IMPORTANT POINTS

1. FRACTION:
A fraction is a quantity which expresses a part of the whole.

\[
\text{FRACTION} = \frac{\text{Numerator}}{\text{Denominator}}
\]

Type of Fractions:

1. **Proper Fraction**: A fraction, whose numerator is less than its denominator, is called a proper fraction. e.g., \(\frac{3}{5}, \frac{4}{6}\) etc.

2. **Improper Fraction**: A fraction, whose numerator is greater than or equal to its denominator, is called an improper fraction. e.g., \(\frac{8}{6}, \frac{24}{13}, \frac{2}{3}, \frac{3}{6}\) etc.

3. **Mixed Fraction**: A mixed fraction consists of two parts:
   (i) an integer and (ii) a proper fraction
   e.g., \(5\frac{2}{3}\) is a mixed fraction, consisting of an integer (5) and a proper fraction \(\frac{2}{3}\).

4. **Like and Unlike Fractions**: Fraction having the same denominator but different numerators are called unlike fractions e.g., \(\frac{2}{3}, \frac{1}{5}, \frac{3}{5}, \frac{7}{5}\) etc. are like fractions.

   If denominator of the given fractions are not same, the fractions are called unlike fractions
   e.g., \(\frac{1}{4}, \frac{3}{8}, \frac{6}{9}, \frac{7}{10}\) etc.

5. **Equivalent Fractions**: If two or more fractions have the same value, they are called equivalent or equal fractions.

   e.g., \(\frac{1}{2}, \frac{2}{4}, \frac{6}{12}, \frac{8}{16}\) etc. are equivalent fractions as \(\frac{1}{2} = \frac{2}{4} = \frac{6}{12} = \frac{8}{16}\).

CONVERSION OF FRACTIONS:

1. **Mixed Fraction into an Improper Fraction** — Multiply the integral part by the denominator
   and to this product add the numerator e.g., \(2\frac{5}{15}\)
   the required improper fraction = \(\frac{2 \times 15 + 5}{15} = \frac{35}{15}\)

2. **Improper Fraction into Mixed Fraction** — Divide numerator by the denominator. The quotient of this division is the integral part and the remainder obtained is numerator of the required mixed fraction.
For example: \[ \frac{23}{3} = \text{Quotient} \]
\[ \frac{\text{Remainder}}{\text{Numerator}} = 7 \frac{2}{3} \]

(iii) Unlike Fraction into Like Fractions:

1. Find L.C.M. of the denominators of all given fractions.
2. Divide L.C.M. by the denominator and multiply the quotient to numerator and denominator of fraction.

\[ \text{e.g., } \frac{2}{7}, \frac{3}{5}, \text{ and } \frac{1}{3} \]
\[ \text{L.C.M. of denominator } 7, 5, 3 = 105 \]

Now, in \( \frac{2}{7} \) dividing L.C.M. by 7 Quotient = 15
\[ \therefore \frac{2 \times 15}{7 \times 15} = \frac{30}{105} \]

\( \frac{3}{5} \) dividing L.C.M. by 5 Quotient = 21
\[ \therefore \frac{3 \times 21}{5 \times 21} = \frac{63}{105} \]

\( \frac{1}{3} \) dividing L.C.M. by 3 Quotient = 35
\[ \therefore \frac{1 \times 35}{3 \times 35} = \frac{35}{105} \]

\[ \therefore \frac{2}{7}, \frac{3}{5}, \text{ and } \frac{1}{3} = \frac{30}{105}, \frac{63}{105}, \text{ and } \frac{35}{103} \]

**EXERCISE 14(A)**

**Question 1.**
For each expression, given below, write a fraction :
(i) 2 out of 7 = .......... 
(ii) 5 out of 17 = .......... 
(iii) three-fifths = .......... 

**Solution:**
(i) 2 out of 7 = \( \frac{2}{7} \)
(ii) 5 out of 17 = \( \frac{5}{17} \)
(iii) three-fifths = \( \frac{3}{5} \)

**Question 2.**
Fill in the blanks :

(i) \( \frac{5}{8} \) is .......... fraction.  
(ii) \( \frac{8}{3} \) is .......... fraction. 

(iii) \( \frac{-15}{-15} \) is .......... fraction.  
(iv) The value of \( \frac{5}{5} = .......... \). 

(v) The value of \( \frac{5}{5} = .......... \).  
(vi) \( \frac{3}{10} \) is .......... fraction. 

(vii) \( \frac{2}{15} \) and \( \frac{7}{15} \) are .......... fractions.
(viii) \( \frac{23}{12} \) and \( \frac{23}{15} \) are .......... fractions.

(ix) \( \frac{6}{15} \) and \( \frac{28}{70} \) are .......... fractions.

(x) \( \frac{8}{24} \) and \( \frac{8}{32} \) are not .......... fractions.

(xi) \( \frac{2}{13} = \frac{3 \times 13 + \ldots}{13} = ............. \).

(xii) \( -\frac{4}{3} = ............. = ............. \).

Solution:
(i) Proper
(ii) Improper
(iii) Improper
(iv) 1
(v) -1
(vi) Mixed
(vii) Like
(viii) Unlike fraction
(ix) Equal fraction
(x) Like

(xi) \( + 2 = \frac{41}{13} \)

(xii) \( -\frac{4 \times 5 + 3}{5} = -\frac{23}{5} \)

Question 3.
From the following fractions, separate:
(i) Proper fractions
(ii) Improper fractions:
\[ \frac{2}{9}, \frac{4}{3}, \frac{7}{15}, \frac{11}{20}, \frac{20}{11}, \frac{18}{23} \text{ and } \frac{27}{35} \]

Solution:
We know that proper fraction is a fraction whose numerator is less than its denominator and improper fraction is the fraction whose numerator is greater than its denominator:

\[ \frac{2}{9}, \frac{7}{15}, \frac{11}{20}, \frac{18}{23} \text{ and } \frac{27}{35} \text{ are proper fractions} \]

\[ \frac{4}{3}, \frac{20}{11} \text{ are improper fractions.} \]

Question 4.
Change the following mixed fractions to improper fractions:
Question 5.
Change the following improper fractions to mixed fractions:
(i) \( \frac{100}{17} \)  
(ii) \( \frac{81}{11} \)  
(iii) \( \frac{-209}{7} \)  
(iv) \( \frac{-113}{15} \)

Solution:
(i) \( \frac{100}{17} = 5 \frac{15}{17} \)  
(ii) \( \frac{81}{11} = 7 \frac{4}{11} \)  
(iii) \( \frac{-209}{7} = -29 \frac{6}{7} \)  
(iv) \( \frac{-113}{15} = -7 \frac{8}{15} \)

Question 6.
Change the following groups of fractions to like fractions:
(i) \( \frac{1}{3}, \frac{2}{5}, \frac{3}{6}, \frac{1}{6} \)  
(ii) \( \frac{5}{6}, \frac{7}{8}, \frac{11}{12}, \frac{3}{10} \)  
(iii) \( \frac{2}{7}, \frac{7}{8}, \frac{5}{14}, \frac{9}{16} \)

Solution:
(i) \( \frac{1}{3} \cdot \frac{2}{5} \cdot \frac{3}{4} \cdot \frac{1}{6} \)

L.C.M. of denominators 3, 5, 4, 6 = 60

\[
\begin{array}{c|cccc}
2 & 3, & 5, & 4, & 6 \\
3 & 3, & 5, & 2, & 3 \\
1, & 5, & 2, & 1 \\
\end{array}
\]

\[= 2 \times 3 \times 1 \times 5 \times 2 \times 1 = 60\]

Now, \( \frac{1}{3} = \frac{1 \times 20}{3 \times 20} = \frac{20}{60} \);

\[
\frac{2}{5} = \frac{2 \times 12}{5 \times 12} = \frac{24}{60}; \frac{3}{4} = \frac{3 \times 15}{4 \times 15} = \frac{45}{60}
\]

\[
\frac{1}{6} = \frac{1 \times 10}{6 \times 10} = \frac{10}{60}
\]

\[
\frac{1}{3} \cdot \frac{2}{5} \cdot \frac{3}{4} \cdot \frac{1}{6} = \frac{20}{60} \cdot \frac{24}{60} \cdot \frac{45}{60} \cdot \frac{10}{60}
\]

(ii) \( \frac{5}{6}, \frac{7}{8}, \frac{11}{12}, \frac{3}{10} \)

L.C.M. of denominators 6, 8, 12, 10 = 120

\[
\begin{array}{c|cccc}
2 & 6, & 8, & 12, & 10 \\
2 & 3, & 4, & 6, & 5 \\
3 & 3, & 2, & 3, & 5 \\
1, & 2, & 1, & 5 \\
\end{array}
\]

\[= 2 \times 2 \times 3 \times 2 \times 5 = 120\]

Now, \( \frac{5}{6} = \frac{5 \times 20}{6 \times 20} = \frac{100}{120} \);

\[
\frac{7}{8} = \frac{7 \times 15}{8 \times 15} = \frac{105}{120}; \frac{11}{12} = \frac{11 \times 10}{12 \times 10}
\]

\[
\frac{110}{120}; \frac{3}{10} = \frac{3 \times 12}{10 \times 12} = \frac{36}{120}
\]

\[
\therefore \frac{5}{6}, \frac{7}{8}, \frac{11}{12}, \frac{3}{10} = \frac{100}{120}, \frac{105}{120}, \frac{110}{120}, \frac{36}{120}
\]
Question 1.
Reduce the given fractions to their lowest terms:

(i) \( \frac{8}{10} \)

(ii) \( \frac{50}{75} \)

(iii) \( \frac{18}{81} \)

(iv) \( \frac{40}{120} \)

(v) \( \frac{105}{70} \)

Solution:

(i) \( \frac{8}{10} = \frac{8 \div 2}{10 \div 2} = \frac{4}{5} \)

(ii) \( \frac{50}{75} = \frac{50 \div 25}{75 \div 25} = \frac{2}{3} \)

(iii) \( \frac{18}{81} = \frac{18 \div 9}{81 \div 9} = \frac{2}{9} \)

(iv) \( \frac{40}{120} = \frac{40 \div 40}{120 \div 40} = \frac{1}{3} \)

(v) \( \frac{105}{70} = \frac{105 \div 35}{70 \div 35} = \frac{3}{2} \)
Question 2.
State, whether true or false?

