

EXERCISE 6.9

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

It can be written as

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

We know that the LCM of 4 and 6 is 12

In order to convert fraction into equivalent fraction having 12 as denominator

$$= \left[\frac{3 \times 3}{4 \times 3}\right] + \left[\frac{5 \times 2}{6 \times 2}\right]$$

On further calculation

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

We get

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

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

It can be written as

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

We know that the LCM of 10 and 15 is 30

In order to convert fraction into equivalent fraction having 30 as denominator

$$= \left[\frac{7 \times 3}{10 \times 3}\right] + \left[\frac{2 \times 2}{15 \times 2}\right]$$

On further calculation

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

We get

$$= \frac{21 + 4}{30} = \frac{25}{30} = \frac{5}{6}$$

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

It can be written as

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

We know that the LCM of 13 and 3 is 39

In order to convert fraction into equivalent fraction having 39 as denominator

$$= \left[\frac{8 \times 3}{13 \times 3}\right] + \left[\frac{2 \times 13}{3 \times 13}\right]$$

On further calculation

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

We get

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

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

It can be written as

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

We know that the LCM of 5 and 15 is 15

In order to convert fraction into equivalent fraction having 15 as denominator

$$= \left[\frac{4 \times 3}{5 \times 3}\right] + \left[\frac{7 \times 1}{15 \times 1}\right]$$

On further calculation

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

We get
 $= (12 + 7)/15 = 19/15$

2. Subtract:**(i) $2/7$ from $19/21$** **(ii) $21/25$ from $18/20$** **(iii) $7/16$ from 2** **(iv) $4/15$ from $2\frac{1}{5}$** **Solution:****(i) $2/7$ from $19/21$**

It can be written as

$$19/21 - 2/7$$

We know that LCM of 21 and 7 is 21

In order to convert fraction into equivalent fraction having 21 as denominator

$$= [(19 \times 1)/(21 \times 1)] - [(2 \times 3)/(7 \times 3)]$$

On further calculation

$$= 19/21 - 6/21$$

We get

$$= (19 - 6)/21 = 13/21$$

(ii) $21/25$ from $18/20$

It can be written as

$$18/20 - 21/25$$

We know that LCM of 20 and 25 is 100

In order to convert fraction into equivalent fraction having 100 as denominator

$$= [(18 \times 5)/(20 \times 5)] - [(21 \times 4)/(25 \times 4)]$$

On further calculation

$$= 90/100 - 84/100$$

We get

$$= (90 - 84)/100 = 6/100 = 3/50$$

(iii) $7/16$ from 2

It can be written as

$$2/1 - 7/16$$

We know that LCM of 1 and 16 is 16

In order to convert fraction into equivalent fraction having 16 as denominator

$$= [(16 \times 2)/(16 \times 1)] - [(7 \times 1)/(16 \times 1)]$$

On further calculation

$$= 32/16 - 7/16$$

We get

$$= (32 - 7)/16 = 25/16$$

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

It can be written as

$$11/5 - 4/15$$

We know that LCM of 5 and 15 is 15

In order to convert fraction into equivalent fraction having 15 as denominator

$$= [(11 \times 3)/(5 \times 3)] - [(4 \times 1)/(15 \times 1)]$$

On further calculation
 $= 33/15 - 4/15$
We get
 $= (33 - 4)/15 = 29/15$

3. Find the difference of:

(i) $13/24$ and $7/16$

(ii) $5/18$ and $4/15$

(iii) $1/12$ and $3/4$

(iv) $2/3$ and $6/7$

Solution:

