

## Exercise 6.9

### Question: 1

Add:

i)  $\frac{3}{4}$  and  $\frac{5}{6}$

ii)  $\frac{7}{10}$  and  $\frac{2}{15}$

iii)  $\frac{8}{13}$  and  $\frac{2}{3}$

iv)  $\frac{4}{5}$  and  $\frac{7}{15}$

### Solution:

i) Given:  $\frac{3}{4}$  and  $\frac{5}{6}$

$$\frac{3}{4} + \frac{5}{6}$$

LCM of 4 and 6 is 12, so we will convert each fraction into an equivalent fraction with denominator 12.

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

$$= \frac{9}{12} + \frac{10}{12}$$

$$= \frac{9 + 10}{12} = \frac{19}{12}$$

ii) Given:  $\frac{7}{10}$  and  $\frac{2}{15}$

$$\frac{7}{10} + \frac{2}{15}$$

LCM of 10 and 15 is 30, so we will convert each fraction into an equivalent fraction with denominator 30.

$$= \frac{7 \times 3}{10 \times 3} + \frac{2 \times 2}{15 \times 2}$$

$$= \frac{21}{30} + \frac{4}{30}$$

$$= \frac{21 + 4}{30} = \frac{25}{30}$$

iii) Given:  $\frac{8}{13}$  and  $\frac{2}{3}$

$$\frac{8}{13} + \frac{2}{3}$$

LCM of 13 and 3 is 39, so we will convert each fraction into an equivalent fraction with denominator 39.

$$= \frac{8 \times 3}{13 \times 3} + \frac{2 \times 13}{3 \times 13}$$

$$= \frac{24}{39} + \frac{26}{39}$$

$$= \frac{24 + 26}{39} = \frac{50}{39}$$

iv) Given:  $\frac{4}{5}$  and  $\frac{7}{15}$

$$\frac{4}{5} + \frac{7}{15}$$

LCM of 5 and 15 is 15, so we will convert each fraction into an equivalent fraction with denominator 15.

$$= \frac{4 \times 3}{5 \times 3} + \frac{7 \times 1}{15 \times 1}$$

$$= \frac{12}{15} + \frac{7}{15}$$

$$= \frac{12 + 7}{15} = \frac{19}{15}$$

## Question: 2

Subtract:



i)  $\frac{2}{7}$  from  $\frac{19}{21}$

ii)  $\frac{21}{25}$  from  $\frac{18}{20}$

iii)  $\frac{7}{16}$  from  $\frac{2}{1}$

iv)  $\frac{4}{15}$  from  $2\frac{1}{5}$

**Solution:**

i) Given:  $\frac{2}{7}$  and  $\frac{19}{21}$

$$\frac{2}{7} + \frac{19}{21}$$

LCM of 21 and 7 is 21, so we will convert each fraction into an equivalent fraction with denominator 21.

$$\begin{aligned} &= \frac{19 \times 1}{21 \times 1} - \frac{2 \times 3}{7 \times 3} \\ &= \frac{19}{21} - \frac{6}{21} \\ &= \frac{19-6}{21} = \frac{13}{21} \end{aligned}$$

ii) Given:  $\frac{21}{25}$  and  $\frac{18}{20}$

$$\frac{18}{20} - \frac{21}{25}$$

LCM of 20 and 25 is 100, so we will convert each fraction into an equivalent fraction with denominator 100.



$$= \frac{18 \times 5}{20 \times 5} - \frac{21 \times 4}{25 \times 4}$$

$$= \frac{90}{100} - \frac{84}{100}$$

$$= \frac{90 - 84}{100} = \frac{6}{100}$$

iii) Given:  $\frac{2}{1}$  and  $\frac{7}{16}$

$$\frac{2}{1} - \frac{7}{16}$$

LCM of 1 and 16 is 16, so we will convert each fraction into an equivalent fraction with denominator 16.

