

Class 7-Mathematics

Instructions for students: The notes provided must be copied to the Maths copy and then do the homework in the same copy.

Chapter 3

RATIONAL NUMBERS

Definition: Any number that can be expressed in the form $\frac{p}{q}$, where p, q are integers and $q \neq 0$, is called a rational number.

e. g. $\frac{2}{3}, \frac{-5}{9}, \frac{-4}{-7}, 0, 3, -6$

IMPORTANT FACTS ABOUT RATIONAL NUMBERS

- The word 'rational' comes from the word 'ratio'. Because every rational number is a ratio between two integers. E. g.: $\frac{6}{11} = 6 : 11$

- Every integer is a rational number.

$$\text{E.g. } 3 = \frac{3}{1}, -5 = \frac{-5}{1}, 0 = \frac{0}{1}$$

- Every fraction is a rational number.

$$\text{e. g. } \frac{5}{4}, \frac{6}{7}, 3\frac{1}{2}$$

- $\frac{3}{0}, \frac{-2}{0}, \frac{1}{0}$, etc. are not rational numbers since division by 0 is not allowed.
- Every rational number can be expressed as decimals.

$$\text{e.g. } \frac{1}{8} = 0.125, \frac{11}{25} = 0.44$$

EQUIVALENT RATIONAL NUMBERS

Two or more rational numbers are said to be **equivalent** if they have **same value**.

We obtain the equivalent rational numbers for a give rational number by multiplying both Numerator and denominator by same non- zero integer.

$$\text{e. g. } \frac{4}{-5} = \frac{8}{-10} = \frac{12}{-15} \text{ are equivalent rational numbers.}$$

EQUAL RATIONAL NUMBERS

Two rational numbers $\frac{p}{q}$ and $\frac{r}{s}$ are equal if and only if $p \times s = q \times r$

i.e., $\frac{p}{q} = \frac{r}{s}$ if and only if $p \times s = q \times r$

$$\begin{array}{ccc} \frac{p}{q} & \begin{array}{l} \nearrow \\ \searrow \end{array} & \frac{r}{s} \\ & & \end{array}$$

Exercise 3.1

1. Ans. $\frac{5}{8}, 7, \frac{-3}{-13} = \frac{3}{13}, \frac{-17}{-6} = \frac{17}{6}$

2. Ans. $\frac{-5}{7}, \frac{4}{-3}, -6, \frac{-28}{5}$

3. ii) Find four rational numbers equivalent to $\frac{-5}{-9}$

Solution:

$$\frac{-5}{-9} = \frac{-5 \times 2}{-9 \times 2} = \frac{-10}{-18}$$

$$\frac{-5}{-9} = \frac{-5 \times 3}{-9 \times 3} = \frac{-15}{-27}$$

$$\frac{-5}{-9} = \frac{-5 \times 4}{-9 \times 4} = \frac{-20}{-36}$$

$$\frac{-5}{-9} = \frac{-5 \times 5}{-9 \times 5} = \frac{-25}{-45}$$

$$\frac{-10}{-18}, \frac{-15}{-27}, \frac{-20}{-36}, \frac{-25}{-45} \text{ are equivalent to } \frac{-5}{-9}.$$

5. i) Ans. $\frac{5}{20}, \frac{6}{24}, \frac{7}{28}, \frac{8}{32}$

ii) Ans. $\frac{-10}{15}, \frac{-12}{18}, \frac{-14}{21}, \frac{-16}{24}$

Home Work: Complete **Exercise 3.1** in the Maths copy.

Solve Yourself: Questions 7, 8, 9

Watch the video for rest of the solutions.