

REAL NUMBER / REAL SET

Equations and Variables are the essential ingredients of a mathematical model

When variables take numerical values: **Number System**

Positive Integer: 1, 2, 3,

Negative Integer: -1, -2, -3,

Zero: Neither Positive nor negative

Set of all integers (I): {..., -3, -2, -1, 0, 1, 2, 3, ...}

Rational Number / Fractions: Ratio of two integers

Positive Fractions: $\frac{2}{3}, \frac{5}{4}, \frac{7}{3}$.

Negative Fractions: $-\frac{2}{3}, -\frac{3}{4}, -\frac{5}{7}, \dots$

Set of all Fractions/ Rational Numbers (R): $(-\frac{2}{3}, -\frac{3}{4}, -\frac{5}{7}, \frac{2}{3}, \frac{5}{4}, \frac{7}{3}, 2, 7, -2, -6)$
 $7 = 7/1$

Rational Number: Any number that can be expressed as ratio of two integers

$y = f(x)$, such that $x \in R^+$

R = (All Fractions + All Integers)

Now a fraction could be of 2 types:

- 1) **Terminating** (e.g. $\frac{1}{4} = 0.25$)
- 2) **Repeating** (e.g. $\frac{1}{3} = 0.333333$)

Irrational Number: Can not be expressed as a ratio of two numbers

Non-repeating & Non-terminating

e.g. $\sqrt{2} = 1.4142$; $\pi = 3.1415$



0 1 1.5 1.7 2

Real Line: Number Line

Fraction lies between two integers

Irrational Number lies between two Rational Numbers

Set of Real Numbers (R): A non-void continuous set

