



Fractions

Exercise-1

1. (a) like (b) proper (c) improper
(d) numerator, denominator
2. (a) $\frac{1}{4}$ (b) $\frac{2}{15}$ (c) $\frac{3}{8}$
3. (a) unit (b) proper (c) mixed (d) improper
(e) improper (f) proper

4. (a) $\frac{18}{7} = 2\frac{4}{7}$ $7 \overline{) 18} \begin{array}{r} 2 \\ -14 \\ \hline 4 \end{array}$

(b) $\frac{121}{8} = 15\frac{1}{8}$

(c) $\frac{46}{13} = 3\frac{7}{13}$

(d) $\frac{106}{11} = 9\frac{7}{11}$

(e) $\frac{78}{9} = 8\frac{6}{9}$

5. (a) $8\frac{1}{5} = \frac{5 \times 8 + 1}{5} = \frac{40 + 1}{5} = \frac{41}{5}$

(b) $6\frac{1}{9} = \frac{9 \times 6 + 1}{9} = \frac{54 + 1}{9} = \frac{55}{9}$

(c) $3\frac{2}{11} = \frac{11 \times 3 + 2}{11} = \frac{33 + 2}{11} = \frac{35}{11}$

(d) $4\frac{1}{7} = \frac{7 \times 4 + 1}{7} = \frac{28 + 1}{7} = \frac{29}{7}$

(e) $7\frac{3}{4} = \frac{4 \times 7 + 3}{4} = \frac{28 + 3}{4} = \frac{31}{4}$

Exercise-2

1. (a) $\frac{35}{40} = \frac{35 \div \boxed{5}}{40 \div 5} = \frac{7}{8}$

(b) $\frac{50}{60} = \frac{50 \div 10}{60 \div 10} = \frac{\boxed{5}}{\boxed{6}}$

(c) $\frac{64}{72} = \frac{64 \div 8}{72 \div \boxed{8}} = \frac{\boxed{8}}{\boxed{9}}$

(d) $\frac{108}{120} = \frac{108 \div \boxed{12}}{120 \div 12} = \frac{\boxed{9}}{\boxed{10}}$

(e) $\frac{24}{36} = \frac{24 \div 12}{36 \div \boxed{12}} = \frac{\boxed{2}}{\boxed{3}}$

(f) $\frac{63}{81} = \frac{63 \div \boxed{9}}{81 \div \boxed{9}} = \frac{7}{9}$

2. (a) $\frac{45}{65} = \frac{45 \div 5}{65 \div 5}$
 $= \frac{9}{13}$

$\left\{ \begin{array}{l} 45 = 3 \times 3 \times \textcircled{5} \\ 65 = \textcircled{5} \times 13 \end{array} \right. \therefore \text{HCF} = 5$

$$(b) \frac{48}{108} = \frac{48 \div 12}{108 \div 12} = \frac{4}{9}$$

$$(c) \frac{54}{72} = \frac{54 \div 18}{72 \div 18} = \frac{3}{4}$$

$$(d) \frac{189}{234} = \frac{189 \div 9}{234 \div 9} = \frac{21}{26}$$

$$(e) \frac{99}{110} = \frac{99 \div 11}{110 \div 11} = \frac{9}{10}$$

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

$$(g) \frac{78}{169} = \frac{78 \div 13}{169 \div 13} = \frac{6}{13}$$

$$(h) \frac{96}{120} = \frac{96 \div 24}{120 \div 24} = \frac{4}{5}$$

$$(i) \frac{32}{72} = \frac{32 \div 8}{72 \div 8} = \frac{4}{9}$$

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

$$(k) \frac{225}{300} = \frac{225 \div 75}{300 \div 75} = \frac{3}{4}$$

$$(l) \frac{240}{255} = \frac{240 \div 15}{255 \div 15} = \frac{16}{17}$$

$$\begin{cases} 48 = 2 \times 2 \times 2 \times 2 \times 3 \\ 108 = 2 \times 2 \times 3 \times 3 \times 3 \end{cases} \therefore \text{HCF} = 2 \times 2 \times 3 = 12$$

$$\begin{cases} 54 = 2 \times 3 \times 3 \times 3 \\ 72 = 2 \times 2 \times 2 \times 3 \times 3 \end{cases} \therefore \text{HCF} = 2 \times 3 \times 3 = 18$$

$$\begin{cases} 189 = 3 \times 3 \times 3 \times 7 \\ 234 = 2 \times 3 \times 3 \times 13 \end{cases} \therefore \text{HCF} = 3 \times 3 = 9$$

$$\begin{cases} 99 = 3 \times 3 \times 11 \\ 110 = 2 \times 5 \times 11 \end{cases} \therefore \text{HCF} = 11$$

$$\begin{cases} 50 = 2 \times 5 \times 5 \\ 75 = 3 \times 5 \times 5 \end{cases} \therefore \text{HCF} = 5 \times 5 = 25$$