$$= \frac{16 \times 2}{16 \times 1} - \frac{7 \times 1}{16 \times 1}$$

$$= \frac{32}{16} - \frac{7}{16}$$

$$= \frac{32 - 7}{16} = \frac{25}{16}$$

iv) Given:  $2\frac{1}{5}$  and  $4\frac{1}{5}$

$$\frac{(2 \times 5) + 1}{5} - \frac{4}{5}$$

LCM of 5 and 15 is 15, so we will convert each fraction into an equivalent fraction with denominator 15.

$$= \frac{11 \times 3}{5 \times 3} - \frac{4 \times 1}{15 \times 1}$$

$$= \frac{33}{15} - \frac{4}{15}$$

$$= \frac{33 - 4}{15} = \frac{29}{15}$$

### Question: 3

Find the difference of:



i)  $\frac{13}{24}$  and  $\frac{7}{16}$

i)  $\frac{5}{18}$  and  $\frac{4}{15}$

i)  $\frac{1}{12}$  and  $\frac{3}{4}$

i)  $\frac{2}{3}$  and  $\frac{6}{7}$

**Solution:**

i) Given:  $\frac{13}{24}$  and  $\frac{7}{16}$

$$\begin{aligned} & \frac{13}{24} - \frac{7}{16} \\ &= \frac{13 \times 2}{24 \times 2} - \frac{7 \times 3}{16 \times 3} \\ &= \frac{26}{48} - \frac{21}{48} \text{ (because LCM of 24 and 16 is 48)} \\ &= \frac{26-21}{48} = \frac{5}{48} \end{aligned}$$

ii) Given:  $\frac{5}{18}$  and  $\frac{4}{15}$

$$\begin{aligned} & \frac{5}{18} - \frac{4}{15} \\ &= \frac{5 \times 5}{18 \times 5} - \frac{4 \times 6}{15 \times 6} \\ &= \frac{25}{90} - \frac{24}{90} \text{ (because LCM of 18 and 15 is 90)} \\ &= \frac{25-24}{90} = \frac{1}{90} \end{aligned}$$

iii) Given:  $\frac{3}{4}$  and  $\frac{1}{12}$

$$\begin{aligned} & \frac{3}{4} - \frac{1}{12} \\ &= \frac{3 \times 3}{4 \times 3} - \frac{1 \times 1}{12 \times 1} \\ &= \frac{9}{12} - \frac{1}{12} \text{ (because LCM of 4 and 12 is 12)} \\ &= \frac{9-1}{12} = \frac{8}{12} \end{aligned}$$

iv) Given:  $\frac{6}{7}$  and  $\frac{2}{3}$

$$\begin{aligned} & \frac{6}{7} - \frac{2}{3} \\ &= \frac{6 \times 3}{7 \times 3} - \frac{2 \times 7}{3 \times 7} \\ &= \frac{18}{21} - \frac{14}{21} \text{ (because LCM of 7 and 3 is 21)} \\ &= \frac{18-14}{21} = \frac{4}{21} \end{aligned}$$

### Question: 4

Subtract as indicated:

i)  $\frac{8}{3} - \frac{5}{9}$

ii)  $4\frac{2}{5} - 2\frac{1}{5}$

iii)  $5\frac{6}{7} - 2\frac{2}{3}$

iv)  $4\frac{3}{4} - 2\frac{1}{6}$

### Solution:

i) Given:  $\frac{8}{3}$  and  $\frac{5}{9}$



$$\frac{8}{3} - \frac{5}{9}$$

$$= \frac{8 \times 3}{3 \times 3} - \frac{5 \times 1}{9 \times 1}$$

$$= \frac{24}{9} - \frac{5}{9} \text{ (because LCM of 3 and 9 is 9)}$$

$$= \frac{24-5}{9} = \frac{19}{9}$$

ii) Given :  $4\frac{2}{5}$  and  $2\frac{1}{5}$

$$4\frac{2}{5} - 2\frac{1}{5}$$

$$\frac{(5 \times 4) + 2}{5} - \frac{(5 \times 2) + 1}{5}$$

$$= \frac{22}{5} - \frac{11}{5}$$

$$= \frac{22-11}{5} = \frac{11}{5}$$

iii) Given :  $5\frac{6}{7}$  and  $2\frac{2}{3}$

$$5\frac{6}{7} - 2\frac{2}{3}$$

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

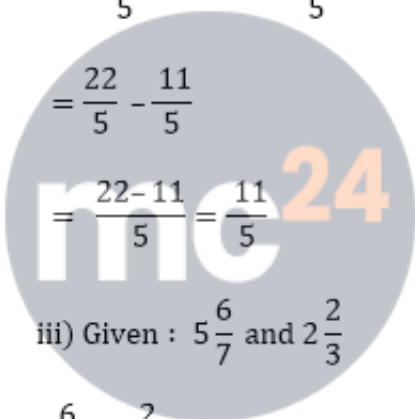
$$= \frac{41}{7} - \frac{8}{3}$$

$$= \frac{(41 \times 3)}{7 \times 3} - \frac{(8 \times 7)}{3 \times 7}$$

(because LCM of 7 and 3 is 21)

$$= \frac{123}{21} - \frac{56}{21}$$

$$= \frac{123-56}{21} = \frac{67}{21}$$



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iv) Given:  $4\frac{3}{4}$  and  $2\frac{1}{6}$

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

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

$$= \frac{19}{4} - \frac{13}{6}$$

$$= \frac{19 \times 3}{4 \times 3} - \frac{(13 \times 2)}{6 \times 2}$$

(because LCM of 4 and 6 is 12)

$$= \frac{57}{12} - \frac{26}{12}$$

$$= \frac{57-26}{12} = \frac{31}{12}$$

### Question: 5

Simplify:

i)  $\frac{2}{3} + \frac{3}{4} + \frac{1}{2}$

ii)  $\frac{5}{8} + \frac{2}{5} + \frac{3}{4}$

iii)  $\frac{3}{10} + \frac{7}{15} + \frac{3}{5}$

iv)  $\frac{3}{4} + \frac{7}{16} + \frac{5}{8}$

v)  $4\frac{2}{3} + 3\frac{1}{4} + 7\frac{1}{2}$

vi)  $\frac{7}{13} + 3\frac{2}{3} + 5\frac{1}{6}$

vii)  $\frac{7}{1} + \frac{7}{4} + 5\frac{1}{6}$

viii)  $\frac{5}{6} + \frac{3}{1} + \frac{3}{4}$

ix)  $\frac{7}{18} + \frac{5}{6} + 1\frac{1}{12}$

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**Solution:**

$$\text{i) given: } \frac{2}{3} + \frac{3}{4} + \frac{1}{2}$$

$$= \frac{2 \times 4}{3 \times 4} + \frac{3 \times 3}{4 \times 3} + \frac{1 \times 6}{2 \times 6} \text{ (because LCM of 3, 4 and 2 is 12)}$$

$$= \frac{8}{12} + \frac{9}{12} + \frac{6}{12}$$

$$= \frac{8+9+6}{12} = \frac{23}{12}$$

$$\text{ii) given: } \frac{5}{8} + \frac{2}{5} + \frac{3}{4}$$

$$= \frac{5 \times 5}{8 \times 5} + \frac{2 \times 8}{5 \times 8} + \frac{3 \times 10}{4 \times 10} \text{ (because LCM of 8, 5 and 4 is 40)}$$

$$= \frac{25}{40} + \frac{16}{40} + \frac{30}{40}$$

$$= \frac{25+16+30}{40} = \frac{71}{40}$$

$$\text{iii) given: } \frac{3}{10} + \frac{2}{5} + \frac{3}{4}$$

$$= \frac{3 \times 4}{10 \times 4} + \frac{2 \times 8}{5 \times 8} + \frac{3 \times 10}{4 \times 10} \text{ (because LCM of 10, 5 and 4 is 20)}$$

$$= \frac{12}{40} + \frac{16}{40} + \frac{30}{40}$$

$$= \frac{12+16+30}{40} = \frac{58}{40}$$

$$\text{iv) given: } \frac{3}{4} + \frac{7}{16} + \frac{5}{8}$$

$$= \frac{3 \times 4}{4 \times 4} + \frac{7 \times 1}{16 \times 1} + \frac{5 \times 2}{8 \times 2} \text{ (because LCM of 4, 16 and 8 is 16)}$$

