

CHAPTER - 1 (RATIONAL NUMBERS)

* RATIONAL NUMBERS - A number which is in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$ is known as rational number.

e.g. $\frac{3}{4}$, $-\frac{1}{5}$, $-\frac{2}{3}$ etc

* EQUIVALENT RATIONAL NUMBERS - (1) Two rational numbers $\frac{p}{q}$ and $\frac{r}{s}$ are equivalent if $p \times s = r \times q$. e.g. $\frac{2}{3} = \frac{4}{6}$ as $2 \times 6 = 12$; $3 \times 4 = 12$.

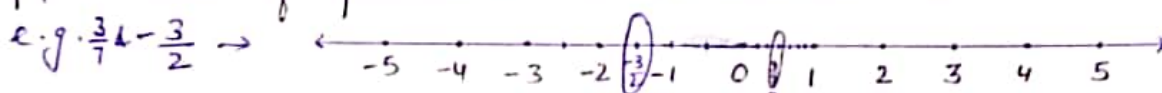
$$(2) \frac{p}{q} = \frac{p \times m}{q \times m} ; m \neq 0$$

e.g. $\frac{-4}{7} = \frac{-4 \times 2}{7 \times 2} = \frac{-8}{14}$, Here $m = 2$

* ABSOLUTE VALUE OF RATIONAL NO. :- The absolute value of a rational no. is written in the following ways.

e.g. Absolute value of $\frac{3}{5}$ is $|\frac{3}{5}| = \frac{3}{5}$
 Absolute value of $-\frac{3}{5}$ is $|\frac{-3}{5}| = \frac{3}{5}$

* Representation of Rational nos. on a Number line -



Rule - Divide each integer into that many part starting from zero and count the number as many number in Numerator.

NOW ANSWER THE FOLLOWING QUESTIONS -

Q.1. Which of the following is a rational number :-

a) $-\frac{2}{9}$ b) -3 c) $-\frac{2}{3}$ d) $\frac{4}{0}$ e) $\frac{0}{-3}$ f) $\frac{3}{-20}$ g) $\frac{4}{7}$ h) 3

Q.2. In each of the following case, show that the rational number is equivalent. If not, show it also :-

a) $\frac{4}{9}$ and $\frac{44}{99}$ (b) $\frac{4}{9}$ and $\frac{11}{27}$ (c) $\frac{7}{-3}$ and $\frac{35}{-15}$ (d) $-\frac{3}{5}$ & $-\frac{12}{20}$

e) $-\frac{100}{3}$ and $\frac{300}{9}$ (f) $\frac{3}{-17}$ and $\frac{8}{-51}$ (g) $\frac{5}{-7}$ and $\frac{10}{-14}$ (h) $\frac{6}{7}$ and $\frac{7}{6}$

Q.3. Write absolute value of the following rational numbers and represent the original value as well as absolute value in different number lines.

(a) $\frac{3}{4}$ (b) $\frac{4}{5}$ (c) $-\frac{8}{3}$ (d) $\frac{5}{2}$ (e) $-\frac{3}{5}$ (f) $\frac{3}{4}$ (g) $-\frac{1}{11}$

(h) $\frac{7}{5}$ (i) $\frac{8}{7}$ (j) $\frac{5}{-6}$ (k) $-\frac{5}{7}$ (l) $3\frac{1}{2}$ (m) $-5\frac{1}{3}$ (n) $2\frac{2}{7}$

CHAPTER-2 (OPERATIONS ON RATIONAL NUMBERS)

* ADDITION OF RATIONAL NUMBERS AND ITS PROPERTIES

$$\Rightarrow \text{ADDITION - e.g. Add } -\frac{2}{4} + \frac{1}{7} = \frac{-14 + 4}{28} = \frac{-10}{28} \text{ or } -\frac{5}{14} \text{ (1st METHOD)}$$

ALT. METHOD \rightarrow LCM of 4 & 7 is 28

$$-\frac{2}{4} = \frac{-2 \times 7}{4 \times 7} = \frac{-14}{28} \quad \& \quad \frac{1}{7} = \frac{1 \times 4}{7 \times 4} = \frac{4}{28}$$

$$\text{Now } \frac{-14}{28} + \frac{4}{28} = \frac{-14 + 4}{28} = \frac{-10}{28} \text{ or } -\frac{5}{14}$$

$$\Rightarrow \text{COMMUTATIVE PROPERTY } \rightarrow x + y = y + x$$

$$\Rightarrow \text{ASSOCIATIVE PROPERTY } \rightarrow (x + y) + z = x + (y + z)$$

* SUBTRACTION OF RATIONAL NUMBERS -

$$\text{e.g. Subtract } \frac{5}{63} \text{ from } -\frac{6}{7} \Rightarrow -\frac{6}{7} - \frac{5}{63} = \frac{-6 \times 9}{7 \times 9} - \frac{5}{63} = \frac{-54}{63} - \frac{5}{63}$$

$$= \frac{-54 - 5}{63} = \frac{-59}{63}$$

* COMMUTATIVE & ASSOCIATIVE PROPERTY DOES NOT HOLD TRUE FOR SUBTRACTION ; $x - y \neq y - x$

$$(x - y) - z \neq x - (y - z)$$

NOW ANSWER THE FOLLOWING QUESTIONS -

Q.1. Add the following :-

$$(a) \frac{2}{3} + \frac{5}{7} \quad (b) -\frac{5}{9} + \frac{7}{9} \quad (c) \frac{5}{8} + -\frac{3}{5} \quad (d) 2\frac{3}{11} + \frac{9}{-11}$$

$$(e) -\frac{7}{11} + \frac{1}{4} \quad (f) \frac{5}{8} + -\frac{3}{5} \quad (g) \frac{5}{12} + \frac{-9}{20} \quad (h) -2\frac{5}{6} + \frac{13}{-6}$$

Q.2. Verify $x + y = y + x$ for the following values of x & y :-

$$(a) x = \frac{4}{9} ; y = \frac{7}{4} \quad (b) x = -\frac{7}{11} ; y = \frac{3}{4} \quad (c) x = 5, y = \frac{3}{2}$$

$$(d) x = \frac{2}{7} ; y = -\frac{3}{7} \quad (e) x = -8 ; y = \frac{2}{2} \quad (f) x = -\frac{5}{14} ; y = -\frac{1}{21}$$

Q.3. Simplify :-

$$(a) -\frac{5}{10} + \frac{6}{13} + 8 \quad (b) \frac{5}{36} + -\frac{7}{8} + \frac{6}{-72} + \frac{-3}{-12} \quad (c) -\frac{3}{10} + \frac{12}{-10} + \frac{14}{10}$$

Q.4. Subtract :-

$$(a) \frac{2}{10} - \frac{7}{15} \quad (b) \frac{6}{7} - -\frac{5}{7} \quad (c) \frac{5}{11} \text{ from } \frac{-8}{23} \quad (d) \frac{5}{9} \text{ from } -\frac{7}{9}$$

Q.5. What no. should be added to $-\frac{3}{7}$ so as to get 1?

Q.6. What no. should be subtracted from -1 so as to get $\frac{5}{3}$?