$$\begin{cases} 78 = 2 \times 3 \times 13 \\ 169 = 13 \times 13 \end{cases} \therefore \text{HCF} = 13$$

$$\begin{cases} 96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \\ 120 = 2 \times 2 \times 2 \times 3 \times 5 \end{cases} \therefore \text{HCF} = 2 \times 2 \times 2 \times 3 = 24$$

$$\begin{cases} 32 = 2 \times 2 \times 2 \times 2 \times 2 \\ 72 = 2 \times 2 \times 2 \times 3 \times 3 \end{cases} \therefore \text{HCF} = 2 \times 2 \times 2 = 8$$

$$\begin{cases} 18 = 2 \times 3 \times 3 \\ 81 = 3 \times 3 \times 3 \times 3 \end{cases} \therefore \text{HCF} = 3 \times 3 = 9$$

$$\begin{cases} 225 = 3 \times 3 \times 5 \times 5 \\ 300 = 2 \times 2 \times 3 \times 5 \times 5 \end{cases} \therefore \text{HCF} = 3 \times 3 \times 5 \times 5 = 225$$

$$\begin{cases} 240 = 2 \times 2 \times 2 \times 2 \times 3 \times 5 \\ 255 = 3 \times 5 \times 17 \end{cases} \therefore \text{HCF} = 3 \times 5 = 15$$

$$3. (a) \frac{4}{9} \text{ and } \frac{32}{72}$$

We cross multiply to check the equivalence

$$4 \times 72 = 288,$$

$$9 \times 32 = 288$$

Both the products are equal.

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

$$(b) \frac{42}{70} \text{ and } \frac{7}{12}$$

$$42 \times 12 = 504,$$

$$70 \times 7 = 490$$

The products are not equal.

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

$$(b) \frac{48}{108} = \frac{48 \div 12}{108 \div 12} = \frac{4}{9}$$

$$(c) \frac{54}{72} = \frac{54 \div 18}{72 \div 18} = \frac{3}{4}$$

$$(d) \frac{189}{234} = \frac{189 \div 9}{234 \div 9} = \frac{21}{26}$$

$$(e) \frac{99}{110} = \frac{99 \div 11}{110 \div 11} = \frac{9}{10}$$

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

$$(g) \frac{78}{169} = \frac{78 \div 13}{169 \div 13} = \frac{6}{13}$$

$$(h) \frac{96}{120} = \frac{96 \div 24}{120 \div 24} = \frac{4}{5}$$

$$(i) \frac{32}{72} = \frac{32 \div 8}{72 \div 8} = \frac{4}{9}$$

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

$$(k) \frac{225}{300} = \frac{225 \div 75}{300 \div 75} = \frac{3}{4}$$

$$(l) \frac{240}{255} = \frac{240 \div 15}{255 \div 15} = \frac{16}{17}$$

$$\begin{cases} 48 = 2 \times 2 \times 2 \times 2 \times 3 \\ 108 = 2 \times 2 \times 3 \times 3 \times 3 \end{cases} \therefore \text{HCF} = 12$$

$$\begin{cases} 54 = 2 \times 3 \times 3 \times 3 \\ 72 = 2 \times 2 \times 2 \times 3 \times 3 \end{cases} \therefore \text{HCF} = 18$$

$$\begin{cases} 189 = 3 \times 3 \times 3 \times 7 \\ 234 = 2 \times 3 \times 3 \times 13 \end{cases} \therefore \text{HCF} = 9$$

$$\begin{cases} 99 = 3 \times 3 \times 11 \\ 110 = 2 \times 5 \times 11 \end{cases} \therefore \text{HCF} = 11$$

$$\begin{cases} 50 = 2 \times 5 \times 5 \\ 75 = 3 \times 5 \times 5 \end{cases} \therefore \text{HCF} = 25$$

$$\begin{cases} 78 = 2 \times 3 \times 13 \\ 169 = 13 \times 13 \end{cases} \therefore \text{HCF} = 13$$

$$\begin{cases} 96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \\ 120 = 2 \times 2 \times 2 \times 3 \times 5 \end{cases} \therefore \text{HCF} = 24$$

$$\begin{cases} 32 = 2 \times 2 \times 2 \times 2 \times 2 \\ 72 = 2 \times 2 \times 2 \times 3 \times 3 \end{cases} \therefore \text{HCF} = 8$$

$$\begin{cases} 18 = 2 \times 3 \times 3 \\ 81 = 3 \times 3 \times 3 \times 3 \end{cases} \therefore \text{HCF} = 9$$

$$\begin{cases} 225 = 3 \times 3 \times 5 \times 5 \\ 300 = 2 \times 2 \times 3 \times 5 \times 5 \end{cases} \therefore \text{HCF} = 75$$

$$\begin{cases} 240 = 2 \times 2 \times 2 \times 2 \times 3 \times 5 \\ 255 = 3 \times 5 \times 17 \end{cases} \therefore \text{HCF} = 15$$

$$3. (a) \frac{4}{9} \text{ and } \frac{32}{72}$$

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.

$$(b) \frac{42}{70} \text{ and } \frac{7}{12}$$

$$42 \times 12 = 504, \quad 70 \times 7 = 490$$

The products are not equal.