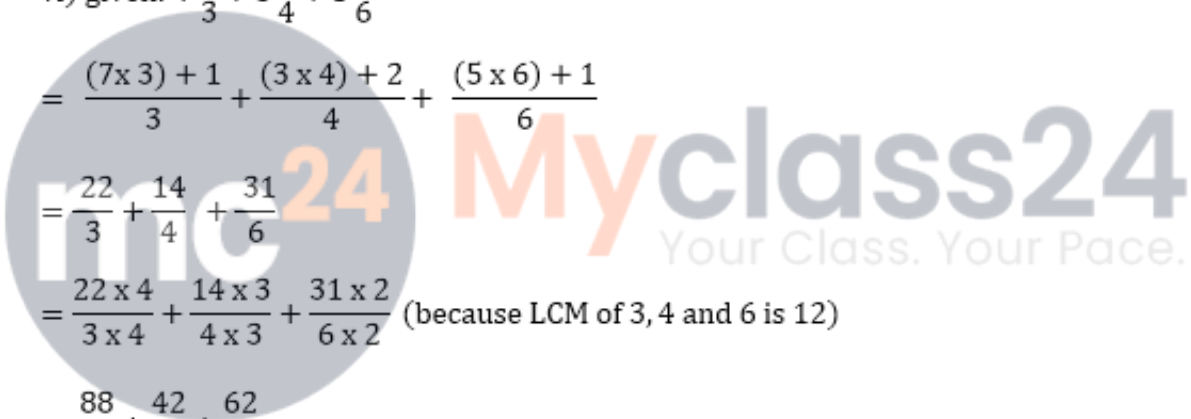
$$= \frac{12}{16} + \frac{7}{16} + \frac{10}{16}$$

$$= \frac{12+7+10}{16} = \frac{29}{16}$$

$$\begin{aligned}
 \text{v) given: } & 4\frac{2}{3} + 3\frac{1}{4} + 7\frac{1}{2} \\
 = & \frac{(4 \times 3) + 2}{3} + \frac{(3 \times 4) + 1}{4} + \frac{(7 \times 2) + 1}{2} \\
 = & \frac{14}{3} + \frac{13}{4} + \frac{15}{2} \\
 = & \frac{14 \times 4}{3 \times 4} + \frac{13 \times 3}{4 \times 3} + \frac{15 \times 6}{2 \times 6} \quad (\text{because LCM of 3, 4 and 2 is 12}) \\
 = & \frac{56}{12} + \frac{39}{12} + \frac{90}{12} \\
 = & \frac{56 + 39 + 90}{12} = \frac{185}{12}
 \end{aligned}$$

$$\begin{aligned}
 \text{vi) given: } & 7\frac{1}{3} + 3\frac{2}{4} + 5\frac{1}{6} \\
 = & \frac{(7 \times 3) + 1}{3} + \frac{(3 \times 4) + 2}{4} + \frac{(5 \times 6) + 1}{6} \\
 = & \frac{22}{3} + \frac{14}{4} + \frac{31}{6} \\
 = & \frac{22 \times 4}{3 \times 4} + \frac{14 \times 3}{4 \times 3} + \frac{31 \times 2}{6 \times 2} \quad (\text{because LCM of 3, 4 and 6 is 12}) \\
 = & \frac{88}{12} + \frac{42}{12} + \frac{62}{12} \\
 = & \frac{88 + 42 + 62}{12} = \frac{16}{1}
 \end{aligned}$$

