Fractions (Including Problems)

POINTS TO REMEMBER

1. **Fraction.** A rational number in form of — where a and b are integers is called a fraction.
   'a' is called the numerator and Lb' is called the denominator of the fraction.
2. **Classification of Fractions :**
   Decimal fraction : A fraction whose denominator is 10 or multiple of 10.
   Vulgur fraction : A fraction whose denominator is oilier than 10 or multiple of 10.
   Proper fraction : A fraction whose denominator is greater than its numerator.
   Improper fraction : A fraction whose denominator less than its numerator.
   Mixed fraction : A fraction which consists of an integer and a proper fraction.
   Note. If the numerator of a fraction is equal to its denominator, then the fraction is equal to unity i.e. 1.
3. **Equivalent Fractions**
   Fractions having the same value are called the equivalent fractions.
4. **Simple and Complex Fractions**
   A fraction whose numerator and denominator both are integers, is called a simple fraction.
   A fraction whose numerator or denominator or both are not integers, is called a complex fraction.
5. **Like and Unlike Fractions**
   Fractions having the same denominators are called like fractions.
   The fractions with different denominators are called unlike fractions.
6. **Converting unlike fractions into like fractions**
   Find the LCM of the denominators of all the give- fractions.
   For each given fraction, multiply its denominator by a suitable numbers so that the product obtained is equal to the LCM in (i).
   Multiply the numerator also by the same number.
7. **To insert a fraction between two given fractions .**
   Add the numerators as well as denominators of the given fractions. Then simplify if required.
8. **Addition and Subtraction of fractions**
9. For like fractions, add or subtract (as required) their numerators, keeping the denominator same.
   For unlike fractions, first change all the fractions into like fractions and then add or subtract as above given in (i).
10. **Multiplication**
    To multiply two or more fractions, multiply their numerators as well as their denominators.
11. **Division**
    To divide on fraction or integer by some other fractions or integer, multiply the first by the reciprocal of the second as given above in multiplication.

12. **Using 'BODMAS'**
    The word 'BODMAS' is the abbreviation formed by taking the initial letters of six operations i.e. 'Bracket', ;OF, 'Division', 'Multiplication', 'Addition' and 'Subtraction'. So, according to the rule of 'BODMAS', working must be done in the order corresponding to the letters in the word 'BODMAS'.
13. **Brackets and their removal**
    Brackets are four kinds i.e., bar bracket , circular brackets ( ), curly brackets { } and square brackets [ ] and these can be removed in this order i.e. firstly bar, then circular, then curly and lastly square brackets keeping in considerations of the sign given before them.

EXERCISE 3 (A)

Question 1.

Classify, each fraction given below, as decimal or vulgar fraction, proper or improper fraction and mixed fraction :

$(i)\ \frac{3}{5}$ $(ii)\ \frac{11}{10}$ $(iii)\ \frac{13}{20}$

$(iv)\ \frac{13}{7}$ $(v)\ 3\frac{2}{9}$ $(vi)\ \frac{19}{10^3}$

$(vii)\ 2\frac{7}{10}$ $(viii)\ \frac{23}{500}$

Solution:

(i) Vulgar and Proper
(ii) Decimal and Improper
(iii) Decimal and Proper
(iv) Vulgar and Improper
(v) Mixed
(vi) Decimal
(vii) Mixed and Decimal
(viii) Vulgar and Proper Ans.

Question 2.

Express the following improper fractions as mixed fractions :

$(i)\ \frac{18}{5}$ $(ii)\ \frac{7}{4}$ $(iii)\ \frac{25}{6}$

$(iv)\ \frac{38}{5}$ $(v)\ \frac{22}{5}$

Solution:

(*i*) $\frac{18}{5} = 3\frac{3}{5}$ (*ii*) $\frac{7}{4} = 1\frac{3}{4}$

(*iii*) $\frac{25}{6} = 4\frac{1}{6}$ (*iv*) $\frac{38}{5} = 7\frac{3}{5}$

(*v*) $\frac{22}{5} = 4\frac{2}{5}$ **Ans.**

Question 3.

Express the following mixed fractions as improper fractions :

(*i*) $2\frac{4}{9}$ (*ii*) $7\frac{5}{13}$ (*iii*) $3\frac{1}{4}$

(*iv*) $2\frac{5}{48}$ (*v*) $12\frac{7}{11}$

Solution:

(*i*) $2\frac{4}{9} = \frac{2 \times 9 + 4}{9} = \frac{18 + 4}{9} = \frac{22}{9}$

(*ii*) $7\frac{5}{13} = \frac{7 \times 13 + 5}{13} = \frac{91 + 5}{13} = \frac{96}{13}$

(*iii*) $3\frac{1}{4} = \frac{3 \times 4 + 1}{4} = \frac{12 + 1}{4} = \frac{13}{4}$

(*iv*) $2\frac{5}{48} = \frac{2 \times 48 + 5}{48} = \frac{96 + 5}{48} = \frac{101}{48}$

(*v*) $12\frac{7}{11} = \frac{12 \times 11 + 7}{11} = \frac{132 + 7}{11} = \frac{139}{11}$

Question 4.

Reduce the given fractions to lowest terms

(*i*) $\frac{8}{18}$ (*ii*) $\frac{27}{36}$ (*iii*) $\frac{18}{42}$

(*iv*) $\frac{35}{75}$ (*v*) $\frac{18}{45}$

Solution:

(*i*) $\frac{8}{18} = \frac{8 \div 2}{18 \div 2}$

(Dividing by 2, the HCF of 8 and 18)

$= \frac{4}{9}$

(*ii*) $\frac{27}{36} = \frac{27 \div 9}{36 \div 9}$

(Dividing by 9, the HCF of 27 and 36)

$= \frac{3}{4}$

(*iii*) $\frac{18}{42} = \frac{18 \div 6}{42 \div 6}$

(Dividing by 6, the HCF of 18 and 42)

$= \frac{3}{7}$

(*iv*) $\frac{35}{75} = \frac{35 \div 5}{75 \div 5}$

(Dividing by 5, the HCF of 35 and 75)

$= \frac{7}{15}$

(*v*) $\frac{18}{45} = \frac{18 \div 9}{45 \div 9}$

(Dividing by 9, the HCF of 18 and 45)

$= \frac{2}{5}$ **Ans.**

Question 5.

State : true or false

(*i*) $\frac{30}{40}$ and $\frac{12}{16}$ are equivalent fractions.

(*ii*) $\frac{10}{25}$ and $\frac{25}{10}$ are equivalent fractions.

(*iii*) $\frac{35}{49}, \frac{20}{28}, \frac{45}{63}$ and $\frac{100}{140}$ are equivalent fractions.

Solution:

(*i*) True as $\frac{30}{40} = \frac{3}{4}$ and $\frac{12}{16} = \frac{3}{4}$

(*ii*) False as $\frac{10}{25} = \frac{2}{5}$ and $\frac{25}{10} = \frac{5}{2}$

(*iii*) True as $\frac{35}{49} = \frac{5}{7}, \frac{20}{28} = \frac{5}{7}, \frac{45}{63} = \frac{5}{7}$ and $\frac{100}{140} = \frac{5}{7}$, all are equal **Ans.**

Question 6.

