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Class :-12(Maths)

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**1. Is zero a rational number? Can you write it in the form  $p/q$  where  $p$  and  $q$  are integers and  $q \neq 0$ ?**

Solution:

We know that, a number is said to be rational if it can be written in the form  $p/q$ , where  $p$  and  $q$  are integers and  $q \neq 0$ .

Taking the case of '0',

Zero can be written in the form  $0/1, 0/2, 0/3 \dots$  as well as  $, 0/1, 0/2, 0/3 \dots$

Since it satisfies the necessary condition, we can conclude that 0 can be written in the  $p/q$  form, where  $q$  can either be positive or negative number.

Hence, 0 is a rational number.

**2. Find six rational numbers between 3 and 4.**

Solution:

There are infinite rational numbers between 3 and 4.

As we have to find 6 rational numbers between 3 and 4, we will multiply both the numbers, 3 and 4, with  $6+1 = 7$  (or any number greater than 6)

$$\text{i.e., } 3 \times (7/7) = 21/7$$

and,  $4 \times (7/7) = 28/7$ . The numbers in between  $21/7$  and  $28/7$  will be rational and will fall between 3 and 4.

Hence,  $22/7, 23/7, 24/7, 25/7, 26/7, 27/7$  are the 6 rational numbers between 3 and 4.

**3. Find five rational numbers between  $3/5$  and  $4/5$ .**

Solution:

There are infinite rational numbers between  $3/5$  and  $4/5$ .

To find out 5 rational numbers between  $3/5$  and  $4/5$ , we will multiply both the numbers  $3/5$  and  $4/5$

with  $5+1=6$  (or any number greater than 5)

i.e.,  $(\frac{3}{5}) \times (\frac{6}{6}) = \frac{18}{30}$

and,  $(\frac{4}{5}) \times (\frac{6}{6}) = \frac{24}{30}$

The numbers in between  $\frac{18}{30}$  and  $\frac{24}{30}$  will be rational and will fall between  $\frac{3}{5}$  and  $\frac{4}{5}$ .

Hence,  $\frac{19}{30}$ ,  $\frac{20}{30}$ ,  $\frac{21}{30}$ ,  $\frac{22}{30}$ ,  $\frac{23}{30}$  are the 5 rational numbers between  $\frac{3}{5}$  and  $\frac{4}{5}$

**4. State whether the following statements are true or false. Give reasons for your answers.**

**(i) Every natural number is a whole number.**

Solution:

**True**

Natural numbers- Numbers starting from 1 to infinity (without fractions or decimals)

i.e., Natural numbers= 1,2,3,4...

Whole numbers- Numbers starting from 0 to infinity (without fractions or decimals)

i.e., Whole numbers= 0,1,2,3...

Or, we can say that whole numbers have all the elements of natural numbers and zero.

Every natural number is a whole number; however, every whole number is not a natural number.