



# Chapter 5 Operations on Rational Numbers

VII Exercise-5.1. 5. Operations on Rational Number

Solution-5.1.

(i)  $-\frac{5}{7}$  and  $\frac{3}{7}$

We have,

$$\begin{aligned} -\frac{5}{7} + \frac{3}{7} &= \frac{-5+3}{7} \\ &= \frac{-2}{7} \end{aligned}$$

(ii)  $-\frac{15}{4}$  and  $\frac{7}{4}$

We have,

$$-\frac{15}{4} + \frac{7}{4} = \frac{-15+7}{4} = \frac{-8}{4} = -2.$$

(iii)  $-\frac{8}{11} + \left(-\frac{4}{11}\right) = \frac{-8-4}{11} = \frac{-12}{11}.$

(iv)  $\frac{6}{13} + \left(-\frac{9}{13}\right) = \frac{6-9}{13}$   
 $= \frac{6-9}{13}$   
 $= \frac{-3}{13}.$



solution -02:-

(i)  $\frac{3}{4}$  and  $-\frac{3}{5}$ .

If  $\frac{p}{q}$  and  $\frac{r}{s}$  are two rational numberssuch that  $q$  and  $s$  do not have a common factor other than 1, H.C.F of  $q$  and  $s$  is 1, then

$$\frac{p}{q} + \frac{r}{s} = \frac{p \times s + r \times q}{q \times s}$$

$$\frac{3}{4} + \frac{-3}{5} = \frac{3 \times (5) + (-3) \times 4}{4 \times 5}$$

$$= \frac{15 - 12}{20}$$

$$= \frac{3}{20}$$

(ii)  $\frac{-3}{1} + \frac{3}{5}$

$$\frac{(-3) \times 5 + 3 \times (1)}{5}$$

$$= \frac{-15 + 3}{5}$$

$$= \frac{-12}{5}$$



(iii)  $-\frac{7}{27}$  and  $\frac{11}{18}$ .

L.C.M of 27 and 18 is 54

$$\frac{-7}{27} = \frac{-7 \times 2}{27 \times 2} = \frac{-14}{54}; \quad \frac{11}{18} = \frac{11 \times 3}{18 \times 3} = \frac{33}{54}$$

$$\frac{-7}{27} + \frac{11}{18} = \frac{-14}{54} + \frac{33}{54} = \frac{33-14}{54}$$

$$= \frac{19}{54}$$

(iv)  $\frac{31}{-4}$  and  $\frac{-5}{8}$ .

L.C.M of 4 and 8 is 8.

$$\frac{31}{-4} = \frac{31 \times 2}{-4 \times 2} = \frac{62}{-8}; \quad \frac{-5}{8}$$

$$\frac{31}{-4} + \frac{-5}{8} = \frac{-62}{8} + \frac{(-5)}{8}$$

$$= \frac{-62-5}{8}$$

$$= \frac{-67}{8}$$



solution-03

$$(i) \quad \frac{8}{9} + \frac{-11}{6} = \frac{8}{9} - \frac{11}{6}$$

L.C.M of 9 and 6 is 18

$$\frac{8}{9} = \frac{8 \times 2}{9 \times 2} = \frac{16}{18}$$

$$\frac{11}{6} = \frac{11 \times 3}{6 \times 3} = \frac{33}{18}$$

$$\begin{aligned} \therefore \frac{8}{9} + \frac{-11}{6} &= \frac{16}{18} - \frac{33}{18} \\ &= \frac{-17}{18} \end{aligned}$$

$$(ii) \quad \frac{-5}{16} + \frac{7}{24}$$

L.C.M of 16 and 24 is 48

$$\frac{-5}{16} = \frac{-5 \times 3}{16 \times 3} = \frac{-15}{48}$$

$$\frac{7}{24} = \frac{7 \times 2}{24 \times 2} = \frac{14}{48}$$

$$\begin{aligned} \frac{-5}{16} + \frac{7}{24} &= \frac{-15}{48} + \frac{14}{48} \\ &= \frac{-15 + 14}{48} \\ &= \frac{-1}{48} \end{aligned}$$