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

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

Both the products are equal.

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

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

Both the products are equal.

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

Exercise-3

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

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

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

$$\frac{54}{72} = \frac{54 \div 18}{72 \div 18} = \frac{3}{4}$$

$$(d) \begin{aligned} 45 &= 3 \times 3 \times 5 \\ 25 &= 5 \times 5 \\ \text{HCF} &= 5 \end{aligned}$$

$$\frac{45}{25} = \frac{45 \div 5}{25 \div 5} = \frac{9}{5} = 1\frac{4}{5}$$

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

$$\frac{32}{50} = \frac{32 \div 2}{50 \div 2} = \frac{16}{25}$$

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

$$\frac{75}{35} = \frac{75 \div 5}{35 \div 5} = \frac{15}{7} = 2\frac{1}{7}$$

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

$$\frac{112}{92} = \frac{112 \div 4}{92 \div 4} = \frac{28}{23} = 1\frac{5}{23}$$

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

$$\frac{55}{100} = \frac{55 \div 5}{100 \div 5} = \frac{11}{20}$$

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

(b) $\frac{16^1}{64_4} = \frac{1}{4}$ (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) $\frac{150^{75}}{124_{62}} = \frac{75}{62}$

Exercise-4

1. (a) $\frac{7}{11} \square \frac{9}{11}$

(b) $\frac{5}{9} \square \frac{5}{7}$

(c) $5 \times 8 = 40, 12 \times 3 = 36, 40 > 36 \therefore \frac{5}{12} \square \frac{3}{8}$

(d) $4 \times 15 = 60, 9 \times 7 = 63, 60 < 63 \therefore \frac{4}{9} \square \frac{7}{15}$

(e) $7 \times 13 = 91, 10 \times 8 = 80, 91 > 80 \therefore \frac{7}{10} \square \frac{8}{13}$

(f) $9 \times 15 = 135, 20 \times 8 = 160, 135 < 160 \therefore \frac{9}{20} \square \frac{8}{15}$

(g) $1\frac{1}{4} = \frac{5}{4}, 1\frac{2}{3} = \frac{5}{3}, 5 \times 3 = 15, 4 \times 5 = 20, 15 < 20 \therefore 1\frac{1}{4} \square 1\frac{2}{3}$

(h) $2\frac{1}{8} = \frac{17}{8}, 2\frac{1}{6} = \frac{13}{6}, 17 \times 6 = 102, 8 \times 13 = 104, 102 < 104 \therefore 2\frac{1}{8} \square 2\frac{1}{6}$

(i) $4\frac{1}{2} = \frac{9}{2}, 4\frac{2}{3} = \frac{14}{3}, 9 \times 3 = 27, 2 \times 14 = 28, 27 < 28 \therefore 4\frac{1}{2} \square 4\frac{2}{3}$

2. (a) LCM of 5, 10, 15, 4 = 60

$\frac{2}{5} = \frac{24}{60}, \frac{7}{10} = \frac{42}{60}, \frac{4}{15} = \frac{16}{60}, \frac{1}{4} = \frac{15}{60}$

$\therefore \frac{15}{60} < \frac{16}{60} < \frac{24}{60} < \frac{42}{60} \Rightarrow \frac{1}{4} < \frac{4}{15} < \frac{2}{5} < \frac{7}{10}$

(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

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

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

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

LCM of 3, 7, 14 and 6 = 42

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

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

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

Exercise-5

$$1. (a) \frac{5}{7} + \frac{3}{7} = \frac{5+3}{7} = \frac{8}{7} = 1\frac{1}{7}$$

$$(b) \frac{3}{8} + \frac{7}{8} = \frac{3+7}{8} = \frac{10}{8} = \frac{5}{4} = 1\frac{1}{4}$$

$$(c) \frac{5}{9} + \frac{4}{9} + \frac{2}{9} = \frac{5+4+2}{9} = \frac{11}{9} = 1\frac{2}{9}$$

(d) LCM of 5 and 8 = 40

$$\frac{3}{5} = \frac{3 \times 8}{5 \times 8} = \frac{24}{40}, \frac{3}{8} = \frac{3 \times 5}{8 \times 5} = \frac{15}{40}$$

$$\therefore \frac{3}{5} + \frac{3}{8} = \frac{24}{40} + \frac{15}{40} = \frac{24+15}{40} = \frac{39}{40}$$

