

RD SHARMA

Solutions

Class 8 Maths

Chapter 1

Ex 1.1

Q1. Add the following rational numbers:

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

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

(iii) $\frac{-8}{11}$ and $\frac{-4}{11}$

(iv) $\frac{6}{13}$ and $\frac{-9}{13}$

Solution:

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

(ii) $\frac{-15}{4} + \frac{7}{4} = \frac{-15+7}{4} = \frac{-8}{4} = -2$

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

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

Q2: Add the following rational numbers:

(i) $\frac{3}{4}$ and $\frac{-5}{8}$

(ii) $\frac{5}{-9}$ and $\frac{7}{3}$

(iii) -3 and $\frac{3}{5}$

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

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

(vi) $\frac{5}{36}$ and $\frac{-7}{12}$

(vii) $\frac{-5}{16}$ and $\frac{-7}{24}$

(viii) $\frac{7}{-18}$ and $\frac{8}{27}$

Solution:

(i) Clearly, denominators of the given numbers are positive.

The LCM of the denominators 4 and 8 is 8.

Now, we will express $\frac{3}{4}$ in the form in which it takes the denominator as 8.

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

Now,

$$\begin{aligned} & \frac{-5}{8} + \frac{6}{8} \\ &= \frac{-5+6}{8} = \frac{1}{8} \end{aligned}$$

(ii) $\frac{5}{-9} + \frac{7}{3}$

$$= \frac{-5}{9} + \frac{7}{3}$$

The LCM of the denominators 9 and 3 is 9.

Now,

We will express $\frac{7}{3}$ in the form in which it takes denominator as 9.

$$\frac{7 \times 3}{3 \times 3} = \frac{21}{9}$$

So,

$$\begin{aligned} \frac{-5}{9} + \frac{21}{9} \\ = \frac{-5+21}{9} = \frac{16}{9} \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad -3 + \frac{3}{5} \\ = \frac{-3}{1} + \frac{3}{5} \end{aligned}$$

The LCM of the denominators 1 and 5 is 5.

Now,

We will express $\frac{-3}{1}$ in the form in which it takes denominator as 5.

$$\frac{-3}{1} = \frac{-3 \times 5}{1 \times 5} = \frac{-15}{5}$$

So,

$$\begin{aligned} \frac{15}{5} + \frac{3}{5} \\ = \frac{-15+3}{5} = \frac{-12}{5} \end{aligned}$$

$$\text{(iv)} \quad \frac{-7}{27} + \frac{11}{18}$$

The LCM of the denominators 27 and 18 is 54.

Now,

We will express $\frac{-7}{27}$ and $\frac{11}{18}$ in the form in which it takes denominator as 54.

$$\frac{-7}{27} = \frac{-7 \times 2}{27 \times 2} = \frac{-14}{54}$$

$$\frac{11}{18} = \frac{11 \times 3}{18 \times 3} = \frac{33}{54}$$

So,

$$\begin{aligned} \frac{-14}{54} + \frac{33}{54} \\ = \frac{-14+33}{54} = \frac{19}{54} \end{aligned}$$

$$\begin{aligned} \text{(v)} \quad \frac{31}{-4} + \frac{-5}{8} \\ = \frac{31}{-4} = \frac{-31}{4} \end{aligned}$$

The LCM of the denominators 4 and 8 is 8.

Now,

We will express $\frac{-31}{4}$ in the form in which it takes denominator as 8.

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

So,

$$\begin{aligned} \frac{-62}{8} + \frac{-5}{8} \\ = \frac{-62-5}{8} = \frac{-67}{8} \end{aligned}$$

$$\text{(vi)} \quad \frac{5}{36} + \frac{-7}{12}$$

The LCM of the denominator 12 and 36 is 36.

Now,

We will express $\frac{-7}{12}$ in the form in which it takes denominator as 36.

$$\frac{-7}{12} = \frac{-7 \times 3}{12 \times 3} = \frac{-21}{36}$$

So,

$$\begin{aligned} & \frac{-21}{36} + \frac{5}{36} \\ &= \frac{-21+5}{36} = \frac{-16}{36} = \frac{-4}{9} \end{aligned}$$

(vii) $\frac{-5}{16}$ and $\frac{7}{24}$

The LCM of the denominators 16 and 24 is 48.

