



Fractions

Activity-1

- (a) like (b) proper (c) improper
(d) numerator, denominator
- (a) $\frac{1}{4}$ (b) $\frac{2}{15}$ (c) $\frac{3}{8}$
- (a) unit (b) proper (c) mixed (d) improper
(e) improper (f) proper
- (a) $2\frac{4}{7}$ (b) $15\frac{1}{8}$ (c) $3\frac{7}{13}$ (d) $9\frac{7}{11}$ (e) $8\frac{6}{9}$
- (a) $\frac{41}{5}$ (b) $\frac{55}{9}$ (c) $\frac{35}{11}$ (d) $\frac{29}{7}$ (e) $\frac{31}{4}$
- (a) > (b) > (c) <
- (a) $\frac{1}{2}$ and $\frac{6}{9}$ Cross multiplying 'numerator of 1st fraction $\times$
denominator of 2nd fraction' and 'numerator of
2nd fraction $\times$ denominator of 1st fraction'

$$\frac{1}{2} \times \frac{6}{9}$$

$\Rightarrow 9 < 12$, so, $\frac{1}{2}$ and $\frac{6}{9}$ are not equivalent fractions.

$$(b) \frac{2}{5} \times \frac{10}{15}$$

$\Rightarrow 30 < 50$, so, $\frac{2}{5}$ and $\frac{10}{15}$ are not equivalent fractions.

$$(c) \frac{7}{10} \times \frac{14}{20}$$

$\Rightarrow 140 = 140$, so, $\frac{7}{10}$ and $\frac{14}{20}$ are equivalent fractions.

$$8. (a) \frac{1}{9} = \frac{1 \times 2}{9 \times 2} = \frac{1 \times 3}{9 \times 3} = \frac{1 \times 4}{9 \times 4} \Rightarrow \frac{1}{9} = \frac{2}{18} = \frac{3}{27} = \frac{4}{36}$$

$$(b) \frac{2}{9} = \frac{2 \times 2}{9 \times 2} = \frac{2 \times 3}{9 \times 3} = \frac{2 \times 4}{9 \times 4} \Rightarrow \frac{2}{9} = \frac{4}{18} = \frac{6}{27} = \frac{8}{36}$$

$$(c) \frac{3}{7} = \frac{3 \times 2}{7 \times 2} = \frac{3 \times 3}{7 \times 3} = \frac{3 \times 4}{7 \times 4} \Rightarrow \frac{3}{7} = \frac{6}{14} = \frac{9}{21} = \frac{12}{28}$$

9. (a) $\frac{2}{3}, \frac{5}{6}, \frac{8}{9}, \frac{11}{12}, \frac{17}{18}$

We first find the LCM of 3, 6, 9, 12, 18.

Now, we shall form equivalent fractions with denominator 36.

$$\frac{2}{3} = \frac{2 \times 12}{3 \times 12} = \frac{24}{36}, \frac{5}{6} = \frac{5 \times 6}{6 \times 6} = \frac{30}{36}, \frac{8}{9} = \frac{8 \times 4}{9 \times 4} = \frac{32}{36}$$

$$\frac{11}{12} = \frac{11 \times 3}{12 \times 3} = \frac{33}{36}, \frac{17}{18} = \frac{17 \times 2}{18 \times 2} = \frac{34}{36}$$

Now arrange them in ascending order.

$$\frac{24}{36} < \frac{30}{36} < \frac{32}{36} < \frac{33}{36} < \frac{34}{36} \quad \text{or} \quad \frac{2}{3} < \frac{5}{6} < \frac{8}{9} < \frac{11}{12} < \frac{17}{18}$$

(b) LCM of 4, 6, 8, 12 and 2 = 24

$$\frac{1}{4} = \frac{6}{24}, \frac{5}{6} = \frac{20}{24}, \frac{5}{8} = \frac{15}{24}, \frac{7}{12} = \frac{14}{12}, \frac{1}{2} = \frac{12}{24}$$

$$\therefore \frac{6}{24} < \frac{12}{24} < \frac{14}{24} < \frac{15}{24} < \frac{20}{24}$$

$$\therefore \frac{1}{4} < \frac{1}{2} < \frac{7}{12} < \frac{5}{8} < \frac{5}{6}$$

2	3, 6, 9, 12, 18
3	3, 3, 9, 6, 9
3	1, 1, 3, 2, 3
	1, 1, 1, 2, 1

$$\text{LCM} = 2 \times 3 \times 3 \times 2 = 36$$

2	4, 6, 8, 12, 2
2	2, 3, 4, 6, 1
3	1, 3, 2, 3, 1
	1, 1, 2, 1, 1

$$\text{LCM} = 2 \times 2 \times 3 \times 2 = 24$$

10. (a) LCM of 5, 10, 20 and 40 = 40.

$$\frac{3}{5} = \frac{24}{40}, \frac{7}{10} = \frac{28}{40}, \frac{13}{20} = \frac{26}{40}, \frac{11}{40} = \frac{11}{40}$$

$$\therefore \frac{28}{40} > \frac{26}{40} > \frac{24}{40} > \frac{11}{40}$$

$$\text{So, } \frac{7}{10} > \frac{13}{20} > \frac{3}{5} > \frac{11}{40}$$

(b) LCM of 9, 12, 7 and 63 = 63

$$\frac{4}{9} = \frac{28}{63}, \frac{1}{12} = \frac{5}{63}, \frac{5}{7} = \frac{45}{63}, \frac{11}{63} = \frac{11}{63}$$

$$\therefore \frac{45}{63} > \frac{28}{63} > \frac{11}{63} > \frac{5}{63} \quad \text{or} \quad \frac{5}{7} > \frac{4}{9} > \frac{11}{63} > \frac{1}{12}$$

11. (a) $\frac{3}{24} + \frac{11}{24} = \frac{3+11}{24} = \frac{14}{24} = \frac{7}{12}$
 (b) $\frac{3}{10} + \frac{2}{10} + \frac{7}{10} = \frac{3+2+7}{10} = \frac{12}{10} = \frac{6}{5} = 1\frac{1}{5}$
 (c) $3\frac{1}{9} + 1\frac{5}{9} = \frac{28}{9} + \frac{14}{9} = \frac{28+14}{9} = \frac{42}{9} = \frac{14}{3} = 4\frac{2}{3}$
12. (a) $\frac{1}{7} - \frac{1}{7} = 0$
 (b) $\frac{13}{21} - \frac{5}{21} = \frac{13-5}{21} = \frac{8}{21}$
 (c) $1\frac{5}{8} - 1\frac{3}{8} = \frac{13}{8} - \frac{11}{8} = \frac{13-11}{8} = \frac{2}{8} = \frac{1}{4}$