(i) $\frac{2}{5} = \frac{10}{15}$
(ii) $\frac{35}{42} = \frac{5}{6}$

(iii) $\frac{5}{4} = \frac{4}{5}$
(iv) $\frac{7}{9} = 1 \frac{1}{7}$

(v) $\frac{9}{7} = 1 \frac{2}{7}$

Solution:

(i) $\frac{2}{5} = \frac{10}{15} = \frac{10 \div 5}{15 \div 5} = \frac{2}{3}$

$\therefore \frac{2}{5} \neq \frac{2}{3}$, False

(ii) $\frac{35}{42} = \frac{5}{6}$

\[
\frac{35}{42} = \frac{35 \div 7}{42 \div 7} = \frac{5}{6}
\]

$\therefore \frac{5}{6} = \frac{5}{6}$, True

(iii) $\frac{5}{4} = \frac{4}{5}$, False

(iv) $\frac{7}{9} = 1 \frac{1}{7}$

Now, $\frac{7}{9} ; 1 \frac{1}{7} = \frac{7 \times 1 + 1}{7} = \frac{8}{7}$

$\frac{7}{9} \neq \frac{8}{7}$, False

(v) $\frac{9}{7} = 1 \frac{2}{7}$

Now, $\frac{9}{7} ; 1 \frac{1}{7} = \frac{7 \times 1 + 1}{7} = \frac{8}{7}$

$\frac{9}{7} \neq \frac{8}{7}$, False.

Question 3.
Which fraction is greater?

(i) $\frac{3}{5}$ or $\frac{2}{3}$
(ii) $\frac{5}{9}$ or $\frac{3}{4}$

(iii) $\frac{11}{14}$ or $\frac{26}{35}$
Solution:

(i) \( \frac{3}{5} \) or \( \frac{2}{3} \)

L.C.M. of 5, 3 = 15

Now,

\[ \frac{3}{5} = \frac{3 \times 3}{5 \times 3} = \frac{9}{15}; \]
\[ \frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15} \]

\[ \frac{10}{15} > \frac{9}{15} \]

\[ \Rightarrow \frac{2}{3} > \frac{3}{5} \] [as its numerator is greater]

(ii) \( \frac{5}{9} \) or \( \frac{3}{4} \)

Converting in like fraction,

\[ \frac{5 \times 4}{9 \times 4} = \frac{20}{36}; \frac{3 \times 9}{4 \times 9} = \frac{27}{36} \]

\[ \frac{3}{4} > \frac{5}{9} \] [as its numerator is greater]

(iii) \( \frac{11}{14} \) or \( \frac{26}{35} \)

Converting in like fraction,

\[ \frac{11 \times 5}{14 \times 5} = \frac{55}{70}; \frac{26 \times 2}{35 \times 2} = \frac{52}{70} \]

\[ \frac{11}{14} > \frac{26}{35} \] [as its numerator is greater]

Question 4.

Which fraction is smaller?

(i) \( \frac{3}{8} \) or \( \frac{4}{5} \)

(ii) \( \frac{8}{15} \) or \( \frac{4}{7} \)

(iii) \( \frac{7}{26} \) or \( \frac{10}{39} \)
Solution:

(i) \( \frac{3}{8} \) or \( \frac{4}{5} \)

Converting in like fraction
\[
\frac{3}{8} = \frac{3 \times 5}{8 \times 5} = \frac{15}{40}, \quad \frac{4}{5} = \frac{4 \times 8}{5 \times 8} = \frac{32}{40}
\]
\[\frac{3}{8} < \frac{4}{5} \quad \text{[as its numerator is smaller]}\]

(ii) \( \frac{8}{15} \) or \( \frac{4}{7} \)

Converting into like fraction
\[
\frac{8}{15} = \frac{8 \times 7}{15 \times 7} = \frac{56}{105}, \quad \frac{4}{7} = \frac{4 \times 15}{7 \times 15} = \frac{60}{105}
\]
\[\frac{8}{15} < \frac{4}{7} \quad \text{[as its numerator is smaller]}\]

(iii) \( \frac{7}{26} \) or \( \frac{10}{39} \)

Converting the like fraction
\[
\frac{7}{26} = \frac{7 \times 3}{26 \times 3} = \frac{21}{78}, \quad \frac{10}{39} = \frac{10 \times 2}{39 \times 2} = \frac{20}{78}
\]
\[\frac{10}{39} < \frac{7}{26} \quad \text{[as its numerator is smaller]}\]

Question 5.
Arrange the given fractions in descending order of magnitude :

(i) \( \frac{5}{16}, \frac{13}{24}, \frac{7}{8} \)  
(ii) \( \frac{4}{5}, \frac{7}{15}, \frac{11}{20}, \frac{3}{4} \)  
(iii) \( \frac{5}{7}, \frac{3}{8}, \frac{9}{11} \)

Solution:

\[
\begin{array}{c|cccc}
(i) & 5 & 13 & 7 & 16, 24, 8 \\
2 & 8, 12, 4 \\
2 & 4, 6, 2 \\
2 & 2, 3, 1 \\
3 & 1, 3, 1 \\
& 1, 1, 1 \\
\end{array}
\]

\[\therefore \text{L.C.M. of } 16, 24, 8 = 2 \times 2 \times 2 \times 2 \times 3 = 48\]
L.C.M. of denominator 16, 24, 8 = 48
Converting into like fractions
\[
\begin{align*}
\frac{5}{16} &= \frac{5 \times 3}{16 \times 3} = \frac{15}{48}, \\
\frac{13}{24} &= \frac{13 \times 2}{24 \times 2} = \frac{26}{48}, \\
\frac{7}{8} &= \frac{7 \times 6}{8 \times 6} = \frac{42}{48}
\end{align*}
\]
Now, arranging in descending order
\[
\frac{7}{8}, \frac{13}{24}, \frac{5}{16}
\]
(ii) \[
\frac{4}{5}, \frac{7}{15}, \frac{11}{20}, \frac{3}{4}
\]
L.C.M. of denominator 5, 15, 20, 4 = 60
Converting into like fractions,
\[
\begin{align*}
\frac{4}{5} &= \frac{4 \times 12}{5 \times 12} = \frac{48}{60}, \\
\frac{7}{15} &= \frac{7 \times 4}{15 \times 4} = \frac{28}{60}, \\
\frac{11}{20} &= \frac{11 \times 3}{20 \times 3} = \frac{33}{60}, \\
\frac{3}{4} &= \frac{3 \times 15}{4 \times 15} = \frac{45}{60}
\end{align*}
\]
Now, arranging in descending order,
\[
\frac{4}{5}, \frac{7}{15}, \frac{11}{20}, \frac{3}{4}
\]
(iii) \[
\frac{5}{7}, \frac{3}{8}, \frac{9}{11}
\]
L.C.M. of numerator 5, 3, 9 = 45
<table>
<thead>
<tr>
<th>3</th>
<th>5, 3, 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5, 1, 3</td>
</tr>
<tr>
<td>3</td>
<td>1, 1, 3</td>
</tr>
<tr>
<td>1</td>
<td>1, 1, 1</td>
</tr>
</tbody>
</table>
\[
= 3 \times 5 \times 3 = 45
\]
\[
\begin{align*}
\frac{5}{7} &= \frac{5 \times 9}{7 \times 9} = \frac{45}{63}, \\
\frac{3}{8} &= \frac{3 \times 15}{8 \times 15} = \frac{45}{120}, \\
\frac{9}{11} &= \frac{9 \times 5}{11 \times 5} = \frac{45}{55}
\end{align*}
\]
We know that the numerator being same, the fraction having the smallest denominator is the biggest fraction.
\[
\frac{45}{55}, \frac{45}{63}, \frac{45}{120}
\]
\[
\therefore \frac{9}{11}, \frac{5}{7}, \frac{3}{8}
\]
\text{i.e.} \[
\frac{9}{11}, \frac{5}{7}, \frac{3}{8}
\]
Question 6.
Arrange the given fractions in ascending order of magnitude:

(i) \( \frac{9}{16}, \frac{7}{12}, \frac{1}{4} \)
(ii) \( \frac{5}{6}, \frac{2}{7}, \frac{8}{9}, \frac{1}{3} \)
(iii) \( \frac{2}{3}, \frac{5}{9}, \frac{5}{6}, \frac{3}{8} \)

Solution:

(i) \( \frac{9}{16}, \frac{7}{12}, \frac{1}{4} \)

L.C.M. of the denominator 16, 12, 4
= 48

\[
\begin{array}{c|cccc}
& 16 & 12 & 4 \\
4 & 4 & 3 & 1 \\
3 & 1 & 3 & 1 \\
\hline
& 1 & 1 & 1 \\
\end{array}
\]

= \( 4 \times 4 \times 3 = 48 \)

\[
\begin{array}{c|cccc}
9 & 3 & 27 & 7 & 28 \\
16 & 6 & 48 & 12 & 48 \\
\hline
1 & 1 & 12 & 48 \\
\end{array}
\]

Arranging in ascending order,

\[
\begin{array}{c|cccc}
12 & 27 & 28 \\
48 & 48 & 48 \\
\hline
& \frac{9}{16}, \frac{7}{12} \\
\end{array}
\]

i.e. \( \frac{1}{4}, \frac{9}{16}, \frac{7}{12} \)
Question 7.
I bought one dozen bananas and ate five of them. What fraction of the total number of bananas was left?

