

## Real Numbers

## Rational numbers

A number which can be expressed in the form of  $\frac{p}{q}$ , where  $p$  and  $q$  are integers but  $q \neq 0$  is called rational number.

- Natural numbers

- All counting numbers

Ex - 1, 2, 3, 4, ...

- Whole numbers

- All counting numbers along with 0 is called whole numbers.

Ex - 0, 1, 2, 3, 4, ...

- Integers

- All whole no (+) All negative natural no.

0, 1, 2, 3, 4, ... (+)

-1, -2, -3, -4, ...

- Fraction

- part of a whole is called fractions,

$\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{5}{6}$  etc, ...

- Remaining numbers

$-\frac{1}{2}$ ,  $-\frac{3}{4}$ ,  $-\frac{5}{6}$

## Irrational Number

A number which can ~~be~~ not be expressed in the form of  $\frac{p}{q}$ , where  $p, q$  are integers, but  $q \neq 0$ , is

called irrational number.

$$\sqrt{2} = 1.41421356\dots$$

$$\sqrt{3} = 1.73205081\dots$$

$$\sqrt{5} = 2.23606\dots$$

$$\sqrt{6} = 2.44948974\dots$$

Decimal expansion of irrational number

Non-terminating as well as non-recurring

Q1 Find 5 rational numbers between 1 and 2.

Q2 Find 5 rational numbers  $\frac{3}{5}$  and  $\frac{4}{5}$

Q3 Find 5 rational numbers between  $-\frac{5}{6}$  and 0.

①  $1 = \frac{1}{1} = \frac{1 \times 500}{1 \times 500} = \frac{500}{500}$

$2 = \frac{2}{1} = \frac{2 \times 500}{1 \times 500} = \frac{1000}{500}$

The required rational numbers

between  $\frac{500}{500}$  and  $\frac{1000}{500}$  are

$\frac{501}{500}, \frac{502}{500}, \frac{503}{500}, \frac{504}{500}, \frac{505}{500}$

②  $\frac{3}{5} = \frac{3 \times 40}{5 \times 40} = \frac{120}{200}$

$\frac{4}{5} = \frac{4 \times 40}{5 \times 40} = \frac{160}{200}$

The required rational numbers between

$\frac{120}{200}$  and  $\frac{160}{200}$  are  $\frac{121}{200}, \frac{122}{200}$

$\frac{123}{200}, \frac{124}{200}, \frac{125}{200}$

③  $-\frac{5}{6} = \frac{-5 \times 20}{6 \times 20} = \frac{-100}{120}$

$0 = \frac{0}{1} = \frac{0 \times 120}{1 \times 120} = \frac{0}{120}$

H.W

Q1 find 0.1

Q2 find  $\frac{5}{7}$

Q3 find

Q4 find

Q5 find

①

②

e

H.W

Q1 Find a rational number between 0 and 0.1.

Q2 Find 4 rational nos. between  $\frac{3}{7}$  and  $\frac{5}{7}$ .

Q3 Find 7 rational nos. between  $-\frac{2}{5}$  and  $\frac{1}{7}$ .

Q4 Find 3 rational nos. between -3 and -2.

Q5 Find 10 rational nos. between  $-\frac{5}{6}$  and  $\frac{7}{8}$ .

Q1

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Ex - 1.1

Yes 0 is a rational number because it is in the form of  $\frac{0}{1}$ , where 0 and 1 are integers and  $1 \neq 0$ .

Q2

3 & 4

$$3 = \frac{3}{1} = \frac{3 \times 100}{1 \times 100} = \frac{300}{100}$$

$$4 = \frac{4}{1} = \frac{4 \times 100}{1 \times 100} = \frac{400}{100}$$

Q3

~~100~~

$\therefore$  The 6 rational numbers between  $\frac{300}{100}$  &  $\frac{400}{100}$  are  $\frac{301}{100}, \frac{302}{100}, \frac{303}{100},$

$$\frac{304}{100}, \frac{305}{100}, \frac{306}{100}$$

Q3

(i) True, because whole number includes all natural number.

(ii) False, because -1 is an integer but not a whole no.

(iii) False because  $\frac{1}{2}$  is rational no. but not whole no.

$\therefore$  The required rational nos. between  $-\frac{100}{120}$  &  $\frac{0}{120}$

are  $-\frac{99}{120}, -\frac{98}{120}, -\frac{97}{120}, -\frac{96}{120}, -\frac{1}{120}$