Activity-2

1. (a) $\frac{35}{40} = \frac{35 \div \boxed{5}}{40 \div 5} = \frac{7}{8}$
 (b) $\frac{50}{60} = \frac{50 \div 10}{60 \div 10} = \frac{\boxed{5}}{6}$
 (c) $\frac{64}{72} = \frac{64 \div 8}{72 \div \boxed{8}} = \frac{\boxed{8}}{9}$
 (d) $\frac{108}{120} = \frac{108 \div \boxed{12}}{120 \div 12} = \frac{\boxed{9}}{10}$
 (e) $\frac{24}{36} = \frac{24 \div 12}{36 \div \boxed{12}} = \frac{\boxed{2}}{3}$
 (f) $\frac{63}{81} = \frac{63 \div \boxed{9}}{81 \div \boxed{9}} = \frac{7}{9}$
2. (a) $\frac{45}{65} = \frac{45 \div 5}{65 \div 5} = \frac{9}{13}$
 $\left\{ \begin{array}{l} 45 = 3 \times 3 \times \textcircled{5} \\ 65 = \textcircled{5} \times 13 \end{array} \right. \therefore \text{HCF} = 5$
- (b) $\frac{48}{108} = \frac{48 \div 12}{108 \div 12} = \frac{4}{9}$
 $\left\{ \begin{array}{l} 48 = \textcircled{2} \times \textcircled{2} \times 2 \times 2 \times \textcircled{3} \\ 108 = \textcircled{2} \times \textcircled{2} \times \textcircled{3} \times 3 \times 3 \end{array} \right. \therefore \text{HCF} = 12$
- (c) $\frac{54}{72} = \frac{54 \div 18}{72 \div 18} = \frac{3}{4}$
 $\left\{ \begin{array}{l} 54 = \textcircled{2} \times \textcircled{3} \times \textcircled{3} \times 3 \\ 72 = \textcircled{2} \times 2 \times 2 \times \textcircled{3} \times \textcircled{3} \end{array} \right. \therefore \text{HCF} = 18$
- (d) $\frac{189}{234} = \frac{189 \div 9}{234 \div 9} = \frac{21}{26}$
 $\left\{ \begin{array}{l} 189 = \textcircled{3} \times \textcircled{3} \times 3 \times 7 \\ 234 = 2 \times \textcircled{3} \times \textcircled{3} \times 13 \end{array} \right. \therefore \text{HCF} = 9$
- (e) $\frac{99}{110} = \frac{99 \div 11}{110 \div 11} = \frac{9}{10}$
 $\left\{ \begin{array}{l} 99 = 3 \times 3 \times \textcircled{11} \\ 110 = 2 \times 5 \times \textcircled{11} \end{array} \right. \therefore \text{HCF} = 11$
- (f) $\frac{50}{75} = \frac{50 \div 25}{75 \div 25} = \frac{2}{3}$
 $\left\{ \begin{array}{l} 50 = 2 \times \textcircled{5} \times \textcircled{5} \\ 75 = 3 \times \textcircled{5} \times \textcircled{5} \end{array} \right. \therefore \text{HCF} = 25$

$$\begin{array}{ll}
 \text{(g)} \quad \frac{78}{169} = \frac{78 \div 13}{169 \div 13} = \frac{6}{13} & \left\{ \begin{array}{l} 78 = 2 \times 3 \times \textcircled{13} \\ 169 = \textcircled{13} \times 13 \quad \therefore \text{HCF} = 13 \end{array} \right\} \\
 \text{(h)} \quad \frac{96}{120} = \frac{96 \div 24}{120 \div 24} = \frac{4}{5} & \left\{ \begin{array}{l} 96 = \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times 2 \times 2 \times \textcircled{3} \\ 120 = \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times \textcircled{3} \times 5 \quad \therefore \text{HCF} = 24 \end{array} \right\} \\
 \text{(i)} \quad \frac{32}{72} = \frac{32 \div 8}{72 \div 8} = \frac{4}{9} & \left\{ \begin{array}{l} 32 = \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times 2 \times 2 \\ 72 = \textcircled{2} \times \textcircled{2} \times \textcircled{2} \times 3 \times 3 \quad \therefore \text{HCF} = 8 \end{array} \right\} \\
 \text{(j)} \quad \frac{18}{81} = \frac{18 \div 9}{81 \div 9} = \frac{2}{9} & \left\{ \begin{array}{l} 18 = 2 \times \textcircled{3} \times \textcircled{3} \\ 81 = 3 \times \textcircled{3} \times \textcircled{3} \times 3 \quad \therefore \text{HCF} = 9 \end{array} \right\} \\
 \text{(k)} \quad \frac{225}{300} = \frac{225 \div 75}{300 \div 75} = \frac{3}{4} & \left\{ \begin{array}{l} 225 = \textcircled{3} \times 3 \times \textcircled{5} \times \textcircled{5} \\ 300 = 2 \times 2 \times \textcircled{3} \times \textcircled{5} \times \textcircled{5} \quad \therefore \text{HCF} = 75 \end{array} \right\} \\
 \text{(l)} \quad \frac{240}{255} = \frac{240 \div 15}{255 \div 15} = \frac{16}{17} & \left\{ \begin{array}{l} 240 = 2 \times 2 \times 2 \times 2 \times \textcircled{3} \times \textcircled{5} \\ 255 = \textcircled{3} \times \textcircled{5} \times 17 \quad \therefore \text{HCF} = 15 \end{array} \right\}
 \end{array}$$

3. (a) $\frac{4}{9} \times \frac{32}{72}$ We cross multiply to check the equivalence.
 $4 \times 72 = 288, \quad 9 \times 32 = 288$

Both the products are equal.

Thus, $\frac{4}{9}$ and $\frac{32}{72}$ are equivalent fractions.

(b) $\frac{42}{70} \times \frac{7}{12}$
 $42 \times 12 = 504, \quad 70 \times 7 = 490$

The products are not equal.

Thus, $\frac{42}{70}$ and $\frac{7}{12}$ are not equivalent fractions.

(c) $\frac{40}{75} \times \frac{8}{15}$
 $40 \times 15 = 600, \quad 75 \times 8 = 600$

Both the products are equal.

Thus, $\frac{40}{75}$ and $\frac{8}{15}$ are equivalent fractions.

(d) $\frac{72}{32} \times \frac{9}{4}$ $72 \times 4 = 288, \quad 32 \times 9 = 288$

Both the products are equal.

Thus, $\frac{72}{32}$ and $\frac{9}{4}$ are equivalent fractions.

Activity-3

$$1. (a) \frac{16}{28} = \frac{16 \div 4}{28 \div 4} = \frac{4}{7} \quad \left\{ \begin{array}{l} 16 = 2 \times 2 \times 2 \times 2 \\ 28 = 2 \times 2 \times 7 \end{array} \right. \therefore \text{HCF} = 4$$

$$(b) \frac{18}{15} = \frac{18 \div 3}{15 \div 3} = \frac{6}{5} = 1\frac{1}{5} \quad \left\{ \begin{array}{l} 18 = 2 \times 3 \times 3 \\ 15 = 3 \times 5 \end{array} \right. \therefore \text{HCF} = 3$$

$$(c) \begin{aligned} 54 &= 2 \times 3 \times 3 \times 3 \\ 72 &= 2 \times 2 \times 2 \times 3 \times 3 \\ \text{HCF} &= 2 \times 3 \times 3 = 18 \\ \frac{54}{72} &= \frac{54 \div 18}{72 \div 18} = \frac{3}{4} \end{aligned}$$

