Number sets – notation

Natural numbers: $\mathbf{N} = \{1, 2, 3, 4, \cdots\}$

Whole numbers: $\mathbf{W} = \{0, 1, 2, 3, 4, \cdots\}$

Integers: $\mathbf{Z} = \{\cdots -3, -2, -1, 0, 1, 2, 3, \cdots\}$

Rational numbers: $\mathbf{Q} = \left\{ \frac{p}{q} \,\middle|\, p \in \mathbf{Z}, q \in \mathbf{Z}, q \neq 0 \right\}$

Real numbers: $\mathbf{R}$

Complex numbers: $\mathbf{C} = \left\{ a + bi \,\middle|\, a \in \mathbf{R}, b \in \mathbf{R}, i^2 = -1 \right\}$

Irrational Numbers

Irrational refers to a kind of number that cannot be written as a fraction (ratio) using only positive and negative counting numbers (integers). For example, you can write the rational number 2.11 as 211/100, but you cannot turn the irrational number 'square root of 2' or $\sqrt{2}$ into an exact fraction of any kind.

Real Numbers(R)

What is a real number? A real number is any number on the number line and includes subsets of numbers including natural, whole, integer, rational and irrational numbers. In simpler terms, all numbers are real numbers except for imaginary numbers—which are a set of complex numbers once thought to be impossible to calculate.