(e) LCM of 6 and 9 = 18

$$\frac{5}{6} = \frac{5 \times 3}{6 \times 3} = \frac{15}{18}, \quad \frac{4}{9} = \frac{4 \times 2}{9 \times 2} = \frac{8}{18}$$

$$\therefore \frac{5}{6} + \frac{4}{9} = \frac{15}{18} + \frac{8}{18} = \frac{15+8}{18} = \frac{23}{18} = 1\frac{5}{18}$$

(f) LCM of 3, 4, 5 = 60

$$\frac{2}{3} = \frac{2 \times 20}{3 \times 20} = \frac{40}{60}, \quad \frac{3}{4} = \frac{3 \times 15}{4 \times 15} = \frac{45}{60}, \quad \frac{4}{5} = \frac{4 \times 12}{5 \times 12} = \frac{48}{60}$$

$$\therefore \frac{2}{3} + \frac{3}{4} + \frac{4}{5} = \frac{40}{60} + \frac{45}{60} + \frac{48}{60} = \frac{40+45+48}{60} = \frac{133}{60} = 2\frac{13}{60}$$

(g) $1\frac{2}{3} = \frac{5}{3}, 1\frac{4}{5} = \frac{9}{5}$

LCM of 3 and 5 = 15

$$\frac{5}{3} = \frac{5 \times 5}{3 \times 5} = \frac{25}{15}, \quad \frac{9}{5} = \frac{9 \times 3}{5 \times 3} = \frac{27}{15}$$

$$\therefore 1\frac{2}{3} + 1\frac{4}{5} = \frac{25}{15} + \frac{27}{15} = \frac{25+27}{15} = \frac{52}{15} = 3\frac{7}{15}$$

(h) $2\frac{2}{3} = \frac{8}{3}, \frac{5}{9}, 1\frac{1}{4} = \frac{5}{4}$

LCM of 3, 9 and 4 = 36

$$\therefore \frac{8}{3} = \frac{8 \times 12}{3 \times 12} = \frac{96}{36}, \quad \frac{5}{9} = \frac{5 \times 4}{9 \times 4} = \frac{20}{36}, \quad \frac{5}{4} = \frac{5 \times 9}{4 \times 9} = \frac{45}{36}$$

$$\therefore 2\frac{2}{3} + \frac{5}{9} + 1\frac{1}{4} = \frac{96}{36} + \frac{20}{36} + \frac{45}{36} = \frac{96+20+45}{36} = \frac{161}{36} = 4\frac{17}{36}$$

(i) $1\frac{3}{5} = \frac{8}{5}, 2\frac{4}{7} = \frac{18}{7}, 3\frac{3}{5} = \frac{18}{5}$

LCM of 5, 7 and 5 = 35

$$\frac{8}{5} = \frac{8 \times 7}{5 \times 7} = \frac{56}{35}, \quad \frac{18}{7} = \frac{18 \times 5}{7 \times 5} = \frac{90}{35}, \quad \frac{18}{5} = \frac{18 \times 7}{5 \times 7} = \frac{126}{35}$$

$$\therefore 1\frac{3}{5} + 2\frac{4}{7} + 3\frac{3}{5} = \frac{56}{35} + \frac{90}{35} + \frac{126}{35} = \frac{56+90+126}{35} = \frac{272}{35} = 7\frac{27}{35}$$

2. Total length of the two ribbons = $4\frac{1}{5}$ m + $3\frac{1}{2}$ m

$$\text{Now, } 4\frac{1}{5} = \frac{21}{5}, \quad 3\frac{1}{2} = \frac{7}{2}$$

LCM of 5 and 2 = 10

$$\frac{21}{5} = \frac{21 \times 2}{5 \times 2} = \frac{42}{10}, \frac{7}{2} = \frac{7 \times 5}{2 \times 5} = \frac{35}{10}$$

$$\begin{aligned}\therefore 4\frac{1}{5} + 3\frac{1}{2} &= \frac{42}{10} + \frac{35}{10} \\ &= \frac{42 + 35}{10} = \frac{77}{10} = 7\frac{7}{10}\end{aligned}$$

Thus, the total length of the two ribbons is $7\frac{7}{10}$ m.

3. Total length of cloth bought by Nidhi and Shweta = $4\frac{5}{6}$ m + $2\frac{1}{4}$ m

$$\text{Now, } 4\frac{5}{6} = \frac{29}{6}, 2\frac{1}{4} = \frac{9}{4}$$

LCM of 6 and 4 = 12

$$\frac{29}{6} = \frac{29 \times 2}{6 \times 2} = \frac{58}{12}, \frac{9}{4} = \frac{9 \times 3}{4 \times 3} = \frac{27}{12}$$

$$\begin{aligned}\therefore 4\frac{5}{6} + 2\frac{1}{4} &= \frac{58}{12} + \frac{27}{12} \\ &= \frac{58 + 27}{12} \\ &= \frac{85}{12} = 7\frac{1}{12}\end{aligned}$$

Thus, the total length of the cloth bought by Nidhi and Shweta is $7\frac{1}{12}$ m.