$$(d) \begin{aligned} 45 &= 3 \times 3 \times 5 \\ 25 &= 5 \times 5 \\ \text{HCF} &= 5 \\ \frac{45}{25} &= \frac{45 \div 5}{25 \div 5} = \frac{9}{5} = 1\frac{4}{5} \end{aligned}$$

$$(e) \begin{aligned} 32 &= 2 \times 2 \times 2 \times 2 \times 2 \\ 50 &= 2 \times 5 \times 5 \\ \text{HCF} &= 2 \\ \frac{32}{50} &= \frac{32 \div 2}{50 \div 2} = \frac{16}{25} \end{aligned}$$

$$(f) \begin{aligned} 75 &= 3 \times 5 \times 5 \\ 35 &= 5 \times 7 \\ \text{HCF} &= 5 \\ \frac{75}{35} &= \frac{75 \div 5}{35 \div 5} = \frac{15}{7} = 2\frac{1}{7} \end{aligned}$$

$$(g) \begin{aligned} 112 &= 2 \times 2 \times 2 \times 2 \times 7 \\ 92 &= 2 \times 2 \times 23 \\ \text{HCF} &= 4 \\ \frac{112}{92} &= \frac{112 \div 4}{92 \div 4} = \frac{28}{23} = 1\frac{5}{23} \end{aligned}$$

$$(h) \begin{aligned} 55 &= 5 \times 11 \\ 100 &= 2 \times 2 \times 5 \times 5 \\ \text{HCF} &= 5 \\ \frac{55}{100} &= \frac{55 \div 5}{100 \div 5} = \frac{11}{20} \end{aligned}$$

$$2. (a) \frac{19^1}{38_2} = \frac{1}{2} \quad (\text{Dividing numerator and denominator both by 19.})$$

$$(b) \frac{16^1}{64_4} = \frac{1}{4} \quad (\text{Dividing numerator and denominator both by 16.})$$

$$(c) \frac{38^{19}}{54_{27}} = \frac{19}{27}$$

$$(d) \frac{105^7}{75_5} = \frac{7}{5} = 1\frac{2}{5}$$

$$(e) \frac{12^6}{38_{19}} = \frac{6}{19}$$

$$(f) \frac{28^7}{64_{16}} = \frac{7}{16}$$

$$(g) \frac{128^1}{256_2} = \frac{1}{2}$$

$$(h) \frac{150^{75}}{124_{62}} = \frac{75}{62} = 1\frac{13}{62}$$

Activity-4

1. (a) < (b) < (c) > (d) < (e) >
 (f) < (g) < (h) < (i) <

2. (a) LCM of 5, 10, 15, 20 = 60

$$\frac{2}{5} = \frac{24}{60}, \frac{7}{10} = \frac{42}{60}, \frac{4}{15} = \frac{16}{60}, \frac{5}{20} = \frac{15}{60}$$

$$\therefore \frac{15}{60} < \frac{16}{60} < \frac{24}{60} < \frac{42}{60} \Rightarrow \frac{5}{20} < \frac{4}{15} < \frac{2}{5} < \frac{7}{10}$$

(b) $1\frac{1}{3} = \frac{4}{3}, 1\frac{2}{5} = \frac{7}{5}, 1\frac{5}{6} = \frac{11}{6}, 1\frac{7}{10} = \frac{17}{10}$

LCM of 3, 5, 6 and 10 = 30

$$\frac{4}{3} = \frac{40}{30}, \frac{7}{5} = \frac{42}{30}, \frac{11}{6} = \frac{55}{30}, \frac{17}{10} = \frac{51}{30}$$

$$\therefore \frac{40}{30} < \frac{42}{30} < \frac{51}{30} < \frac{55}{30} \Rightarrow \frac{4}{3} < \frac{7}{5} < \frac{17}{10} < \frac{11}{6}$$

$$\text{or } 1\frac{1}{3} < 1\frac{2}{5} < 1\frac{7}{10} < 1\frac{5}{6}$$

3. (a) LCM of 16, 4, 12 and 24 = 48

$$\frac{7}{16} = \frac{21}{48}, \frac{1}{4} = \frac{12}{48}, \frac{11}{12} = \frac{44}{48}, \frac{17}{24} = \frac{34}{48}$$

$$\frac{44}{48} > \frac{34}{48} > \frac{21}{48} > \frac{12}{48} \Rightarrow \frac{11}{12} > \frac{17}{24} > \frac{7}{16} > \frac{1}{4}$$

(b) $2\frac{2}{3} = \frac{8}{3}, 2\frac{2}{7} = \frac{16}{7}, 2\frac{1}{14} = \frac{29}{14}, 2\frac{1}{6} = \frac{13}{6}$

LCM of 3, 7, 14 and 6 = 42

$$\frac{8}{3} = \frac{112}{42}, \frac{16}{7} = \frac{96}{42}, \frac{29}{14} = \frac{87}{42}, \frac{13}{6} = \frac{91}{42}$$

$$\frac{112}{42} > \frac{96}{42} > \frac{91}{42} > \frac{87}{42} \Rightarrow \frac{8}{3} > \frac{16}{7} > \frac{13}{6} > \frac{29}{14}$$

$$\therefore 2\frac{2}{3} > 2\frac{2}{7} > 2\frac{1}{6} > 2\frac{1}{14}$$

Activity-5

1. (a) $\frac{5}{7}$ (b) $\frac{12}{17}$ (c) 0

2. (a) $3\frac{2}{3} = \frac{11}{3}$, $1\frac{1}{4} = \frac{5}{4}$

$$\frac{11}{3} = \frac{11 \times 4}{3 \times 4} = \frac{44}{12}, \quad \frac{5}{4} = \frac{5 \times 3}{4 \times 3} = \frac{15}{12} \quad (\text{LCM of 3 and 4} = 12)$$

$$3\frac{2}{3} + 1\frac{1}{4} = \frac{44}{12} + \frac{15}{12} = \frac{59}{12} = 4\frac{11}{12}$$

(b) $2\frac{1}{10} = \frac{21}{10}$, $3\frac{4}{5} = \frac{19}{5}$

$$\frac{21}{10} = \frac{21}{10}, \quad \frac{19}{5} = \frac{19 \times 2}{5 \times 2} = \frac{38}{10} \quad (\text{LCM of 10 and 5} = 10)$$

$$2\frac{1}{10} + 3\frac{4}{5} = \frac{21}{10} + \frac{38}{10} = \frac{59}{10} = 5\frac{9}{10}$$

(c) $\frac{9}{20} = \frac{9 \times 3}{20 \times 3} = \frac{27}{60}$ (LCM of 20, 15 and 30 = 60)

$$\frac{13}{15} = \frac{13 \times 4}{15 \times 4} = \frac{52}{60}$$

$$\frac{27}{30} = \frac{27 \times 2}{30 \times 2} = \frac{54}{60}$$

$$\frac{9}{20} + \frac{13}{15} + \frac{27}{30} = \frac{27}{60} + \frac{52}{60} + \frac{54}{60} = \frac{133}{60} = 2\frac{13}{60}$$