(HCF of numerator and denominator is 12)



$$\text{vii) given : } \frac{7}{1} + \frac{7}{4} + 5\frac{1}{6}$$

$$= \frac{7 \times 12}{1 \times 12} + \frac{7 \times 3}{4 \times 3} + \frac{31 \times 2}{6 \times 2} \text{ (because LCM of 1, 4 and 6 is 12)}$$

$$= \frac{84}{12} + \frac{21}{12} + \frac{62}{12}$$

$$= \frac{84 + 21 + 62}{12} = \frac{167}{12}$$

$$\text{viii) given : } \frac{5}{6} + \frac{3}{1} + \frac{3}{4}$$

$$= \frac{5 \times 2}{6 \times 2} + \frac{3 \times 12}{1 \times 12} + \frac{3 \times 3}{4 \times 3} \text{ (because LCM of 6, 1 and 4 is 12)}$$

$$= \frac{10}{12} + \frac{36}{12} + \frac{9}{12}$$

$$= \frac{10 + 36 + 9}{12} = \frac{55}{12}$$

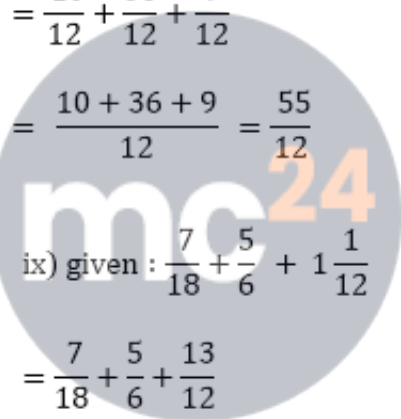
$$\text{ix) given : } \frac{7}{18} + \frac{5}{6} + 1\frac{1}{12}$$

$$= \frac{7}{18} + \frac{5}{6} + \frac{13}{12}$$

$$= \frac{7 \times 2}{18 \times 2} + \frac{5 \times 6}{6 \times 6} + \frac{13 \times 3}{12 \times 3}$$

$$= \frac{14}{36} + \frac{30}{36} + \frac{39}{36}$$

$$= \frac{14 + 30 + 39}{36} = \frac{83}{36}$$



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### Question: 6

Replace \* with a correct number:

$$\text{i) } * - \frac{5}{8} = \frac{1}{4}$$

$$\text{ii) } * - \frac{1}{5} = \frac{1}{2}$$

$$\text{iii) } \frac{1}{2} - * = \frac{1}{6}$$

### Solution:

$$\text{i) } * - \frac{5}{8} = \frac{1}{4}$$

$$* = \frac{5}{8} + \frac{1}{4}$$

$$* = \frac{1 \times 2}{4 \times 2} + \frac{5 \times 1}{8 \times 1}$$

$$* = \frac{2}{8} + \frac{5}{8} = \frac{2+5}{8} = \frac{7}{8}$$

Therefore,  $\frac{7}{8}$



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$$\text{ii) } * - \frac{1}{5} = \frac{1}{2}$$

$$* = \frac{1}{2} + \frac{1}{5}$$

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

$$= \frac{5}{10} + \frac{2}{10}$$

$$= \frac{5+2}{10} = \frac{7}{10}$$

$$\text{iii) } \frac{1}{2} - * = \frac{1}{6}$$

$$* = \frac{1}{2} - \frac{1}{6}$$

$$* = \frac{1 \times 3}{2 \times 3} - \frac{1 \times 1}{6 \times 1} \text{ (because LCM of 2 and 6 is 6)}$$

$$= \frac{3}{6} - \frac{1}{6}$$

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

### Question: 7

Savita bought  $\frac{2}{5}$  m of ribbon and kavita  $\frac{3}{4}$  m of ribbon. What was the total length of the ribbon they bought?

### Solution:

Length of the ribbon bought by savita =  $\frac{2}{5}$  metres

Length of the ribbon bought by kavita =  $\frac{3}{4}$  metres

Total length of the ribbon bought by them:

$$\frac{2}{5} \text{ metres} + \frac{3}{4} \text{ metres}$$

$$= \frac{2 \times 4}{5 \times 4} \text{ metres} + \frac{3 \times 5}{4 \times 5} \text{ metres}$$

(because LCM of 5 and 4 is 20)

$$= \frac{8}{20} \text{ metres} + \frac{15}{20} \text{ metres} = \frac{8 + 15}{20} \text{ metres}$$

$$= \frac{23}{20} \text{ metres}$$

### Question: 8

Ravish takes  $2\frac{1}{5}$  minutes to walk across the school ground. Rahul takes  $\frac{7}{4}$  minutes to do the same. Who takes less time and by what fraction?