Distinguish each of the following fractions, given below, as a simple fraction or a complex fraction :

(*i*) $\frac{0}{8}$ (*ii*) $\frac{-3}{-8}$ (*iii*) $\frac{5}{-7}$

(*iv*) $\frac{3\frac{3}{5}}{18}$ (*v*) $\frac{-6}{2\frac{2}{5}}$ (*vi*) $\frac{3\frac{1}{3}}{7\frac{2}{7}}$

(*vii*) $\frac{-5\frac{2}{9}}{5}$ (*viii*) $\frac{-8}{0}$

Solution:

(*i*) $\frac{0}{8}$: It is a simple fraction

(*ii*) $\frac{-3}{-8}$: It is a simple fraction

(*iii*) $\frac{5}{-7}$: It is a simple fraction

(*iv*) $\frac{3\frac{3}{5}}{18}$: It is complex fraction

(*v*) $\frac{-6}{2\frac{2}{5}}$: It is complex fraction

(*vi*) $\frac{3\frac{1}{3}}{7\frac{2}{7}}$: It is complex fraction

(*vii*) $\frac{-5\frac{2}{9}}{5}$: It is complex fraction

(*viii*) $\frac{-8}{0}$: It neither complex nor simple as denominator is zero. **Ans.**

EXERCISE 3 (B)

Question 1.

For each pair, given below, state whether it forms like fractions or unlike fractions :

(*i*) $\frac{5}{8}$ and $\frac{7}{8}$ (*ii*) $\frac{8}{15}$ and $\frac{8}{21}$

(*iii*) $\frac{4}{9}$ and $\frac{9}{4}$

Solution:

(*i*) $\frac{5}{8}$ and $\frac{7}{8}$: These are like fractions.

(*ii*) $\frac{8}{15}$ and $\frac{8}{21}$: These are unlike fractions.

(*iii*) $\frac{4}{9}$ and $\frac{9}{4}$: These are unlike fractions.

Question 2.

Convert given fractions into fractions with equal denominators :

(*i*) $\frac{5}{6}$ and $\frac{7}{9}$ (*ii*) $\frac{2}{3}$, $\frac{5}{6}$ and $\frac{7}{12}$

(*iii*) $\frac{4}{5}$, $\frac{17}{20}$, $\frac{23}{40}$ and $\frac{11}{16}$

Solution:

(*i*) In $\frac{5}{6}$ and $\frac{7}{9}$: LCM of 6 and 9 = 18

$\therefore \quad \frac{5}{6} = \frac{5 \times 3}{6 \times 3} = \frac{15}{18}$

$\frac{7}{9} = \frac{7 \times 2}{9 \times 2} = \frac{14}{18}$

Hence, $\frac{15}{18}$ and $\frac{14}{18}$ are the required fractions.

(*ii*) In $\frac{2}{3}$, $\frac{5}{6}$ and $\frac{7}{12}$: LCM of 3, 6 and 12 = 12

$\therefore \quad \frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}$

$\frac{5}{6} = \frac{5 \times 2}{6 \times 2} = \frac{10}{12}$

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

Hence, the required fractions are $\frac{8}{12}$, $\frac{10}{12}$ and $\frac{7}{12}$ **Ans.**

(*iii*) In $\frac{4}{5}, \frac{17}{20}, \frac{23}{40}$ and $\frac{11}{16}$

LCM of 5, 20, 40 and 16 = 80

$\therefore \quad \frac{4}{5} = \frac{4 \times 16}{5 \times 16} = \frac{64}{80}$

$\frac{17}{20} = \frac{17 \times 4}{20 \times 4} = \frac{68}{80}$

$\frac{23}{40} = \frac{23 \times 2}{40 \times 2} = \frac{46}{80}$

and $\frac{11}{16} = \frac{11 \times 5}{16 \times 5} = \frac{55}{80}$

Hence the required fractions are

$\frac{64}{80}, \frac{68}{80}, \frac{46}{80}$ and $\frac{55}{80}$ **Ans.**

Question 3.

Convert given fractions into fractions with equal numerators :

(*i*) $\frac{8}{9}$ and $\frac{12}{17}$ (*ii*) $\frac{6}{13}, \frac{15}{23}$ and $\frac{12}{17}$

(*iii*) $\frac{15}{19}, \frac{25}{28}, \frac{9}{11}$ and $\frac{45}{47}$

Solution:

(*i*) In $\frac{8}{9}$ and $\frac{12}{17}$, LCM of 8 and 12 = 24

$$\therefore \quad \frac{8}{9} = \frac{8 \times 3}{9 \times 3} = \frac{24}{27}$$

$$\frac{12}{17} = \frac{12 \times 2}{17 \times 2} = \frac{24}{34}$$

Hence, the required fractions are $\frac{24}{27}$ and $\frac{24}{34}$

Ans.

(*ii*) In $\frac{6}{13}$, $\frac{15}{23}$ and $\frac{12}{17}$, LCM of 6, 15 and 12 = 60

$$\therefore \quad \frac{6}{13} = \frac{6 \times 10}{13 \times 10} = \frac{60}{130}$$

$$\frac{15}{23} = \frac{15 \times 4}{23 \times 4} = \frac{60}{92}$$

and $$\frac{12}{17} = \frac{12 \times 5}{17 \times 5} = \frac{60}{85}$$

Hence, required fractions are

$\frac{60}{130}, \frac{60}{92}$ and $\frac{60}{85}$ **Ans.**

(*iii*) In $\frac{15}{19}, \frac{25}{28}, \frac{9}{11}$ and $\frac{45}{47}$

LCM of 15, 25, 9 and 45 = 225

$$\therefore \quad \frac{15}{19} = \frac{15 \times 15}{19 \times 15} = \frac{225}{285}$$

$$\frac{25}{28} = \frac{25 \times 9}{28 \times 9} = \frac{225}{252}$$

$$\frac{9}{11} = \frac{9 \times 25}{11 \times 25} = \frac{225}{275}$$

$$\frac{45}{47} = \frac{45 \times 5}{47 \times 5} = \frac{225}{235}$$

Hence, required fractions are

$\frac{225}{285}, \frac{225}{252}, \frac{225}{275}$ and $\frac{225}{235}$ **Ans.**

Question 4.

Put the given fractions in ascending order by making denominators equal :

(*i*) $\frac{1}{3}, \frac{2}{5}, \frac{3}{4}$ and $\frac{1}{6}$

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

(*iii*) $\frac{5}{7}, \frac{3}{8}, \frac{9}{14}$ and $\frac{20}{21}$

Solution:

(*i*) $\frac{1}{3}, \frac{2}{5}, \frac{3}{4}$ and $\frac{1}{6}$

LCM of denominators 3, 5, 4 and 6 = 60

$$\therefore \quad \frac{1}{3} = \frac{1 \times 20}{3 \times 20} = \frac{20}{60}$$

$$\frac{2}{5} = \frac{2 \times 12}{5 \times 12} = \frac{24}{60}$$

$$\frac{3}{4} = \frac{3 \times 15}{4 \times 15} = \frac{45}{60}$$

$$\frac{1}{6} = \frac{1 \times 10}{6 \times 10} = \frac{10}{60}$$

From above we see that

$$\frac{10}{60} < \frac{20}{60} < \frac{24}{60} < \frac{45}{60}$$

or $$\frac{1}{6} < \frac{1}{3} < \frac{2}{5} < \frac{3}{4}$$

Hence, $\frac{1}{6}, \frac{1}{3}, \frac{2}{5}, \frac{3}{4}$ are in ascending order.

Ans.