4. Total distance covered by Ravi = $4\frac{5}{9}$ km + $2\frac{3}{7}$ km + $\frac{1}{3}$ km

$$\text{Now, } 4\frac{5}{9} = \frac{41}{9}, 2\frac{3}{7} = \frac{17}{7}, \frac{1}{3}$$

LCM of 9, 7 and 3 = 63

$$\frac{41}{9} = \frac{41 \times 7}{9 \times 7} = \frac{287}{63}, \frac{17}{7} = \frac{17 \times 9}{7 \times 9} = \frac{133}{63}$$

$$\frac{1}{3} = \frac{1 \times 21}{3 \times 21} = \frac{21}{63}$$

$$\begin{aligned}\therefore 4\frac{5}{9} + 2\frac{3}{7} + \frac{1}{3} &= \frac{287}{63} + \frac{133}{63} + \frac{21}{63} \\ &= \frac{287 + 133 + 21}{63} = \frac{441}{63} = 7\frac{20}{63}\end{aligned}$$

Thus, the total distance covered by Ravi is $7\frac{20}{63}$ km.

$$5. \text{ Total weight of the two books} = 1\frac{4}{9} \text{ kg} + \frac{4}{5} \text{ kg}$$

$$\left[\begin{array}{l} \text{LCM of 9 and 5} = 45 \\ \frac{13}{9} = \frac{13 \times 5}{9 \times 5} = \frac{65}{45} \\ \frac{4}{5} = \frac{4 \times 9}{5 \times 9} = \frac{36}{45} \end{array} \right]$$

$$= \frac{13}{9} \text{ kg} + \frac{4}{5} \text{ kg}$$

$$= \frac{65}{45} \text{ kg} + \frac{36}{45} \text{ kg}$$

$$= \frac{65 + 36}{45} \text{ kg}$$

$$= \frac{101}{45} \text{ kg}$$

$$= 2\frac{11}{45} \text{ kg}$$

Thus, the total weight of the two books is $2\frac{11}{45}$ kg.

Exercise-6

$$1. (a) \frac{3}{7} - \frac{1}{7} = \frac{3-1}{7} = \frac{2}{7}$$

$$(b) \frac{15}{16} - \frac{11}{16} = \frac{15-11}{16} = \frac{4}{16} = \frac{1}{4}$$

$$(c) \frac{8}{21} - \frac{5}{21} = \frac{8-5}{21} = \frac{3}{21} = \frac{1}{7}$$

$$\begin{aligned} (d) \quad 3 - \frac{2}{3} &= \frac{3}{1} - \frac{2}{3} \\ &= \frac{3 \times 3}{1 \times 3} - \frac{2}{3} \\ &= \frac{9}{3} - \frac{2}{3} = \frac{9-2}{3} = \frac{7}{3} = 2\frac{1}{3} \end{aligned}$$

$$(e) \quad 10 - \frac{6}{7} = \frac{10}{1} - \frac{6}{7}$$

We will convert them into like fractions

$$\frac{10}{1} = \frac{10 \times 7}{1 \times 7} = \frac{70}{7}, \quad \frac{6}{7} = \frac{6 \times 1}{7 \times 1} = \frac{6}{7} \quad (\text{LCM of 1 and 7} = 7)$$

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

$$\begin{aligned} (f) \quad 2\frac{4}{9} - \frac{5}{12} \\ = \frac{22}{9} - \frac{5}{12} \end{aligned}$$

$$\left[\because 2\frac{4}{9} = \frac{22}{9} \right]$$

(LCM of 9 and 12 = 36)

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

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

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

$$(g) \quad 2\frac{13}{36} - 1\frac{5}{9}$$

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

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

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

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

(LCM of 36 and 9 = 36)

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

$$(h) \quad 3\frac{4}{7} - \frac{3}{4}$$

$$= \frac{25}{7} - \frac{3}{4}$$

$$= \frac{100}{28} - \frac{21}{28}$$

$$= \frac{79}{28} = 2\frac{23}{28}$$

$$\left[\because 3\frac{4}{7} = \frac{25}{7} \right]$$

(LCM of 7 and 4 = 28)

$$\left[\frac{25}{7} = \frac{25 \times 4}{7 \times 4} = \frac{100}{28}, \frac{3}{4} = \frac{3 \times 7}{4 \times 7} = \frac{21}{28} \right]$$

$$(i) \quad 4\frac{1}{5} - \frac{2}{3}$$

$$= \frac{21}{5} - \frac{2}{3}$$

$$= \frac{63}{15} - \frac{10}{15} = \frac{53}{15}$$

$$= 3\frac{8}{15}$$

$$\left[\because 4\frac{1}{5} = \frac{21}{5} \right]$$

(LCM of 5 and 3 = 15)

$$\left[\frac{21}{5} = \frac{21 \times 3}{5 \times 3} = \frac{63}{15}, \frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15} \right]$$