$$(iii) \frac{-1}{-12} + \frac{2}{-15}$$

$$\frac{-1}{12} - \frac{2}{15}$$

L.C.M of 12 and 15 is 60

$$\frac{-1}{12} = \frac{-1 \times 5}{60} = \frac{-5}{60}$$

$$\frac{-2}{15} = \frac{-2 \times 4}{15 \times 4} = \frac{-8}{60}$$

$$\frac{-1}{12} - \frac{2}{15} = \frac{-5}{60} - \frac{8}{60}$$

$$= \frac{-5-8}{60}$$

$$= \frac{-13}{60}$$

$$(iv) \frac{-8}{19} + \frac{-4}{57}$$

L.C.M of 19 and 57 is 57

$$\frac{-8}{19} = \frac{-8 \times 3}{19 \times 3} = \frac{-24}{57}$$

$$\frac{-24}{57} + \frac{-4}{57} = \frac{-24-4}{57}$$

$$= \frac{-28}{57}$$



solution-04:-

(i)  $-\frac{12}{5} + \frac{43}{10}$

L.C.M of 5 and 10 is 10.

$$-\frac{12}{5} = \frac{-12 \times 2}{5 \times 2} = \frac{-24}{10}$$

$$\frac{43}{10} = \frac{43}{10}$$

$$\begin{aligned} -\frac{12}{5} + \frac{43}{10} &= \frac{-24}{10} + \frac{43}{10} \\ &= \frac{-24 + 43}{10} \\ &= \frac{19}{10} = 1\frac{9}{10} \end{aligned}$$

(ii)  $\frac{24}{7} + \frac{-11}{4}$

L.C.M of 7 and 4 is 28.

$$\frac{24}{7} = \frac{24 \times 4}{7 \times 4} = \frac{96}{28}$$

$$\frac{-11}{4} = \frac{-11 \times 7}{4 \times 7} = \frac{-77}{28}$$

$$\begin{aligned} \frac{24}{7} + \frac{-11}{4} &= \frac{96}{28} - \frac{77}{28} \\ &= \frac{19}{28} \end{aligned}$$



$$(iii) -\frac{31}{6} + -\frac{27}{8}$$

L. cm of 6 and 8 is 24

$$-\frac{31}{6} = -\frac{31 \times 4}{6 \times 4} = -\frac{124}{24}$$

$$-\frac{27}{8} = -\frac{27 \times 3}{8 \times 3} = -\frac{81}{24}$$

$$\therefore -\frac{31}{6} + -\frac{27}{8} = -\frac{124}{24} + \left(-\frac{81}{24}\right)$$

$$= -\frac{124 + 81}{24}$$

$$= -\frac{205}{24}$$

$$= -8\frac{13}{24}$$



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## Exercise - 5.2

$$01. (i) \frac{3}{8}, \frac{5}{8}$$

$$\frac{5}{8} - \frac{3}{8} = \frac{5-3}{8}$$

$$= \frac{2}{8}$$

$$(ii) -\frac{7}{9} + \frac{4}{9} = \frac{4}{9} - \left(-\frac{7}{9}\right)$$

$$= \frac{4}{9} + \frac{7}{9}$$

$$= \frac{4+7}{9}$$

$$= \frac{11}{9}$$

$$(iii) -\frac{2}{11} + \left(-\frac{9}{11}\right) = -\frac{9}{11} + \frac{2}{11}$$

$$= -\frac{9+2}{11}$$

$$= -\frac{11}{11}$$

$$(iv) -\frac{11}{13} - \frac{4}{13} = \frac{-4-11}{13}$$

$$= \frac{-15}{13}$$



solution-02:-

(i)  $\frac{2}{3} - \frac{3}{5}$

L.C.M of 3 and 5 is 15

$$\frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15}$$

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

$$\frac{2}{3} - \frac{3}{5} = \frac{10}{15} - \frac{9}{15}$$

$$= \frac{1}{15}$$

(ii)  $-\frac{4}{7} - \frac{2}{-3}$

L.C.M of 3 and 7 is 21

$$-\frac{4}{7} = \frac{-4 \times 3}{7 \times 3} = \frac{-12}{21}$$

$$-\frac{2}{-3} = \frac{2 \times 7}{-3 \times 7} = \frac{-14}{21}$$

$$-\frac{4}{7} - \frac{2}{-3} = \left( \frac{-12}{21} \right) - \left( \frac{-14}{21} \right)$$