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

LCM of denominators 6, 8, 12 and 10 = 240

$$\therefore \quad \frac{5}{6} = \frac{5 \times 40}{6 \times 40} = \frac{200}{240}$$

$$\frac{7}{8} = \frac{7 \times 30}{8 \times 30} = \frac{210}{240}$$

$$\frac{11}{12} = \frac{11 \times 20}{12 \times 20} = \frac{220}{240}$$

$$\frac{3}{10} = \frac{3 \times 24}{10 \times 24} = \frac{72}{240}$$

It is clear from the above that

$$\frac{72}{240} < \frac{200}{240} < \frac{210}{240} < \frac{220}{240}$$

or $$\frac{3}{10} < \frac{5}{6} < \frac{7}{8} < \frac{11}{12}$$

Hence, $\frac{3}{10}, \frac{5}{6}, \frac{7}{8}$ and $\frac{11}{12}$ are in ascending order. **Ans.**

(*iii*) $\frac{5}{7}, \frac{3}{8}, \frac{9}{14}$ and $\frac{20}{21}$

LCM of denominators 7, 8, 14, 21 = 168

$$\therefore \quad \frac{5}{7} = \frac{5 \times 24}{7 \times 24} = \frac{120}{168}$$

$$\frac{3}{8} = \frac{3 \times 21}{8 \times 21} = \frac{63}{168}$$

$$\frac{9}{14} = \frac{9 \times 12}{14 \times 12} = \frac{108}{168}$$

$$\frac{20}{21} = \frac{20 \times 8}{21 \times 8} = \frac{160}{168}$$

It is clear from the above that

$$\frac{63}{168} < \frac{108}{168} < \frac{120}{168} < \frac{160}{168}$$

or $$\frac{3}{8} < \frac{9}{14} < \frac{5}{7} < \frac{20}{21}$$

Hence, $\frac{3}{8}, \frac{9}{14}, \frac{5}{7}$ and $\frac{20}{21}$ are in ascending order. **Ans.**

Question 5.

Arrange the given fractions in descending order by making numerators equal :

(*i*) $\frac{5}{6}, \frac{4}{15}, \frac{8}{9}$ and $\frac{i}{3}$

(*ii*) $\frac{3}{7}, \frac{4}{9}, \frac{5}{7}$ and $\frac{8}{11}$

(*iii*) $\frac{1}{10}, \frac{6}{11}, \frac{8}{11}$ and $\frac{3}{5}$

Solution:

(*i*) $\frac{5}{6}, \frac{4}{15}, \frac{8}{9}$ and $\frac{1}{3}$

LCM of numerators 5, 4, 8 and 1 = 40

$\therefore \quad \frac{5}{6} = \frac{5 \times 8}{6 \times 8} = \frac{40}{48}$

$\frac{4}{15} = \frac{4 \times 10}{15 \times 10} = \frac{40}{150}$

$\frac{8}{9} = \frac{8 \times 5}{9 \times 5} = \frac{40}{45}$

$\frac{1}{3} = \frac{1 \times 40}{3 \times 40} = \frac{40}{120}$

From above we see that

$\frac{40}{45} > \frac{40}{48} > \frac{40}{120} > \frac{40}{150}$

$\therefore \quad \frac{8}{9} > \frac{5}{6} > \frac{1}{3} > \frac{4}{15}$

Hence, $\frac{8}{9}, \frac{5}{6}, \frac{1}{3}, \frac{4}{15}$ are in descending order. **Ans.**

(*ii*) $\frac{3}{7}, \frac{4}{9}, \frac{5}{7}$ and $\frac{8}{11}$

LCM of numerators 3, 4, 5 and 8 = 120

$\therefore \quad \frac{3}{7} = \frac{3 \times 40}{7 \times 40} = \frac{120}{280}$

$$\frac{4}{9} = \frac{4 \times 30}{9 \times 30} = \frac{120}{270}$$

$$\frac{5}{7} = \frac{5 \times 24}{7 \times 24} = \frac{120}{168}$$

$$\frac{8}{11} = \frac{8 \times 15}{11 \times 15} = \frac{120}{165}$$

It is clear from the above that

$$\frac{120}{165} > \frac{120}{168} > \frac{120}{270} > \frac{120}{280}$$

or $$\frac{8}{11} > \frac{5}{7} > \frac{4}{9} > \frac{3}{7}$$

Hence, $\frac{8}{11}, \frac{5}{7}, \frac{4}{9}$ and $\frac{3}{7}$ are in descending order **Ans.**

(*iii*) $\frac{1}{10}, \frac{6}{11}, \frac{8}{11}$ and $\frac{3}{5}$

LCM of 1, 6, 8 and 3 = 24

$$\therefore \quad \frac{1}{10} = \frac{1 \times 24}{10 \times 24} = \frac{24}{240}$$

$$\frac{6}{11} = \frac{6 \times 4}{11 \times 4} = \frac{24}{44}$$

$$\frac{8}{11} = \frac{8 \times 3}{11 \times 3} = \frac{24}{33}$$

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

It is clear from the above that

$$\frac{24}{33} > \frac{24}{40} > \frac{24}{44} > \frac{24}{240}$$

or $$\frac{8}{11} > \frac{3}{5} > \frac{6}{11} > \frac{1}{10}$$

Hence, $\frac{8}{11}, \frac{3}{5}, \frac{6}{11}$ and $\frac{1}{10}$ are in descending order. **Ans.**

Question 6.

Find the greater fraction :

(*i*) $\frac{3}{5}$ and $\frac{11}{15}$ (*ii*) $\frac{4}{5}$ and $\frac{3}{10}$

(*iii*) $\frac{6}{7}$ and $\frac{5}{9}$ (*iv*) $\frac{3}{8}$ and $\frac{4}{9}$

(*v*) $\frac{-2}{7}$ and $\frac{-3}{10}$

Solution:

(*i*) In $\frac{3}{5}$ and $\frac{11}{15}$, LCM of 5 and 15 = 15

$\therefore \quad \frac{3}{5} = \frac{3 \times 3}{5 \times 3} = \frac{9}{15}$

$\frac{11}{15} = \frac{11}{15}$

It is clear from above that $\frac{11}{15} > \frac{9}{15}$

Hence $\frac{11}{15}$ is greater.

(*ii*) In $\frac{4}{5}$ and $\frac{3}{10}$, LCM of 5 and 10 = 10

$\therefore \quad \frac{4}{5} = \frac{4 \times 2}{5 \times 2} = \frac{8}{10}$

and $\frac{3}{10} = \frac{3}{10}$

It is clear from the above that $\frac{8}{10} > \frac{3}{10}$

Hence $\frac{4}{5}$ is greater.

(*iii*) In $\frac{6}{7}$ and $\frac{5}{9}$, LCM of 7 and 9 = 63

$\therefore \quad \frac{6}{7} = \frac{6 \times 9}{7 \times 9} = \frac{54}{63}$

and $\frac{5}{9} = \frac{5 \times 7}{9 \times 7} = \frac{35}{63}$

It is clear from the above that $\frac{54}{63} > \frac{35}{63}$

Hence $\frac{54}{63}$ or $\frac{6}{7}$ is greater.

(*iii*) In $\frac{6}{7}$ and $\frac{5}{9}$, LCM of 7 and 9 = 63

$$\therefore \quad \frac{6}{7} = \frac{6 \times 9}{7 \times 9} = \frac{54}{63}$$

and $$\frac{5}{9} = \frac{5 \times 7}{9 \times 7} = \frac{35}{63}$$

It is clear from the above that $\frac{54}{63} > \frac{35}{63}$

Hence $\frac{54}{63}$ or $\frac{6}{7}$ is greater.

