

Exercise 1.3

(16)

Q.1 Subtract the first rational number from the second in each of the following:

(i) $\frac{3}{8}, \frac{5}{8}$ (ii) $-\frac{7}{9}, \frac{4}{9}$ (iii) $-\frac{2}{11}, -\frac{9}{11}$ (iv) $\frac{11}{13}, -\frac{4}{13}$

(v) $\frac{1}{4}, -\frac{3}{8}$ (vi) $-\frac{2}{3}, \frac{5}{6}$ (vii) $-\frac{6}{7}, -\frac{13}{14}$

(viii) $-\frac{8}{33}, -\frac{7}{22}$

Solution: (i) $\frac{5}{8} - \frac{3}{8} = \frac{5-3}{8} = \frac{2}{8} = \frac{1}{4}$

(ii) $\frac{4}{9} - (-\frac{7}{9}) = \frac{4}{9} + \frac{7}{9} = \frac{4+7}{9} = \frac{11}{9}$

(iii) $-\frac{9}{11} - (-\frac{2}{11}) = -\frac{9}{11} + \frac{2}{11} = \frac{-9+2}{11} = -\frac{7}{11}$

(iv) $-\frac{4}{13} - \frac{11}{13} = \frac{-4-11}{13} = -\frac{15}{13}$

(v) $-\frac{3}{8} - \frac{1}{4} = \frac{-3-2}{8} = -\frac{5}{8}$

(vi) $\frac{5}{6} - (-\frac{2}{3}) = \frac{5}{6} + \frac{2}{3} = \frac{5+4}{6} = \frac{9}{6} = \frac{3}{2}$

(vii) $-\frac{13}{14} - (-\frac{6}{7}) = -\frac{13}{14} + \frac{6}{7} = \frac{-13+12}{14} = -\frac{1}{14}$

$$(vii) \quad -\frac{7}{22} - \left(-\frac{8}{33}\right) = -\frac{7}{22} + \frac{8}{33}$$

$$= \frac{-21 + 16}{66} = -\frac{5}{66}$$

Q.2 Evaluate each of the following

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

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

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

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

(v) $\frac{-3}{-8} - \frac{-2}{7}$

(vi) $-\frac{4}{13} - \frac{-5}{26}$

(vii) $-\frac{5}{14} - \frac{-2}{7}$

(viii) $\frac{13}{15} - \frac{12}{25}$

(ix) $-\frac{6}{13} - \frac{-7}{13}$

(x) $\frac{7}{24} - \frac{19}{36}$

(xi) $\frac{5}{63} - \frac{-8}{21}$

Solution: (i) $\frac{2}{3} - \frac{3}{5} = \frac{2 \times 5 - 3 \times 3}{15} = \frac{10 - 9}{15} = \frac{1}{15}$

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

$$= -\frac{4}{7} + \frac{2}{3} = \frac{-4 \times 3 + 2 \times 7}{21}$$

$$= \frac{-12 + 14}{21} = \frac{2}{21}$$

$$(iii) \frac{4}{7} - \frac{-5}{-7} = \frac{4}{7} - \frac{5}{7} = \frac{4-5}{7} = \frac{-2}{7}$$

$$(iv) -2 - \frac{5}{9} = \frac{-18-5}{9} = \frac{-23}{9}$$

$$(v) \frac{-3}{-8} - \frac{-2}{7} = \frac{3}{8} + \frac{2}{7} = \frac{3 \times 7 + 8 \times 2}{56} = \frac{21+16}{56} = \frac{37}{56}$$

$$(vi) -\frac{4}{13} - \frac{-5}{26} = -\frac{4}{13} + \frac{5}{26} = \frac{-4 \times 2 + 5}{26} = \frac{-8+5}{26} = \frac{-3}{26}$$

$$(vii) -\frac{5}{14} - \frac{-2}{7} = -\frac{5}{14} + \frac{2}{7} = \frac{-5+4}{14} = \frac{-1}{14}$$

$$(ix) -\frac{6}{13} - \frac{-7}{13} = -\frac{6}{13} + \frac{7}{13} = \frac{-6+7}{13} = \frac{1}{13}$$

$$(x) \frac{7}{24} - \frac{19}{36} = \frac{7 \times 3 - 19 \times 2}{72} = \frac{21-38}{72} = \frac{-17}{72}$$

$$(xi) \frac{5}{63} - \frac{-8}{21} = \frac{5}{63} + \frac{8}{21} = \frac{5 \times 1 + 8 \times 3}{63} = \frac{5+24}{63} = \frac{29}{63}$$

Q3 The Sum of the two numbers is $\frac{5}{9}$. If one of the numbers is $\frac{1}{3}$, find the other.

Solution: $\therefore$ Sum of two numbers = $\frac{5}{9}$
One number = $\frac{1}{3}$

$$\therefore \text{Other number} = \frac{5}{9} - \frac{1}{3} = \frac{5 \times 1 - 1 \times 3}{9} \\ = \frac{5-3}{9} = \frac{2}{9}$$

Q4 The sum of two numbers is $-\frac{1}{3}$. If one of the numbers is $-\frac{12}{3}$, find the other.

Solution: $\therefore$ Sum of two numbers = $-\frac{1}{3}$
one number = $-\frac{12}{3}$

$$\therefore \text{Other number} = -\frac{1}{3} - \left(-\frac{12}{3}\right) = -\frac{1}{3} + \frac{12}{3} \\ = \frac{-1+12}{3} = \frac{11}{3}$$

Q.5 The Sum of two numbers is $-\frac{4}{3}$. If one of the number is -5 , find the other.