Solution:
Number of bananas bought = 1

(iii) \( \frac{5}{6}, \frac{2}{7}, \frac{8}{9}, \frac{1}{3} \)

L.C.M. of the denominator 6, 7, 9, 3
= 126

\[
\begin{array}{c|cccc}
3 & 6, & 7, & 9, & 3 \\
2 & 7, & 3, & 1 \\
\end{array}
\]

= \(3 \times 2 \times 7 \times 3 = 126\)

\[
\begin{array}{c|cccc}
2 & 5 \times 21 & 105 & 2 \times 2 \times 18 & 36 \\
7 & 6 \times 21 & 126 & 7 \times 18 & 126 \\
\end{array}
\]

\[
\begin{array}{c|cccc}
8 & 8 \times 14 & 112 & 9 \times 14 & 126 \\
9 & 9 \times 14 & 126 & 9 \times 14 & 126 \\
\end{array}
\]

\[
\begin{array}{c}
1 \times 42 \\
3 \times 42 = \frac{42}{126} \\
\end{array}
\]

Arranging in ascending order,

\[
\frac{36}{126}, \frac{42}{126}, \frac{105}{126}, \frac{112}{126}
\]

i.e. \(\frac{2}{7}, \frac{1}{3}, \frac{5}{6}, \frac{8}{9}\)

(ii) \( \frac{5}{3}, \frac{2}{9}, \frac{5}{6}, \frac{3}{8} \)

L.C.M. of the denominator 3, 9, 6, 8
= 72

\[
\begin{array}{c|cccc}
2 & 3, & 9, & 6, & 8 \\
3 & 3, & 9, & 3, & 4 \\
\end{array}
\]

= \(2 \times 3 \times 3 \times 4 = 72\)

\[
\begin{array}{c|cccc}
2 & 2 \times 24 & 48 & 5 \times 8 & 40 \\
3 & 3 \times 24 & 72 & 9 \times 8 & 72 \\
\end{array}
\]

\[
\begin{array}{c|cccc}
5 & 5 \times 12 & 60 & 3 \times 9 & 27 \\
6 & 6 \times 12 & 72 & 8 \times 9 & 72 \\
\end{array}
\]

Arranging in ascending order,

\[
\frac{27}{72}, \frac{40}{72}, \frac{48}{72}, \frac{60}{72}
\]

i.e. \(\frac{3}{8}, \frac{5}{9}, \frac{2}{3}, \frac{5}{6}\)
Dozen = 12
Number of bananas eaten by me = 5
Number of bananas left = 12 – 5 = 7
Fraction = \( \frac{7}{12} \)

**Question 8.**

Insert the symbol ‘=’ or ‘>’ or ‘<’ between each of the pairs of fractions, given below:

(i) \( \frac{6}{11} \) ... \( \frac{5}{9} \)

(ii) \( \frac{3}{7} \) ... \( \frac{9}{13} \)

(iii) \( \frac{56}{64} \) ... \( \frac{7}{8} \)

(iv) \( \frac{5}{12} \) ... \( \frac{8}{33} \)

**Solution:**

(i) \( \frac{6}{11}, \frac{5}{9} \)

\[ \text{L.C.M. of } 11, 9 = 99 \]

\[ \frac{6}{11} = \frac{6 \times 9}{11 \times 9} = \frac{54}{99} \]

\[ \frac{5}{9} = \frac{5 \times 11}{9 \times 11} = \frac{55}{99} \]

\[ \text{It is clear that } \frac{54}{99} < \frac{55}{99} \]

\[ \Rightarrow \frac{6}{11} < \frac{5}{9} \]

(ii) \( \frac{3}{7}, \frac{9}{13} \)

\[ \text{L.C.M. of } 7, 13 = 91 \]

\[ \frac{3}{7} = \frac{3 \times 13}{7 \times 13} = \frac{39}{91} \]

\[ \frac{9}{13} = \frac{9 \times 7}{13 \times 7} = \frac{63}{91} \]

\[ \text{It is clear that } \frac{39}{91} < \frac{63}{91} \]

\[ \Rightarrow \frac{3}{7} < \frac{9}{13} \]
Out of 50 identical articles, 36 are broken. Find the fraction of:

(i) The total number of articles and the articles broken.

(ii) The remaining articles and total number of articles.

Solution:

Total number of articles = 50
Number of articles broken = 36
Remaining articles = 50 – 36 = 14

Now (i) the fraction of the total number of articles and articles broken $\frac{50}{36}$

$= \frac{50 \div 2}{36 \div 2} = \frac{25}{18}$

(ii) The fraction between the remaining articles and total number of articles

$= \frac{14}{50} = \frac{14 \div 2}{50 \div 2} = \frac{7}{25}$

Question 9.

Out of 50 identical articles, 36 are broken. Find the fraction of:

(i) The total number of articles and the articles broken.

(ii) The remaining articles and total number of articles.

Solution:

Total number of articles = 50
Number of articles broken = 36
Remaining articles = 50 – 36 = 14

Now (i) the fraction of the total number of articles and articles broken $\frac{50}{36}$

$= \frac{50 \div 2}{36 \div 2} = \frac{25}{18}$

(ii) The fraction between the remaining articles and total number of articles

$= \frac{14}{50} = \frac{14 \div 2}{50 \div 2} = \frac{7}{25}$

EXERCISE 14(C)
Question 1.
Add the following fractions:

(i) $1 \frac{3}{4} \text{ and } \frac{3}{8}$

$= \frac{7}{4} + \frac{3}{8}$

$= \frac{7 \times 2}{4 \times 2} + \frac{3}{8}$  \hspace{1cm} (LCM of 4, 8 = 8)

$= \frac{14}{8} + \frac{3}{8} = \frac{14 + 3}{8} = \frac{17}{8} = 2 \frac{1}{8}$

(ii) $\frac{2}{5}, 2 \frac{3}{15} \text{ and } \frac{7}{10}$

$= \frac{2}{5} + \frac{33}{15} + \frac{7}{10}$

$= \frac{2 \times 6}{5 \times 6} + \frac{33 \times 2}{15 \times 2} + \frac{7 \times 3}{10 \times 3}$  \hspace{1cm} (LCM of 5, 15 and 10 = 30)

$= \frac{12}{30} + \frac{66}{30} + \frac{21}{30}$

$= \frac{12 + 66 + 21}{30} = \frac{99}{30} = \frac{99 \div 3}{30 \div 3}$

$= \frac{33}{10} = 3 \frac{3}{10}$
(iii) \[ \frac{7}{8} + \frac{1}{2} + \frac{3}{4} \]
\[ = \frac{1 \times 8 + 7 + 1 \times 2 + 1 \times 4 + 3}{8} \]
\[ = \frac{15 + 3 + 7}{8} = \frac{15 \times 1 + 3 \times 4 + 7 \times 2}{8 \times 1 + 2 \times 4 + 4 \times 2} \]
\[ = \frac{15 + 12 + 14}{8} \]
\[ = \frac{41}{8} = 5 \frac{1}{8} \]

(iv) \[ \frac{3}{4} + 2 \frac{1}{6} + 1 \frac{5}{8} \]
\[ = \frac{3 \times 4 + 3 + 2 \times 6 + 1 + 1 \times 8 + 5}{4} \]
\[ = \frac{15 + 13 + 13}{4} \]
\[ = \frac{15 \times 6}{4 \times 6} + \frac{13 \times 4}{6 \times 4} + \frac{13 \times 3}{8 \times 3} \]
\[ = \frac{90 + 52 + 39}{24} = \frac{181}{24} = 7 \frac{13}{24} \]

(v) \[ \frac{8}{9}, \frac{11}{18} \text{ and } 3 \frac{5}{6} \]
\[ = \frac{26}{9} + \frac{11}{18} + \frac{23}{6} = \frac{26 \times 2}{9 \times 2} + \frac{11}{18} + \frac{23 \times 3}{6 \times 3} \]
\[ = \frac{52 + 11 + 69}{18} = \frac{132}{18} = \frac{132 \div 6}{18 \div 6} \]
\[ = \frac{22}{3} = 7 \frac{1}{3} \]
(vi) \[ \frac{3}{8} + \frac{5}{12} + \frac{5}{16} = \frac{3 \times 8 + 1}{8} + \frac{5 \times 12 + 5}{12} + \frac{5}{16} = \frac{25}{8} + \frac{65}{12} + \frac{5}{16} \]
(L.C.M. 8, 12 and 16 is 48)
\[ = \frac{25 \times 6}{8 \times 6} + \frac{65 \times 4}{12 \times 4} + \frac{5 \times 3}{16 \times 3} = \frac{150}{48} + \frac{260}{48} + \frac{15}{48} = \frac{150 + 260 + 15}{48} = \frac{425}{48} = 8 \frac{41}{48} \]

Question 2.
Simplify:

(i) \[ 1 \frac{11}{12} - \frac{13}{16} \]
(ii) \[ 2 \frac{3}{4} - 1 \frac{5}{6} \]
(iii) \[ 2 \frac{5}{7} + \frac{3}{14} - \frac{13}{21} \]
(iv) \[ 3 \frac{5}{6} - \frac{1}{6} - 1 \frac{1}{12} \]
(v) \[ 6 + \frac{3}{10} - \frac{8}{15} \]
(vi) \[ 1 \frac{3}{4} + 2 \frac{5}{7} - 1 \frac{3}{14} \]
(vii) \[ 4 + 3 \frac{1}{8} - 3 \frac{1}{6} \]
(viii) \[ 6 - 3 \frac{1}{2} - 2 \frac{1}{5} \]
(ix) \[ 1 \frac{5}{8} - 2 \frac{1}{6} + 3 \frac{3}{4} \]
(x) \[ 3 \frac{1}{2} + 1 \frac{2}{3} - 2 \frac{1}{4} \]
(xi) \[ 4 \frac{3}{5} - 2 \frac{7}{9} - 1 \frac{2}{15} - \frac{2}{45} \]
Solution:

(i) \[ \frac{11}{12} - \frac{13}{16} = \frac{23}{12} - \frac{13}{16} \]
\[= \frac{23 \times 4}{12 \times 4} - \frac{13 \times 3}{16 \times 3} \quad \text{(LCM of 12, 16 = 48)} \]
\[= \frac{92}{48} - \frac{39}{48} = \frac{92 - 39}{48} \]
\[= \frac{53}{48} = 1 \frac{5}{48} \]

(ii) \[ \frac{3}{4} - \frac{5}{6} = \frac{11}{4} - \frac{11}{6} = \frac{11 \times 6}{4 \times 6} - \frac{11 \times 4}{6 \times 4} \]
\[= \frac{66}{24} - \frac{44}{24} \]
\[= \frac{66 - 44}{24} = \frac{22}{24} = \frac{11}{12} \]

(iii) \[ \frac{5}{7} + \frac{3}{14} - \frac{13}{21} \]
\[= \frac{19}{7} + \frac{3}{14} - \frac{13}{21} \]
\[= \frac{19 \times 6}{7 \times 6} + \frac{3 \times 3}{14 \times 3} - \frac{13 \times 2}{21 \times 2} \quad \text{(LCM of 7, 14, 21 = 42)} \]
\[= \frac{114}{42} + \frac{9}{42} - \frac{26}{42} \]
\[= \frac{114 + 9 - 26}{42} = \frac{123 - 26}{42} \]
\[= \frac{97}{42} = 2 \frac{13}{42} \]
(iv) \[ \frac{5}{6} - \frac{1}{6} - \frac{1}{12} = \frac{23}{6} - \frac{1}{6} - \frac{13}{12} \]
\[ = \frac{23 \times 2}{6 \times 2} - \frac{1 \times 2}{6 \times 2} - \frac{13}{12} \]
\[ = \frac{46}{12} - \frac{2}{12} - \frac{13}{12} = \frac{46 - 2 - 13}{12} \]
\[ = \frac{46 - 15}{12} = \frac{31}{12} = 2 \frac{7}{12} \]

(v) \[ 6 + \frac{3}{10} - \frac{1}{15} \]
\[ = \frac{6}{1} + \frac{3}{10} - \frac{1}{15} \]
\[ = \frac{6 \times 30}{1 \times 30} + \frac{3 \times 3}{10 \times 3} - \frac{1 \times 2}{15 \times 2} \]
\[ = \frac{180}{30} + \frac{9}{30} - \frac{46}{30} \]
\[ = \frac{180 + 9 - 46}{30} = \frac{189 - 46}{30} \]
\[ \frac{143}{30} = \frac{23}{30} \]

\[ \text{vii} \quad \frac{3}{4} + \frac{5}{7} - \frac{13}{14} = \frac{7 + 19 - 17}{14} \]
\[ = \frac{\frac{7 \times 7}{4 \times 7} + \frac{19 \times 4}{7 \times 4} - 17 \times 2}{14 \times 2} \]
\[ = \frac{49 + 76 - 34}{28} = \frac{91}{28} = \frac{31}{4} \]
\[ = \frac{3}{1\frac{7}{28}} = \frac{3}{4} \]

\[ \text{viii} \quad 4 + 3\frac{1}{8} - 3\frac{1}{6} \]
\[ = \frac{4}{1} + \frac{25}{8} - \frac{19}{6} \]
\[ = \frac{4 \times 24 + 25 \times 3 - 19 \times 4}{1 \times 24 + 8 \times 3 - 6 \times 4} \]
\[ \text{(LCM of 8, 6 = 24)} \]
\[ = \frac{96 + 75 - 76}{24} = \frac{95}{24} = \frac{3}{1\frac{23}{24}} \]

\[ \text{viii} \quad 6 - 3\frac{1}{2} - 2\frac{1}{5} \]
\[ = \frac{6}{1} - \frac{7}{2} - \frac{11}{5} \]
\[ = \frac{6 \times 10 - 7 \times 5 - 11 \times 2}{1 \times 10 - 2 \times 5 - 5 \times 2} \]
\[ \text{(LCM of 2, 5 = 10)} \]
\[ = \frac{60 - 35 - 22}{10} = \frac{60 - 57}{10} = \frac{3}{10} \]

\[ \text{ix} \quad \frac{5}{8} - 2\frac{1}{6} + 3\frac{3}{4} = \frac{13}{8} - \frac{13}{6} + \frac{15}{4} \]
\[
\frac{13 \times 3}{8 \times 3} - \frac{13 \times 4}{6 \times 4} + \frac{15 \times 6}{4 \times 6} = \frac{39}{24} - \frac{52}{24} + \frac{90}{24}
\]
\[
= \frac{39 - 52 + 90}{24} = \frac{129 - 52}{24} = \frac{77}{24} = 3 \frac{5}{24}
\]

\[\text{(x)}\]
\[
\frac{3\frac{1}{2}}{3} + \frac{1\frac{2}{3}}{4} - \frac{2\frac{1}{4}}{2} = \frac{7}{2} + \frac{5}{3} - \frac{9}{4}
\]
\[
= \frac{7 \times 6}{2 \times 6} + \frac{5 \times 4}{3 \times 4} - \frac{9 \times 3}{4 \times 3}
\]
\[
= \frac{42}{12} + \frac{20}{12} - \frac{27}{12}
\]
\[
= \frac{42 + 20 - 27}{12} = \frac{62 - 27}{12} = \frac{35}{12} = 2 \frac{11}{12}
\]

\[\text{(x)}\]
\[
\frac{4\frac{3}{5}}{2} - \frac{7\frac{1}{9}}{15} = \frac{23}{5} - \frac{25}{9}
\]
\[
= \frac{23 \times 9}{5 \times 9} - \frac{25 \times 5}{9 \times 5} - \frac{17 \times 3}{15 \times 3} - \frac{2 \times 1}{45 \times 1}
\]
\[
= \frac{207}{45} - \frac{125}{45} - \frac{51}{45} - \frac{2}{45}
\]
\[
= \frac{207 - 125 - 51 - 2}{45} = \frac{29}{45}
\]

**EXERCISE 14(D)**

Point to Remember:
**BODMAS** :- While simplifying an expressions we can involve six operation in following orders.

B Stands for “BRACKET”
O Stands for “OF”
D Stands for “DIVISION”
M Stands for “MULTIPLICATION”
A Stands for “ADDITION”
S Stands for “SUBTRACTION”
Solution:

(i) \( \frac{3}{7} \times \frac{2}{5} = \frac{3 \times 2}{7 \times 5} = \frac{6}{35} \)

(ii) \( \frac{4}{9} \times \frac{3}{5} = \frac{4 \times 3}{9 \times 5} = \frac{4 \times 1}{3 \times 5} = \frac{4}{15} \)

(iii) \( \frac{5}{12} \times 8 = \frac{5 \times 8}{12 \times 1} = \frac{5 \times 2}{3 \times 1} = \frac{10}{3} = 3 \frac{1}{3} \)

(iv) \( \frac{7}{6} \text{ of } \frac{3}{14} = \frac{7}{6} \times \frac{3}{14} = \frac{3 \times 1}{2 \times 1} = \frac{1}{4} \)

(v) \( \frac{3}{8} \times \frac{6}{7} = \frac{27}{8} \times \frac{27}{7} = \frac{27 \times 27}{8 \times 7} = \frac{729}{56} = 13 \frac{1}{56} \)

(vi) \( \frac{1}{2} \text{ of } \frac{1}{3} \times \frac{3}{4} = \frac{1}{2} \times \frac{1}{3} \times \frac{3}{4} = \frac{1}{6} \times \frac{3}{4} = \frac{1 \times 1}{2 \times 4} = \frac{1}{8} \)

[Using Bodmas: \( \frac{1}{2} \text{ of } \frac{1}{3} = \frac{1}{2} \times \frac{1}{3} = \frac{1}{6} \)]

(vii) \( \frac{3}{7} \times \frac{5}{9} \times \frac{4}{5} = \frac{3 \times 5}{7 \times 9} \times \frac{2\text{?}}{5} \)
Question 2.
Simplify:

(i) \( \frac{2}{3} + \frac{1}{5} \)

(ii) \( \frac{4}{2} + \frac{4}{9} \)

(iii) \( 1 + \frac{2}{5} \)

(iv) \( \frac{4}{9} + \frac{4}{9} \)

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

(vi) \( 2 \frac{2}{3} \times 3 \frac{1}{2} + 2 \frac{4}{9} \)

Solution:

(i) \[
\frac{2}{3} + \frac{1}{5} = \frac{2}{3} + \frac{6}{30} = \frac{20}{30} + \frac{6}{30} = \frac{26}{30} = \frac{13}{15}
\]

(ii) \[
\frac{4}{2} + \frac{4}{9} = \frac{18}{18} + \frac{8}{18} = \frac{26}{18} = \frac{13}{9}
\]

(iii) \[
1 + \frac{2}{5} = \frac{5}{5} + \frac{2}{5} = \frac{7}{5} = 1 \frac{2}{5}
\]