(*iv*) In $\frac{3}{8}$ and $\frac{4}{9}$, LCM of 8 and 9 = 72

$$\therefore \quad \frac{3}{8} = \frac{3 \times 9}{8 \times 9} = \frac{27}{72}$$

$$\frac{4}{9} = \frac{4 \times 8}{9 \times 8} = \frac{32}{72}$$

It is clear from the above that $\frac{32}{72} > \frac{27}{72}$

Hence $\frac{32}{72}$ or $\frac{4}{9}$ is greater

(*v*) In $\frac{-2}{7}$ and $\frac{-3}{10}$, LCM of 7 and 10 = 70

$$\therefore \quad \frac{-2}{7} = \frac{-2 \times 10}{7 \times 10} = \frac{-20}{70}$$

$$\frac{-3}{10} = \frac{-3 \times 7}{10 \times 7} = \frac{-21}{70}$$

It is clear from the above that $\frac{-20}{70} > \frac{-21}{70}$

Hence $\frac{-20}{70}$ or $\frac{-2}{7}$ is greater **Ans.**

Question 7.

Insert one fraction between :

(*i*) $\frac{3}{7}$ and $\frac{4}{9}$ (*ii*) 2 and $\frac{8}{3}$

(*iii*) $\frac{9}{17}$ and $\frac{6}{13}$

Solution:

(*i*) Fraction between $\frac{3}{7}$ and $\frac{4}{9}$

$$= \frac{3+4}{7+9} = \frac{7}{16}$$

(*ii*) Fraction between 2 and $\frac{8}{3}$

$$= \frac{2+8}{1+3} = \frac{10}{4} = \frac{5}{2} = 2\frac{1}{2}$$

(*iii*) Fraction between $\frac{9}{17}$ and $\frac{6}{13}$

$$= \frac{9+6}{17+13} = \frac{15}{30} = \frac{1}{2}$$ **Ans.**

Question 8.

Insert three fractions between

(*i*) $\frac{2}{5}$ and $\frac{4}{9}$ (*ii*) $\frac{1}{2}$ and $\frac{5}{7}$

(*iii*) $\frac{3}{8}$ and $\frac{6}{11}$ (*iv*) $\frac{11}{12}$ and $\frac{2}{3}$

(*v*) $\frac{4}{7}$ and $\frac{3}{4}$

Solution:

(*i*) Fraction between $\frac{2}{5}$ and $\frac{4}{9}$

$$= \frac{2+4}{5+9} = \frac{6}{14} = \frac{3}{7}$$

Fraction between $\frac{2}{5}$ and $\frac{3}{7}$

$$= \frac{2+3}{5+7} = \frac{5}{12}$$

and fraction between $\frac{3}{7}$ and $\frac{4}{9}$

$$= \frac{3+4}{7+9} = \frac{7}{16}$$

Hence, three fractions between $\frac{2}{5}$ and $\frac{4}{9}$ will be $\frac{5}{12}$, $\frac{3}{7}$ and $\frac{7}{16}$ **Ans.**

(*ii*) Fraction between $\frac{1}{2}$ and $\frac{5}{7}$

$$= \frac{1+5}{2+7} = \frac{6}{9} = \frac{2}{3}$$

Fraction between $\frac{1}{2}$ and $\frac{2}{3}$

$$= \frac{1+2}{2+3} = \frac{3}{5}$$

Fraction between $\frac{2}{3}$ and $\frac{5}{7}$

$$= \frac{2+5}{3+7} = \frac{7}{10}$$

Hence, three fractions between $\frac{1}{2}$ and $\frac{5}{7}$ will be $\frac{3}{5}$, $\frac{2}{3}$ and $\frac{7}{10}$ **Ans.**

(*iii*) Fraction between $\frac{3}{8}$ and $\frac{6}{11}$

$$= \frac{3+6}{8+11} = \frac{9}{19}$$

Fraction between $\frac{3}{8}$ and $\frac{9}{19}$

$$= \frac{3+9}{8+19} = \frac{12}{27} = \frac{4}{9}$$

Fraction between $\frac{9}{19}$ and $\frac{6}{11}$

$$= \frac{9+6}{19+11} = \frac{15}{30} = \frac{1}{2}$$

Hence, three fractions between $\frac{3}{8}$ and $\frac{6}{11}$ will be $\frac{4}{9}$, $\frac{9}{19}$ and $\frac{1}{2}$ **Ans.**

(*iv*) Fraction between $\frac{11}{12}$ and $\frac{2}{3}$

$$= \frac{11+2}{12+3} = \frac{13}{15}$$

Fraction between $\frac{11}{12}$ and $\frac{13}{15}$

$$= \frac{11+13}{12+15} = \frac{24}{27} = \frac{8}{9}$$

Fraction between $\frac{13}{15}$ and $\frac{2}{3}$

$$= \frac{13+2}{15+3} = \frac{15}{18} = \frac{5}{6}$$

Hence, three fractions between $\frac{11}{12}$ and $\frac{2}{3}$ will be $\frac{8}{9}$, $\frac{13}{15}$ and $\frac{5}{6}$ **Ans.**

(v) Fraction between $\frac{4}{7}$ and $\frac{3}{4}$

$$= \frac{4+3}{7+4} = \frac{7}{11}$$

Fraction between $\frac{4}{7}$ and $\frac{7}{11}$

$$= \frac{4+7}{7+11} = \frac{11}{18}$$

Fraction between $\frac{7}{11}$ and $\frac{3}{4}$

$$= \frac{7+3}{11+4} = \frac{10}{15} = \frac{2}{3}$$

Hence, three fractions between $\frac{4}{7}$ and $\frac{3}{4}$ will be $\frac{11}{18}, \frac{7}{11}, \frac{2}{3}$ Ans.

Question 9.

Insert two fractions between

(i) 1 and $\frac{3}{11}$ (ii) $\frac{5}{9}$ and $\frac{1}{4}$ (iii) $\frac{5}{6}$ and $1\frac{1}{5}$

Solution:

(*i*) Fraction between 1 and $\frac{3}{11}$

$$= \frac{1+3}{1+11} = \frac{4}{12} = \frac{1}{3}$$

Fraction between $\frac{1}{3}$ and $\frac{3}{11} = \frac{1+3}{3+11} = \frac{4}{14} = \frac{2}{7}$

Hence, two fractions between 1 and $\frac{3}{11}$ will be $\frac{1}{3}$ and $\frac{2}{7}$ **Ans.**

(*ii*) Fraction between $\frac{5}{9}$ and $\frac{1}{4} = \frac{5+1}{9+4} = \frac{6}{13}$

Fraction between $\frac{6}{13}$ and $\frac{1}{4} = \frac{6+1}{13+4} = \frac{7}{17}$

Hence, two fractions between $\frac{5}{9}$ and $\frac{1}{4}$ will be $\frac{6}{13}$ and $\frac{7}{17}$ **Ans.**

(*iii*) Fraction between $\frac{5}{6}$ and $1\frac{1}{5}$ or $\frac{5}{6}$ and $\frac{6}{5}$

$$= \frac{5+6}{6+5} = \frac{11}{11} = 1$$

Fraction between 1 and $\frac{6}{5} = \frac{1+6}{1+5} = \frac{7}{6} = 1\frac{1}{6}$

Hence, two fractions between $\frac{5}{6}$ and $1\frac{1}{5}$ will be 1 and $1\frac{1}{6}$ **Ans.**

EXERCISE 3 (C)

Question 1.