(i) $13/24$ and $7/16$

It can be written as

$$13/24 - 7/16$$

We know that LCM of 24 and 16 is 48

In order to convert fraction into equivalent fraction having 48 as denominator

$$= [(13 \times 2)/(24 \times 2)] - [(7 \times 3)/(16 \times 3)]$$

On further calculation

$$= 26/48 - 21/48$$

We get

$$= (26 - 21)/48 = 5/48$$

(ii) $5/18$ and $4/15$

It can be written as

$$5/18 - 4/15$$

We know that LCM of 18 and 15 is 90

In order to convert fraction into equivalent fraction having 90 as denominator

$$= [(5 \times 5)/(18 \times 5)] - [(4 \times 6)/(15 \times 6)]$$

On further calculation

$$= 25/90 - 24/90$$

We get

$$= (25 - 24)/90 = 1/90$$

(iii) $1/12$ and $3/4$

It can be written as

$$3/4 - 1/12$$

We know that LCM of 4 and 12 is 12

In order to convert fraction into equivalent fraction having 12 as denominator

$$= [(3 \times 3)/(4 \times 3)] - [(1 \times 1)/(12 \times 1)]$$

On further calculation

$$= 9/12 - 1/12$$

We get

$$= (9 - 1)/12 = 8/12 = 2/3$$

(iv) $2/3$ and $6/7$

It can be written as

$$6/7 - 2/3$$

We know that LCM of 7 and 3 is 21

In order to convert fraction into equivalent fraction having 48 as denominator

$$= [(6 \times 3) / (7 \times 3)] - [(2 \times 7) / (3 \times 7)]$$

On further calculation

$$= 18/21 - 14/21$$

We get

$$= (18 - 14)/21 = 4/21$$

4. Subtract as indicated:

(i) $8/3 - 5/9$

(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) $8/3 - 5/9$

It can be written as

$$8/3 - 5/9$$

We know that LCM of 3 and 9 is 9

In order to convert fraction into equivalent fraction having 9 as denominator

$$= [(8 \times 3) / (3 \times 3)] - [(5 \times 1) / (9 \times 1)]$$

On further calculation

$$= 24/9 - 5/9$$

We get

$$= (24 - 5)/9 = 19/9$$

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

It can be written as

$$22/5 - 11/5$$

We get

$$= (22 - 11)/5 = 11/5$$

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

It can be written as

$$41/7 - 8/3$$

We know that LCM of 7 and 3 is 21

In order to convert fraction into equivalent fraction having 21 as denominator

$$= [(41 \times 3) / (7 \times 3)] - [(8 \times 7) / (3 \times 7)]$$

On further calculation

$$= 123/21 - 56/21$$

We get

$$= (123 - 56)/21 = 67/21$$

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

It can be written as

$$19/4 - 13/6$$

We know that LCM of 4 and 6 is 12

In order to convert fraction into equivalent fraction having 12 as denominator

$$= [(19 \times 3) / (4 \times 3)] - [(13 \times 2) / (6 \times 2)]$$

On further calculation
 $= 57/12 - 26/12$
We get
 $= (57 - 26)/12 = 31/12$

5. Simplify:

(i) $2/3 + 3/4 + 1/2$

(ii) $5/8 + 2/5 + 3/4$

(iii) $3/10 + 7/15 + 3/5$

(iv) $3/4 + 7/16 + 5/8$

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

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

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

(viii) $5/6 + 3 + 3/4$

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

Solution:

(i) $2/3 + 3/4 + 1/2$

We know that the LCM of 3, 4 and 2 is 12

In order to convert fraction into equivalent fraction having 12 as denominator

$= [(2 \times 4)/(3 \times 4)] + [(3 \times 3)/(4 \times 3)] + [(1 \times 6)/(2 \times 6)]$

On further calculation

$= 8/12 + 9/12 + 6/12$

We get

$= (8 + 9 + 6)/12 = 23/12$

(ii) $5/8 + 2/5 + 3/4$

We know that the LCM of 8, 5 and 4 is 40

In order to convert fraction into equivalent fraction having 40 as denominator

$= [(5 \times 5)/(8 \times 5)] + [(2 \times 8)/(5 \times 8)] + [(3 \times 10)/(4 \times 10)]$

On further calculation

$= 25/40 + 16/40 + 30/40$

We get

$= (25 + 16 + 30)/40 = 71/40$

(iii) $3/10 + 7/15 + 3/5$

We know that the LCM of 10, 15 and 5 is 30

In order to convert fraction into equivalent fraction having 30 as denominator

$= [(3 \times 3)/(10 \times 3)] + [(7 \times 2)/(15 \times 2)] + [(3 \times 6)/(5 \times 6)]$