Solution: $\therefore$ Sum of numbers = $-\frac{4}{3}$
one number = -5

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

Q6 The sum of two rational numbers is -8 . If one of the numbers is $-\frac{15}{7}$, find the other.

Solution: $\therefore$ Sum of numbers $= -8$
 one number $= -\frac{15}{7}$

$$\begin{aligned}
 \therefore \text{other number} &= -8 - \left(-\frac{15}{7}\right) = -8 + \frac{15}{7} \\
 &= \frac{-56 + 15}{7} = -\frac{41}{7}
 \end{aligned}$$

Q7 What should be added to $-\frac{7}{8}$ to get $\frac{5}{9}$?

Solution: Required number $= \frac{5}{9} - \left(-\frac{7}{8}\right)$

$$\begin{aligned}
 &= \frac{5}{9} + \frac{7}{8} = \frac{5 \times 8 + 7 \times 9}{72} \\
 &= \frac{40 + 63}{72} = \frac{103}{72}
 \end{aligned}$$

Q.8 What number should be added to $-\frac{5}{11}$ so as to get $\frac{26}{33}$?

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

$$= \frac{26}{33} + \frac{5}{11} = \frac{26 + (5 \times 3)}{33}$$

$$= \frac{26 + 15}{33} = \frac{41}{33}$$

Q.9 What number should be added to $-\frac{5}{7}$ to get $-\frac{2}{3}$?

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

$$= -\frac{2}{3} + \frac{5}{7} = \frac{-2 \times 7 + 5 \times 3}{21}$$

$$= \frac{-14 + 15}{21} = \frac{1}{21}$$

Q.10 What number should be subtracted from $-\frac{5}{3}$ to get $\frac{5}{6}$?

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

$$= -\frac{5}{3} - \frac{5}{6} = \frac{-5 \times 2 - 5 \times 1}{6}$$

$$= \frac{-10 - 5}{6} = \frac{-15}{6} = -\frac{5}{2}$$

Q.11 what number should be subtracted from $\frac{3}{7}$ to get $\frac{5}{4}$?

Solution: let x should be subtracted.

$$\therefore \frac{3}{7} - x = \frac{5}{4}$$

Transposing x to RHS, $\frac{5}{4}$ to LHS

$$\Rightarrow \frac{3}{7} - \frac{5}{4} = x$$

$$= \frac{(3 \times 4) - (5 \times 7)}{28} = x$$

$$= \frac{12 - 35}{28} = x \Rightarrow x = -\frac{23}{28}$$

Q.12 what should be added to $(\frac{2}{3} + \frac{3}{5})$ to get $-\frac{2}{15}$

Solution: let required number be x , then

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

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

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

$$\Rightarrow x = \frac{-2 - 10 - 9}{15} = -\frac{21}{15} = -\frac{7}{5}$$

Q.12 What should be subtracted from $(\frac{3}{4} - \frac{2}{3})$ to get $-\frac{1}{6}$.

Solution: $\therefore \frac{3}{4} - \frac{2}{3} = \frac{3 \times 3 - 2 \times 4}{12} = \frac{9 - 8}{12} = \frac{1}{12}$

Let x should be subtracted from $\frac{1}{12}$ to get $-\frac{1}{6}$

$$\therefore \frac{1}{12} - x = -\frac{1}{6}$$

$$\Rightarrow \frac{1}{12} + \frac{1}{6} = x$$

$$\Rightarrow \frac{1+2}{12} = x \Rightarrow \frac{3}{12} = x$$

$$\Rightarrow x = \frac{1}{4}$$

Q.13 What should be added to $(\frac{1}{2} + \frac{1}{3} + \frac{1}{5})$ to get 3

Solution: $\therefore \frac{1}{2} + \frac{1}{3} + \frac{1}{5} = \frac{15+10+6}{30} = \frac{31}{30}$

Let x should be added.

$$\therefore \frac{31}{30} + x = 3$$

$$\Rightarrow x = 3 - \frac{31}{30} = \frac{3 \times 30 - 31}{30} = \frac{90 - 31}{30} = \frac{59}{30}$$

Q.15 Fill in the blanks.

$$(i) -\frac{4}{13} - \frac{-3}{26} = \dots$$

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

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

$$(iv) \dots + \frac{15}{23} = 4$$

Solution: (i) $-\frac{4}{13} + \frac{3}{26} = \frac{-4 \times 2 + 3}{26} = \frac{-8 + 3}{26} = \frac{-5}{26}$

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

$$\Rightarrow x = -1 + \frac{9}{14} = \frac{-14 + 9}{14} = -\frac{5}{14}$$

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

$$\Rightarrow -\frac{7}{9} + x = 3 \Rightarrow x = 3 + \frac{7}{9} = \frac{9 \times 3 + 7}{9} = \frac{27 + 7}{9}$$

$$\Rightarrow x = \frac{34}{9}$$

$$(iv) \dots + \frac{15}{23} = 4$$

$$\therefore x + \frac{15}{23} = 4 \Rightarrow x = 4 - \frac{15}{23} = \frac{4 \times 23 - 15}{23}$$

$$\Rightarrow x = \frac{92 - 15}{23} = \frac{77}{23}$$