

Question 1

Find the additive inverses

Answer

Ans. (i) Additive inverse of $\frac{9}{13}$

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

(ii) Additive inverse of $\frac{16}{7}$

$$= -\left(\frac{16}{7}\right) = \frac{-16}{7}$$

(iii) Additive inverse of $\frac{-3}{23}$

$$= -\left(\frac{-3}{23}\right) = \frac{3}{23}$$

(iv) Additive inverse of $\frac{8}{-11}$

$$= -\left(\frac{8}{-11}\right) = \frac{8}{11}$$

(v) Additive inverse of $\frac{-22}{15}$

$$= -\left(\frac{-22}{15}\right) = \frac{22}{15}$$

Ans. Additive inverse of $\frac{-11}{-9}$

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

Question 2

find the sum.....

Answer

$$\frac{-7}{17} + \frac{6}{17} = \frac{-6+7}{17} = \frac{1}{17}$$

$$\begin{aligned}\frac{-5}{12} + \frac{7}{-12} &= \frac{-5}{12} + \frac{-7}{12} = \frac{-5-7}{12} \\ &= \frac{-12}{12} = -1\end{aligned}$$

$$\frac{8}{15} + \frac{5}{12}$$

L.C.M. of 15 and 12 = 60

$$\frac{8}{15} = \frac{8 \times 4}{15 \times 4} = \frac{32}{60}, \quad \frac{5}{12} = \frac{5 \times 5}{12 \times 5} = \frac{25}{60}$$

$$\frac{8}{15} + \frac{5}{12} = \frac{32}{60} + \frac{25}{60} = \frac{32+25}{60} = \frac{57}{60}$$

$$\Rightarrow \frac{-11}{18} + \frac{5}{-12}$$

LCM of 18 and 12 = 36

$$\frac{-11}{18} = \frac{-11 \times 2}{18 \times 2} = \frac{-22}{36}, \quad \frac{5}{-12} = \frac{5 \times 3}{-12 \times 3} = \frac{-15}{36}$$

$$\frac{-11}{18} + \frac{5}{-12} = \frac{-22}{36} + \frac{-15}{36}$$

$$= \frac{-22-15}{36} = \frac{-37}{36} = -1\frac{1}{36}$$

$$(v) \frac{-11}{6} + \frac{-3}{4} + \frac{5}{8} + \frac{-7}{3}$$

L.C.M. of 6, 4, 8, 3 = 24

$$\therefore \frac{-11}{6} = \frac{-11 \times 4}{6 \times 4} = \frac{-44}{24}$$

$$\frac{-3}{4} = \frac{-3 \times 6}{4 \times 6} = \frac{-18}{24}, \frac{5}{8} = \frac{5 \times 3}{8 \times 3} = \frac{15}{24}$$

$$\frac{-7}{3} = \frac{-7 \times 8}{3 \times 8} = \frac{-56}{24}$$

$$\therefore \frac{-11}{6} + \frac{-3}{4} + \frac{5}{8} + \frac{-7}{3}$$

$$= \frac{-44}{24} + \frac{-18}{24} + \frac{15}{24} + \frac{-56}{24}$$

$$= \frac{-44 - 18 + 15 - 56}{24} = \frac{-44 - 18 - 56 + 15}{24}$$

$$= \frac{-118 + 15}{24} = \frac{-103}{24} = -4\frac{7}{24}$$

$$(vi) \frac{4}{7} + \frac{2}{-3} + \frac{5}{21} + \frac{-8}{9}$$

L.C.M. of 7, 3, 21, 9 = 63

$$\therefore \frac{4}{7} = \frac{4 \times 9}{7 \times 9} = \frac{36}{63}$$

$$\frac{2}{-3} = \frac{2 \times 21}{-3 \times 21} = \frac{42}{-63} = \frac{-42}{63}$$

$$\frac{5}{21} = \frac{5 \times 3}{21 \times 3} = \frac{15}{63}, \frac{-8}{9} = \frac{-8 \times 7}{9 \times 7} = \frac{-56}{63}$$

$$\therefore \frac{4}{7} + \frac{2}{-3} + \frac{5}{21} + \frac{-8}{9}$$

$$= \frac{36}{63} + \frac{-42}{63} + \frac{15}{63} + \frac{-56}{63} = \frac{36 - 42 + 15 - 56}{63}$$

$$= \frac{36 + 15 - 42 - 56}{63} = \frac{51 - 98}{63} = \frac{-47}{63}$$

Subtract

Answer

Ans. Subtract

$$(i) \frac{2}{3} \text{ from } \frac{5}{6} = \frac{5}{6} - \frac{2}{3}$$

$$\text{L.C.M. of 6, 3} = 6$$

$$\therefore \frac{5}{6} = \frac{5}{6} \Rightarrow \frac{2}{3} = \frac{2 \times 2}{3 \times 2} = \frac{4}{6}$$

$$\therefore \frac{5}{6} - \frac{2}{3} = \frac{5}{6} - \frac{4}{6} = \frac{5-4}{6} = \frac{1}{6}$$