(iv) \[
\frac{4}{9} + \frac{4}{9} = \frac{8}{9} + \frac{4}{9} = \frac{12}{9} = \frac{4}{3}
\]

(v) \[
2 \frac{1}{3} + \frac{3}{4} = \frac{7}{3} + \frac{3}{4} = \frac{28}{12} + \frac{9}{12} = \frac{37}{12} = 3 \frac{1}{12}
\]

(vi) \[
2 \frac{2}{3} \times 3 \frac{1}{2} + 2 \frac{4}{9} = \frac{8}{3} \times \frac{7}{2} + \frac{22}{9} = \frac{56}{9} + \frac{22}{9} = \frac{78}{9} = 8
\]
Question 3.
Simplify:

(i) \( \frac{1}{4} \) of \( 2 \frac{2}{7} + \frac{3}{5} \)

(ii) \( 1 \frac{1}{4} \times 1 \frac{1}{2} + 1 \frac{1}{3} \)

(iii) \( 6 \frac{1}{7} \times 0 \times 5 \frac{3}{8} \)

(iv) \( \frac{3}{4} \times 1 \frac{1}{3} + \frac{3}{7} \) of \( 2 \frac{5}{8} \)

(v) \( 2 \frac{1}{4} \div 2 \frac{2}{7} \) of \( 1 \frac{1}{3} \times \frac{2}{3} \)

(vi) \( \left( \frac{3}{7} + \frac{1}{2} \right) \) of \( 1 \frac{1}{7} \)

(vii) \( \left( 1 \frac{7}{8} + 1 \frac{1}{2} \right) \) of \( \left( 8 \frac{1}{3} + 1 \frac{1}{2} \right) \)

(viii) \( \frac{1}{3} \) of \( 60 + 60 \).

Solution:

(i) \( \frac{1}{4} \) of \( 2 \frac{2}{7} + \frac{3}{5} \)

\[
= \frac{1}{4} \times 2 \frac{2}{7} + \frac{3}{5} = \frac{1}{4} \times \frac{16}{7} + \frac{3}{5} = \frac{4}{7} \times \frac{5}{3} = \frac{20}{21}
\]

(ii) \( 1 \frac{1}{4} \times 1 \frac{1}{2} + 1 \frac{1}{3} = \frac{5}{4} \times \frac{1}{2} + \frac{4}{3} \)

\[
= \frac{5}{8} = \frac{15}{32}
\]

(iii) \( 6 \frac{1}{7} \times 0 \times 5 \frac{3}{8} = \frac{43}{7} \times 0 \times \frac{43}{8} \)

\[
= 0
\]

(iv) \( \frac{3}{4} \times 1 \frac{1}{3} + \frac{3}{7} \) of \( 2 \frac{5}{8} = \frac{3}{4} \times \frac{4}{3} + \frac{9}{8} \)

\[
= \frac{3}{7} \times \frac{21}{8} = \frac{9}{8}
\]

(v) \( 2 \frac{1}{4} \div 2 \frac{2}{7} \) of \( 1 \frac{1}{3} \times \frac{2}{3} \)
\[
\left[ \frac{2}{7} \text{ of } \frac{1}{3} = \frac{2}{7} \times \frac{4}{3} = \frac{8}{21} \right]
\]

\[
= \frac{9}{4} \div \frac{8}{21} \times \frac{2}{3}
\]

\[
= \frac{9}{4} \times \frac{21}{8} \times \frac{2}{3} = \frac{63}{16} = 3 \frac{15}{16}
\]

(vi) \[
\left( \frac{3}{7} \div \frac{1}{2} \right) \text{ of } \frac{1}{7} = \frac{3}{7} \times \frac{2}{1} \text{ of } \frac{8}{7} = \frac{2}{1} \text{ of } \frac{2 \times 8}{7 \times 1} = \frac{16}{7}
\]

\[
= \frac{3}{7} \times \frac{16}{7} = \frac{48}{49}
\]

(vii) \[
\left( \frac{1}{8} + \frac{1}{2} \right) \text{ of } \left( \frac{8}{3} + \frac{1}{2} \right) = \left( \frac{15}{8} + \frac{3}{2} \right) \text{ of } \left( \frac{25}{3} + \frac{3}{2} \right)
\]

\[
= \frac{15}{8} \times \frac{2}{3} \text{ of } \frac{25}{3} \times \frac{2}{3}
\]

\[
= \frac{5}{4} \text{ of } \frac{50}{9} = \frac{5}{4} \times \frac{50}{9} = \frac{125}{18} = 6 \frac{17}{18}
\]

(viii) \[
\frac{1}{3} \text{ of } 60 \div 60 = \frac{1}{3} \times \frac{60}{1} \div \frac{60}{1}
\]

\[
= 20 \times \frac{1}{60} = \frac{20}{60} = \frac{1}{3}
\]
Question 4.
Simplify:

(i) \(5 - \left(\frac{8}{11} - \frac{3}{11}\right)\)

(ii) \(\frac{1}{2} \div \left(\frac{7}{8} - \frac{3}{5}\right)\)

(iii) \(2\frac{1}{3} \div \left(5\frac{1}{2} + 3\frac{3}{4}\right)\)

(iv) \(\left(\frac{7}{8} - \frac{3}{5}\right) \div \frac{1}{2}\)

(v) \(\frac{4}{7} \div \left(\frac{1}{3} \times 2\frac{4}{5}\right)\)

(vi) \(\frac{3}{4} \div \left(\frac{1}{6} \div \frac{1}{2}\right)\)

(vii) \(\left(\frac{1}{4} - \frac{1}{6}\right) \text{ of } \left(\frac{2}{3} - \frac{5}{12}\right) \times \left(\frac{5}{8} - \frac{7}{12}\right)\)

Solution:

(i) \(5 - \left(\frac{8}{11} - \frac{3}{11}\right) = 5 - \left(\frac{8}{11} - \frac{36}{11}\right)\)

\[= 5 - \frac{8}{11} + \frac{36}{11} = \frac{55 - 8 + 36}{11}\]

\[= \frac{55 + 36 - 8}{11} = \frac{83}{11} = \frac{76}{11}\]

(ii) \(\frac{1}{2} \div \left(\frac{7 - 3}{5}\right) = \frac{1}{2} \div \left(\frac{5 \times 7 - 8 \times 3}{40}\right)\)

\[= \frac{1}{2} \div \left(\frac{35 - 24}{40}\right) = \frac{1}{2} \div \left(\frac{11}{40}\right)\]

\[= \frac{1}{2} \times \frac{40}{11} = \frac{20}{11} = 1\frac{9}{11}\]
(iii) \[ \frac{2}{3} + \left( \frac{5}{2} + \frac{3}{4} \right) = \frac{7}{3} \div \left( \frac{11}{2} + \frac{15}{4} \right) \]
\[ = \frac{7}{3} \times \left( \frac{2 \times 11 + 1 \times 15}{4} \right) \]
\[ = \frac{7}{3} \times \left( \frac{22 + 15}{4} \right) = \frac{7}{3} \times \left( \frac{37}{4} \right) \]
\[ = \frac{7}{3} \times \frac{4}{37} = \frac{28}{111} \]

(iv) \[ \left( \frac{7}{8} - \frac{3}{5} \right) + \frac{1}{2} \]
\[ = \left( \frac{31 - 18}{8 - 5} \right) + \frac{1}{2} \]
\[ = \left( \frac{31 \times 5 - 18 \times 8}{8 \times 5 - 5 \times 8} \right) + \frac{1}{2} \]
\[ = \left( \frac{155 - 144}{40 - 40} \right) + \frac{1}{2} \]
\[ = \frac{11}{40} + \frac{1}{2} = \frac{11}{40} \times \frac{2}{1} = \frac{11}{20} \]

(v) \[ \frac{4}{7} \div \left( \frac{1}{3} \times 2 \frac{4}{5} \right) \]
\[ = \frac{4}{7} \div \left( \frac{1}{3} \times \frac{14}{5} \right) = \frac{4}{7} \div \left( \frac{14}{15} \right) \]
\[ = \frac{4}{7} \times \frac{15}{14} = \frac{60}{98} = \frac{30}{49} \]

(vi) \[ \frac{3}{4} + \left( \frac{1}{6} + \frac{1}{2} \right) \]
\[ = \frac{3}{4} + \left( \frac{1}{6} \times \frac{2}{1} \right) = \frac{3}{4} + \left( \frac{1}{3} \right) \]
\[ = \frac{3}{4} + \frac{3}{1} = \frac{9}{4} = 2 \frac{1}{4} \]

(vii) \[ \left( \frac{1}{4} - \frac{1}{6} \right) \text{ of } \left( \frac{2}{3} - \frac{5}{12} \right) \times \left( \frac{5}{8} - \frac{7}{12} \right) \]
\[ = \left( \frac{3 - 2}{12} \right) \text{ of } \left( \frac{8 - 5}{12} \right) \times \left( \frac{15 - 14}{24} \right) \]
\[ = \left( \frac{1}{12} \right) \text{ of } \left( \frac{3}{12} \right) \times \left( \frac{1}{24} \right) \]
\[ = \frac{1}{12} \text{ of } \frac{3}{12} \times \frac{1}{24} \]
\[ = \frac{1}{12} \times 1 \times \frac{1}{24} = \frac{1}{1152} \]
Question 5.