(d) $\frac{4}{9} = \frac{4 \times 8}{9 \times 8} = \frac{32}{72}$ (LCM of 9, 24, 36 = 72)

$$\frac{7}{24} = \frac{7 \times 3}{24 \times 3} = \frac{21}{72}$$

$$\frac{23}{36} = \frac{23 \times 2}{36 \times 2} = \frac{46}{72}$$

$$\frac{4}{9} + \frac{7}{24} + \frac{23}{36} = \frac{32}{72} + \frac{21}{72} + \frac{46}{72} = \frac{99}{72} = \frac{11}{8} = 1\frac{3}{8}$$

$$(e) \quad \frac{3}{11} = \frac{3 \times 5}{11 \times 5} = \frac{15}{55} \quad (\text{LCM of 11, 5 and 55} = 55)$$

$$\frac{2}{5} = \frac{2 \times 11}{5 \times 11} = \frac{22}{55}$$

$$\frac{4}{55} = \frac{4 \times 1}{55 \times 1} = \frac{4}{55}$$

$$\frac{3}{11} + \frac{2}{5} + \frac{4}{55} = \frac{15}{55} + \frac{22}{55} + \frac{4}{55} = \frac{41}{55}$$

$$(f) \quad 1\frac{4}{9} = \frac{13}{9} = \frac{13 \times 1}{9 \times 1} = \frac{13}{9} \quad (\text{LCM of 9 and 3} = 9)$$

$$2\frac{2}{3} = \frac{8}{3} = \frac{8 \times 3}{3 \times 3} = \frac{24}{9}, \quad \frac{3}{1} = \frac{3 \times 9}{1 \times 9} = \frac{27}{9}$$

$$\text{So, } 3 + 1\frac{4}{9} + 2\frac{2}{3} = \frac{27}{9} + \frac{13}{9} + \frac{24}{9} = \frac{64}{9} = 7\frac{1}{9}$$

$$3. (a) \quad 10 - \frac{6}{7} = \frac{10}{1} - \frac{6}{7} \quad (\text{LCM of 1 and 7} = 7)$$

We will convert them into like fractions

$$\frac{10}{1} = \frac{10 \times 7}{1 \times 7} = \frac{70}{7}, \quad \frac{6}{7} = \frac{6 \times 1}{7 \times 1} = \frac{6}{7}$$

$$10 - \frac{6}{7} = \frac{70}{7} - \frac{6}{7} = \frac{64}{7} = 9\frac{1}{7}$$

$$(b) \quad 2\frac{4}{9} - \frac{5}{12} \quad \left[\because 2\frac{4}{9} = \frac{22}{9} \right]$$

$$= \frac{22}{9} - \frac{5}{12}$$

(LCM of 9 and 12 = 36)

$$= \frac{88}{36} - \frac{15}{36}$$

$$\left[\frac{22}{9} = \frac{22 \times 4}{9 \times 4} = \frac{88}{36}, \quad \frac{5}{12} = \frac{5 \times 3}{12 \times 3} = \frac{15}{36} \right]$$

$$= \frac{73}{36} = 2\frac{1}{36}$$

$$(c) \quad 2\frac{13}{36} - 1\frac{5}{9} \quad \left[\because 2\frac{13}{36} = \frac{85}{36}, \quad 1\frac{5}{9} = \frac{14}{9} \right]$$

$$= \frac{85}{36} - \frac{14}{9}$$

(LCM of 36 and 9 = 36)

$$= \frac{85}{36} - \frac{56}{36}$$

$$\left[\frac{85}{36} = \frac{85 \times 1}{36 \times 1} = \frac{85}{36}, \quad \frac{14}{9} = \frac{14 \times 4}{9 \times 4} = \frac{56}{36} \right]$$

$$= \frac{29}{36}$$

$$\begin{aligned}
 \text{(d)} \quad & 3\frac{4}{7} - \frac{3}{4} & \left[\because 3\frac{4}{7} = \frac{25}{7} \right] \\
 & = \frac{25}{7} - \frac{3}{4} & (\text{LCM of 7 and 4} = 28) \\
 & = \frac{100}{28} - \frac{21}{28} & \left[\frac{25}{7} = \frac{25 \times 4}{7 \times 4} = \frac{100}{28}, \frac{3}{4} = \frac{3 \times 7}{4 \times 7} = \frac{21}{28} \right] \\
 & = \frac{79}{28} = 2\frac{23}{28}
 \end{aligned}$$

$$\begin{aligned}
 \text{(e)} \quad & 4\frac{1}{5} - \frac{2}{3} & \left[\because 4\frac{1}{5} = \frac{21}{5} \right] \\
 & = \frac{21}{5} - \frac{2}{3} & (\text{LCM of 5 and 3} = 15) \\
 & = \frac{63}{15} - \frac{10}{15} = \frac{53}{15} & \left[\frac{21}{5} = \frac{21 \times 3}{5 \times 3} = \frac{63}{15}, \frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15} \right] \\
 & = 3\frac{8}{15}
 \end{aligned}$$

$$\begin{aligned}
 \text{(f)} \quad & 5\frac{3}{8} - 1\frac{3}{4} & \left[\because 5\frac{3}{8} = \frac{43}{8}, 1\frac{3}{4} = \frac{7}{4} \right] \\
 & = \frac{43}{8} - \frac{7}{4} & (\text{LCM of 8 and 4} = 8) \\
 & = \frac{43}{8} - \frac{14}{8} & \left[\frac{43}{8} = \frac{43 \times 1}{8 \times 1} = \frac{43}{8}, \frac{7}{4} = \frac{7 \times 2}{4 \times 2} = \frac{14}{8} \right] \\
 & = \frac{29}{8} = 3\frac{5}{8}
 \end{aligned}$$

4. The length of red ribbon = $5\frac{1}{5}$ m

The length of green ribbon = $2\frac{1}{2}$ m

Total length of ribbons = $\left(5\frac{1}{5} + 2\frac{1}{2}\right)$ m

$$\begin{aligned}
 5\frac{1}{5} + 2\frac{1}{2} &= \frac{26}{5} + \frac{5}{2} & \left[\because 5\frac{1}{5} = \frac{26}{5}, 2\frac{1}{2} = \frac{5}{2} \right] \\
 &= \frac{52}{10} + \frac{25}{10} & (\text{LCM of 5 and 2} = 10) \\
 &= \frac{77}{10} = 7\frac{7}{10} & \left[\frac{26}{5} = \frac{26 \times 2}{5 \times 2} = \frac{52}{10}, \frac{5}{2} = \frac{5 \times 5}{2 \times 5} = \frac{25}{10} \right]
 \end{aligned}$$

$\therefore$ Total length of ribbons = $7\frac{7}{10}$ m

5. Weight of 2 books together = $3\frac{1}{4}$ kg

Weight of one book = $1\frac{2}{5}$ kg

Weight of another book = $\left(3\frac{1}{4} - 1\frac{2}{5}\right)$ kg

$$\begin{aligned} 3\frac{1}{4} - 1\frac{2}{5} &= \frac{13}{4} - \frac{7}{5} & \left[\because 3\frac{1}{4} = \frac{13}{4}, 1\frac{2}{5} = \frac{7}{5} \right] \\ &= \frac{65}{20} - \frac{28}{20} & \left[\text{LCM of 4 and 5} = 20 \right. \\ & & \left. \frac{13}{4} = \frac{13 \times 5}{4 \times 5} = \frac{65}{20}, \frac{7}{5} = \frac{7 \times 4}{5 \times 4} = \frac{28}{20} \right] \\ &= \frac{37}{20} = 1\frac{17}{20} \end{aligned}$$

Weight of another book = $1\frac{17}{20}$ kg .