$$= \frac{-12}{21} - \frac{-14}{21}$$

$$= \frac{2}{21}$$



$$(ii) \frac{4}{7} - \left(+\frac{5}{7}\right)$$

$$\frac{4}{7} - \left(\frac{5}{7}\right) = \frac{4-5}{7} = -\frac{1}{7}$$

$$(iv) -\frac{2}{1} - \frac{5}{9}$$

$$= \frac{-2 \times 9 - 5 \times 1}{9 \times 1}$$

$$= \frac{-18 - 5}{9}$$

$$= -\frac{23}{9}$$

Solution-03:-

$$\text{Required number} = \frac{5}{9} - \frac{1}{3}$$

L.C.M of 3 and 9 is 9

$$\frac{1}{3} = \frac{1 \times 3}{3 \times 3} = \frac{3}{9}$$

$$\therefore \text{Required number} = \frac{5}{9} - \frac{3}{9}$$

$$= \frac{2}{9}$$



$$\begin{aligned} 4. \text{ Required number} &= -\frac{1}{3} + \frac{12}{3} \\ &= \frac{-1+12}{3} \\ &= \frac{+11}{3} \end{aligned}$$

solution-05:-

$$\begin{aligned} \text{Required number} &= -\frac{4}{3} - (5) \\ &= -\frac{4}{3} + 5 \\ &= \frac{-4 \times 1 + 5 \times 3}{3 \times 1} \\ &= \frac{15-4}{3} \\ &= \frac{11}{3} \end{aligned}$$

$\therefore$  Required number is  $\frac{11}{3}$ .

solution-06:-

$$\begin{aligned} \text{Required number} &= -8 - \left(-\frac{15}{7}\right) \\ &= -8 + \frac{15}{7} \\ &= \frac{-8 \times 7 + 15 \times 1}{7 \times 1} \quad [\because \text{H.C.F}=1] \\ &= \frac{-56+15}{7} = -\frac{41}{7} \end{aligned}$$



solution-07:-

$$\text{Required number} = \frac{5}{9} + \frac{7}{8} = \frac{5}{9} + \frac{7}{8}$$

$$= \frac{5 \times 8 + 7 \times 9}{9 \times 8} \quad [\because \text{H.C.F} = 1]$$

$$= \frac{40 + 63}{72}$$

$$= \frac{103}{72}$$

Solution-08:-

$$\text{Required number} = -\left(\frac{5}{11}\right) + \frac{26}{33}$$

$$= \frac{26}{33} + \frac{5}{11}$$

$$= \frac{26 + 5 \times 3}{33} \quad [\because \text{L.C.M} = 33]$$

$$= \frac{26 + 15}{33}$$

$$= \frac{41}{33}$$

$$\therefore \text{Required number} \rightarrow \frac{41}{33}$$



Solution-09:-

$$\text{Required number} = -\frac{2}{3} - \left(-\frac{5}{7}\right)$$

$$= -\frac{2}{3} + \frac{5}{7}$$

$$= \frac{5}{7} - \frac{2}{3}$$

[  $\therefore$  H.C.F of 7 and 3 is 21 ]

$$= \frac{5 \times 3 - 2 \times 7}{7 \times 3}$$

$$= \frac{15 - 14}{21}$$

$$= \frac{1}{21}$$

Solution-10:-

$$\text{Required number} = -\frac{5}{6} + \left(-\frac{5}{2}\right)$$

$$= -\frac{5}{6} - \frac{5}{2}$$

$$= \frac{-5 \times 1 - 5 \times 3}{6}$$

$$= \frac{-5 - 15}{6}$$

$$= \frac{-20}{6}$$

$$= -\frac{10}{3}$$



Solution-11:-

$$\text{Required number} = \frac{3}{7} - \frac{5}{4}$$

[  $\because$  H.C.F of 7 and 4 is = 1, Then

$$\frac{p}{q} - \frac{r}{s} = \frac{p \times s - r \times q}{q \times s} ]$$

$$= \frac{3 \times 4 - 5 \times 7}{7 \times 4}$$

$$= \frac{12 - 35}{28}$$

$$= \frac{-23}{28}$$

Solution-12:-

$$\text{Required number} = \frac{-2}{15} - \left( \frac{2}{3} + \frac{3}{5} \right)$$

