Chapter 5 Operations on Rational Numbers

Solution-5.1.

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

we have,

$$\dfrac{-5}{7} + \dfrac{3}{7} = \dfrac{-5+3}{7}$$

$$= \dfrac{-2}{7}$$

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

we have,

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

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

(iv) $\dfrac{6}{13} + \left(\dfrac{-9}{13}\right) = \dfrac{6}{13} - \dfrac{9}{13}$

$$= \dfrac{6-9}{13}$$

$$= \dfrac{-3}{13}.$$

solution -02:-

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

If $\frac{P}{q}$ and $\frac{r}{s}$ are two rational numbers

such 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) $\dfrac{-7}{27}$ and $\dfrac{11}{18}$.

L.C.M of 27 and 18 is 54

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

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

$$= \dfrac{19}{54}.$$

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

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

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

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

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

$$= -\dfrac{67}{8}.$$

solution-03

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

L.C.M of 9 and 6 is 18

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

$$\dfrac{11}{6} = \dfrac{11 \times 3}{6 \times 3} = \dfrac{33}{18}.$$

$$\therefore \dfrac{8}{9} + \dfrac{-11}{6} = \dfrac{16}{18} - \dfrac{33}{18}$$

$$= \dfrac{-17}{18}.$$

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

L.C.M of 16 and 24 is 48.

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

$$\dfrac{7}{24} = \dfrac{7 \times 2}{24 \times 2} = \dfrac{14}{48}.$$

$$\dfrac{-5}{16} + \dfrac{7}{24} = \dfrac{-15}{48} + \dfrac{14}{48}$$

$$= \dfrac{14 - 15}{48}$$

$$= \dfrac{-1}{48}.$$

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

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

L.c M of 12 and 15 is 60

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

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

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

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

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

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

L.cm of 19 and 57 is 57

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

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

$= \dfrac{-28}{57}$.

Solution-04:-

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

L.cm of 5 and 10 is 10.

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

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

$$\frac{-12}{5} + \frac{43}{10} = \frac{-24}{10} + \frac{43}{10}$$

$$= \frac{-24 + 43}{10}$$

$$= \frac{19}{10} = 1\frac{9}{10}.$$

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

L.cm of 7 and 4 is 28.

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

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

$$\frac{24}{7} + \frac{-11}{4} = \frac{96}{28} - \frac{77}{28}$$

$$= \frac{19}{28}.$$

(III) $\dfrac{-31}{6} + \dfrac{-27}{8}$

L. CM of 6 and 8 is 24

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

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

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

$= \dfrac{-124 - 81}{24}$

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

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

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

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

$$= \frac{-7}{11}.$$

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

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

solution-02:-

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

L.cM 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.cM of 3 and 7 is 21

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

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

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

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

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

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

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

(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 :-

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

L.cm of 3 and 9 is 9

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

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

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

4. Required number $= \dfrac{-1}{3} + \dfrac{12}{3}$

$$= \dfrac{-1+12}{3}$$

$$= +\dfrac{11}{3}.$$

Solution-05:-

Required number $= \dfrac{-4}{3} - (5)$

$$= -\dfrac{4}{3} + 5$$

$$= \dfrac{-4 \times 1 + 5 \times 3}{3 \times 1}$$

$$= \dfrac{15-4}{3}$$

$$= \dfrac{11}{3}.$$

∴ Required number is $\dfrac{11}{3}$.

Solution-06:-

Required number $= -8 - \left(-\dfrac{15}{7}\right)$

$$= -8 + \dfrac{15}{7}$$

$$= \dfrac{-8 \times 7 + 15 \times 1}{7 \times 1} \qquad [\because H.C.F = 1]$$

$$= \dfrac{-56+15}{7} = \dfrac{-41}{7}.$$

solution-07:-

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

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

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

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

Solution-08:-

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

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

$= \frac{26 + 5 \times 3}{33}$ [$\because$ L.CM = 33]

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

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

$\therefore$ Required number $\to \frac{41}{33}$.

Solution -09:-

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

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

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

[$\because$ H.C.F of 7 and 3 is 1]

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

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

$= \dfrac{1}{21}$

Solution-10:.