Simplify:

(i) \( \left( \frac{1}{2} + \frac{1}{3} \right) \div \left( \frac{1}{4} - \frac{1}{6} \right) \)

(ii) \( \left( \frac{24}{35} + \frac{6}{7} + \frac{5}{9} \right) \times \frac{3}{4} \)

(iii) \( \frac{3}{4} \text{ of } 6 \frac{1}{8} - \frac{2}{3} \text{ of } 2 \frac{1}{4} \)

(iv) \( \frac{7}{30} \text{ of } \left( \frac{1}{3} + \frac{7}{15} \right) + \left( \frac{5}{6} - \frac{3}{5} \right) \)

(v) \( 2 \frac{1}{2} - 3 \frac{1}{2} \times 1 \frac{3}{4} + 2 \frac{1}{2} \)

(vi) \( 4 \frac{5}{7} \left( 3 \frac{1}{8} + \frac{11}{12} \right) \)

(vii) \( \frac{2}{5} \text{ of } \left( \frac{1}{7} - \frac{1}{12} \right) \text{ of } 1 \frac{2}{5} \)

(viii) \( \left( \frac{1}{2} - \frac{1}{3} \right) \left( \frac{3}{4} - \frac{4}{5} \right) \div \left( \frac{1}{2} - \frac{2}{5} + \frac{1}{7} \right) \)

(ix) \( \frac{5}{6} - \frac{3}{5} \left( \frac{1}{3} + \frac{2}{11} \right) \)

(x) \( \frac{4}{3} \div \left( 3 - \frac{1}{2} \right) + \left( \frac{2}{5} \div 1 \frac{1}{5} \right) \)

(xi) \( \frac{1}{2} \text{ of } 40 + 1 \frac{3}{4} \text{ of } 2 \frac{2}{9} + 2 \frac{1}{5} \times 0 \)

(xii) \( 1 + 2 \frac{4}{5} + 2 \frac{1}{5} \text{ of } 2 \frac{1}{2} - 2 \)

(xiii) \( 2 \frac{6}{11} \text{ of } 1 \frac{2}{7} + 2 \frac{2}{11} \)
Solution:

(i) \( \left( \frac{1}{2} + \frac{1}{3} \right) \div \left( \frac{1}{4} - \frac{1}{6} \right) \)

\[ = \left( \frac{3+2}{6} \right) \div \left( \frac{3-2}{12} \right) = \left( \frac{5}{6} \right) \div \left( \frac{1}{12} \right) \]

\[ = \frac{5}{6} \times \frac{12}{1} = 10 \]

(ii) \( \left( \frac{24}{35} \div \frac{6}{7} + \frac{5}{9} \right) \times \frac{3}{4} \)

\[ = \left( \frac{24}{35} \times \frac{7}{6} + \frac{5}{9} \right) \times \frac{3}{4} = \left( \frac{4}{5} + \frac{5}{9} \right) \times \frac{3}{4} \]

\[ = \left( \frac{36+25}{45} \right) \times \frac{3}{4} \]

\[ = \frac{61}{45} \times \frac{3}{4} = \frac{61}{60} = 1 \frac{1}{60} \]

(iii) \( \frac{3}{4} \) of \( 6 \frac{1}{8} - \frac{2}{3} \) of \( 2 \frac{1}{4} \)

\[ = \frac{3}{4} \times \frac{49}{8} - \frac{2}{3} \times \frac{9}{4} \]

\[ = \frac{3 \times 49}{8} - \frac{2 \times 9}{3 \times 4} \]

\[ = \frac{147}{32} - \frac{3}{2} = \frac{147 - 48}{32} = \frac{99}{32} \]

\[ = 3 \frac{3}{32} \]
(iv) \[ \frac{7}{30} \text{ of } \left( \frac{1}{3} + \frac{7}{15} \right) \div \left( \frac{5}{6} - \frac{3}{5} \right) \]
\[= \frac{7}{30} \text{ of } \left( \frac{5+7}{15} \right) \div \left( \frac{25-18}{30} \right) \]
\[= \frac{7}{30} \times \frac{12}{15} \div \left( \frac{7}{30} \right) \]
\[= \frac{7}{30} \times \frac{12}{15} \times \frac{30}{7} = \frac{12}{15} = \frac{4}{5} \]

(v) \[2\frac{1}{2} - 3\frac{1}{2} \times 1\frac{3}{4} + 2 \frac{1}{2} \]
\[= \frac{5}{2} - \frac{7}{2} \times \frac{7}{4} + \frac{5}{2} \]
\[= \frac{5}{2} - \frac{49}{8} + \frac{5}{2} = \frac{5}{2} + \frac{5}{2} - \frac{49}{8} \]
\[= \frac{20 + 20 - 49}{8} = -\frac{9}{8} = -1 \frac{1}{8} \]

(vi) \[4\frac{5}{7} \div \left( 3\frac{1}{8} \div 12 \right) = \frac{33}{7} \left( \frac{25}{8} \div 12 \right) \]
\[= \frac{33}{7} \left( \frac{25}{8} \times \frac{12}{11} \right) = \frac{33}{7} \left( \frac{75}{22} \right) \]
\[= \frac{33}{7} \times \frac{75}{22} = \frac{225}{14} = 16 \frac{1}{14} \]

(vii) \[\frac{2}{5} \text{ of } \left( \frac{1}{7} - \frac{1}{12} \right) \text{ of } 1\frac{2}{5} \]
\[= \frac{2}{5} \text{ of } \left( \frac{12-7}{84} \right) \text{ of } \frac{7}{5} \]
\[= \frac{2}{5} \text{ of } \left( \frac{5}{84} \right) \text{ of } \frac{7}{5} \]
\[= \frac{2}{5} \times \frac{5}{84} \times \frac{7}{5} = \frac{1}{30} \]

(viii) \[\left( \frac{1}{2} - \frac{1}{3} \right) \left( \frac{3}{4} - \frac{4}{5} \right) + \left( \frac{1}{2} - \frac{2}{5} + \frac{1}{7} \right) \]
\[= \left( \frac{3-2}{6} \right) \left( \frac{15-16}{20} \right) + \left( \frac{35-28+10}{70} \right) \]
\[= \left( \frac{1}{6} \right) \left( \frac{-1}{20} \right) = \frac{17}{70} = \frac{1}{6} \times \frac{-1}{20} + \frac{17}{70} \]
\[= \frac{1}{6} \times \frac{-1}{20} \times \frac{70}{17} = -\frac{7}{204} \]
(ix) \[
\frac{5}{6} - \frac{3}{5} \left( \frac{1}{3} + \frac{2}{11} \right) = \frac{5}{6} - \frac{3}{5} \left( \frac{11+6}{33} \right)
\]
\[
= \frac{5}{6} - \frac{3}{5} \times \frac{17}{33} = \frac{5}{6} - \frac{17}{55}
\]
\[
= \frac{275 - 102}{330} = \frac{173}{330}
\]

(x) \[
\frac{4}{3} \div \left( \frac{3 - \frac{1}{2}}{2} + \frac{2}{5} \cdot \frac{1}{5} \right)
\]
\[
= \frac{14}{3} \div \left( \frac{3 - \frac{1}{2}}{2} + \frac{2}{5} \cdot \frac{1}{5} \right)
\]
\[
= \frac{14}{3} \div \left( \frac{6 - 1}{2} \right) + \frac{2}{5} \cdot \frac{5}{6}
\]
\[
= \frac{14}{3} \div \left( \frac{5}{2} \right) + \frac{1}{3} = \frac{14}{3} \times \frac{2}{5} + \frac{1}{3}
\]
\[
= \frac{28}{15} + \frac{1}{3} = \frac{28 + 5}{15} = \frac{33}{15} = \frac{11}{5} = 2 \frac{1}{5}
\]

(xi) \[
\frac{1}{2} \text{ of } 40 + \frac{3}{4} \text{ of } \frac{2}{9} + 2 \frac{1}{5} \times 0
\]
\[
= \frac{1}{2} \times 40 + \frac{7}{4} \times \frac{20}{9} + \frac{11}{5} \times 0
\]
\[
= 20 + \frac{35}{9} + 0 = \frac{180 + 35}{9} = \frac{215}{9}
\]
\[
= 23 \frac{8}{9}
\]

(xii) \[
\left( 1 \div 2 \frac{1}{5} \right) + 2 \frac{1}{5} \text{ of } 2 \frac{1}{2} - 2
\]
\[
= \left( 1 + \frac{11}{5} \right) + \frac{11}{5} \text{ of } \frac{5}{2} - 2
\]
\[
= \left( 1 \times \frac{5}{11} \right) + \frac{11}{5} \text{ of } \frac{5}{2} - 2
\]
\[
= \frac{5}{11} \times \frac{5}{2} - 2 = \frac{5}{11} + \frac{11}{2} - 2
\]
\[
= \frac{5}{11} \times \frac{2}{11} - 2 = \frac{10}{121} - 2
\]
\[
= \frac{10 - 242}{121} = \frac{232}{121} = -1 \frac{111}{121}
\]

(xiii) \[
2 \frac{6}{11} \text{ of } 1 \frac{2}{7} + 2 \frac{2}{11}
\]
Question 1.
From a rope of $10\frac{1}{2}$ m long, $4\frac{5}{8}$ m is cut off. Find the length of the remaining rope.

**Solution:**
Length of rope = $10\frac{1}{2}$ m

Length of cut off rope = $4\frac{5}{8}$ m

Remaining rope = $\left(10\frac{1}{2} - 4\frac{5}{8}\right)$ m

\[\frac{21}{2} - \frac{37}{8} = \frac{17}{8} = \frac{5}{8} \text{ m}.\]

Question 2.
A piece of cloth is 5 metre long. After washing, it shrinks by $\frac{1}{25}$ of its length. What is the length of the cloth after washing?