On further calculation

$= 9/30 + 14/30 + 18/30$

We get

$= (9 + 14 + 18)/30 = 41/30$

(iv) $3/4 + 7/16 + 5/8$

We know that the LCM of 4, 16 and 8 is 16

In order to convert fraction into equivalent fraction having 16 as denominator

$= [(3 \times 4)/(4 \times 4)] + [(7 \times 1)/(16 \times 1)] + [(5 \times 2)/(8 \times 2)]$

On further calculation
 $= 12/16 + 7/16 + 10/16$
We get
 $= (12 + 7 + 10)/16 = 29/16$

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

It can be written as

$$14/3 + 13/4 + 15/2$$

We know that the LCM of 3, 4 and 2 is 12

In order to convert fraction into equivalent fraction having 12 as denominator

$$= [(14 \times 4)/(3 \times 4)] + [(13 \times 3)/(4 \times 3)] + [(15 \times 6)/(2 \times 6)]$$

On further calculation

$$= 56/12 + 39/12 + 90/12$$

We get

$$= (56 + 39 + 90)/12 = 185/12$$

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

It can be written as

$$22/3 + 11/3 + 31/6$$

We know that the LCM of 3, 3 and 6 is 6

In order to convert fraction into equivalent fraction having 6 as denominator

$$= [(22 \times 2)/(3 \times 2)] + [(11 \times 2)/(3 \times 2)] + [(31 \times 1)/(6 \times 1)]$$

On further calculation

$$= 44/6 + 22/6 + 31/6$$

We get

$$= (44 + 22 + 31)/6 = 97/6$$

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

It can be written as

$$7/1 + 7/4 + 31/6$$

We know that the LCM of 1, 4 and 6 is 12

In order to convert fraction into equivalent fraction having 12 as denominator

$$= [(7 \times 12)/(1 \times 12)] + [(7 \times 3)/(4 \times 3)] + [(31 \times 2)/(6 \times 2)]$$

On further calculation

$$= 84/12 + 21/12 + 62/12$$

We get

$$= (84 + 21 + 62)/12 = 167/12$$

(viii) $5/6 + 3 + 3/4$

We know that the LCM of 6, 1 and 4 is 12

In order to convert fraction into equivalent fraction having 12 as denominator

$$= [(5 \times 2)/(6 \times 2)] + [(3 \times 12)/(1 \times 12)] + [(3 \times 3)/(4 \times 3)]$$

On further calculation

$$= 10/12 + 36/12 + 9/12$$

We get

$$= (10 + 36 + 9)/12 = 55/12$$

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

It can be written as

$$7/18 + 5/6 + 13/12$$

We know that the LCM of 18, 6 and 12 is 36

In order to convert fraction into equivalent fraction having 12 as denominator

$$= [(7 \times 2)/(18 \times 2)] + [(5 \times 6)/(6 \times 6)] + [(13 \times 3)/(12 \times 3)]$$

On further calculation

$$= 14/36 + 30/36 + 39/36$$

We get

$$= (14 + 30 + 39)/36 = 83/36$$

6. Replace \square by the correct number:

(i) $\square - 5/8 = 1/4$

(ii) $\square - 1/5 = 1/2$

(iii) $1/2 - \square = 1/6$

Solution:

(i) $\square - 5/8 = 1/4$

It can be written as

$$\square = 1/4 + 5/8$$

On further calculation

$$\square = [(1 \times 2)/(4 \times 2)] + [(5 \times 1)/(8 \times 1)]$$

We get

$$\square = 2/8 + 5/8$$

By addition

$$\square = (2 + 5)/8 = 7/8$$

(ii) $\square - 1/5 = 1/2$

It can be written as

$$\square = 1/2 + 1/5$$

On further calculation

$$\square = [(1 \times 5)/(2 \times 5)] + [(1 \times 2)/(5 \times 2)]$$

We get

$$\square = 5/10 + 2/10$$

By addition

$$\square = (5 + 2)/10 = 7/10$$

(iii) $1/2 - \square = 1/6$

It can be written as

$$\square = 1/2 - 1/6$$

On further calculation

$$\square = [(1 \times 3)/(2 \times 3)] - [(1 \times 1)/(6 \times 1)]$$

We get

$$\square = 3/6 - 1/6$$

By addition

$$\square = (3 - 1)/6 = 2/6 = 1/3$$

7. Savita bought $2/5$ m of ribbon and Kavita $3/4$ m of the ribbon. What was the total length of the ribbon they bought?