Required number $= \dfrac{-5}{6} + \left(\dfrac{-5}{3}\right)$

$= \dfrac{-5}{6} - \dfrac{5}{3}$

$= \dfrac{-5 \times 1 - 5 \times 2}{6}$

$= \dfrac{-5 - 10}{6}$

$= \dfrac{-15}{6}$

$= \dfrac{-5}{2}$

Solution-11:-

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

$$\left[\because \text{H.C.F of } 7 \text{ and } 4 \text{ is } = 1, \text{ Then} \right.$$

$$\left. \frac{P}{q} - \frac{r}{s} = \frac{P \times s - r \times q}{q \times s} \right]$$

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

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

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

Solution-12:-

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:-

Required number = $3 - \left[\frac{1}{2} + \frac{1}{3} + \frac{1}{5} \right]$

$= 3 - \left[\frac{1 \times 15 + 1 \times 10 + 1 \times 6}{30} \right]$

$= 3 - \left[\frac{31}{30} \right]$

$= \frac{3 \times 30 - 31}{30}$

$= \frac{90 - 31}{30}$

$= \frac{59}{30}$

Solution -14:-

(i) 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

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

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

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

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

Solution-15:

(i) $-\dfrac{3}{2} + \dfrac{5}{4} - \dfrac{7}{4} = \dfrac{-3 \times 2 + 5 - 7}{4}$

$\phantom{(i) -\dfrac{3}{2} + \dfrac{5}{4} - \dfrac{7}{4}} = \dfrac{-6 + 5 - 7}{4}$

$\phantom{(i) -\dfrac{3}{2} + \dfrac{5}{4} - \dfrac{7}{4}} = \dfrac{-13 + 5}{4}$

$\phantom{(i) -\dfrac{3}{2} + \dfrac{5}{4} - \dfrac{7}{4}} = -\dfrac{8}{4}$

$\phantom{(i) -\dfrac{3}{2} + \dfrac{5}{4} - \dfrac{7}{4}} = -2.$

(ii) $\dfrac{5}{3} - \dfrac{7}{6} + \dfrac{-2}{3} = \dfrac{5}{3} - \dfrac{7}{6} - \dfrac{2}{3}$

$\phantom{(ii) \dfrac{5}{3} - \dfrac{7}{6} + \dfrac{-2}{3}} = \dfrac{5 \times 2 - 7 \times 1 - 2 \times 2}{6}$

$\phantom{(ii) \dfrac{5}{3} - \dfrac{7}{6} + \dfrac{-2}{3}} = \dfrac{10 - 7 - 4}{6}$

$\phantom{(ii) \dfrac{5}{3} - \dfrac{7}{6} + \dfrac{-2}{3}} = \dfrac{-1}{6}$

(iii) $\dfrac{5}{4} - \dfrac{7}{6} - \left(\dfrac{-2}{3}\right) = \dfrac{5}{4} - \dfrac{7}{6} + \dfrac{2}{3}$

$\phantom{(iii) \dfrac{5}{4} - \dfrac{7}{6}} [\because L.CM = 24]$

$\phantom{(iii) \dfrac{5}{4} - \dfrac{7}{6} -} = \dfrac{5 \times 6}{4 \times 6} - \dfrac{7 \times 4}{6 \times 4} + \dfrac{2 \times 8}{3 \times 8}$

$\phantom{(iii) \dfrac{5}{4} - \dfrac{7}{6} -} = \dfrac{30 - 28 + 16}{24}$

$\phantom{(iii) \dfrac{5}{4} - \dfrac{7}{6} -} = \dfrac{18}{24} = \dfrac{3}{4}.$

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

L.cm of 5, 10 and 7 is 70

$5 \dfrac{(\;5,\;10,\;7}{1,\;2,\;7}$

L.C.M = 70

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

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

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

$= \dfrac{33}{70}$

solution - 16 :-

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

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

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

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

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

$-\left[\frac{-9}{14} + 1\right] = -\left[\frac{-09 + 14}{14}\right]$

$= -\frac{5}{14}$

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

$+\frac{7}{9} + 3 = \frac{+7 + 3 \times 9}{9}$

$= \frac{+7 + 27}{9}$

$= +\frac{34}{9}$

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

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

$= \frac{77}{23}$

Exercise -5.3

Solution-01

(i) $\quad \dfrac{7}{11} \times \dfrac{5}{4} = \dfrac{7 \times 5}{11 \times 4}$

$\qquad\qquad = \dfrac{35}{44}$

(ii) $\quad \dfrac{5}{7} \times \left(\dfrac{-3}{4}\right) = \dfrac{5 \times (-3)}{7 \times 4}$

$\qquad\qquad = \dfrac{-15}{28}$

(iii) $\quad \dfrac{-2}{9} \times \dfrac{5}{11} = \dfrac{-2 \times 5}{99}$

$\qquad\qquad = \dfrac{-10}{99}$

(iv) $\quad \dfrac{-3}{17} \times \dfrac{-5}{-4} = \dfrac{-3}{17} \times \dfrac{5}{4}$