Reduce to a single fraction :

(i) $\frac{1}{2}+\frac{2}{3}$ (ii) $\frac{3}{5}-\frac{1}{10}$

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

(v) $\frac{1}{4}+\frac{5}{6}-\frac{1}{12}$ (vi) $\frac{2}{3}-\frac{3}{5}+3-\frac{1}{5}$

(vii) $\frac{2}{3}-\frac{1}{5}+\frac{1}{10}$ (viii) $2\frac{1}{2}+2\frac{1}{3}-1\frac{1}{4}$

(ix) $2\frac{5}{8}-2\frac{1}{6}+4\frac{3}{4}$

Solution:

(i) $\frac{1}{2}+\frac{2}{3}=\frac{1\times 3}{2\times 3}+\frac{2\times 2}{3\times 2}$

(LCM of 2 and 3 = 6)

$=\frac{3}{6}+\frac{4}{6}=\frac{3+4}{6}=\frac{7}{6}=1\frac{1}{6}$ **Ans.**

(ii) $\frac{3}{5}-\frac{1}{10}=\frac{3\times 2}{5\times 2}-\frac{1}{10}=\frac{6}{10}-\frac{1}{10}$

(LCM of 5, 10 = 10)

$=\frac{6-1}{10}=\frac{5}{10}=\frac{1}{2}$ **Ans.**

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

(LCM of 3, 6 = 6)

$=\frac{4-1}{6}=\frac{3}{6}=\frac{1}{2}$ **Ans.**

(iv) $1\frac{1}{3}+2\frac{1}{4}=\frac{4}{3}+\frac{9}{4}$

$=\frac{4\times 4}{3\times 4}+\frac{9\times 3}{4\times 3}=\frac{16}{12}+\frac{27}{12}$

(LCM of 3, 4 = 12)

$=\frac{16+27}{12}=\frac{43}{12}=3\frac{7}{12}$ **Ans.**

(v) $\frac{1}{4}+\frac{5}{6}-\frac{1}{12}=\frac{1\times 3}{4\times 3}+\frac{5\times 2}{6\times 2}-\frac{1}{12}$

(LCM of 4, 6, 12 = 12)

$=\frac{3}{12}+\frac{10}{12}-\frac{1}{12}=\frac{3+10-1}{12}$

$$= \frac{13-1}{12} = \frac{12}{12} = 1 \quad \textbf{Ans.}$$

(*vi*) $\frac{2}{3} - \frac{3}{5} + 3 - \frac{1}{5}$

$$= \frac{2\times5}{3\times5} - \frac{3\times3}{5\times3} + \frac{3\times15}{15} - \frac{1\times3}{5\times3}$$

(LCM of 3 and 5 = 15)

$$= \frac{10}{15} - \frac{9}{15} + \frac{45}{15} - \frac{3}{15}$$

$$= \frac{10-9+45-3}{15} = \frac{55-12}{15}$$

$$= \frac{43}{15} = 2\frac{13}{15} \quad \textbf{Ans.}$$

(*vii*) $\frac{2}{3} - \frac{1}{5} + \frac{1}{10} = \frac{2\times10}{3\times10} - \frac{1\times6}{5\times6} + \frac{1\times3}{10\times3}$

(LCM of 3, 5, 10 = 30)

$$= \frac{20}{30} - \frac{6}{30} + \frac{3}{30} = \frac{20-6+3}{30}$$

$$= \frac{23-6}{30} = \frac{17}{30} \quad \textbf{Ans.}$$

(*viii*) $2\frac{1}{2} + 2\frac{1}{3} - 1\frac{1}{4} = \frac{5}{2} + \frac{7}{3} - \frac{5}{4}$

$$= \frac{5\times6}{2\times6} + \frac{7\times4}{3\times4} - \frac{5\times3}{4\times3}$$

(LCM of 2, 3, 4 = 12)

$$= \frac{30}{12} + \frac{28}{12} - \frac{15}{12}$$

$$= \frac{30+28-15}{12} = \frac{58-15}{12}$$

$$= \frac{43}{12} = 3\frac{7}{12} \quad \textbf{Ans.}$$

(ix) $2\frac{5}{8} - 2\frac{1}{6} + 4\frac{3}{4} = \frac{21}{8} - \frac{13}{6} + \frac{19}{4}$

$= \frac{21 \times 3}{8 \times 3} - \frac{13 \times 4}{6 \times 4} + \frac{19 \times 6}{4 \times 6}$

(LCM of 8, 6, 4 = 24)

$= \frac{63}{24} - \frac{52}{24} + \frac{114}{24} = \frac{63 - 52 + 114}{24}$

$= \frac{177 - 52}{24} = \frac{125}{24} = 5\frac{5}{24}$ **Ans.**

Question 2.

Simplify :

(i) $\frac{3}{4} \times 6 = \frac{3}{4} \times \frac{6}{1} = \frac{3 \times 6}{4 \times 1} = \frac{18}{4}$

$= \frac{18 \div 2}{4 \div 2} = \frac{9}{2} = 4\frac{1}{2}$ **Ans.**

(ii) $\frac{2}{3} \times 15 = \frac{2}{3} \times \frac{15}{1} = \frac{2 \times 15}{3 \times 1} = \frac{30}{3} = 10$

Ans.

(iii) $\frac{3}{4} \times \frac{1}{2} = \frac{3 \times 1}{4 \times 2} = \frac{3}{8}$ **Ans.**

(iv) $\frac{9}{12} \times \frac{4}{7} = \frac{9 \times 4}{12 \times 7} = \frac{36}{84}$

$= \frac{36 \div 12}{84 \div 12} = \frac{3}{7}$ **Ans.**

(HCF of 36 and 84 = 12)

(v) $45 \times 2\frac{1}{3} = \frac{45}{1} \times \frac{7}{3} = \frac{45 \times 7}{1 \times 3}$

$= \frac{315}{3} = 105$ **Ans.**

Solution:

(*vi*) $36 \times 3\frac{1}{4} = \frac{36}{1} \times \frac{13}{4} = \frac{36 \times 13}{4 \times 1}$

$= \frac{468}{4} = 117$ **Ans.**

(*vii*) $2 \div \frac{1}{3} = \frac{2}{1} \times \frac{3}{1} = \frac{2 \times 3}{1 \times 1} = \frac{6}{1} = 6$ **Ans.**

(*viii*) $3 \div \frac{2}{5} = \frac{3}{1} \times \frac{5}{2} = \frac{3 \times 5}{1 \times 2} = \frac{15}{2} = 7\frac{1}{2}$ **Ans.**

(*ix*) $1 \div \frac{3}{5} = 1 \times \frac{5}{3} = \frac{1 \times 5}{3} = \frac{5}{3} = 1\frac{2}{3}$ **Ans.**

(*x*) $\frac{1}{3} \div \frac{1}{4} = \frac{1}{3} \times \frac{4}{1} = \frac{1 \times 4}{3 \times 1} = \frac{4}{3} = 1\frac{1}{3}$ **Ans.**

(*xi*) $-\frac{5}{8} \div \frac{3}{4} = -\frac{5}{8} \times \frac{4}{3} = -\frac{5 \times 4}{8 \times 3} = -\frac{20}{24}$

$= -\frac{20 \div 4}{24 \div 4} = -\frac{5}{6}$ **Ans.**

(*xii*) $3\frac{3}{7} \div 1\frac{1}{14} = \frac{24}{7} \times \frac{14}{15} = \frac{24 \times 14}{7 \times 15}$

$= \frac{336}{105} = \frac{336 \div 21}{105 \div 21}$

(HCF of 336 and 105 = 21)

$= \frac{16}{5} = 3\frac{1}{5}$ **Ans.**

(*xiii*) $3\frac{3}{4} \times 1\frac{1}{5} \times \frac{20}{21} = \frac{15}{4} \times \frac{6}{5} \times \frac{20}{21}$

$= \frac{15 \times 6 \times 20}{4 \times 5 \times 21} = \frac{1800}{420} = \frac{1800 \div 60}{420 \div 60}$

(HCF of 1800 and 420 = 60)

$= \frac{30}{7} = 4\frac{2}{7}$ **Ans.**

Question 3.