$$= \frac{-2}{15} - \frac{2}{3} - \frac{3}{5}$$

$$= \frac{-2 - 2 \times 5 - 3 \times 3}{15}$$

$$= \frac{-21}{15}$$

$$= \frac{-7}{5}$$

$$\therefore \frac{-2}{15} = \frac{2}{3} + \frac{3}{5} - \frac{7}{5}$$



Solution-13:-

$$\begin{aligned}\text{Required number} &= 3 - \left[ \frac{1}{2} + \frac{1}{3} + \frac{1}{5} \right] \\&= 3 - \left[ \frac{1 \times 15 + 1 \times 10 + 1 \times 6}{30} \right] \\&= 3 - \left[ \frac{31}{30} \right] \\&= \frac{3 \times 30 - 31}{30} \\&= \frac{90 - 31}{30} \\&= \frac{59}{30}\end{aligned}$$

Solution-14:-

$$(x) \text{ Required number} = \left( \frac{3}{4} - \frac{2}{3} \right) - \left( -\frac{1}{6} \right)$$

$$= \frac{3}{4} - \frac{2}{3} + \frac{1}{6}$$

L.C.M of 4, 3 and 6 is 24

$$= \frac{3 \times 6}{4 \times 6} - \frac{2 \times 8}{3 \times 8} + \frac{1 \times 4}{6 \times 4}$$

$$= \frac{18}{24} - \frac{16}{24} + \frac{4}{24}$$

$$= \frac{18 - 16 + 4}{24}$$

$$= \frac{6}{24} = \frac{1}{4}$$



Solution-15.

$$\begin{aligned} \text{(i)} \quad -\frac{3}{2} + \frac{5}{4} - \frac{7}{4} &= \frac{-3 \times 2 + 5 - 7}{4} \\ &= \frac{-6 + 5 - 7}{4} \\ &= \frac{-13 + 5}{4} \\ &= \frac{-8}{4} \\ &= -2. \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad \frac{5}{3} - \frac{7}{6} + \frac{-2}{3} &= \frac{5}{3} - \frac{7}{6} - \frac{2}{3} \\ &= \frac{5 \times 2 - 7 \times 1 - 2 \times 2}{6} \\ &= \frac{10 - 7 - 4}{6} \\ &= \frac{-1}{6} \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad \frac{5}{4} - \frac{7}{6} - \left(\frac{-2}{3}\right) &= \frac{5}{4} - \frac{7}{6} + \frac{2}{3} \\ [\because \text{L.C.M} &= 24] \\ &= \frac{5 \times 6}{4 \times 6} - \frac{7 \times 4}{6 \times 4} + \frac{2 \times 8}{3 \times 8} \\ &= \frac{30 - 28 + 16}{24} \\ &= \frac{18}{24} = \frac{3}{4}. \end{aligned}$$



$$(iv) \quad -\frac{2}{5} - \frac{-3}{10} - \frac{-4}{7} = -\frac{2}{5} + \frac{3}{10} + \frac{4}{7}$$

L. C. M of 5, 10 and 7 is 70

$$5 \overline{) \begin{matrix} 5, 10, 7 \\ 1, 2, 7 \end{matrix}}$$

$$L.C.M = 70$$

$$= \frac{-2 \times 14}{5 \times 14} + \frac{3 \times 7}{10 \times 7} + \frac{4 \times 10}{7 \times 10}$$

$$= \frac{-28 + 21 + 40}{70}$$

$$= \frac{61 - 28}{70}$$

$$= \frac{33}{70}$$

Solution-16:-

$$(i) \quad -\frac{4}{13} - \left(\frac{-3}{26}\right) = -\frac{4}{13} + \frac{3}{26}$$

$$= \frac{-4 \times 2 + 3}{26}$$

$$= \frac{-8 + 3}{26}$$

$$= \frac{-5}{26}$$



$$(ii) \quad -\frac{9}{14} + \dots = -1$$

$$\begin{aligned} -\left[-\frac{9}{14} + 1\right] &= -\left[\frac{-09 + 14}{14}\right] \\ &= -\frac{5}{14} \end{aligned}$$

$$(iii) \quad -\frac{7}{9} + \dots = 3$$

$$\begin{aligned} +\frac{7}{9} + 3 &= \frac{+7 + 3 \times 9}{9} \\ &= \frac{+7 + 27}{9} \\ &= \frac{+34}{9} \end{aligned}$$

$$(iv) \quad 4 - \frac{15}{23} = \frac{4 \times 23 - 15}{23}$$

$$= \frac{92 - 15}{23}$$

$$= \frac{77}{23}$$



## Exercise - 5.3

Solution-01.