$\qquad\qquad = \dfrac{-3 \times 5}{17 \times 4}$

$\qquad\qquad = \dfrac{-15}{68}$

Solution -02:

(i) $\dfrac{-5}{17} \times \dfrac{51}{-60}$ $= \dfrac{-5 \times 51}{17 \times -60}$

$= \dfrac{-5 \times 3}{1 \times -60}$

$= \dfrac{-3}{+120}$

$-\dfrac{1}{4}$

(ii) $\dfrac{-6}{11} \times \dfrac{-55}{36}$ $= \dfrac{-6 \times -55^{5}}{11 \times 36_{6}}$

$= \dfrac{+5}{6}$

(iii) $\dfrac{-8}{25} \times \dfrac{-5}{16}$ $= \dfrac{-8 \times -5^{1}}{25 \times 16_{2}}$
$ 5$

$= \dfrac{1}{5 \times 2}$

$= \dfrac{1}{10}$.

(iv) $\dfrac{6}{7} \times \dfrac{-49}{36}$ $= \dfrac{6 \times -49^{7}}{7 \times 36_{6}}$

$= -\dfrac{7}{6}$.

solution-03:-

(i) $\dfrac{-16}{21} \times \dfrac{14}{5} = \dfrac{-16 \times \overset{2}{\cancel{14}}}{\underset{3}{\cancel{21}} \times 5}$

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

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

(ii) $\dfrac{7}{6} \times \dfrac{-3}{28} = \dfrac{\cancel{7} \times -\overset{1}{\cancel{3}}}{\underset{2}{\cancel{6}} \times \underset{4}{\cancel{28}}}$

$= -\dfrac{1}{8}$

(iii) $\dfrac{-19}{36} \times 16 = \dfrac{-19 \times \overset{4}{\cancel{16}}}{\underset{9}{\cancel{36}}}$

$= \dfrac{-76}{9}.$

(iv) $\dfrac{-13}{9} \times \dfrac{27}{-26} = \dfrac{-\overset{1}{\cancel{13}} \times \overset{3}{\cancel{27}}}{\cancel{9} \times -\underset{2}{\cancel{26}}}$

$= \dfrac{-3}{-2}$

$= \dfrac{3}{2}.$

Solution-04:-

(i) $\left(-5 \times \dfrac{2}{15}\right) - \left(-6 \times \dfrac{2}{9}\right) = -\dfrac{\overset{1}{\cancel{5}} \times 2}{\underset{3}{\cancel{15}}} + \dfrac{\overset{2}{\cancel{6}} \times 2}{\underset{3}{\cancel{9}}}$

$\qquad = -\dfrac{2}{3} + \dfrac{4}{3}$

$\qquad = \dfrac{4-2}{3}$

$\qquad = \dfrac{2}{3}$

(ii) $\left(-\dfrac{\overset{3}{\cancel{9}}}{4} \times \dfrac{5}{\underset{1}{\cancel{8}}}\right) + \left(\dfrac{13}{2} \times \dfrac{5}{6}\right) = -\dfrac{15}{4} + \dfrac{65}{12}$

$\qquad = \dfrac{-15 \times 3 + 65}{12}$

$\qquad = \dfrac{65-45}{12}$

$\qquad = \dfrac{20}{12}$

$\qquad = \dfrac{4 \times 5}{4 \times 3}$

$\qquad = \dfrac{5}{3}.$

Solution-05:-

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

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

L.CM of 18, 15, 10.

$$
\begin{array}{r|l}
3 & 18, 15, 10 \\
5 & 6, 5, 10 \\
2 & 6, 1, 2 \\
\hline
 & 3, 1, 1
\end{array}
$$

L.CM $= 3 \times 5 \times 2 \times 3$

$= 90$

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

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

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

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

$= \dfrac{-975 + 336 + 27}{90} = \dfrac{363 - 975}{90} = \dfrac{-612}{90}$

$= \dfrac{-34}{5}$

5. (11) $\left[\dfrac{5}{11} \times \dfrac{5}{9}\right] - \left[\dfrac{9}{13} \times \dfrac{4}{3}\right] + \left[\dfrac{8}{13} \times \dfrac{6}{16}\right]$

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

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

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

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

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

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

Solution-of :-

(i) 1 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) $\frac{7}{-4}$ by $\frac{63}{64} = \frac{7}{-4} \div \frac{63}{64}$