Subtract :

(*i*) 2 from $\frac{2}{3}$ (*ii*) $\frac{1}{8}$ from $\frac{5}{8}$

(*iii*) $-\frac{2}{5}$ from $\frac{2}{5}$ (*iv*) $-\frac{3}{7}$ from $\frac{3}{7}$

(*v*) 0 from $-\frac{4}{5}$ (*vi*) $\frac{2}{9}$ from $\frac{4}{5}$

(*vii*) $-\frac{4}{7}$ from $-\frac{6}{11}$

Solution:

(*i*) 2 from $\frac{2}{3} = \frac{2}{3} - \frac{2}{1}$

$= \frac{2}{3} - \frac{2 \times 3}{3} = \frac{2}{3} - \frac{6}{3}$

$= \frac{2-6}{3} = -\frac{4}{3} = -1\frac{1}{3}$ **Ans.**

(*ii*) $\frac{1}{8}$ from $\frac{5}{8} = \frac{5}{8} - \frac{1}{8} = \frac{5-1}{8} = \frac{4}{8} = \frac{1}{2}$ **Ans.**

(*iii*) $-\frac{2}{5}$ from $\frac{2}{5} = \frac{2}{5} - \left(-\frac{2}{5}\right) = \frac{2}{5} + \frac{2}{5}$

$= \frac{2+2}{5} = \frac{4}{5}$ **Ans.**

(*iv*) $-\frac{3}{7}$ from $\frac{3}{7} = \frac{3}{7} - \left(-\frac{3}{7}\right) = \frac{3}{7} + \frac{3}{7}$

$= \frac{3+3}{7} = \frac{6}{7}$ **Ans.**

(*v*) 0 from $-\frac{4}{5} = -\frac{4}{5} - 0 = -\frac{4}{5}$ **Ans.**

(*vi*) $\frac{2}{9}$ from $\frac{4}{5} = \frac{4}{5} - \frac{2}{9} = \frac{4 \times 9}{5 \times 9} - \frac{2 \times 5}{9 \times 5}$

(LCM of 5 and 9 = 45)

$= \frac{36}{45} - \frac{10}{45} = \frac{36-10}{45} = \frac{26}{45}$ **Ans.**

(*vii*) $-\frac{4}{7}$ from $-\frac{6}{11} = -\frac{6}{11} - \left(-\frac{4}{7}\right) = -\frac{6}{11} + \frac{4}{7}$

$= \frac{-6 \times 7}{11 \times 7} + \frac{4 \times 11}{7 \times 11}$

(LCM of 7 and 11 = 77)

$= -\frac{42}{77} + \frac{44}{77} = -\frac{42+44}{77} = \frac{2}{77}$ **Ans.**

Question 4.

Find the value of

(*i*) $\frac{1}{2}$ of 10 kg (*ii*) $\frac{3}{5}$ of 1 hour

(*iii*) $\frac{4}{7}$ of $2\frac{1}{3}$ kg

(*iv*) $3\frac{1}{2}$ times of 2 metres

(*v*) $\frac{1}{2}$ of $2\frac{2}{3}$

(*vi*) $\frac{5}{11}$ of $\frac{4}{5}$ of 22 kg.

Solution:

(*i*) $\frac{1}{2}$ of 10 kg $= \left(\frac{1}{2} \times 10\right)$ kg $= 5$ kg **Ans.**

(*ii*) $\frac{3}{5}$ of 1 hour $= \left(\frac{3}{5} \times 60\right)$ minutes

$= 3 \times 12 = 36$ minutes **Ans.**

(*iii*) $\frac{4}{7}$ of $2\frac{1}{3}$ kg $= \left(\frac{4}{7} \times \frac{7}{3}\right)$ kg

$= \frac{4}{3}$ kg $= 1\frac{1}{3}$ kg **Ans.**

(*iv*) $3\frac{1}{2}$ times of 2 metres $= \left(\frac{7}{2} \times 2\right)$ metres

$= 7$ metres **Ans.**

(*v*) $\frac{1}{2}$ of $2\frac{2}{3} = \frac{1}{2} \times \frac{8}{3} = \frac{4}{3} = 1\frac{1}{3}$ **Ans.**

(*vi*) $\frac{5}{11}$ of $\frac{4}{5}$ of 22 kg $= \left(\frac{5}{11} \times \frac{4}{5} \times \frac{22}{1}\right)$ kg

$= (4 \times 2) = 8$ kg **Ans.**

Question 5.

Simplify and reduce to a simple fraction :

$(i)\ \dfrac{3}{3\frac{3}{4}}$ $(ii)\ \dfrac{\frac{3}{5}}{7}$

$(iii)\ \dfrac{3}{\frac{5}{7}}$ $(iv)\ \dfrac{2\frac{1}{5}}{1\frac{1}{10}}$

$(v)\ \frac{2}{5}$ of $\frac{6}{11} \times 1\frac{1}{4}$ $(vi)\ 2\frac{1}{4} \div \frac{1}{7} \times \frac{1}{3}$

$(vii)\ \frac{1}{3} \times 4\frac{2}{3} \div 3\frac{1}{2} \times \frac{1}{2}$

$(viii)\ \frac{2}{3} \times 1\frac{1}{4} \div \frac{3}{7}$ of $2\frac{5}{8}$

$(ix)\ 0 + \frac{8}{11}$

Solution:

$(x)\ \frac{4}{5} + \frac{7}{15}$ of $\frac{8}{9}$

$(xi)\ \frac{4}{5} + \frac{7}{15} \times \frac{8}{9}$ $(xii)\ \frac{4}{5}$ of $\frac{7}{15} + \frac{8}{9}$

$(xiii)\ \frac{1}{2}$ of $\frac{3}{4} \times \frac{1}{2} + \frac{2}{3}$

(*i*) $\dfrac{3}{3\frac{3}{4}} = \dfrac{3}{\frac{15}{4}} = \dfrac{3 \times 4}{15} = \dfrac{4}{5}$ **Ans.**

(*ii*) $\dfrac{\frac{3}{5}}{7} = \dfrac{3}{5} \times \dfrac{1}{7} = \dfrac{3}{35}$ **Ans.**

(*iii*) $\dfrac{3}{\frac{5}{7}} = 3 \times \dfrac{7}{5} = \dfrac{21}{5} = 4\dfrac{1}{5}$

(*iv*) $\dfrac{2\frac{1}{5}}{1\frac{1}{10}} = \dfrac{\frac{11}{5}}{\frac{11}{10}} = \dfrac{11}{5} \times \dfrac{10}{11} = 2$ **Ans.**

(*v*) $\dfrac{2}{5}$ of $\dfrac{6}{11} \times 1\dfrac{1}{4}$

$= \dfrac{2}{5}$ of $\dfrac{6}{11} \times \dfrac{5}{4} = \dfrac{12}{55} \times \dfrac{5}{4}$

[Removing 'of']

$= \dfrac{3}{11}$ **Ans.**

(*vi*) $2\dfrac{1}{4} \div \dfrac{1}{7} \times \dfrac{1}{3}$

$= \dfrac{9}{4} \div \dfrac{1}{7} \times \dfrac{1}{3} = \dfrac{9}{4} \times \dfrac{7}{1} \times \dfrac{1}{3}$