$$\begin{aligned} \text{(i)} \quad \frac{7}{11} \times \frac{5}{4} &= \frac{7 \times 5}{11 \times 4} \\ &= \frac{35}{44} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad \frac{5}{7} \times \left(-\frac{3}{4}\right) &= \frac{5 \times (-3)}{7 \times 4} \\ &= -\frac{15}{28} \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad -\frac{2}{9} \times \frac{5}{11} &= \frac{-2 \times 5}{9 \times 11} \\ &= -\frac{10}{99} \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad \frac{-3}{17} \times \frac{-5}{4} &= \frac{-3}{17} \times \frac{5}{4} \\ &= \frac{-3 \times 5}{17 \times 4} \\ &= -\frac{15}{68} \end{aligned}$$



Solution -02:

$$\begin{aligned} \text{(i)} \quad \frac{-5}{17} \times \frac{51}{-60} &= \frac{-5 \times 51}{17 \times -60} \\ &= \frac{-5 \times 3}{1 \times -60} \\ &= \frac{+3}{+120} \\ &= -\frac{1}{40} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad \frac{-6}{11} \times \frac{-55}{36} &= \frac{-\cancel{6} \times -5\cancel{5}}{\cancel{11} \times 3\cancel{6}}^5 \\ &= \frac{+5}{6} \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad \frac{-8}{25} \times \frac{-5}{16} &= \frac{-\cancel{8} \times -\cancel{5}}{\cancel{25} \times \cancel{16}}^1 \\ &= \frac{+1}{5 \times 2} \\ &= \frac{1}{10} \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad \frac{6}{7} \times \frac{-49}{36} &= \frac{\cancel{6} \times -4\cancel{9}}{\cancel{7} \times 3\cancel{6}}^1 \\ &= -\frac{7}{6} \end{aligned}$$



solution-03:-

$$(i) \quad \frac{-16}{21} \times \frac{14}{5} = \frac{-16 \times 14^2}{21 \times 5}$$

$$= \frac{-16 \times 2}{3 \times 5}$$

$$= \frac{-32}{15}$$

$$(ii) \quad \frac{7}{6} \times \frac{-3}{28} = \frac{7 \times -3^1}{6 \times 28^4}$$
$$= \frac{-1}{8}$$

$$(iii) \quad \frac{-19}{36} \times 16 = \frac{-19 \times 16^4}{36^9}$$
$$= \frac{-76}{9}$$

$$(iv) \quad \frac{-13}{9} \times \frac{27}{-26} = \frac{-13 \times 27^3}{9 \times -26^2}$$
$$= \frac{-3}{-2}$$
$$= \frac{3}{2}$$



Solution-04:-

$$\begin{aligned} \text{(i)} \quad \left(-5 \times \frac{2}{15}\right) - \left(-6 \times \frac{2}{9}\right) &= -\frac{\cancel{5}^1 \times 2}{\cancel{15}_3} + \frac{\cancel{6}^2 \times 2}{\cancel{9}_3} \\ &= -\frac{2}{3} + \frac{4}{3} \\ &= \frac{4-2}{3} \\ &= \frac{2}{3} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad \left(-\frac{5}{4} \times \frac{3}{2}\right) + \left(\frac{13}{2} \times \frac{5}{6}\right) &= -\frac{15}{4} + \frac{65}{12} \\ &= \frac{-15 \times 3 + 65}{12} \\ &= \frac{65 - 45}{12} \\ &= \frac{20}{12} \\ &= \frac{4 \times 5}{4 \times 3} \\ &= \frac{5}{3} \end{aligned}$$



