Chapter-1

Rational Numbers

Introduction

- A number which can be written in the form of p/q, where p and q are integers and $q \neq 0$ is called rational number.

For Example: $-2/3$, $4/5$

- Rational numbers are closed under the operations of addition, subtraction and multiplication.
- The operation addition and multiplication are :-
- Commutative for rational numbers.
  i.e For any two rational numbers a and b
  $$a + b = b + a$$
  $$a \times b = b \times a$$
- Rational number 0 is the additive identity for all rational numbers i.e For any rational number a, $a + 0 = a$
- The rational number 1 is the muliplicative identity for all rational numbers
  i.e For any rational number a, $a \times 1 = a$

- The additive inverse of rational number $\frac{a}{b}$ is $-\frac{a}{b}$

The multiplicative inverse or reciprocal of a rational number a/b is b/a

i.e $a/b \times b/a = 1$

- Distributive Property :-

For any three rational numbers a, b and c

$a(b+c) = a \times b + a \times c$ [Distribution of Multiplication over addition]

$a(b-c) = a \times b - a \times c$ [Distribution of Multiplication over subtraction]

- Rational numbers can be represented on a number line.

- Between any two given rational numbers there are countless rational numbers.

- For any three rational numbers a, b and c

$a \times (b \times c) = (a \times b) \times c$ (Associative property for multiplication)

$a + (b + c) = (a + b) + c$ (Associative property for addition)

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