

**CLASS-IX
MATHS
EXERCISE 1.1
BASED ON RATIONAL
NUMBER**

PREPARED BY - S K BHATIA
TGI, MATHS
KV, BARKUHI

NCERT SOLUTION CLASS CH-1

EXERCISE - 1.1

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

Ans. Yes, zero is a rational number

Yes, we can write Zero in the form $\frac{p}{q}$.
 $0 = 0/1 = 0/2 = 0/3 \dots = p/q$,

clearly $p=0$ (in each case) is an integer, $q=1,2,3,\dots$ ($q \neq 0$) is also an integer (in each case)

Explanation

Consider the definition of a rational number.

A rational number is the one that can be written in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

Zero can be written as $\frac{0}{1}, \frac{0}{2}, \frac{0}{3}, \frac{0}{4}, \frac{0}{5}, \dots$.

So, we arrive at the conclusion that 0 can be written in the form of $\frac{p}{q}$, where p , q are

any integer & $q \neq 0$ as in $\frac{0}{1}, \frac{0}{2}, \frac{0}{3}, \frac{0}{4}, \frac{0}{5}, \dots$ $q=1,2,3,4,5$ and $q \neq 0$

Therefore, zero is a rational number.

2. Find six rational numbers between 3 and 4.

Ans. We know that there are infinite rational numbers between any two numbers.

A rational number is the one that can be written in the form of $\frac{p}{q}$, where p and q are Integers and $q \neq 0$.

We know that the numbers $3.1, 3.2, 3.3, 3.4, 3.5$ and 3.6 all lie between 3 and 4.

We need to rewrite the numbers $3.1, 3.2, 3.3, 3.4, 3.5$ and 3.6 in $\frac{p}{q}$ form to get the rational numbers between 3 and 4.

So, after converting, we get $\frac{31}{10}, \frac{32}{10}, \frac{33}{10}, \frac{34}{10}, \frac{35}{10}$ and $\frac{36}{10}$.

We can further convert the rational numbers $\frac{32}{10}, \frac{34}{10}, \frac{35}{10}$ and $\frac{36}{10}$ into lowest fractions.

On converting the fractions into lowest fractions, we get $\frac{16}{5}, \frac{17}{5}, \frac{7}{2}$ and $\frac{18}{5}$.

Therefore, six rational numbers between 3 and 4 are $\frac{31}{10}, \frac{16}{5}, \frac{33}{10}, \frac{17}{5}, \frac{7}{2}$ and $\frac{18}{5}$.

3. Find five rational numbers between $\frac{3}{5}$ and $\frac{4}{5}$.

Ans. We know that there are infinite rational numbers between any two numbers.

A rational number is the one that can be written in the form of $\frac{p}{q}$, where p and q are Integers and $q \neq 0$.

We know that the numbers $\frac{3}{5}$ and $\frac{4}{5}$ can also be written as 0.6 and 0.8.

We can conclude that the numbers 0.61, 0.62, 0.63, 0.64 and 0.65 all lie between 0.6 and 0.8

We need to rewrite the numbers 0.61, 0.62, 0.63, 0.64 and 0.65 in $\frac{p}{q}$ form to get the rational numbers between 3 and 4.

So, after converting, we get $\frac{61}{100}$, $\frac{62}{100}$, $\frac{63}{100}$, $\frac{64}{100}$ and $\frac{65}{100}$.

We can further convert the rational numbers $\frac{62}{100}$, $\frac{64}{100}$ and $\frac{65}{100}$ into lowest fractions.

On converting the fractions, we get $\frac{31}{50}$, $\frac{16}{25}$ and $\frac{13}{20}$.

Therefore, six rational numbers between 3 and 4 are $\frac{61}{100}$, $\frac{31}{50}$, $\frac{63}{100}$, $\frac{16}{25}$ and $\frac{13}{50}$.

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

(i) Every natural number is a whole number.

(ii) Every integer is a whole number.

(iii) Every rational number is a whole number.

Ans. (i) yes every natural number is a whole number.

Explanation

Consider the Natural numbers and Whole numbers separately.

Natural Number = $N = \{1, 2, 3, 4, \dots\}$.

Whole Number = $W = \{0, 1, 2, 3, 4, \dots\}$.

So, we can conclude that every number 1, 2, 3, in the Collection of natural numbers is also the member of in the Collection of whole numbers

Therefore, we conclude that, **yes every natural number is a whole number.**

(ii) No, every integer is not a whole number.

Explanation

Consider the integers and whole numbers separately.

Whole Number= $W=\{0,1,2,3,4,\dots\}$.

INTEGER= $Z=\{\dots,-4,-3,-2,-1,0,1,2,3,4,\dots\}$.

Clearly $0,1,2,3,4,5,\dots$ are whole numbers as well as in the collection of integers but

but negative integers like $-1,-2,-3,-4,\dots$ are not the members of whole numbers

So, We can conclude that all the whole numbers are also integers. But every number of collection of integers does not appear in the whole number

Hence answer is No, every integer is not a whole number.

(iii) No, every rational number is not a whole number

Explanation

Consider the rational numbers and whole numbers separately.

And find out reason

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the left and right sides of the frame, leaving a large white central area. The shapes are composed of triangles and polygons, some of which are semi-transparent, creating a layered effect.

THANKS