Now,

We will express $\frac{-5}{16}$ and $\frac{7}{24}$ in the form in which it takes denominator as 48.

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

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

So,

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

(viii) $\frac{7}{-18} + \frac{8}{27}$

$$\frac{7}{-18} = \frac{-7}{18}$$

The LCM of the denominator 18 and 27 is 54.

Now,

We will express $\frac{-7}{18}$ and $\frac{8}{27}$ in the form in which it takes denominator as 54.

$$\frac{-7}{18} = \frac{-7 \times 3}{18 \times 3} = \frac{-21}{54}$$

$$\frac{8}{27} = \frac{8 \times 2}{27 \times 2} = \frac{16}{54}$$

So,

$$\begin{aligned} & \frac{-21}{54} + \frac{16}{54} \\ &= \frac{-21+16}{54} = \frac{-5}{54} \end{aligned}$$

Q-3. Simplify:

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

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

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

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

(v) $\frac{7}{9} + \frac{3}{-4}$

(vi) $\frac{5}{26} + \frac{11}{-39}$

(vii) $\frac{-16}{9} + \frac{-5}{12}$

$$\text{(viii)} \quad \frac{-13}{8} + \frac{5}{36}$$

$$\text{(ix)} \quad 0 + \frac{-3}{5}$$

$$\text{(x)} \quad 1 + \frac{-4}{5}$$

Solution:

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

The LCM of the denominator 9 and 6 is 18.

Now,

We will express $\frac{8}{9}$ and $\frac{-11}{6}$ in the form in which it takes denominator as 18.

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

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

So,

$$\frac{16}{18} + \frac{-33}{18}$$

$$= \frac{16-33}{18} = \frac{-17}{18}$$

$$\text{(ii)} \quad 3 + \frac{5}{-7}$$

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

The LCM of the denominator 1 and 7 is 7.

Now,

We will express $\frac{3}{1}$ in the form in which it takes denominator as 7.

$$\frac{3}{1} = \frac{3 \times 7}{1 \times 7} = \frac{21}{7}$$

So,

$$\frac{21}{7} + \frac{-5}{7}$$

$$= \frac{21-5}{7} = \frac{16}{7}$$

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

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

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

The LCM of the denominators 12 and 15 is 60.

Now,

We will express $\frac{-1}{12}$ and $\frac{-2}{15}$ in the form in which it takes denominator as 60.

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

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

So,

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

$$= \frac{-5-8}{60} = \frac{-13}{60}$$

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

The LCM of the denominator of 19 and 57 is 57.

Now,

We will express $\frac{-8}{19}$ in the form in which it takes denominator as 57.

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

So,

$$\begin{aligned} & \frac{-24}{57} + \frac{-4}{57} \\ &= \frac{-24-4}{57} = \frac{-28}{57} \end{aligned}$$

(v) $\frac{7}{9} + \frac{3}{-4}$

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

The LCM of the denominator 9 and 4 is 36.

Now,

We will express $\frac{7}{9}$ and $\frac{-3}{4}$ in the form in which it takes denominator as 36.

$$\frac{7}{9} = \frac{7 \times 4}{9 \times 4} = \frac{28}{36}$$

$$\frac{-3}{4} = \frac{-3 \times 9}{4 \times 9} = \frac{-27}{36}$$

So,

$$\begin{aligned} & \frac{28}{36} + \frac{-27}{36} \\ &= \frac{28-27}{36} = \frac{1}{36} \end{aligned}$$

(vi) $\frac{5}{26} + \frac{11}{-39}$

$$\frac{11}{-39} = \frac{-11}{39}$$

The LCM of the denominator 26 and 39 is 78.

Now,

We will express $\frac{-3}{4}$ and $\frac{-11}{39}$ in the form in which it takes denominator as 78.

$$\frac{5}{26} = \frac{5 \times 3}{26 \times 3} = \frac{15}{78}$$

$$\frac{-11}{39} = \frac{-11 \times 2}{39 \times 2} = \frac{-22}{78}$$

So,

$$\begin{aligned} & \frac{15}{78} + \frac{-22}{78} \\ &= \frac{15-22}{78} = \frac{-7}{78} \end{aligned}$$

(vii) $\frac{-16}{9} + \frac{-5}{12}$

The LCM of the denominator 9 and 12 is 36.