6. Nina bought $4\frac{5}{6}$ m of cloth while Rajan bought $2\frac{1}{4}$ m of cloth.

(a) Total length of the cloth bought = $\left(4\frac{5}{6} + 2\frac{1}{4}\right)$ m

$$\begin{aligned} 4\frac{5}{6} + 2\frac{1}{4} &= \frac{29}{6} + \frac{9}{4} & \left[\because 4\frac{5}{6} = \frac{29}{6}, 2\frac{1}{4} = \frac{9}{4} \right] \\ &= \frac{58}{12} + \frac{27}{12} & \left[\text{LCM of 6 and 4} = 12 \right. \\ & & \left. \frac{29}{6} = \frac{29 \times 2}{6 \times 2} = \frac{58}{12}, \frac{9}{4} = \frac{9 \times 3}{4 \times 3} = \frac{27}{12} \right] \\ &= \frac{85}{12} \\ &= 7\frac{1}{12} \end{aligned}$$

Total length of the cloth = $7\frac{1}{12}$ m.

(b) $4\frac{5}{6} - 2\frac{1}{4}$

$$\begin{aligned} &= \frac{29}{6} - \frac{9}{4} \\ &= \frac{58}{12} - \frac{27}{12} = \frac{31}{12} = 2\frac{7}{12} \end{aligned}$$

Nina bought $2\frac{7}{12}$ more cloth than that of Rajan.

$$7. \quad 3\frac{1}{3} + 2\frac{2}{3} = \frac{10}{3} + \frac{8}{3} = \frac{18}{3} = 6$$

$$\text{and } 2\frac{3}{4} + 5\frac{1}{3} = \frac{11}{4} + \frac{16}{3} \quad (\text{LCM of 4 and 3} = 12)$$

$$= \frac{33}{12} + \frac{64}{12} \quad \left[\frac{11}{4} = \frac{11 \times 3}{4 \times 3} = \frac{33}{12}, \quad \frac{16}{3} = \frac{16 \times 4}{3 \times 4} = \frac{64}{12} \right]$$

$$= \frac{97}{12} = 8\frac{1}{12}$$

$$\text{Now, } \left(2\frac{3}{4} + 5\frac{1}{3} \right) - \left(3\frac{1}{3} + 2\frac{2}{3} \right)$$

$$= \frac{97}{12} - 6$$

$$= \frac{97}{12} - \frac{6}{1} \quad (\text{LCM of 12 and 1} = 12)$$

$$= \frac{97}{12} - \frac{72}{12} \quad \left[\frac{97}{12} = \frac{97 \times 1}{12 \times 1} = \frac{97}{12}, \quad \frac{6}{1} = \frac{6 \times 12}{1 \times 12} = \frac{72}{12} \right]$$

$$= \frac{25}{12} = 2\frac{1}{12}$$

Activity-6

$$1. \text{ (a) } \frac{11}{15} \times 1 = \frac{\boxed{11}}{\boxed{15}}$$

$$\text{(b) } \frac{7}{9} \times \frac{1}{2} = \frac{1}{2} \times \frac{\boxed{7}}{\boxed{9}} = \frac{7}{18}$$

$$\text{(c) } \frac{5}{7} \times 14 = \frac{\boxed{14}}{\boxed{7}} \times \frac{5}{7}$$

$$\text{(d) } \frac{8}{17} \times \boxed{0} = 0$$

$$\text{(e) } \frac{9}{13} \times \boxed{1} = \frac{9}{13}$$

$$\text{(f) } 0 \times \frac{14}{15} = \boxed{0}$$

$$\text{(f) } \left(\frac{2}{3} \times \frac{4}{5} \right) \times \frac{1}{4} = \frac{2}{3} \times \left(\frac{\boxed{4}}{\boxed{5}} \times \frac{1}{4} \right) = \frac{2}{\boxed{15}}$$

$$2. \text{ (a) } 15 \times \frac{12}{20} = \frac{\cancel{15}^3 \times \cancel{12}^3}{\cancel{20}_4} = 9$$

$$\text{(b) } 24 \times 3\frac{1}{4} = 24 \times \frac{13}{4} = \frac{\cancel{24}^6 \times 13}{\cancel{4}_1} = 78$$

$$(c) 3 \times 2 \frac{2}{15} = 3 \times \frac{32}{15} = \frac{\cancel{3} \times 32}{5 \cancel{15}} = \frac{32}{5} = 6 \frac{2}{5}$$

$$(d) 6 \frac{1}{16} \times 36 = \frac{97}{16} \times \cancel{36}^9 = \frac{873}{4} = 218 \frac{1}{4}$$

$$(e) \frac{9}{22} \times \cancel{22}^3 = \frac{27}{2} = 13 \frac{1}{2}$$

$$(f) 5 \frac{1}{8} \times 4 = \frac{41}{8} \times 4 = \frac{41 \times \cancel{4}^1}{2 \cancel{8}} = \frac{41}{2} = 20 \frac{1}{2}$$

$$(g) 4 \frac{1}{5} \times 3 = \frac{21}{5} \times 3 = \frac{21 \times 3}{5} = \frac{63}{5} = 12 \frac{3}{5}$$

$$(h) \frac{11}{24} \times 32 = \frac{11 \times \cancel{32}^4}{\cancel{24}_3} = \frac{44}{3} = 14 \frac{2}{3}$$

$$(i) 10 \times 2 \frac{1}{5} = 10 \times \frac{11}{5} = \frac{2 \cancel{10} \times 11}{\cancel{5}_1} = 22$$

$$3. (a) \frac{7}{8} \text{ of } \frac{16}{21} = \frac{7}{8} \times \frac{16}{21} = \frac{\cancel{7} \times \cancel{16}^2}{1 \times \cancel{21}_3} = \frac{2}{3}$$

$$(b) \frac{4}{15} \text{ of } \frac{20}{21} = \frac{4}{15} \times \frac{20}{21} = \frac{4 \times \cancel{20}^4}{3 \times \cancel{15}_5 \times 21} = \frac{16}{63}$$

$$(c) \frac{3}{8} \text{ of } 36 = \frac{3}{8} \times 36 = \frac{3 \times \cancel{36}^9}{\cancel{8}_2} = \frac{27}{2} = 13 \frac{1}{2}$$

$$(d) 1 \frac{1}{2} \text{ of } 3 \frac{4}{5} = \frac{3}{2} \text{ of } \frac{19}{5} = \frac{3}{2} \times \frac{19}{5} = \frac{3 \times 19}{2 \times 5} = \frac{57}{10} = 5 \frac{7}{10}$$

$$(e) \frac{24}{25} \text{ of } \frac{35}{36} = \frac{24}{25} \times \frac{35}{36} = \frac{\cancel{24} \times \cancel{35}^7}{\cancel{25}_5 \times \cancel{36}_3} = \frac{14}{15}$$

$$(f) \frac{4}{11} \text{ of } 55 = \frac{4}{11} \times 55 = \frac{4 \times \cancel{55}^5}{\cancel{11}_1} = 20$$