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

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

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

$$\left[\because 3\frac{1}{4} = \frac{13}{4}, 1\frac{2}{5} = \frac{7}{5} \right]$$

$$3\frac{1}{4} - 1\frac{2}{5} = \frac{13}{4} - \frac{7}{5}$$

$$= \frac{65}{20} - \frac{28}{20}$$

$$\left[\text{LCM of 4 and 5} = 20 \right]$$

$$\left[\frac{13}{4} = \frac{13 \times 5}{4 \times 5} = \frac{65}{20}, \frac{7}{5} = \frac{7 \times 4}{5 \times 4} = \frac{28}{20} \right]$$

Mathematics-5 (Term-1)

$$= \frac{37}{20} = 1\frac{17}{20}$$

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

$$\begin{aligned} 3. \text{ Money required} &= ₹ 45 - ₹ 40\frac{3}{4} \\ &= ₹ \left(45 - \frac{163}{4} \right) \\ &= ₹ \left(\frac{45 \times 4}{1 \times 4} - \frac{163}{4} \right) \\ &= ₹ \left(\frac{180}{4} - \frac{163}{4} \right) \\ &= ₹ \frac{17}{4} = ₹ 4\frac{1}{4} \end{aligned}$$

Thus, Rajesh needs ₹ $4\frac{1}{4}$ more to buy the book.

$$\begin{aligned} 4. \quad 7 - 5\frac{5}{9} &= 7 - \frac{50}{9} \\ &= \frac{7 \times 9}{1 \times 9} - \frac{50}{9} \\ &= \frac{63}{9} - \frac{50}{9} \\ &= \frac{63 - 50}{9} = \frac{13}{9} = 1\frac{4}{9} \end{aligned}$$

Thus, 7 is greater than $5\frac{5}{9}$ by $1\frac{4}{9}$.

$$5. \text{ Sum of } 3\frac{1}{3} \text{ and } 2\frac{2}{3} = 3\frac{1}{3} + 2\frac{2}{3} = \frac{10}{3} + \frac{8}{3} = \frac{18}{3} = 6$$

$$\begin{aligned} \text{Sum of } 2\frac{3}{4} \text{ and } 5\frac{1}{3} &= 2\frac{3}{4} + 5\frac{1}{3} = \frac{11}{4} + \frac{16}{3} \quad (\text{LCM of 4 and 3} = 12) \\ &= \frac{33}{12} + \frac{64}{12} \quad \left[\frac{11}{4} = \frac{11 \times 3}{4 \times 3} = \frac{33}{12}, \quad \frac{16}{3} = \frac{16 \times 4}{3 \times 4} = \frac{64}{12} \right] \\ &= \frac{97}{12} \end{aligned}$$

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

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

$$= \frac{97}{12} - \frac{6}{1}$$

$$= \frac{97}{12} - \frac{72}{12}$$

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

(LCM of 12 and 1 = 12)

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

Exercise-7

$$1. (a) \quad 15 \times \frac{12}{20} = \frac{15 \times 12}{20} = 9$$

$$(b) \quad 24 \times 3\frac{1}{4} = 24 \times \frac{13}{4} = \frac{24 \times 13}{4} = 78$$

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

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

$$(e) \quad \frac{9}{22} \times 33 = \frac{27}{2} = 13\frac{1}{2}$$

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

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

$$(h) \quad \frac{11}{24} \times 32 = \frac{11 \times 32}{24} = \frac{44}{3} = 14\frac{2}{3}$$

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

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

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

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

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

$$(e) \frac{24}{25} \text{ of } \frac{35}{36} = \frac{24}{25} \times \frac{35}{36} = \frac{2\cancel{24} \times \cancel{35}^7}{\cancel{25}_5 \times \cancel{36}_3} = \frac{14}{15}$$

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

$$3. (a) 1\frac{2}{7} \times 3\frac{1}{5} = \frac{9}{7} \times \frac{16}{5} = \frac{9 \times 16}{7 \times 5} = \frac{144}{35} = 4\frac{4}{35}$$

$$(b) 3\frac{3}{5} \times 5\frac{1}{2} = \frac{18}{5} \times \frac{11}{2} = \frac{18 \times 11}{5 \times \cancel{2}_1} = \frac{99}{5} = 19\frac{4}{5}$$

$$(c) 2\frac{1}{9} \times 9\frac{1}{2} = \frac{19}{9} \times \frac{19}{2} = \frac{19 \times 19}{9 \times 2} = \frac{361}{18} = 20\frac{1}{18}$$

$$(d) 10\frac{3}{8} \times 3\frac{1}{9} = \frac{83}{8} \times \frac{28}{9} = \frac{83 \times \cancel{28}^7}{\cancel{8}_2 \times 9} = \frac{83 \times 7}{2 \times 9} = \frac{581}{18} = 32\frac{5}{18}$$