Solution - os:-

$$(i) \left[ \frac{13}{9} \times -\frac{15}{2} \right] + \left[ \frac{7}{3} \times \frac{8}{5} \right] + \left[ \frac{3}{5} \times \frac{1}{2} \right]$$

$$= -\frac{195}{18} + \frac{56}{15} + \frac{3}{10}$$

L.C.M of 18, 15, 10.

$$\begin{array}{r} 3 \overline{) 18, 15, 10} \\ 5 \overline{) 6, 5, 10} \\ 2 \overline{) 6, 1, 2} \\ 3, 1, 1 \end{array}$$

$$\begin{aligned} \text{L.C.M} &= 3 \times 5 \times 2 \times 3 \\ &= 90 \end{aligned}$$

$$\frac{-195 \times 5}{18 \times 5} = \frac{-975}{90} = -\frac{975}{90}$$

$$\frac{56}{15} = \frac{56 \times 6}{15 \times 6} = \frac{336}{90}$$

$$\frac{3}{10} = \frac{3 \times 9}{10 \times 9} = \frac{27}{90}$$

$$= -\frac{975}{90} + \frac{336}{90} + \frac{27}{90}$$

$$\begin{aligned} &= \frac{-975 + 336 + 27}{90} = \frac{363 - 975}{90} = \frac{-612}{90} \\ &= -\frac{34}{5} \end{aligned}$$



$$5. (ii) \left[ \frac{5}{11} \times \frac{5}{9} \right] - \left[ \frac{2}{17} \times \frac{1}{3} \right] + \left[ \frac{8}{13} \times \frac{6}{18} \right]$$

$$= \frac{5}{22} - \frac{1}{17} + \frac{6}{39}$$

$$= \frac{5 \times 39 - (22 \times 39) + 6 \times 22}{22 \times 39}$$

$$= \frac{195 - 858 + 132}{858}$$

$$= \frac{227 - 858}{858}$$

$$= \frac{-531}{858}$$

$$= \frac{-177}{286}$$





Exercise-5.4.

26

Solution:-

(i)  $1 \text{ by } \frac{1}{2}$

$$1 \div \frac{1}{2} = \frac{1 \times 2}{1}$$

$$= 2.$$

(ii)  $5 \div \frac{-5}{7} = \frac{5 \times 7}{-5}$

$$= \frac{-35}{5}$$

$$= -7.$$

(iii)  $-\frac{3}{4} \div \frac{9}{16} = \frac{-3 \times 16}{9 \times 4}$

$$= \frac{-1 \times 4}{3}$$

$$= -\frac{4}{3}$$

(iv)  $-\frac{7}{8} \div \frac{-21}{16} = \frac{+7 \times 16}{8 \times +21}$

$$= \frac{2}{3}$$

(v)  $\frac{7}{-4} \text{ by } \frac{63}{64} = \frac{7}{-4} \div \frac{63}{64}$

$$= \frac{7 \times 64}{-4 \times 63} = -\frac{16}{9}$$



$$(vi) 0 \div \frac{-7}{5} = 0$$

$$\begin{aligned}(vii) \quad \frac{-3}{4} \div -6 &= \frac{-3}{4} \times \frac{1}{+6} \\ &= \frac{1}{4 \times 2} \\ &= \frac{1}{8}\end{aligned}$$

$$(viii) \quad \frac{2}{3} \div \frac{-7}{12}$$

$$\begin{aligned}\frac{2}{3} \times \frac{12}{-7} &= \frac{2 \times 4}{-7} \\ &= -\frac{8}{7}\end{aligned}$$

Solution - 02:-

$$(i) \quad \frac{2}{5} \div \frac{26}{15} = \frac{2}{5} \times \frac{15}{26}$$

$$= \frac{2 \times 3}{26}$$

$$= \frac{3}{13}$$

$$(ii) \quad \frac{10}{3} \div \frac{-35}{12} = \frac{10 \times 12}{3 \times -35}$$

$$= \frac{2 \times 4}{1 \times -7}$$

$$= -\frac{8}{7}$$



$$\begin{aligned} \text{(iii)} \quad -6 \div \frac{-8}{17} &= \frac{-6}{1} \div \frac{-8}{17} \\ &= -\frac{6}{1} \times \frac{17}{8} \\ &= \frac{-3 \times 17}{4} \\ &= -\frac{51}{4} \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad \frac{40}{98} \div (-20) &= \frac{40}{98} \times \frac{-1}{20} \\ &= \frac{-2}{98} \\ &= \frac{-1}{49} \end{aligned}$$