4. (a) $1\frac{2}{7} \times 3\frac{1}{5} = \frac{9}{7} \times \frac{16}{5} = \frac{9 \times 16}{7 \times 5} = \frac{144}{35} = 4\frac{4}{35}$
- (b) $3\frac{3}{5} \times 5\frac{1}{2} = \frac{18}{5} \times \frac{11}{2} = \frac{18 \times 11}{5 \times 2} = \frac{99}{5} = 19\frac{4}{5}$
- (c) $2\frac{1}{9} \times 9\frac{1}{2} = \frac{19}{9} \times \frac{19}{2} = \frac{19 \times 19}{9 \times 2} = \frac{361}{18} = 20\frac{1}{18}$
- (d) $10\frac{3}{8} \times 3\frac{1}{9} = \frac{83}{8} \times \frac{28}{9} = \frac{83 \times 28}{8 \times 9} = \frac{83 \times 7}{2 \times 9} = \frac{581}{18} = 32\frac{5}{18}$
- (e) $\frac{1}{8} \times \frac{1}{6} \times 1\frac{1}{2} = \frac{1}{8} \times \frac{1}{6} \times \frac{3}{2} = \frac{1 \times 1 \times 3}{8 \times 6 \times 2} = \frac{1}{32}$
- (f) $\frac{2}{7} \times \frac{8}{9} \times \frac{1}{4} = \frac{2 \times 8 \times 1}{7 \times 9 \times 4} = \frac{4}{63}$
- (g) $1\frac{1}{4} \times \frac{2}{5} \times \frac{4}{5} = \frac{5}{4} \times \frac{2}{5} \times \frac{4}{5} = \frac{5 \times 2 \times 4}{4 \times 5 \times 5} = \frac{2}{5}$
- (h) $\frac{8}{9} \times \frac{4}{5} \times 2\frac{1}{3} = \frac{8}{9} \times \frac{4}{5} \times \frac{7}{3} = \frac{8 \times 4 \times 7}{9 \times 5 \times 3} = \frac{224}{135} = 1\frac{89}{135}$
- (i) $1\frac{1}{2} \times 2\frac{1}{3} \times 3\frac{1}{4} = \frac{3}{2} \times \frac{7}{3} \times \frac{13}{4} = \frac{3 \times 7 \times 13}{2 \times 3 \times 4} = \frac{91}{8} = 11\frac{3}{8}$

5. (a) Total number of pages = 125

Maya read $\frac{3}{5}$ of the book.

$$\therefore \text{Number of pages read by Maya} = \frac{3}{5} \times 125$$

$$= 75$$

Maya has read 75 pages of the book.

- (b) Total weight of the cake was $2\frac{1}{2}$ kg. Taufiq ate $\frac{2}{3}$ of the cake.

$$\therefore \frac{2}{3} \times 2\frac{1}{2} = \frac{2}{3} \times \frac{5}{2} = \frac{2 \times 5}{3 \times 2} = \frac{5}{3} = 1\frac{2}{3}$$

$\therefore$ Taufiq ate $1\frac{2}{3}$ kg of the cake.

(c) Som spends $\frac{5}{7}$ of ₹ 2100.

$$\therefore \frac{5}{7} \times 2100 = \frac{5 \times \cancel{2100}^{300}}{\cancel{7}_1} = 1500$$

Som spends ₹ 1500.

Tomar spends $\frac{2}{3}$ of ₹ 2100

$$\therefore \frac{2}{3} \times 2100 = \frac{2 \times \cancel{2100}^{700}}{\cancel{3}_1} = 1400$$

Tomar spends ₹ 1400.

Therefore, Som spends ₹ 1500 – ₹ 1400 = ₹ 100 more.

Activity-7

- (a) $\frac{8}{3}$ (b) $\frac{1}{9}$ (c) 1 (d) 1 (e) $\frac{15}{13}$ (f) 1
- (a) $\frac{1}{6}$ (b) $\frac{5}{2}$ (c) $\frac{3}{11}$ (d) $\frac{1}{19}$ (e) $\frac{23}{15}$ (f) $\frac{8}{21}$

(g) $\frac{7}{15}$ (h) $\frac{2}{11}$ (i) 1 (j) $\frac{11}{5}$ (k) $\frac{17}{12}$ (l) $\frac{3}{20}$

Activity-8

- (a) $\frac{7}{9}$ (b) 0 (c) 1 (d) 1 (e) $\frac{11}{6}$ (f) 0

(g) $\frac{4}{15}$ (h) 1

$$2. (a) 6 \div 8 = \frac{6}{1} \div \frac{8}{1} = \frac{6}{1} \times \frac{1}{8} = \frac{\cancel{3} \times 1}{1 \times \cancel{8}_4} = \frac{3}{4}$$

$$(b) \frac{1}{3} \div 4 = \frac{1}{3} \times \frac{1}{4} = \frac{1 \times 1}{3 \times 4} = \frac{1}{12}$$

$$(c) \frac{5}{9} \div 15 = \frac{5}{9} \div \frac{15}{1} = \frac{5}{9} \times \frac{1}{\cancel{15}_3} = \frac{1}{27}$$

$$(d) \frac{12}{13} \div 9 = \frac{12}{13} \times \frac{1}{9} = \frac{\cancel{12}_4 \times 1}{13 \times \cancel{9}_3} = \frac{4}{39}$$

$$(e) 48 \div 2\frac{2}{5} = 48 \div \frac{12}{5} = 48 \times \frac{5}{12} = \frac{\cancel{48}^{12} \times 5}{\cancel{12}_1} = 20$$

$$(f) 72 \div \frac{6}{7} = \frac{72}{1} \div \frac{6}{7} = \frac{72}{1} \times \frac{7}{6} = \frac{72 \times 7}{1 \times 6} = 84$$

$$(g) 77 \div \frac{11}{3} = 77 \times \frac{3}{11} = \frac{77 \times 3}{11} = 21$$

$$(h) \frac{18}{36} \div 12 = \frac{18}{36} \times \frac{1}{12} = \frac{18 \times 1}{36 \times 12} = \frac{1}{24}$$

$$(i) \frac{11}{4} \div 55 = \frac{11}{4} \times \frac{1}{55} = \frac{11^1}{4 \times 55} = \frac{1}{20}$$

$$3. (a) \frac{4}{5} \div 2 = \frac{4}{5} \times \frac{1}{2} = \frac{4}{5 \times 2} = \frac{2}{5}$$

$$(b) 7 \div 1\frac{2}{3} = 7 \div \frac{5}{3} = 7 \times \frac{3}{5} = \frac{7 \times 3}{5} = \frac{21}{5} = 4\frac{1}{5}$$

$$(c) \frac{1}{9} \div \frac{1}{6} = \frac{1}{9} \times 6 = \frac{6}{9} = \frac{2}{3}$$

$$(d) \frac{5}{9} \div \frac{15}{36} = \frac{5}{9} \times \frac{36}{15} = \frac{4}{3} = 1\frac{1}{3}$$