Now,

We will express $\frac{-16}{9}$ and $\frac{-5}{12}$ in the form in which it takes denominator as 36.

$$\frac{-16}{9} = \frac{-16 \times 4}{9 \times 4} = \frac{-64}{36}$$

$$\frac{-5}{12} = \frac{-5 \times 3}{12 \times 3} = \frac{-15}{36}$$

So,

$$\frac{-64}{36} + \frac{-15}{36}$$

$$= \frac{-64-15}{36} = \frac{-79}{36}$$

$$\text{(viii)} \quad \frac{-13}{8} + \frac{5}{36}$$

The LCM of the denominator 8 and 36 is 72.

Now,

We will express $\frac{-13}{8}$ and $\frac{5}{36}$ in the form in which it takes denominator as 72.

$$\frac{-13}{8} = \frac{-13 \times 9}{8 \times 9} = \frac{-117}{72}$$

$$\frac{5}{36} = \frac{5 \times 2}{36 \times 2} = \frac{10}{72}$$

So,

$$\frac{-117}{72} + \frac{10}{72}$$

$$= \frac{-117+10}{72} = \frac{-107}{72}$$

$$\text{(ix)} \quad 0 + \frac{-3}{5}$$

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

$$\text{(x)} \quad 1 + \frac{-4}{5}$$

The LCM of the denominator 1 and 5 is 5.

Now,

We need to express $\frac{1}{1}$ in the form in which it takes denominator as 5.

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

So,

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

$$= \frac{5-4}{5} = \frac{1}{5}$$

Q-4. Add and express the sum as a mixed fraction:

$$\text{(i)} \quad \frac{-12}{5} \text{ and } \frac{43}{10}$$

$$\text{(ii)} \quad \frac{24}{7} \text{ and } \frac{-11}{4}$$

$$\text{(iii)} \quad \frac{-31}{6} \text{ and } \frac{-27}{8}$$

$$\text{(iv)} \quad \frac{101}{6} \text{ and } \frac{7}{8}$$

Solution:

(i) We have:

$$\frac{-12}{5} \text{ and } \frac{43}{10}$$

The LCM of the denominator 5 and 10 is 10.

Now,

We will express $\frac{-12}{5}$ in the form in which it takes denominator as 10.

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

So,

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

$$= \frac{-24+43}{10} = \frac{19}{10}$$

(ii) We have:

$$\frac{24}{7} \text{ and } \frac{-11}{4}$$

The LCM of the denominator 7 and 4 is 28.

Now,

We will express $\frac{24}{7}$ and $\frac{-11}{4}$ in the form in which it takes denominator as 28.

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

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

So,

$$\frac{96}{28} + \frac{-77}{28}$$

$$= \frac{96-77}{28} = \frac{19}{28}$$

(iii) We have:

$$\frac{-31}{6} \text{ and } \frac{-27}{8}$$

The LCM of the denominator 6 and 8 is 24.

Now,

We will express $\frac{-31}{6}$ and $\frac{-27}{8}$ in the form in which it takes denominator as 24.

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

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

So,

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

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

$$= \frac{-205}{24} = -8 \frac{13}{24}$$

(iv) We have:

$$\frac{101}{6} \text{ and } \frac{7}{8}$$

The LCM of the denominator 6 and 8 is 24.

Now,

We will express $\frac{101}{6}$ and $\frac{7}{8}$ in the form in which it takes denominator as 24.

$$\frac{101}{6} = \frac{101 \times 4}{6 \times 4} = \frac{404}{24}$$

$$\frac{7}{8} = \frac{7 \times 3}{8 \times 3} = \frac{21}{24}$$

So,

$$\frac{404}{24} + \frac{21}{24}$$

$$= \frac{404+21}{24}$$

$$= \frac{425}{24} = 17 \frac{17}{24}$$