Solution - 03 :-

Q17

Product of two rational numbers is -

one of the number -10

$$\begin{aligned} \text{Required Number} &= \frac{15}{-10} \\ &= \frac{3}{-2} \end{aligned}$$



solution-04:-

29

Q11

Product of two rational numbers  $\rightarrow -\frac{8}{9}$ one of the number  $\rightarrow -\frac{4}{15}$ 

$$\text{Required number} = \frac{-\frac{8}{9}}{-\frac{4}{15}}$$

$$= +\frac{8}{9} \times \frac{15}{4}$$

$$= \frac{2 \times 5}{3}$$

$$= \frac{10}{3}$$

solution-05:-

Q11

$$\text{Product} = -\frac{23}{9}$$

$$\text{Required number} = \frac{-\frac{23}{9}}{-\frac{1}{6}}$$

$$= -\frac{23}{9} \times \frac{6}{-1}$$

$$= \frac{23 \times 2}{3}$$

$$= \frac{46}{3}$$



Solution-06:-

Q11

$$\text{Product} = -\frac{5}{7}$$

$$\text{Required number} = -\frac{5}{7} \div \left(-\frac{15}{28}\right)$$

$$= -\frac{5}{7} \times \frac{28}{-15}$$

$$= \frac{+1 \times 4}{1 \times 3}$$

$$= \frac{4}{3}$$

Solution-07:-

Q11

$$\text{Product} = 24,$$

$$\therefore \text{Required number} = 24 \div -\frac{8}{13}$$

$$= \frac{24}{1} \times \frac{13}{-8}$$

$$= -3 \times 13$$

$$= -39.$$

$$\therefore \text{Required number} = -39.$$



Solution-08:-

$$\text{Required Number} = \frac{2}{3} \div \frac{-3}{4}$$

$$= \frac{2}{3} \times \frac{4}{-3}$$

$$= -\frac{8}{9}$$

Solution-09:-

$$(i) x = \frac{2}{3}, y = \frac{3}{2}$$

$$(x+y) \div (x-y)$$

$$\left(\frac{2}{3} + \frac{3}{2}\right) \div \left(\frac{2}{3} - \frac{3}{2}\right)$$

$$= \left(\frac{4+9}{6}\right) \div \left(\frac{4-9}{6}\right)$$

$$= 13 \div -5$$

$$= -\frac{13}{5}$$

$$(ii) \left(\frac{2}{5} + \frac{1}{2}\right) \div \left(\frac{2}{5} - \frac{1}{2}\right)$$

$$= \left(\frac{4+5}{10}\right) \div \left(\frac{4-5}{10}\right)$$

$$= 9 \div -1$$

$$= -9$$



$$(iii) \left( \frac{5}{4} - \frac{1}{3} \right) \div \left( \frac{5}{4} + \frac{1}{3} \right)$$

$$= \left( \frac{5 \times 3 - 1 \times 4}{12} \right) \div \left( \frac{5 \times 3 + 4}{12} \right)$$

$$= (15 - 4) \div (15 + 4)$$

$$= 11 \div 19$$

$$= \frac{11}{19}$$

Solution - 101

Q 11

$7 \frac{2}{3}$  meters of rope cost  $\rightarrow$  Rs  $\frac{3}{4}$

$\rightarrow$  Rs  $\frac{51}{4}$

$$\text{cost per meter} = \frac{51}{4} \div \left[ \frac{23}{3} \right]$$

$$= \frac{51}{4} \times \frac{3}{23}$$

$$= \frac{153}{92}$$

$$= \text{Rs } 1 \frac{61}{92}$$



Solution-11.