$$(e) \frac{1}{8} \times \frac{1}{6} \times 1\frac{1}{2} = \frac{1}{8} \times \frac{1}{6} \times \frac{3}{2} = \frac{1 \times 1 \times \cancel{3}^1}{8 \times \cancel{6}_2 \times 2} = \frac{1}{32}$$

$$(f) \frac{2}{7} \times \frac{8}{9} \times \frac{1}{4} = \frac{2 \times \cancel{8}^2 \times 1}{7 \times 9 \times \cancel{4}_1} = \frac{4}{63}$$

$$(g) 1\frac{1}{4} \times \frac{2}{5} \times \frac{4}{5} = \frac{5}{4} \times \frac{2}{5} \times \frac{4}{5} = \frac{\cancel{5} \times 2 \times \cancel{4}^1}{1\cancel{4} \times \cancel{5}_1 \times 5} = \frac{2}{5}$$

$$(h) \frac{8}{9} \times \frac{4}{5} \times 2\frac{1}{3} = \frac{8}{9} \times \frac{4}{5} \times \frac{7}{3} = \frac{8 \times 4 \times 7}{9 \times 5 \times 3} = \frac{224}{135} = 1\frac{89}{135}$$

$$(i) 1\frac{1}{2} \times 2\frac{1}{3} \times 3\frac{1}{4} = \frac{3}{2} \times \frac{7}{3} \times \frac{13}{4} = \frac{\cancel{3} \times 7 \times 13}{2 \times \cancel{3}_1 \times 4} = \frac{91}{8} = 11\frac{3}{8}$$

4. (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.

$$\text{Now, } \frac{2}{3} \times 2\frac{1}{2} = \frac{2}{3} \times \frac{5}{2} = \frac{\cancel{2} \times 5}{3 \times \cancel{2}} = \frac{5}{3} = 1\frac{2}{3}$$

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

(c) Sameer spent $\frac{5}{7}$ of ₹ 2100.

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

Sameer spent ₹ 1500.

Anuj spent $\frac{2}{3}$ of ₹ 2100.

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

Anuj spent ₹ 1400.

Therefore, Sameer spent ₹ 1500 – ₹ 1400 = ₹ 100 more.

Exercise-8

1. Reciprocal of 6 is $\frac{1}{6}$.

2. Reciprocal of $\frac{2}{5}$ is $\frac{5}{2}$.

3. Reciprocal of $\frac{11}{3}$ is $\frac{3}{11}$.

4. Reciprocal of 19 is $\frac{1}{19}$.

5. Reciprocal of $\frac{15}{23}$ is $\frac{23}{15}$.

6. Reciprocal of $\frac{21}{8}$ is $\frac{8}{21}$.

7. Reciprocal of $2\frac{1}{7}$ or $\frac{15}{7}$ is $\frac{7}{15}$.

8. Reciprocal of $5\frac{1}{2}$ or $\frac{11}{2}$ is $\frac{2}{11}$.

9. Reciprocal of 1 is 1.

10. Reciprocal of $\frac{5}{11}$ is $\frac{11}{5}$.

11. Reciprocal of $\frac{12}{17}$ is $\frac{17}{12}$.

12. Reciprocal of $6\frac{2}{3}$ or $\frac{20}{3}$ is $\frac{3}{20}$.

Exercise-9

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

(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) $2\frac{1}{5} \div 2\frac{3}{4} = \frac{11}{5} \div \frac{11}{4} = \frac{11}{5} \times \frac{4}{11} = \frac{11 \times 4}{5 \times 11} = \frac{4}{5}$

(n) $5\frac{4}{7} \div \frac{13}{14} = \frac{39}{7} \div \frac{13}{14} = \frac{39}{7} \times \frac{14}{13} = \frac{39 \times 14}{7 \times 13} = 6$

(o) $\frac{8}{21} \div \frac{4}{3} = \frac{8}{21} \times \frac{3}{4} = \frac{28}{21 \times 4} = \frac{2}{7}$

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

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

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

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

3. 24 m cloth is to be cut into 9 equal pieces.

$$\begin{aligned}\text{Length of each piece} &= 24 \text{ m} \div 9 \\ &= 24 \text{ m} \times \frac{1}{9} \\ &= \frac{24 \times 1}{9} \text{ m} \\ &= \frac{8}{3} \text{ m} = 2\frac{2}{3} \text{ m}\end{aligned}$$

Thus, the length of each piece is $2\frac{2}{3}$ m.