### Solution:

$$\text{Time taken by ravish} = 2\frac{1}{5} = \frac{(5 \times 2) + 1}{5} = \frac{11}{5} \text{ minutes}$$

$$\text{Time taken by rahul} = \frac{7}{4} \text{ minutes}$$

Comparing  $\frac{11}{5}$  minutes and  $\frac{7}{4}$  minutes, we get:

$$\frac{11 \times 4}{5 \times 4} \text{ minutes}, \frac{7 \times 5}{4 \times 5} \text{ minutes}$$

(LCM of 4 and 5 is 20, so will we convert each fraction into an equivalent fraction with denominator 20)

$$\frac{44}{20} > \frac{35}{20}$$

Rahul takes less time,

$$\text{i. e., } \frac{44}{20} - \frac{35}{20} = \frac{44 - 35}{20} = \frac{9}{20} \text{ minutes.}$$

**Question: 9**

A piece of a wire  $\frac{7}{8}$  metres long broke into two pieces. One piece was  $\frac{1}{4}$  meter long. How long is the other piece?

**Solution:**

Length of the wire =  $\frac{7}{8}$  metres

Length of one piece of wire =  $\frac{1}{4}$  metres

Let the length of the second piece of wire be  $x$  m.

Therefore, Length of the wire = length of one piece + length of the second piece

$$\frac{7}{8} \text{ metres} = \frac{1}{4} \text{ metres} + x$$

$$X = \frac{7}{8} \text{ metres} - \frac{1}{4} \text{ metres}$$

$$X = \frac{7 \times 1}{8 \times 1} \text{ metres} - \frac{1 \times 2}{4 \times 2} \text{ metres}$$

$$= \frac{7}{8} \text{ metres} - \frac{2}{8} \text{ metres}$$

$$= \frac{7-2}{8} \text{ metres}$$

$$X = \frac{5}{8} \text{ metres}$$

Therefore, the length of the second piece is  $\frac{5}{8}$  metres

**Question: 10**

Shikha and priya have bookshelves of the same size shikha's shelf is  $\frac{5}{6}$  full of book and priya's shelf is  $\frac{2}{5}$  full. Whose bookshelf is more full? By what fraction?

**Solution:**

Fraction of shikha's filled bookshelf =  $\frac{5}{6}$

Fraction of Priya's filled bookshelf =  $\frac{2}{5}$

Comparing  $\frac{5}{6}$  and  $\frac{2}{5}$ , we get :

LCM of 5 and 6 is 30, so will convert each fraction into an equivalent fraction with denominator 30.

$$= \frac{5 \times 5}{6 \times 5} \text{ metres}, \frac{2 \times 6}{5 \times 6} \text{ metres}$$

$$\frac{25}{30} > \frac{12}{30}$$

Shikha's shelf is more full.

Therefore,

$$\frac{25}{30} - \frac{12}{30} = \frac{25-12}{30} = \frac{13}{30}$$

### Question: 11

Ravish's house is  $\frac{9}{10}$  Km from his school. He walked some distance and then took a bus for  $\frac{1}{2}$  Km. How far did he walk?

**Solution:**

Total distance between the house and the school =  $\frac{9}{10}$  Km

Distance covered in the bus =  $\frac{1}{2}$  Km

Distance covered by walking + distance covered in the bus = total distance between

the house and the school

Distance covered by walking = total distance between the house and the school - Distance

covered in the bus

Distance covered by walking:

$$\frac{9}{10} \text{ Km} - \frac{1}{2} \text{ Km}$$

LCM of 10 and 2 is 10, so we convert each fraction into an equivalent fraction with denominator 10

$$= \frac{9 \times 1}{10 \times 1} - \frac{1 \times 5}{2 \times 5} = \frac{9}{10} - \frac{5}{10}$$

$$= \frac{9-5}{10} = \frac{4}{10} \text{ km} = \frac{2}{5} \text{ km}$$

(HCF of numerator and denominator is 2)



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