$$(e) 16 \div \frac{2}{5} = 16 \times \frac{5}{2} = \frac{80}{2} = 40$$

$$(f) \frac{12}{13} \div \frac{1}{52} = \frac{12}{13} \times 52 = \frac{12 \times 52}{13} = 48$$

$$(g) 1\frac{2}{11} \div 2\frac{5}{22} = \frac{13}{11} \div \frac{49}{22} = \frac{13}{11} \times \frac{22}{49} = \frac{13 \times 22}{11 \times 49} = \frac{26}{49}$$

$$(h) 9\frac{5}{6} \div 5\frac{1}{6} = \frac{59}{6} \div \frac{31}{6} = \frac{59}{6} \times \frac{6}{31} = \frac{59}{31} = 1\frac{28}{31}$$

$$(i) 7\frac{3}{5} \div 19 = \frac{38}{5} \div 19 = \frac{38}{5} \times \frac{1}{19} = \frac{38}{5 \times 19} = \frac{2}{5}$$

$$(j) 8\frac{2}{5} \div 2\frac{2}{15} = \frac{42}{5} \div \frac{32}{15} = \frac{42}{5} \times \frac{15}{32} = \frac{63}{16} = 3\frac{15}{16}$$

$$(k) 4\frac{2}{5} \div \frac{11}{15} = \frac{22}{5} \div \frac{11}{15} = \frac{22}{5} \times \frac{15}{11} = \frac{22 \times 15}{5 \times 11} = 6$$

$$(l) 4\frac{1}{2} \div 4\frac{1}{5} = \frac{9}{2} \div \frac{21}{5} = \frac{9}{2} \times \frac{5}{21} = \frac{15}{14} = 1\frac{1}{14}$$

$$(m) \quad 2\frac{1}{5} + 2\frac{3}{4} = \frac{11}{5} + \frac{11}{4} = \frac{11}{5} \times \frac{4}{11} = \frac{11 \times 4}{5 \times 11} = \frac{4}{5}$$

$$(n) \quad 5\frac{4}{7} + \frac{13}{14} = \frac{39}{7} + \frac{13}{14} = \frac{39}{7} \times \frac{14}{13} = \frac{39 \times 14^2}{7 \times 13} = 6$$

$$(o) \quad \frac{8}{21} + \frac{4}{3} = \frac{8}{21} \times \frac{3}{4} = \frac{28 \times 3^1}{21 \times 4} = \frac{2}{7}$$

4. The cost of 5 kg sugar = ₹ $137\frac{1}{2}$

$$\therefore \text{The cost of 1 kg sugar} = ₹ 137\frac{1}{2} \div 5$$

$$\text{Now } 137\frac{1}{2} \div 5 = \frac{275}{2} \div 5 = \frac{275}{2} \times \frac{1}{5} = \frac{55}{2} = 27\frac{1}{2}$$

$$\therefore \text{The cost of 1 kg sugar is ₹ } 27\frac{1}{2}.$$

5. 24 m cloth is to be cut into 9 equal pieces.

$$\text{The length of each piece} = 24 \text{ m} \div 9$$

$$= 24 \text{ m} \times \frac{1}{9}$$

$$= \frac{24 \times 1}{9} \text{ m}$$

$$= \frac{8}{3} \text{ m} = 2\frac{2}{3} \text{ m}$$

6. The perimeter of a square is $21\frac{2}{5}$ m.

$$\text{We know that the perimeter of the square} = 4 \times \text{side}$$

$$21\frac{2}{5} \text{ m} = 4 \times \text{side}$$

$$\therefore \text{Side} = \left(21\frac{2}{5} \div 4\right) \text{ m} = \left(\frac{107}{5} \div 4\right) \text{ m}$$

$$= \left(\frac{107}{5} \times \frac{1}{4}\right) \text{ m} = \frac{107}{20} \text{ m}$$

$$= 5\frac{7}{20} \text{ m}$$

$$7. \quad \text{Second fraction} = 24 \div 4\frac{1}{5} = 24 \div \frac{21}{5} = 24 \times \frac{5}{21} \\ = \frac{40}{7} = 5\frac{5}{7}$$

$\therefore$ The other fraction is $5\frac{5}{7}$.

8. Aman runs a total distance of $12\frac{4}{5}$ km in 4 hours.

The distance covered by Aman in 1 hour

$$= \left(12\frac{4}{5} \div 4\right) \text{ km} \\ = \left(\frac{64}{5} \div 4\right) \text{ km} \\ = \frac{64}{5} \times \frac{1}{4} \text{ km} \\ = \frac{16}{5} \text{ km} = 3\frac{1}{5} \text{ km}$$

9. Rahim cut a 30 m long rope into pieces of $2\frac{1}{2}$ m length each.

$$\therefore \text{Number of equal pieces of rope} = 30 \div 2\frac{1}{2} \\ = 30 \div \frac{5}{2} = 30 \times \frac{2}{5} = 12$$

10. The cost of $3\frac{1}{2}$ kg mangoes is ₹ 157 $\frac{1}{2}$.

$$\therefore \text{The cost of 1 kg mangoes} = ₹ 157\frac{1}{2} \div 3\frac{1}{2}$$

$$\text{Now, } 157\frac{1}{2} \div 3\frac{1}{2} = \frac{315}{2} \div \frac{7}{2} = \frac{315}{2} \times \frac{2}{7} = 45$$

$\therefore$ The cost of 1 kg mangoes is ₹ 45.

Mental Maths Corner

1. (a) (iv) unlike (b) (ii) $\frac{2}{9}$ (c) (ii) less than (d) (ii) $\frac{5}{11}$

- (e) (iii) $5\frac{11}{15}$ (f) (iv) $\frac{1}{100}$ (g) (iii) product (h) (ii) 5

2. (a) $\frac{6}{5}$ (b) 1 (c) improper fraction (d) $\frac{13}{19}$ (e) 1 (f) $5\frac{7}{16}$

$$(b) \frac{90}{104} = \frac{90 \div 2}{104 \div 2} = \frac{45}{52} \quad (\text{HCF of 90 and 104} = 2)$$

3. Convert them into like fractions first.

LCM of 16, 8, 32 and 4 = 32

$$\therefore \frac{5}{16} = \frac{5 \times 2}{16 \times 2} = \frac{10}{32}, \frac{5}{8} = \frac{5 \times 4}{8 \times 4} = \frac{20}{32}, \frac{9}{32} = \frac{9 \times 1}{32 \times 1} = \frac{9}{32}, \frac{1}{4} = \frac{1 \times 8}{4 \times 8} = \frac{8}{32}$$

