Fractions and Integers - Are they Rational Numbers?

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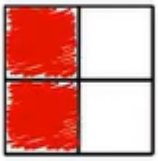
In the previous segment, we had a look at **Rational numbers**. In this segment let us see if Fractions and Integers are Rational Numbers?

Can Fractions be considered as rational numbers?

- A fraction represents a part of a whole or any number of equal parts.

  For example,

Image	Representation as Fraction
	As one part is coloured out of four, it can be expressed as $\frac{1}{4}$
	As two parts are coloured out of four, it can be expressed as $\frac{2}{4}$
	As three parts are coloured out of four, it can be expressed as $\frac{3}{4}$

All these numbers $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}$ are fractions as they are a part of the whole.

- A fraction is of the form $\frac{p}{q}$ where p and q are natural numbers such that p < q.
- A rational number can be defined as any number which can be represented in the form of $\frac{p}{q}$ where p and q are Integers such that $q \neq 0$.
- As the numbers $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}$ satisfies the conditions of Rational numbers, they are rational numbers. But a rational number like $\frac{-3}{4}$ cannot be considered as a fraction as the numerator is not a natural number.
- Thus, all fractions are rational numbers but all rational numbers may or may not be fractions.

Are Integers Rational Numbers?

- An integer defined as a number that can be written without a fractional component.
- Consider an integer, say 6.

  6 is not in the form of $\frac{p}{q}$. But 6 can be written as $\frac{6}{1}$.

  $\frac{6}{1}$ is in the form of $\frac{p}{q}$ where p and q are integers and $q \neq 0$.

  ∴ 6 is a Rational number.

- Let us consider another integer, say -12.

  -12 is not in the form of $\frac{p}{q}$. But -12 can be written as $\frac{-12}{1}$.

  $\frac{-12}{1}$ is in the form of $\frac{p}{q}$ where p and q are integers and $q \neq 0$.

  ∴ - 12 is a Rational number.

- Let us consider another integer, say 0.

  0 is not in the form of $\frac{p}{q}$. But 0 can be written as $\frac{0}{1}$.

  $\frac{0}{1}$ is in the form of $\frac{p}{q}$ where p and q are integers and $q \neq 0$.

- Thus, all Integers are rational numbers.

Summary

Rational Numbers	Natural numbers, Whole numbers, Integers and Fractions are all Rational numbers.

Did you know?

The rational number can be used to construct the real numbers by using infinite decimals, Dedekind cuts, and Cauchy sequences.

What's next?

In the next segment of Class 10 Maths, we will see what are **Positive and Negative Rational Numbers?**