Chapter 5 Operations on Rational Numbers

VII Exercise-5.1. 5. Operations on Rational Number 1

Solution-5.1.

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

we have,

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

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

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

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

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

Solution-02:-

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

If $\frac{p}{q}$ and $\frac{r}{s}$ are two rational 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) $\frac{-7}{27}$ and $\frac{11}{18}$.

L.C.M of 27 and 18 is 54

$$\frac{-7}{27} = \frac{-7\times2}{27\times2} = \frac{-14}{54}; \quad \frac{11}{18} = \frac{11\times3}{18\times3} = \frac{33}{54}$$

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

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

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

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

$$\frac{31}{-4} = \frac{31\times2}{-4\times2} = \frac{62}{-8}; \quad \frac{-5}{8}.$$

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

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

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

Solution-03

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

L.C.M of 9 and 6 is 18

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

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

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

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

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

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

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

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

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

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

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

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

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

L.c M of 12 and 15 is 60

$\frac{-1}{12} = \frac{-1\times5}{60} = \frac{-5}{60}$

$\frac{-2}{15} = \frac{-2\times4}{15\times4} = \frac{-8}{60}$.

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

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

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

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

L.cM of 19 and 57 is 57

$\frac{-8}{19} = \frac{-8\times3}{19\times3} = \frac{-24}{57}$

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

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

solution-04:-

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

L.CM of 5 and 10 is 10.

$$\frac{-12}{5} = \frac{-12\times2}{5\times2} = \frac{-24}{10}.$$

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

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

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

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

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

L.CM of 7 and 4 is 28.

$$\frac{24}{7} = \frac{24\times4}{7\times4} = \frac{96}{28}$$

$$\frac{-11}{4} = \frac{-11\times7}{4\times7} = \frac{-77}{28}.$$

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

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

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

L.CM of 6 and 8 is 24

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

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

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

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

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

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

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

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

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

(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.c.M 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 $= \frac{-1}{3} + \frac{12}{3}$

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

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

solution-05:-

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

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

$= \frac{-4\times1 + 5\times3}{3\times1}$

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

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

∴ Required number is $\frac{11}{3}$.

solution-06:-

Required number $= -8 - (-\frac{15}{7})$

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

$= \frac{-8\times7 + 15\times1}{7\times1}$ [∵ H.C.F=1]

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

Solution-07:-

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

$= \frac{5\times8 + 7\times9}{9\times8}$ [$\because$ H.C.F = 1]

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

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

Solution-08:-

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

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

$= \frac{26+5\times3}{33}$ [$\because$ L.C.M = 33]

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

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

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

Solution-09:-

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

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

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

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

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

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

$= \frac{1}{21}$

Solution-10:-

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

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

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

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

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

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

Solution-11:-

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:-

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:-

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

$$= 3 - \left[\frac{1\times15 + 1\times10 + 1\times6}{30}\right]$$

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

$$= \frac{3\times30 - 31}{30}$$

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

$$= \frac{59}{30}.$$

Solution -14:-

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

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

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

$$= \frac{3\times6}{4\times6} - \frac{2\times8}{3\times8} + \frac{1\times4}{6\times4}$$

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

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

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

Solution-15:

(i) $\frac{-3}{2} + \frac{5}{4} - \frac{7}{4} = \frac{-3\times2+5-7}{4}$

$= \frac{-6+5-7}{4}$

$= \frac{-13+5}{4}$

$= -\frac{8}{4}$

$= -2.$

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

$= \frac{5\times2-7\times1-2\times2}{6}$

$= \frac{10-7-4}{6}$

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

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

[$\because$ L.CM = 24]

$= \frac{5\times6}{4\times6} - \frac{7\times4}{6\times4} + \frac{2\times8}{3\times8}$

$= \frac{30-28+16}{24}$

$= \frac{18}{24} = \frac{3}{4}.$

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

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

$5 \overline{)5, 10, 7}$

$1, 2, 7$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Exercise - 5.3

solution-01

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

$= \frac{35}{44}$

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

$= \frac{-15}{28}$

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

$= \frac{-10}{99}$

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

$= \frac{-3 \times 5}{17 \times 4}$

$= \frac{-15}{68}$

Solution -02:

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

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

$= \frac{+3}{+12}$

$= \frac{1}{4}$

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

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

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

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

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

(iv) $\frac{6}{7} \times \frac{-49}{36} = \frac{6 \times -49\ 7}{7 \times 36\ 6}$

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

solution-03:-

(i) $\frac{-16}{21} \times \frac{14}{5} = \frac{-16 \times 14^{2}}{\cancel{21}_{3} \times 5}$

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

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

(ii) $\frac{7}{6} \times \frac{-3}{28} = \frac{\cancel{7}^{1} \times \cancel{-3}^{1}}{\cancel{2} \times \cancel{28}_{4}}$

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

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

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

(iv) $\frac{-13}{9} \times \frac{27}{-26} = \frac{\cancel{-13}^{1} \times \cancel{27}^{3}}{9 \times \cancel{-26}_{2}}$

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

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

Solution-04:-

(i) $\left(-5 \times \frac{2}{15}\right) - \left(-6 \times \frac{2}{9}\right) = -\frac{\cancel{8}^{1} \times 2}{\cancel{15}_{3}} + \frac{\cancel{6}^{2} \times 2}{\cancel{9}_{3}}$

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

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

$= \frac{2}{3}$

(ii) $\left(-\frac{\cancel{9}^{3}}{4} \times \frac{5}{\cancel{3}_{1}}\right) + \left(\frac{13}{2} \times \frac{5}{6}\right) = -\frac{15}{4} + \frac{65}{12}$

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

$= \frac{65 - 45}{12}$

$= \frac{20}{12}$

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

$= \frac{5}{3}$.

Solution-05:-

(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.

$3 \mid 18, 15, 10$
$5 \mid 6, 5, 10$
$2 \mid 6, 1, 2$
$3, 1, 1$

L.C.M $= 3 \times 5 \times 2 \times 3$
$= 90$

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

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

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

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

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

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

5. (ii) $\left[\frac{\cancel{5}}{\cancel{11}} \times \frac{5}{\cancel{9}_{2}}\right] - \left[\frac{\cancel{9}^{3}}{\cancel{13}} \times \frac{\cancel{14}^{1}}{\cancel{3}}\right] + \left[\frac{\cancel{8}}{13} \times \frac{6}{\cancel{13}_{3}}\right]$

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

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

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

$= \frac{327 - 858}{858}$

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

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

Exercise-5.4.

Solution-05:-

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

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

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

$= \frac{1}{8}$

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

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

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

solution - 02:-

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

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

$= \frac{3}{13}$

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

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

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

(iii) $-6 \div \frac{-8}{17} = \frac{-6}{1} \div \frac{-8}{17}$

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

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

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

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

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

$= \frac{-1}{49}.$

Solution- 03 :-

Given

Product of two rational numbers 15.

one of the number -10

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

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

solution-04:-

GIT

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:-

GIT

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

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

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

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

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

Solution-06:-

Q1T

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

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:-

Q1T

Product $= 24$.

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

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

$\div -3 \times 13$

$= -39$.

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

Solution-08:-

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

$= \left(\frac{5\times3-1\times4}{12}\right) \div \left(\frac{5\times3+4}{12}\right)$

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

$= 11 \div 19$

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

Solution - 10:-

Given

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

↪ Rs $\frac{51}{4}$

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

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

$= \frac{153}{92}$

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

Solution-11.

Gir

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

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

$= \frac{301}{4} \times \frac{3}{7}$

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

$= \frac{129}{4}$

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

Solution-12:-

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

$= \frac{-33}{16} \times \frac{4}{-11}$

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

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

Solution -13 :-

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

$= \frac{-13\times7 + 12\times5}{35}$

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

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

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

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

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

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

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

$\therefore$ Required number $\longrightarrow \frac{-2}{5}$.

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

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

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

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

Exercise-5.5

Q

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- Q3:-

(i) False

(ii) True

(iii) True.