$$(ii) \frac{-2}{5} \text{ from } \frac{-5}{7}$$

$$\frac{-5}{7} - \left(\frac{-2}{5} \right) = \frac{-5}{7} + \frac{2}{5}$$

$$\text{L.C.M. of 7, 5} = 35$$

$$\frac{-5}{7} = \frac{-5 \times 5}{7 \times 5} = \frac{-25}{35}, \quad \frac{2}{5} = \frac{2 \times 7}{5 \times 7} = \frac{14}{35}$$

$$\therefore \frac{-5}{7} + \frac{2}{5} = \frac{-25}{35} + \frac{14}{35} = \frac{-25+14}{35} = \frac{-11}{35}$$

$$(iii) \frac{4}{9} \text{ from } \frac{-7}{8}$$

$$\frac{-7}{8} - \frac{4}{9}$$

$$\text{L.C.M. of 8, 9} = 72$$

$$\therefore \frac{-7}{8} = \frac{-7 \times 9}{8 \times 9} = \frac{-63}{72}$$

$$\frac{4}{9} = \frac{4 \times 8}{9 \times 8} = \frac{32}{72}$$

$$\therefore \frac{-7}{8} - \frac{4}{9} = \frac{-63}{72} - \frac{32}{72}$$

$$= \frac{-63-32}{72} = \frac{-95}{72} = -1 \frac{23}{72}$$

$$(iv) \frac{-11}{6} \text{ from } \frac{8}{3} = \frac{8}{3} - \left(\frac{-11}{6} \right) = \frac{8}{3} + \frac{11}{6}$$

$$\text{L.C.M. of 3, 6} = 6$$

$$\therefore \frac{8}{3} = \frac{8 \times 2}{3 \times 2} = \frac{16}{6}$$

$$\frac{8}{3} + \frac{11}{6} = \frac{16}{6} + \frac{11}{6} = \frac{16+11}{6} = \frac{27}{6} = \frac{9}{2} = 4 \frac{1}{2}$$

Question 7

What number.....

Answer

$$\text{Ans. Sum of two numbers} = \frac{5}{7}$$

$$\text{One number} = -1$$

$$\therefore \text{Second number} = \frac{5}{7} - (-1)$$

$$= \frac{5}{7} + \frac{1}{1}$$

$$= \frac{5+7}{7} = \frac{12}{7} \text{ Ans.}$$

Question 8

What number.....

Answer

$$\text{Ans. Difference of two numbers} = \frac{-1}{6}$$

$$\text{One number} = \frac{-2}{3}$$

$$\therefore \text{Second number} = \frac{-2}{3} - \left(\frac{-1}{6} \right)$$

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

$$= \frac{-1}{2} \text{ Ans.}$$

Question 9

State whether....true or False

Answer

Ans.

(i) Yes, difference of two rational number is also a rational.

(ii) False.

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

$$\begin{aligned}\text{LHS} &= \frac{2 \times 5}{3 \times 5} - \frac{3 \times 3}{5 \times 3} \\ &= \frac{10}{15} - \frac{9}{15} = \frac{1}{15}\end{aligned}$$

$$\text{RHS} = \frac{3 \times 3}{5 \times 3} - \frac{2 \times 5}{3 \times 5} = \frac{9}{15} - \frac{10}{15} = -\frac{1}{5}$$

$\therefore \text{LHS} \neq \text{RHS}.$

(iii) False.

The rational number 0 is the additive identity for rationals.

(iv) No, subtraction is not commutative.

(v) 0 is the rational number which is its own additive inverse.

(vi) False.

$$\frac{19}{-5} + \frac{-3}{11} = \frac{19}{5} + \frac{3}{11}$$

$$\text{LHS} = \frac{19}{-5} + \frac{-3}{11}$$

$$= \frac{-19}{5} + \frac{-3}{11}$$

$$= \frac{-19 \times 11}{5 \times 11} + \frac{-3 \times 5}{11 \times 5}$$

$$= \frac{-209}{55} + \frac{-15}{55} = \frac{-209-15}{55} = \frac{-224}{55}$$

Question 4

the sum.....other

Answer

Ans. Sum of two rational numbers = $-\frac{4}{9}$

One of these numbers = $\frac{13}{6}$

$\therefore$ Second number = $-\frac{4}{9} - \left(\frac{13}{6}\right)$

$$= -\frac{4}{9} - \frac{13}{6} = \frac{-8-39}{18} = \frac{-47}{18} = -2\frac{11}{18}$$

Question 5

What number.....

Answer

Ans. In order to get the required number, we have

to subtract $\left(\frac{-2}{3}\right)$ from $\frac{-1}{7}$

$\therefore$ Required number = $\frac{-1}{7} - \left(\frac{-2}{3}\right)$

$$= \frac{-1}{7} + \frac{2}{3} = \frac{-3+14}{21} = \frac{11}{21}$$

Question 6

What number.....

Answer

Ans. The required number should be, to subtract

$\frac{7}{11}$ from -2

$\therefore$ Required number = $-2 - \left(\frac{7}{11}\right)$

$$= -2 - \frac{7}{11} = \frac{-22-7}{11} = \frac{-29}{11} = -2\frac{7}{11}$$