[Removing (÷)]

$= \dfrac{21}{4} = 5\dfrac{1}{4}$ **Ans.**

(*vii*) $\dfrac{1}{3} \times 4\dfrac{2}{3} \div 3\dfrac{1}{2} \times \dfrac{1}{2}$

$$= \frac{1}{3} \times \frac{14}{3} \div \frac{7}{2} \times \frac{1}{2} = \frac{1}{3} \times \frac{14}{3} \times \frac{2}{7} \times \frac{1}{2}$$

[Solving '÷']

$$= \frac{2}{9}$$

(*viii*) $\frac{2}{3} \times 1\frac{1}{4} \div \frac{3}{7}$ of $2\frac{5}{8}$

$$= \frac{2}{3} \times \frac{5}{4} \div \frac{3}{7} \text{ of } \frac{21}{8}$$

$$= \frac{2}{3} \times \frac{5}{4} \div \frac{9}{8}$$ [Solving 'of']

$$= \frac{2}{3} \times \frac{5}{4} \times \frac{8}{9}$$ [Solving '÷']

$$= \frac{20}{27}$$

(*ix*) $0 \div \frac{8}{11} = 0 \times \frac{11}{8} = 0$

(*x*) $\frac{4}{5} \div \frac{7}{15}$ of $\frac{8}{9}$

Using BODMAS, we get

$$= \frac{4}{5} \div \frac{56}{135}$$

$$= \frac{4}{5} \times \frac{135}{56} = \frac{27}{14} = 1\frac{13}{14}$$

(xi) $\frac{4}{5} \div \frac{7}{15} \times \frac{8}{9}$

$= \frac{4}{5} \times \frac{15}{7} \times \frac{8}{9}$

$= \frac{32}{21} = 1\frac{11}{21}$

(xii) $\frac{4}{5}$ of $\frac{7}{15} \div \frac{8}{9}$

Using BODMAS,

$= \frac{28}{75} \div \frac{8}{9} = \frac{28}{75} \times \frac{9}{8}$

$= \frac{7 \times 3}{25 \times 2} = \frac{21}{50}$

(xiii) $\frac{1}{2}$ of $\frac{3}{4} \times \frac{1}{2} \div \frac{2}{3}$

Using BODMAS

$= \frac{3}{8} \times \frac{1}{2} \div \frac{2}{3} = \frac{3}{8} \times \frac{1}{2} \times \frac{3}{2} = \frac{9}{32}$

Question 6.

A bought $3\frac{3}{4}$ kg of wheat and $2\frac{1}{2}$ kg of rice. Find the total weight of wheat and rice bought.

Solution:

Weight of wheat $= 3\frac{3}{4}$ kg $= \frac{15}{4}$ kg

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

$\therefore$ Total weight of wheat and rice

$= \frac{15}{4} + \frac{5}{2}$

$= \frac{15 \times 1}{4 \times 1} + \frac{5 \times 2}{2 \times 2}$ ($\because$ L.C.M. of 4 and 2 = 4)

$= \frac{15 + 10}{4} = \frac{25}{4}$ kg $= 6\frac{1}{4}$ kg

Question 7.

Which is greater, $\frac{3}{5}$ or $\frac{7}{10}$ and by how much?

Solution:

Taking the cross multiplication, we get

$3 \times 10 = 30$ and $7 \times 5 = 35$

Since, 3×10 (*i.e.*, 30) is smaller than 7×5 (*i.e.*, 35)

$$\therefore \frac{3}{5} < \frac{7}{10}$$

Difference between $\frac{7}{10}$ and $\frac{3}{5}$

$$\Rightarrow \frac{7}{10} - \frac{3}{5} \quad (\because \text{L.C.M. of 10 and 5} = 10)$$

$$\Rightarrow \frac{7 \times 1}{10 \times 1} - \frac{3 \times 2}{5 \times 2}$$

$$\Rightarrow \frac{7-6}{10} = \frac{1}{10}$$

$$\therefore \frac{7}{10} \text{ is greater than } \frac{3}{5} \text{ by } \frac{1}{10}$$

Question 8.

What number should be added to $8\frac{2}{3}$ to $12\frac{5}{6}$

Solution:

For finding the required fraction, we have

to subtract $8\frac{2}{3}$ from $12\frac{5}{6}$

$\therefore$ Required number $= 12\frac{5}{6} - 8\frac{2}{3}$

$= \frac{77}{6} - \frac{26}{3}$

$= \frac{77\times1}{6\times1} - \frac{26\times2}{3\times2}$

($\because$ L.C.M. of 3 and 6 = 6)

$= \frac{77-52}{6} = \frac{25}{6} = 4\frac{1}{6}$

Question 9.

What should be subtracted from $8\frac{3}{4}$ to get $2\frac{2}{3}$

Solution:

The required number $= 8\frac{3}{4} - 2\frac{2}{3}$

$\Rightarrow \frac{35}{4} - \frac{8}{3}$

$\Rightarrow \frac{35\times3}{4\times3} - \frac{8\times4}{3\times4}$ ($\because$ L.C.M. of 4 and 3 = 12)

$\Rightarrow \frac{105-32}{12} = \frac{73}{12} = 6\frac{1}{12}$

Question 10.

A field is $16\frac{1}{2}$ m long and $12\frac{2}{5}$ m wide. Find the perimeter of the field.

Solution:

$$\text{Length of field} = 16\frac{1}{2}\text{ m}$$

$$\text{Breadth of field} = 12\frac{2}{5}\text{ m}$$

$$\therefore \text{ Perimeter of field} = 2(l + b)$$

$$= 2 \times \left(16\frac{1}{2} + 12\frac{2}{5}\right)$$

$$= 2 \times \left(\frac{33}{2} + \frac{62}{5}\right)$$

$$= 2 \times \left(\frac{33 \times 5}{2 \times 5} + \frac{62 \times 2}{5 \times 2}\right)$$

$$(\because \text{L.C.M. of 2 and 5} = 10)$$

$$= 2 \times \left(\frac{165 + 124}{10}\right) = 2 \times \frac{289}{10}$$

$$= \frac{289}{5}\text{ m} = 57\frac{4}{5}\text{ m}$$

Question 11.

Sugar costs ₹37 $\frac{1}{2}$ per kg. Find the cost of $8\frac{3}{4}$ kg sugar.

Solution:

$$\text{Cost of 1 kg sugar} = ₹37\frac{1}{2}$$

$$\therefore \text{ Cost of } 8\frac{3}{4}\text{ kg sugar}$$

$$= 37\frac{1}{2} \times 8\frac{3}{4}$$

$$= \frac{75}{2} \times \frac{35}{4}$$

$$= ₹\frac{2625}{8} = ₹328\frac{1}{8}$$

Question 12.

A motor cycle runs $31\frac{1}{4}$ km consuming 1 litre of petrol. How much distance will it run consuming $1\frac{3}{5}$ liter of petrol?

Solution:

Distance covered in 1 litre petrol

$$= 31\frac{1}{4}\text{ km} = \frac{125}{4}\text{ km}$$

$\therefore$ Distance covered in $1\frac{3}{5}$ litre of petrol

$$= \frac{125}{4} \times \frac{8}{5}$$

$$= \frac{1000}{20} = 50 \text{ km}$$

Question 13.