**Solution:**
Length of a piece of cloth = 5 m

After washing, it is shrunk

\[\frac{1}{25} \text{ of } 5 = \frac{1}{5} \text{ m.}\]

Length of cloth after washing

\[5 - \frac{1}{5} = \frac{24}{5} = 4\frac{4}{5} \text{ m}.\]

Question 3.
I bought wheat worth Rs. $12\frac{1}{2}$, rice worth Rs. $25\frac{3}{4}$ and vegetables worth Rs. $10\frac{3}{4}$. If I gave a hundred-rupee note to the shopkeeper; how much did he return to me.
Solution:

Money given to Shopkeeper = Rs. 100
Total Amount of goods bought

\[= \text{Rs}\left(12 \frac{1}{2} + 25 \frac{3}{4} + 10 \frac{1}{4}\right)\]

(Wheat, Rice and Vegetable)

\[= \frac{25}{2} + \frac{103}{4} + \frac{41}{4}\]

\[= \frac{50 + 103 + 41}{4} = \text{Rs} \frac{194}{4}\]

\[\therefore \text{Money returned by shopkeeper}\]

\[= \text{Rs}\left(100 - \frac{194}{4}\right) = \text{Rs} \frac{400 - 194}{4}\]

\[= \frac{206}{4} = \text{Rs} \frac{103}{2} = \text{Rs} 51 \frac{1}{2}.

Question 4.

Out of 500 oranges in a box, \(\frac{3}{25}\) are rotten and \(\frac{1}{5}\) are kept for some guests. How many oranges are left in the box?

Solution:

Number of oranges = 500

Bad oranges = \(\frac{3}{25}\) of 500 = \(\frac{3}{25} \times 500\) = 60

Kept for guests = \(\frac{1}{5}\) of 500

\[= \frac{1}{5} \times 500 = 100\]

\[\therefore \text{No of oranges which can be used}\]

\[= 500 - 60 - 100 = 500 - 160 = 340.\]

Question 5.

An ornament piece is made of gold and copper. Its total weight is 96g. If \(\frac{1}{12}\) of the ornament is copper, find the weight of gold in it.

Solution:

Total weight = 96 g

Weight of copper = \(\frac{1}{12}\) of 96

\[= \frac{1}{12} \times 96 = 8 \text{ gm}\]

\[\therefore \text{Weight of gold} = \text{Total weight} - \text{weight of copper} = 96 - 8 = 88 \text{g}.

\]
Question 6.
A girl did half of some work on Monday and one-third of it on Tuesday. How much will she have to do on Wednesday in order to complete the work?

Solution:
Let total work done = 1

Work done on Monday = \( \frac{1}{2} \)

Work done on Tuesday = \( \frac{1}{3} \)

Work done on Wednesday = remaining work

\[ = 1 - \left( \frac{1}{2} + \frac{1}{3} \right) \]

\[ = 1 - \frac{3 + 2}{6} = 1 - \frac{5}{6} \]

\[ = \frac{6 - 5}{6} = \frac{1}{6} \]

Work done on Wednesday = \( \frac{1}{6} \) of work

Question 7.
A man spends \( \frac{3}{8} \) of his money and 8 still has Rs. 720 left with him. How much money did he have at first?

Solution:
Let a man has money = Re. 1

Amount spent = \( \frac{3}{8} \) of Re. 1 = Rs. \( \frac{3}{8} \)

Amount left = \( 1 - \frac{3}{8} = \frac{8 - 3}{8} = \frac{5}{8} \) = Re. \( \frac{5}{8} \)

\[ \therefore \frac{5}{8} \text{ of his total money} = \text{Rs. 720} \]

\[ \therefore \text{Total money} = \text{Rs. } \frac{720 \times 8}{5} = \text{Rs. } 144 \times 8 = \text{Rs. } 1152 \]

Question 8.
In a school, \( \frac{4}{5} \) of the students are boys, and the number of girls is 100. Find the number
of boys.

**Solution:**

Let the total number of boys and girls = \(x\)

Total number of boys = \(\frac{4}{5}\) of \(x = \frac{4x}{5}\)

According to question, total strength of School,

\[x - \frac{4x}{5} = 100\]

\[\frac{5x - 4x}{5} = 100\]

\[\frac{x}{5} = 100 \Rightarrow x = 500\]

:. Number of boys = total strength – girls

\[= 500 - 100 = 400.\]

**Question 9.**

After finishing \(\frac{3}{4}\) of my journey, I find that 12 km of my journey is covered. How much distance is still left to be covered?

**Solution:**

Let the total journey = \(x\),

distance covered = \(\frac{3}{4} = 12\) km

Then, according to question \(\frac{3}{4}\) of \(x = 12\) km

\[x = 12 \times \frac{4}{3} \Rightarrow x = 16\) km

Distance left = total distance – distance
cover = 16 – 12 = 4 km.

**Question 10.**

When Ajit travelled 15 km, he found that one-fourth of his journey was still left. What was the full length of the journey?
Solution:

Let the total length of journey = $x$

Journey travelled = 15 km

Journey still left = $\frac{1}{4}$ of $x$

Now, according to question,

$\begin{align*}
 x - 15 &= \frac{1}{4} \text{ of } x \\
 x - 15 &= \frac{x}{4} \\
 x - \frac{x}{4} &= 15 \\
 \frac{4x - x}{4} &= 15 \\
 3x &= 15 \times 4 \\
 x &= \frac{15 \times 4}{3} = 20 \text{ km}
\end{align*}$

$\therefore$ Total length of the journey = 20 km.

Question 11.

In a particular month, a man earns Rs. 7,200. Out of this income, he spends $\frac{3}{10}$ on food, $\frac{1}{4}$ on house rent, $\frac{1}{10}$ on insurance and $\frac{2}{25}$ on holidays. How much did he save in that month?

Solution:
Earning of a man in a particular month
= Rs. 7200

Amount spent on food = \( \frac{3}{10} \) of Rs. 7200
= Rs. 2160

Amount spent on house rent
= \( \frac{1}{4} \) of Rs. 7200 = Rs. 1800

Amount spent on insurance
= \( \frac{1}{10} \) of Rs. 7200 = Rs. 720

Amount spent on holidays
= \( \frac{2}{25} \) of Rs. 7200
= Rs. 2 \times 288 = Rs. 576

\therefore \text{Total amount spent} = \text{Rs.} (2160 + 1800 + 720 + 576) = \text{Rs. 5256}

\therefore \text{Amount saved} = \text{Rs.} 7200 - \text{Rs. 5256}
= \text{Rs. 1944}

REVISION EXERCISE

Question 1.
Show that \( \frac{3}{7} \) lies between \( \frac{2}{5} \) and \( \frac{5}{7} \).
Solution:

\[ \frac{3}{7} \text{ will lie between } \frac{2}{5} \text{ and } \frac{5}{7} \text{ if } \]

\[ \frac{2}{5} > \frac{3}{7} > \frac{5}{7} \text{ or } \frac{2}{5} < \frac{3}{7} < \frac{5}{7} \]

Now, comparing \( \frac{2}{5}, \frac{3}{7}, \frac{5}{7} \)

L.C.M. of 5 and 7 = 35

\[ \frac{2}{5} = \frac{2 \times 7}{5 \times 7} = \frac{14}{35} \]

\[ \frac{3}{7} = \frac{3 \times 5}{7 \times 5} = \frac{15}{35} \]

and \( \frac{5}{7} = \frac{5 \times 5}{7 \times 5} = \frac{25}{35} \)

\[ \therefore \frac{14}{35} < \frac{15}{35} < \frac{25}{35} \]

\[ \Rightarrow \frac{2}{5} < \frac{3}{7} < \frac{5}{7} \]

\[ \frac{3}{7} \text{ lies between } \frac{2}{5} \text{ and } \frac{5}{7} \]

Question 2.

Show that \( \frac{4}{5} \) lies between \( \frac{3}{4} \) and \( \frac{5}{6} \).
Solution:

\[
\frac{3}{4} > \frac{4}{5} > \frac{5}{6} \text{ or } \frac{3}{4} < \frac{4}{5} < \frac{5}{6}
\]

Now L.C.M. of 4, 5, 6 = 60

\[
\Rightarrow \frac{3}{4} = \frac{3 \times 15}{4 \times 15} = \frac{45}{60}
\]

\[
\Rightarrow \frac{4}{5} = \frac{4 \times 12}{5 \times 12} = \frac{48}{60}
\]

\[
\Rightarrow \frac{5}{6} = \frac{5 \times 10}{6 \times 10} = \frac{50}{60}
\]

\[
\Rightarrow \frac{45}{60} < \frac{48}{60} < \frac{50}{60}
\]

\[
\Rightarrow \frac{3}{4} < \frac{4}{5} < \frac{5}{6}
\]

Hence \(\frac{4}{5}\) lies between \(\frac{3}{4}\) and \(\frac{5}{6}\)

Question 3.
Evaluate:

(i) \(\frac{5}{6} - 1 - \frac{4}{15} - \left(\frac{2}{9} - 1\right)\)

(ii) \(\frac{3}{4} \text{ of } 1\frac{1}{2} + 4\frac{1}{2}\)

(iii) \(\frac{5}{6} \text{ of } \frac{3}{4} + \frac{7}{8} \times 1\frac{1}{2}\)

(iv) \(\frac{1}{3} + \frac{7}{9} + \left(\frac{7}{10} \times 1\frac{1}{4}\right)\)

(v) \(\frac{4}{13} \text{ of } \frac{2}{7} + \frac{68}{91} - \left(\frac{1}{2} - 1\frac{1}{3}\right)\)

(vi) \(8 - \left[\frac{1}{3} - \left(3 - 2\frac{1}{2}\right)\right]\)

Solution:

(i) \(\frac{5}{6} - 1 - \frac{4}{15} - \left(\frac{2}{9} - 1\right)\)

\[
= \frac{23}{6} - \frac{19}{15} - \left(\frac{29}{9} - \frac{8}{5}\right)
\]
\[ \frac{23}{6} - \frac{19}{15} - \frac{29}{9} + \frac{8}{5} \]
\[ = \frac{345 - 114 - 290 + 144}{90} \]
\[ \text{L.C.M. of 6, 15, 9, 5 = 90} \]
\[ = \frac{345 + 144 - 114 - 290}{90} = \frac{489 - 404}{90} \]
\[ = \frac{85}{90} = \frac{85 \div 5}{90 \div 5} = \frac{17}{18} \]

(ii) \[ \frac{3}{4} \text{ of } 1 \frac{1}{2} + 4 \frac{1}{2} \]
\[ = \frac{3}{4} \text{ of } \frac{3}{2} + \frac{9}{2} \]
\[ = \frac{9}{8} + \frac{9}{2} \] (first remove 'of')
\[ = \frac{9}{8} \times \frac{2}{1} = \frac{9}{4} \]

(iii) \[ \frac{5}{6} \text{ of } \frac{3}{4} + \frac{7}{8} \times 1 \frac{1}{2} \]
\[ = \frac{5}{6} \text{ of } \frac{3}{4} + \frac{7}{8} \times \frac{3}{2} \]
\[ = \frac{5}{8} + \frac{7}{8} \times \frac{3}{2} \] (first remove of)
\[ = \frac{5}{8} \times \frac{8}{7} \times \frac{3}{2} \] (then remove +)
\[ = \frac{15}{14} = 1 \frac{1}{14} \]

(iv) \[ \frac{1}{3} + \frac{7}{9} + \left( \frac{7}{10} \times \frac{1}{4} \right) \]
\[ = \frac{1}{3} + \frac{7}{9} + \left( \frac{7}{10} \times \frac{5}{4} \right) \]
\[ = \frac{1}{3} + \frac{7}{9} + \frac{7}{8} \] (remove bracket)
\[
\begin{align*}
&= \frac{1}{3} + \frac{7}{9} \times \frac{8}{7} \\
&= \frac{1}{3} + \frac{8}{9} \\
&= \frac{3+8}{9} = \frac{11}{9} = \frac{2}{9} \\
(v) \quad \frac{4}{13} \text{ of } 2 \frac{2}{7} + \frac{68}{91} - \left(\frac{1}{2} - \frac{1}{3}\right) \\
&= \frac{17}{13} \text{ of } \frac{16}{7} + \frac{68}{91} - \left(\frac{3}{2} - \frac{4}{3}\right) \\
&= \frac{17}{13} \text{ of } \frac{16}{7} \div \frac{68}{91} - \frac{3}{2} + \frac{4}{3} \\
&= \frac{272}{91} \div \frac{68}{91} - \frac{3}{2} + \frac{4}{3} \\
&= \frac{272}{91} \times \frac{91}{68} - \frac{3}{2} + \frac{4}{3} \\
&= \frac{4}{1} - \frac{3}{2} + \frac{4}{3} \\
&= \frac{24-9+8}{6} = \frac{32-9}{6} \\
&= \frac{23}{6} = 3 \frac{5}{6} \\
(vi) \quad 8 - \left\{\frac{5}{3} - \left(3 - \frac{1}{2}\right)\right\} \\
&= 8 - \left\{\frac{16}{3} - \left(3 - \frac{5}{2}\right)\right\} \\
&= 8 - \left\{\frac{16}{3} - \frac{3-5}{2}\right\} \\
&= \frac{8}{1} - \frac{16}{3} + \frac{3}{1} - \frac{5}{2} \\
&= \frac{48-32+18-15}{6} = \frac{48+18-32-15}{6} \\
&= \frac{66-47}{6} = \frac{19}{6} = 3 \frac{1}{6}
\end{align*}
\]
**Question 4.**
Mr. Mehra gave one-third of his money to his son, one-fifth of his money to his daughter and the remaining amount to his wife. If his wife got Rs. 91,000, how much money did Mr. Mehra have originally?

**Solution:**

Let Mr. Mehra have money = 1

Money given to his son = $\frac{1}{3}$

and money given to his daughter = $\frac{1}{5}$

$\therefore$ Remaining money given to his wife

$= 1 - \left( \frac{1}{3} + \frac{1}{5} \right)$

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

$= 1 - \frac{8}{15}$

$= \frac{15 - 8}{15} = \frac{7}{15}$

$\therefore \frac{7}{15}$ of his money = Rs. 91000

$\therefore$ Total money = Rs. $\frac{91000 \times 15}{7}$

$= Rs. 13,000 \times 15 = Rs. 1,95,000$

**Question 5.**
A sum of Rs. 84,000 is divided among three persons A, B and C. If A gets one-fourth of it and B gets one-fifth of it; how much did C get?

**Solution:**

Total money = Rs. 84,000

A gets $\frac{1}{4}$ of 84,000 = Rs. 21,000

B gets $\frac{1}{5}$ of 84,000 = Rs. 16,800

$\therefore$ C gets remaining money

$\therefore$ C's share = Rs. 84,000 - (Rs. 21,000 + Rs. 16,800)

$= Rs. 84,000 - (37,800) = Rs. 46,200$

**Question 6.**
In one hour Rohit walks $3\frac{2}{5}$ km. How much distance will he cover in $2\frac{3}{2}$ hours?
Solution:

Distance covered in 1 hour = \(3 \frac{2}{5} = \frac{17}{5}\) km

Distance covered in \(2 \frac{1}{2}\) hours

\[
= 3 \frac{2}{5} \times 2 \frac{1}{2} \text{ km} = \frac{17}{5} \times \frac{5}{2} \text{ km}
\]

\[
= \frac{17}{2} = 8 \frac{1}{2} \text{ km}
\]

**Question 7.**
An 84 m long string is cut into pieces each of length \(5 \frac{1}{4}\) m. How many pieces are obtained?

**Solution:**

Length of string = 84 m

Length of each piece = \(5 \frac{1}{4} = \frac{21}{4}\) m

Number of pieces = \(84 \div \frac{21}{4}\)

\[
= 84 \times \frac{4}{21} = 4 \times 4 = 16
\]

**Question 8.**
In buying a ready made shirt-two-fifths of my pocket money is spent If Rs. 540 is still left with me, find:
(i) The money I had before I bought the shirt.
(ii) The cost of the shirt

**Solution:**
Question 9.
Mohan leaves Rs. 1,20,000 to his wife and three children such that two-fifths of this money is given to his wife and the remaining is distributed equally among the children. Find, how much each child gets?

**Solution:**

Total amount = Rs. 12,0,000

Amount given to his wife = \( \frac{2}{5} \) of Rs. 1,20,000

= Rs. 2 x 24,000 = Rs. 48,000

Remaining amount = Rs. 120000 – Rs. 48000 = Rs. 72000

This amount is distributed among three children equally.

Each's share = Rs. 72,000 x \( \frac{1}{3} \) = Rs. 24,000

Question 10.

Simplify:

\[(i) \quad 3 \frac{5}{8} \times 2 \frac{2}{3} + 1 \frac{3}{8} \]

\[(ii) \quad \left(1 \div 3 \frac{1}{3}\right) \times 3 \frac{1}{3} \times 7 \frac{2}{9} - 6 \]

\[(iii) \quad \frac{3}{4} \times 1 \frac{1}{3} + \frac{3}{7} \times 2 \frac{5}{8} \]

**Solution:**

\[(i) \quad 3 \frac{5}{8} \times 2 \frac{2}{3} + 1 \frac{3}{8} \]

Let total money in the pocket = 1

Amount spent on shirt = \( \frac{2}{5} \)

Balance amount = \( 1 - \frac{2}{5} = \frac{5-2}{5} = \frac{3}{5} \)

Now \( \frac{3}{5} \) of total money = Rs. 540

\( (i) \) Total money = Rs. 540 \times \frac{5}{3} = 180 \times 5

= Rs. 900

\( (ii) \) Cost of shirt = \( \frac{2}{5} \) of Rs. 900 = Rs. 2 x 180

= Rs. 360
\[
\frac{29}{8} \text{ of } \frac{8}{3} + \frac{11}{8} \\
= \frac{29}{3} + \frac{11}{8} \tag{Removing 'of'}
\]
\[
= \frac{29}{3} \times \frac{8}{11} = \frac{232}{33} = 7 \frac{1}{33}
\]

(ii) \[
\left(1 + \frac{3}{3}\right) \times \left(\frac{1}{3} \text{ of } \frac{2}{9}\right) - 6
\]
\[
= \left(1 + \frac{10}{3}\right) \times \frac{10}{3} \text{ of } \frac{65}{9} - 6
\]
\[
= \left(1 + \frac{3}{10}\right) \times \frac{10}{3} \text{ of } \frac{65}{9} - 6
\]
\[
= \frac{3}{10} \times \frac{10}{3} \text{ of } \frac{65}{9} - 6 \tag{Removing bracket}
\]
\[
= \frac{3}{10} \times \frac{650}{27} - 6 \tag{Removing 'of'}
\]
\[
= \frac{65}{9} - 6 \tag{Removing '×')
\]
\[
= \frac{65 - 54}{9} = \frac{11}{9} = 1 \frac{2}{9}
\]

(iii) \[
\frac{3}{4} \times 1 \frac{1}{3} + \frac{3}{7} \text{ of } 2 \frac{5}{8}
\]
\[
= \frac{3}{4} \times \frac{4}{3} + \frac{3}{7} \text{ of } \frac{21}{8} \tag{Removing 'of')}
\]
\[
= \frac{3}{4} \times \frac{4}{3} + \frac{9}{8} \tag{Removing '×')}
\]
\[
= \frac{3}{4} \times \frac{4}{3} \times \frac{8}{9} \tag{Removing +)}
\]
\[
= \frac{8}{9}
\]