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

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

(vii) $\dfrac{-3}{4} \div -6 = \dfrac{+3}{4} \times \dfrac{1}{+6}$

$$= \dfrac{1}{4 \times 2}$$

$$= \dfrac{1}{8}$$

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

$\dfrac{2}{3} \times \dfrac{12}{-7} = \dfrac{2 \times 4}{-7}$

$$= -\dfrac{8}{7}.$$

Solution - 02 :-

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

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

$$= \dfrac{2 \ 3}{13}$$

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

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

$$= \dfrac{-8}{7}.$$

(III) $-6 \div \dfrac{-8}{17} = \dfrac{-6}{1} \div \dfrac{-8}{17}$

$= -\dfrac{6}{1} \times \dfrac{17}{8}$

$= \dfrac{-3 \times 17}{4}$

$= \dfrac{-51}{4}$

(iv) $\dfrac{40}{98} \div (-20) = \dfrac{40}{98} \times \dfrac{-1}{20}$

$= \dfrac{-2}{98}$

$= \dfrac{-1}{49}$

Solution - 03 :-

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Product of two rational numbers is.

one of the number -10

Required Number $= \dfrac{15}{-10}$

$= \dfrac{3}{-2}$

solution-04:-

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Product of two rational numbers → $-\dfrac{8}{9}$

one of the number → $\dfrac{-4}{15}$

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

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

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

$= \dfrac{10}{3}$.

solution-05:-

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Product $= -\dfrac{23}{9}$

Required number $= -\dfrac{23}{9} \div \dfrac{-1}{6}$

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

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

$= \dfrac{46}{3}$

Solution -06:-

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Product $= -\dfrac{5}{7}$

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

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

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

$= \dfrac{4}{3}$

Solution-07:-

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Product $= 24$,

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

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

$= -3 \times 13$

$= -39.$

$\therefore$ Required number $= -39.$

Solution-08:-

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

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

$= -\dfrac{8}{9}$.

Solution-09:-

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

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

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

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

$= 13 \div -5$

$= -\dfrac{13}{5}$.

(II) $\left(\dfrac{2}{5} + \dfrac{1}{2}\right) \div \left(\dfrac{2}{5} - \dfrac{1}{2}\right)$

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

$= 9 \div -1$

$= -9$,

(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 - 10:-

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

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

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

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

$= \frac{153}{92}$

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

Solution -11.

Gir

$\frac{5+2}{3}$ meters of cloth cost $\longrightarrow$ Rs $\frac{301}{4}$.

cost per meter $\longrightarrow \frac{301}{4} \div \frac{7}{3}$

$$= \frac{\overset{43}{\cancel{301}}}{4} \times \frac{3}{\cancel{7}}$$

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

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

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

Solution-12:-

Required number $= \frac{-33}{16} \div \frac{-11}{4}$

$$= \frac{\overset{3}{\cancel{-33}}}{\underset{4}{\cancel{16}}} \times \frac{\cancel{4}^{1}}{\cancel{-11}}$$

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

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

Solution -13 :-

sum of $\frac{-13}{5}$ and $\frac{12}{7}$ $= \frac{-13}{5} + \frac{12}{7}$

$$= \frac{-13 \times 7 + 12 \times 5}{35}$$

$$= \frac{-91 + 60}{35}$$

$$= \frac{-31}{35}$$

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

∴ Required number $= \frac{-31}{35} \div \frac{31}{14}$

$$= \frac{-31}{35} \times \frac{14}{31}$$

$$= \frac{-14}{35}$$

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

∴ Required number → $\frac{-2}{5}$.

Solution-14:

Sum of $\frac{65}{12}$ and $\frac{8}{3}$ = $\frac{65}{12} + \frac{8}{3}$

$$= \frac{65 \times 3 + 12 \times 8}{36}$$

$$= \frac{195 + 96}{36} = \frac{291}{36}$$

Difference = $\frac{65}{12} - \frac{8}{3}$

$$= \frac{65 \times 3 - 8 \times 12}{36}$$

$$= \frac{195 - 96}{36} = \frac{99}{36}$$

Required number = $\frac{291}{36} \div \frac{99}{36}$

$$= \frac{291}{36} \times \frac{36}{99}$$

$$= \frac{291}{99}$$

$$= \frac{97}{33}.$$

solution – 15:-

length of cloth is required for each trouser

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

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

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

§

Solution-01:-

we know that

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

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

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

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

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

$$\frac{-3}{13} > \frac{-4}{13}.$$

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

are $\frac{-3}{13}, \frac{-2}{13}, \frac{-1}{13}, \frac{0}{13}, \frac{1}{13}, \frac{2}{13}, \frac{3}{13}, \frac{4}{13}, \frac{5}{13}, \frac{6}{13}, \frac{7}{13}.$

Solution— 03:-

(i) False

(ii) True

(iii) True.