Arranging them in ascending order, we have

$$\frac{8}{32} < \frac{9}{32} < \frac{10}{32} < \frac{20}{32}$$

$$\text{or } \frac{1}{4} < \frac{9}{32} < \frac{5}{16} < \frac{5}{8}$$

4. Convert them into like fractions first.

LCM of 5, 3, 15 and 10 = 30

$$\frac{4}{5} = \frac{4 \times 6}{5 \times 6} = \frac{24}{30}, \frac{2}{3} = \frac{2 \times 10}{3 \times 10} = \frac{20}{30}, \frac{2}{15} = \frac{2 \times 2}{15 \times 2} = \frac{4}{30},$$

$$\frac{9}{10} = \frac{9 \times 3}{10 \times 3} = \frac{27}{30}$$

Arranging them in descending order, we have

$$\frac{27}{30} > \frac{24}{30} > \frac{20}{30} > \frac{4}{30}$$

$$\therefore \frac{9}{10} > \frac{4}{5} > \frac{2}{3} > \frac{2}{15}$$

$$5. (a) 1\frac{2}{9} + \frac{7}{24} + \frac{23}{36}$$

(Convert them into like fractions)

$$= \frac{11}{9} + \frac{7}{24} + \frac{23}{36}$$

(LCM of 9, 24 and 36 = 72)

$$= \frac{88}{72} + \frac{21}{72} + \frac{46}{72}$$

$$\left[\frac{11}{9} = \frac{11}{9} \times \frac{8}{8} = \frac{88}{72}, \frac{7}{24} = \frac{7 \times 3}{24 \times 3} = \frac{21}{72}, \right.$$

$$= \frac{155}{72}$$

$$\frac{23}{36} = \frac{23 \times 2}{36 \times 2} = \frac{46}{72}$$

$$= 2\frac{11}{72}$$

(Convert improper fraction into mixed fraction)

$$(b) 2\frac{3}{7} - \frac{3}{4}$$

(Convert mixed fraction into improper fraction)

$$= \frac{17}{7} - \frac{3}{4}$$

(Convert them into like fractions)

$$= \frac{68}{28} - \frac{21}{28}$$

(LCM of 7 and 4 = 28)

$$= \frac{47}{28}$$

$$\left[\frac{17}{7} = \frac{17 \times 4}{7 \times 4} = \frac{68}{28}, \frac{3}{4} = \frac{3 \times 7}{4 \times 7} = \frac{21}{28} \right]$$

$$= 1\frac{19}{28}$$

Converting improper fraction into mixed fraction.

$$(c) 3\frac{3}{7} \times \frac{7}{10}$$

$$= \frac{24}{7} \times \frac{7}{10}$$

$$= \frac{24}{10}$$

$$= \frac{12}{5} = 2\frac{2}{5}$$

$$(d) 4\frac{3}{5} + \frac{11}{15}$$

$$= \frac{23}{5} + \frac{11}{15}$$

$$= \frac{23}{5} \times \frac{3}{3} = \frac{69}{15}$$

$$= \frac{69}{15} = 4\frac{3}{5}$$

$$6. \left(3\frac{1}{4} + 7\frac{1}{8} \right) - 2\frac{1}{3}$$

First we find the sum of $3\frac{1}{4}$ and $7\frac{1}{8}$ and then subtract $2\frac{1}{3}$.

$$3\frac{1}{4} + 7\frac{1}{8} = \frac{13}{4} + \frac{57}{8} = \frac{26}{8} + \frac{57}{8} = \frac{83}{8} = 10\frac{3}{8}$$

Now we subtract

$$\Rightarrow 10\frac{3}{8} - 2\frac{1}{3}$$

$$= \frac{83}{8} - \frac{7}{3}$$

$$= \frac{249}{24} - \frac{56}{24}$$

$$= \frac{193}{24} = 8\frac{1}{24}$$

(LCM of 8 and 3 = 24)

$$\left[\frac{83}{8} = \frac{83 \times 3}{8 \times 3} = \frac{249}{24}, \frac{7}{3} = \frac{7 \times 8}{3 \times 8} = \frac{56}{24} \right]$$

7. A cyclist covers $15\frac{1}{3}$ km in one hour.

Distance covered by the cyclist in $3\frac{1}{2}$ hours = $\left(15\frac{1}{3} \times 3\frac{1}{2}\right)$ km

$$\text{Now, } 15\frac{1}{3} \times 3\frac{1}{2} = \frac{46}{3} \times \frac{7}{2} = \frac{\overset{23}{46} \times 7}{3 \times \cancel{2}_1} = \frac{161}{3} = 53\frac{2}{3}$$

$\therefore$ Distance covered by the cyclist in $3\frac{1}{2}$ hours is $53\frac{2}{3}$ km.

8. Total weight of fruits = $2\frac{1}{2}$ kg + $3\frac{1}{4}$ kg + $1\frac{1}{3}$ kg

$$= \left(\frac{5}{2} + \frac{13}{4} + \frac{4}{3}\right) \text{ kg}$$

$$\text{Now, } \frac{5}{2} + \frac{13}{4} + \frac{4}{3} = \frac{30}{12} + \frac{39}{12} + \frac{16}{12} \quad \text{LCM of 2, 4, 3 = 12}$$

$$= \frac{85}{12}$$

$$\frac{5}{2} = \frac{5 \times 6}{2 \times 6} = \frac{30}{12}$$

$$= 7\frac{1}{12}$$

$$\frac{13}{4} = \frac{13 \times 3}{4 \times 3} = \frac{39}{12}$$

$$\text{Total weight of fruits} = 7\frac{1}{12} \text{ kg}$$

$$\frac{4}{3} = \frac{4 \times 4}{3 \times 4} = \frac{16}{12}$$

9. The cost of $4\frac{1}{4}$ kg of sugar = ₹ 153

$\therefore$ The cost of 1 kg of sugar = ₹ $153 \div 4\frac{1}{4}$

$$\text{Now, } 153 \div 4\frac{1}{4} = 153 \div \frac{17}{4} = \overset{9}{153} \times \frac{4}{\cancel{17}_1} = 36$$

$\therefore$ The cost of one kg of sugar = ₹ 36

10. Kabir spends $\frac{1}{3}$ of his pocket money on books.

$$\therefore \frac{1}{3} \times ₹ 450 = ₹ \frac{450}{3} = ₹ 150$$

He spends $\frac{1}{5}$ on travelling.

$$\therefore \frac{1}{5} \times ₹ 450 = ₹ \frac{450}{5} = ₹ 90$$

Amount spent on books and travelling = ₹ 150 + ₹ 90 = ₹ 240

He spends rest amount on food.

So, ₹ 450 - ₹ 240 = ₹ 210

Thus, he spends ₹ 210 on food.

HOTS

1. $\frac{4}{9}$ of a group of students are girls.

It means, if there are 9 students, of these 4 are girls.

So, $\frac{5}{9}$ of the group of students are boys.

$$\text{Their difference} = \frac{5}{9} - \frac{4}{9} = \frac{1}{9}$$

But there are 17 more boys than girls. (given)

$$\therefore \frac{1}{9} \text{ of the group} = 17$$

$$\begin{aligned} \text{Number of students in the group} &= 17 \div \frac{1}{9} \\ &= 17 \times 9 = 153 \end{aligned}$$

There are 153 students in the group.

Maths Lab Activity

(a) $\frac{1}{4} \times \frac{2}{5} = \frac{2}{20}$

(b) $\frac{1}{7} \times \frac{4}{5} = \frac{4}{35}$

(c) $\frac{1}{3} \times \frac{1}{7} = \frac{1}{21}$

(d) $\frac{5}{6} \times \frac{7}{8} = \frac{35}{48}$