Solution:

Length of ribbon Savita bought = $2/5$ m
Length of ribbon Kavita bought = $3/4$ m
So the total length of ribbon they bought = $2/5 + 3/4$
We know that the LCM of 5 and 4 is 20
So we get
= $[(2 \times 4)/(5 \times 4)] + [(3 \times 5)/(4 \times 5)]$
On further calculation
= $8/20 + 15/20$
We get
= $(8 + 15)/20 = 23/20$ m

Hence, the total length of the ribbon they bought is $23/20$ m.

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

Solution:

Time taken by Ravish to walk across the school ground = $2\frac{1}{5}$ minutes = $11/5$ minutes
Time taken by Rahul to walk across the school ground = $7/4$ minutes
By comparing $11/5$ and $7/4$ minutes
We know that LCM of 4 and 5 is 20
In order to convert fraction into equivalent fraction having 20 as denominator
 $[(11 \times 4)/(5 \times 4)]$, $[(7 \times 5)/(4 \times 5)]$
So we get $44/20 > 35/20$
So Rahul takes less time
It can be written as
 $44/20 - 35/20 = (44 - 35)/20 = 9/20$ minutes

Hence, Rahul takes less time by $9/20$ minutes.

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

Solution:

It is given that
Length of wire = $7/8$ m
Length of first piece = $1/4$ m
Consider x m as the length of second piece
It can be written as
Length of wire = Length of first piece + Length of second piece
By substituting the values
 $7/8 = 1/4 + x$
On further calculation
 $x = 7/8 - 1/4$
We know that the LCM of 8 and 4 is 8
 $x = [(7 \times 1)/(8 \times 1)] - [(1 \times 2)/(4 \times 2)]$
We get

$$x = 7/8 - 2/8$$

By subtraction

$$x = (7 - 2)/8 = 5/8 \text{ m}$$

Hence, the length of second piece of wire is $5/8$ m.

10. Shikha and Priya have bookshelves of the same size Shikha's shelf is $5/6$ full of book and Priya's shelf is $2/5$ full. Whose bookshelf is more full? By what fraction?

Solution:

Fraction of Shikha's shelf filled with books = $5/6$

Fraction of Priya's shelf filled with books = $2/5$

We know that LCM of 5 and 6 is 30

In order to convert fraction into equivalent fraction having 30 as denominator

$$= [(5 \times 5)/(6 \times 5)], [(2 \times 6)/(5 \times 6)]$$

So we get $25/30 > 12/30$

So Shikha's shelf is more full.

It can be written as

$$25/30 - 12/30 = (25 - 12)/30 = 13/30$$

Hence, Shikha's bookshelf is more full by $13/30$.

11. Ravish's house is $9/10$ km from his school. He walked some distance and then took a bus for $1/2$ km upto the school. How far did he walk?

Solution:

It is given that

Distance of Ravish's house from his school = $9/10$ km

Distance covered by bus = $1/2$ km

It can be written as

Distance between house and school = Distance covered by walking + Distance covered by bus

So we get

Distance covered by walking = Distance between house and school - Distance covered by bus

Substituting values

$$\text{Distance covered by walking} = 9/10 - 1/2$$

We know that LCM of 10 and 2 is 10

In order to convert fraction into equivalent fraction having 10 as denominator

$$\text{Distance covered by walking} = [(9 \times 1)/(10 \times 1)] - [(1 \times 5)/(2 \times 5)]$$

We get

$$\text{Distance covered by walking} = 9/10 - 5/10$$

By subtraction

$$\text{Distance covered by walking} = (9 - 5)/10 = 4/10 = 2/5 \text{ km}$$

Hence, the distance covered by Ravish by walking is $2/5$ km.