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

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

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

$$\begin{aligned}\Rightarrow \text{Side} &= \left(21\frac{2}{5} \div 4\right) \text{ m} = \left(\frac{107}{5} \div 4\right) \text{ m} \\ &= \left(\frac{107}{5} \times \frac{1}{4}\right) \text{ m} = \frac{107}{20} \text{ m} \\ &= 5\frac{7}{20} \text{ m}\end{aligned}$$

Thus, the length of the side of the square is $5\frac{7}{20}$ m.

$$\begin{aligned}\text{5. Second fraction} &= 24 \div 4\frac{1}{5} = 24 \div \frac{21}{5} = 24 \times \frac{5}{21} \\ &= \frac{40}{7} = 5\frac{5}{7}\end{aligned}$$

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

6. Aman runs a total distance of $12\frac{4}{5}$ km in 4 hours.
The distance covered by Aman in 1 hour

$$= \left(12\frac{4}{5} \div 4\right) \text{ km}$$

$$= \left(\frac{64}{5} \div 4\right) \text{ km}$$

$$= \frac{64}{5} \times \frac{1}{4} \text{ km}$$

$$= \frac{64 \times 1}{5 \times 4} \text{ km} = \frac{16}{5} \text{ km} = 3\frac{1}{5} \text{ km}$$

Thus, Aman runs $3\frac{1}{5}$ km in one hour.

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

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

Thus, Rahim got 12 pieces.

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

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

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

Thus, the cost of 1 kg mangoes is ₹ 45.

Mental Maths Corner

1. (b) $\frac{16}{72} = \frac{16 \div 8}{72 \div 8} = \frac{2}{9}$ 2. (b) $\frac{5}{11}$ is smallest.

3. (d) $\frac{10 \text{ g}}{1 \text{ kg}} = \frac{10 \text{ g}}{1000 \text{ g}} = \frac{10}{1000} = \frac{1}{100}$

4. (c)

5. (b) $\frac{42}{70} = \frac{42 \div 14}{70 \div 14} = \frac{3}{5}$

Review Exercise

$$1. (a) \frac{64}{84} = \frac{64 \div 4}{84 \div 4} = \frac{16}{21}$$

(Dividing by 4 to make the numerator 16)

$$(b) \frac{64}{84} = \frac{64 \div 2}{84 \div 2} = \frac{32}{42}$$

(Dividing by 2 to make the denominator 42)

$$2. (a) \frac{45}{54} = \frac{45 \div 9}{54 \div 9} = \frac{5}{6}$$

(HCF of 45 and 54 is 9)

$$(b) \frac{90}{104} = \frac{90 \div 2}{104 \div 2} = \frac{45}{52}$$

(HCF of 90 and 104 = 2)

3. Convert the given fractions 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

$$\frac{8}{32} < \frac{9}{32} < \frac{10}{32} < \frac{20}{32} \quad \text{or} \quad \frac{1}{4} < \frac{9}{32} < \frac{5}{16} < \frac{5}{8}$$

$$4. (a) 1\frac{2}{9} + \frac{7}{24} + \frac{23}{36}$$

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

(LCM of 9, 24 and 36 = 72)

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

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

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

$$\left[\frac{11}{9} = \frac{11}{9} \times \frac{8}{8} = \frac{88}{72}, \frac{7}{24} = \frac{7 \times 3}{24 \times 3} = \frac{21}{72}, \right. \\ \left. \frac{23}{36} = \frac{23 \times 2}{36 \times 2} = \frac{46}{72} \right]$$

(Converting improper fraction into mixed fraction)

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

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

(Converting mixed fraction into improper fraction)

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

(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)

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

$$= \frac{12}{7} \times \frac{7}{10} = \frac{12}{10} = 2\frac{2}{5}$$

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

$$= \frac{23}{5} \div \frac{11}{15} = \frac{23}{5} \times \frac{15}{11} = \frac{69}{11} = 6\frac{3}{11}$$

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

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

$$\text{Now, } 10\frac{3}{8} - 2\frac{1}{3}$$

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

(LCM of 8 and 3 = 24)

$$= \frac{249}{24} - \frac{56}{24} = \frac{193}{24} = 8\frac{1}{24}$$

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

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

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

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

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

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

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

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

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

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

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

$$\left[\begin{array}{l} \text{LCM of 2, 4, 3 = 12} \\ \frac{5}{2} = \frac{5 \times 6}{2 \times 6} = \frac{30}{12} \\ \frac{13}{4} = \frac{13 \times 3}{4 \times 3} = \frac{39}{12} \\ \frac{4}{3} = \frac{4 \times 4}{3 \times 4} = \frac{16}{12} \end{array} \right]$$

8.

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

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

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

∴ The cost of one kg of sugar = ₹ 36

9.

Kabir spends $\frac{1}{3}$ of his pocket money on books, $\frac{1}{5}$ on travelling and rest on food.

$$\text{Fraction of money spent on food} = 1 - \left(\frac{1}{3} + \frac{1}{5} \right) = 1 - \left(\frac{5}{15} + \frac{3}{15} \right)$$

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

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

$$\text{Money spent on food} = \frac{7}{15} \text{ of ₹ 450}$$

$$= \frac{7}{15} \times ₹ 450 = ₹ 210$$

Thus, Kabir spends ₹ 210 on food.

HOTS

$\frac{4}{9}$ 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)

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

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

There are 153 students in the group.