 4, 5, …	1, 2, 3, 4, 5, … $\sqrt{9}$ = 3 14/2 = 7	-2, 1/8, $\sqrt{3}$, 0
Whole Numbers	The set of natural numbers including zero: W = 0, 1, 2, 3, 4, 5, …	0, 1, 2, 3, 4, 5, … $\sqrt{4}$ = 2 0/10 = 0	$\sqrt{5}$, -1/2, 2/3, -7
Integers	The set of natural numbers, their negatives and zero: Z = … , -3, -2, -1, 0, 1, 2, 3, …	…, -3, -2, -1, 0, 1, 2, 3, … -9/3 = -3 $\sqrt{25}$ = 5	4/5, -6/13
Prime Numbers	All natural numbers greater than one which have no divisors except themselves and one.	5 is a prime number since its only divisors are itself and one: (5 x 1)	8 is not a prime since it has divisors other than itself and one: (2 x 4) and (8 x 1)
Composite Numbers	All natural numbers greater than one which are **not** prime numbers.	4, 6, 8, 9, 10, 12, …	3, 5, 7, 11, 13, …