

Number Systems

=> Natural Numbers: All counting numbers are called natural numbers

$$\{1, 2, 3, 4, \dots\}$$

=> Whole Numbers: Natural numbers along with 0 form the collection of whole number.

$$\{0, 1, 2, 3, \dots\}$$

⊛ Every natural number is a whole number but every whole number is not natural number.

As $0 \rightarrow$ whole number but not natural no.

=> Integers: The natural numbers, zero and negative of all natural numbers form the collection of all integers.

$$\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$$

=> Rational Numbers: The numbers which can be expressed in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

eg. $\frac{3}{2}, -\frac{4}{3}, 0, 5$

\downarrow \searrow
 $\frac{0}{1}$ $\frac{5}{1}$

⊛ $\frac{1}{5} = \frac{2}{10} = \frac{3}{15} = \frac{4}{20} \dots$ are called equivalent rational numbers

=> Writing Rational Number between two given numbers

(i) A rational number between two rational number a and b is $\frac{a+b}{2}$

(ii) Then find rational numbers between a and $\frac{a+b}{2}$

ie. $\frac{a + \left(\frac{a+b}{2}\right)}{2}$ and so on...

(iii) Make fractions equivalent and find required rational numbers between them.

=> Decimal Expansion of a rational number is either terminating or non-terminating

⊛ Terminating and Non-Terminating, repeating are Rational Numbers