Q11

 $\frac{5+2}{3}$  meters of cloth cost  $\rightarrow$  Rs  $\frac{301}{4}$ .cost per meter  $\rightarrow \frac{301}{4} \div \frac{7}{2}$ 

$$= \frac{301}{4} \times \frac{2}{7}$$

$$= \frac{43 \times 3}{4}$$

$$= \frac{129}{4}$$

$$= \text{Rs } 32\frac{1}{4}$$

Solution-12:-

$$\text{Required number} = \frac{-33}{16} \div \frac{-4}{9}$$

$$= \frac{-33}{16} \times \frac{9}{-4}$$

$$= \frac{3}{4}$$

 $\frac{3}{4}$  should be divided by  $\frac{-33}{16}$  to get  $\frac{-11}{9}$



Solution -13:-

$$\begin{aligned}\text{Sum of } -\frac{13}{5} \text{ and } \frac{12}{7} &= -\frac{13}{5} + \frac{12}{7} \\&= \frac{-13 \times 7 + 12 \times 5}{35} \\&= \frac{-91 + 60}{35} \\&= -\frac{31}{35}\end{aligned}$$

$$\text{Product of } +\frac{31}{7} \times \frac{1}{2} = \frac{31}{14}$$

$$\begin{aligned}\therefore \text{Required number} &= \frac{-31}{35} \div \frac{31}{14} \\&= \frac{-31}{35} \times \frac{14}{31} \\&= -\frac{14}{35} \\&= -\frac{2}{5}\end{aligned}$$

$$\therefore \text{Required number} \rightarrow -\frac{2}{5}$$



Solution-14:

$$\begin{aligned}\text{sum of } \frac{65}{12} \text{ and } \frac{8}{3} &= \frac{65}{12} + \frac{8}{3} \\&= \frac{65 \times 3 + 12 \times 8}{36} \\&= \frac{195 + 96}{36} = \frac{291}{36}\end{aligned}$$

$$\begin{aligned}\text{Difference} &= \frac{65}{12} - \frac{8}{3} \\&= \frac{65 \times 3 - 8 \times 12}{36} \\&= \frac{195 - 96}{36} = \frac{99}{36}\end{aligned}$$

$$\begin{aligned}\text{Required number} &= \frac{\frac{291}{36}}{\frac{99}{36}} \\&= \frac{291}{36} \times \frac{36}{99} \\&= \frac{291}{99} \\&= \frac{97}{33}\end{aligned}$$



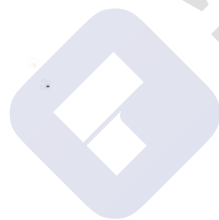
solution - 15:-

length of cloth is required for each trouser

$$= \frac{54}{24} \quad \left[ \because \frac{\text{cloth size}}{\text{No. of cloths}} \right]$$

$$= \frac{9}{4} \text{ metres.}$$

$\therefore \frac{9}{4}$  metres of cloth required for each trouser



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## Exercise-5.5

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Solution-01:

We know that

$$-4 < -3 < -2 < -1 < 0 < 1 < 2 < 3$$

$$\therefore -\frac{4}{8} < -\frac{3}{8} < -\frac{2}{8} < -\frac{1}{8} < \frac{0}{8} < \frac{1}{8} < \frac{2}{8} < \frac{3}{8}$$

Hence, 6 rational numbers between  $-\frac{4}{8}$  and  $\frac{3}{8}$  are

$$-\frac{3}{8}, -\frac{2}{8}, -\frac{1}{8}, \frac{0}{8}, \frac{1}{8}, \frac{2}{8}$$

Solution-02:

We know that

$$7 > 6 > 5 > 4 > 3 > 2 > 1 > 0 > -1 > -2 > -3 > -4$$

$$\therefore \frac{7}{13} > \frac{6}{13} > \frac{5}{13} > \frac{4}{13} > \frac{3}{13} > \frac{2}{13} > \frac{1}{13} > \frac{0}{13} > \frac{-1}{13} > \frac{-2}{13} > \frac{-3}{13} > \frac{-4}{13}$$

Hence, 10 rational numbers between  $\frac{7}{13}$  and  $-\frac{4}{13}$  are

$$-\frac{3}{13}, -\frac{2}{13}, -\frac{1}{13}, \frac{0}{13}, \frac{1}{13}, \frac{2}{13}, \frac{3}{13}, \frac{4}{13}, \frac{5}{13}, \frac{6}{13}$$



Solution- b3:-

(i) False

(ii) True

(iii) True



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