A rectangular park has length = $23\frac{2}{3}$ m and breadth = $16\frac{2}{3}$ m. Find the area of the

Solution:

Length of rectangular park

$$= 23\frac{2}{5}\text{ m} = \frac{117}{5}\text{ m}$$

Breadth of rectangular park

$$= 16\frac{2}{3}\text{ m} = \frac{50}{3}\text{ m}$$

$\therefore$ Area of the park $= l \times b$

$$= \frac{117}{5} \times \frac{50}{3}$$

$$= 39 \times 10 = 390 \text{ m}^2$$

Question 14.

Each of 40 identical boxes weighs $4\frac{4}{5}$ kg Find the total weight of all the boxes.

Solution:

$$\text{Weight of one box} = 4\frac{4}{5}\text{ kg} = \frac{24}{5}\text{ kg}$$

$$\text{Weight of 40 boxes} = 40 \times \frac{24}{5}$$

$$= 8 \times 24 = 192 \text{ kg}$$

Question 15.

Out of 24 kg of wheat, $\frac{5}{6}$ th of wheat is consumed. Find, how much wheat is still left?

Solution:

$$\text{Total wheat available} = 24 \text{ kg}$$

$$\text{Wheat consumed} = \frac{5}{6}\text{ th of } 24 \text{ kg}$$

$$= \frac{5}{6} \times 24 = 20 \text{ kg}$$

$$\therefore \text{ Remaining wheat} = 24 - 20 \text{ kg} = 4 \text{ kg}$$

Question 16.

A rod of length $2\frac{2}{5}$ metre is divided into five equal parts. Find the length of each part so obtained.

Solution:

$$\text{Total length of rod} = 2\frac{2}{5}\text{ m}$$

Length of rod to be divided into 5 equal parts.

$$\therefore \text{ Length of each part of rod} = 2\frac{2}{5} \div 5$$

$$= \frac{12}{5} \times \frac{1}{5} = \frac{12}{25} \text{ metre}$$

Question 17.

IfA = $3\frac{3}{8}$ and B = $6\frac{5}{8}$ find :

(i) A+B

(ii) B A

Solution:

$$A = 3\frac{3}{8} = \frac{27}{8}$$

$$B = 6\frac{5}{8} = \frac{53}{8}$$

(*i*) $A \div B$

$$\Rightarrow \frac{27}{8} \div \frac{53}{8}$$

$$\Rightarrow \frac{27}{8} \times \frac{8}{53} = \frac{27}{53}$$

(*ii*) $B \div A$

$$\Rightarrow \frac{53}{8} \div \frac{27}{8} \Rightarrow \frac{53}{8} \times \frac{8}{27}$$

$$\Rightarrow \frac{53}{27} = 1\frac{26}{27}$$

Question 18.

Cost of $3\frac{5}{7}$ litres of oil is ₹$83\frac{1}{2}$. Find the cost of one litre oil.

Solution:

$$\text{Cost of } 3\frac{5}{7} \text{ litres of oil} = ₹83\frac{1}{2}$$

$$\therefore \text{ Cost of 1 litre oil} = ₹83\frac{1}{2} \div 3\frac{5}{7}$$

$$= ₹\frac{167}{2} \div \frac{26}{7}$$

$$= ₹\frac{167}{2} \times \frac{7}{26}$$

$$= ₹\frac{1169}{52} = ₹22\frac{25}{52}$$

Question 19.

The product of two numbers is $20\frac{5}{7}$. If one of these numbers is $6\frac{2}{3}$, find the other.

Solution:

$$\text{The product of two numbers} = 20\frac{5}{7} = \frac{145}{7}$$

$$\text{One number} = 6\frac{2}{3} = \frac{20}{3}$$

$$\therefore \text{ Second number} = \frac{145}{7} \div \frac{20}{3}$$

$$= \frac{145}{7} \times \frac{3}{20} = \frac{87}{28} = 3\frac{3}{28}$$

Question 20.

By what number should $5\frac{5}{6}$ be multiplied 1 to get $3\frac{1}{3}$?

Solution:

$$\text{Required number} = 3\frac{1}{3} \div 5\frac{5}{6}$$

$$= \frac{10}{3} \div \frac{35}{6} \Rightarrow \frac{10}{3} \times \frac{6}{35} = \frac{4}{7}$$

$$\therefore \text{ Required number} = \frac{4}{7}$$

EXERCISE 3(D)

Question 1.

Simplify

Solution:

$$6+\left\{\frac{4}{3}+\left(\frac{3}{4}-\frac{1}{3}\right)\right\}$$

$$6+\left\{\frac{4}{3}+\left(\frac{3}{4}-\frac{1}{3}\right)\right\}$$

$$=6+\left\{\frac{4}{3}+\frac{3}{4}-\frac{1}{3}\right\}=\frac{6}{1}+\frac{4}{3}+\frac{3}{4}-\frac{1}{3}$$

$$=\frac{72+16+9-4}{12} \qquad (\text{LCM of } 3, 4 = 12)$$

$$=\frac{97-4}{12}=\frac{93}{12}=\frac{31}{4}=7\frac{3}{4}$$

Question 2.

$$8-\left\{\frac{3}{2}+\left(\frac{3}{5}-\frac{1}{2}\right)\right\}$$

Solution:

$$8-\left\{\frac{3}{2}+\left(\frac{3}{5}-\frac{1}{2}\right)\right\}$$

$$=8-\left\{\frac{3}{2}+\frac{3}{5}-\frac{1}{2}\right\}=\frac{8}{1}-\frac{3}{2}-\frac{3}{5}+\frac{1}{2}$$

$$=\frac{80-15-6+5}{10}=\frac{85-21}{10}=\frac{64}{10}$$

$$=\frac{32}{5}=6\frac{2}{5}$$

Question 3.

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

Solution:

$$=\frac{1}{4}\left(\frac{3+4}{12}\right)-\frac{2}{5}=\frac{1}{4}\times\frac{7}{12}-\frac{2}{5}$$

$$=\frac{7}{48}-\frac{2}{5}=\frac{35-96}{240}=\frac{-61}{240}\ \textbf{Ans.}$$

Question 4.

$$2\frac{3}{4}-\left[3\frac{1}{8}\div\left\{5-\left(4\frac{2}{3}-\frac{11}{12}\right)\right\}\right]$$

$$=\frac{11}{4}-\left[\frac{25}{8}\div\left\{5-\left(\frac{14}{3}-\frac{11}{12}\right)\right\}\right]$$

$$=\frac{11}{4}-\left[\frac{25}{8}\div\left\{5-\left(\frac{56-11}{12}\right)\right\}\right]$$

$$=\frac{11}{4}-\left[\frac{25}{8}\div\left\{5-\frac{45}{12}\right\}\right]$$

$$=\frac{11}{4}-\left[\frac{25}{8}\div\left\{\frac{60-45}{12}\right\}\right]$$

$$=\frac{11}{4}-\left[\frac{25}{8}\div\frac{15}{12}\right]=\frac{11}{4}-\left[\frac{25}{8}\times\frac{12}{15}\right]$$

$$=\frac{11}{4}-\frac{5}{2}=\frac{11-10}{4}=\frac{1}{4}\ \textbf{Ans.}$$

Solution:

$$2\frac{3}{4}-\left[3\frac{1}{8}\div\left\{5-\left(4\frac{2}{3}-\frac{11}{12}\right)\right\}\right]$$

Question 5.

$$12\frac{1}{2}-\left[8\frac{1}{2}+\left\{9-(5-\overline{3-2})\right\}\right]$$

$$=\frac{25}{2}-\left[\frac{17}{2}+\{9-(5-1)\}\right]$$

$$=\frac{25}{2}-\left[\frac{17}{2}+\{9-4\}\right]=\frac{25}{2}-\left[\frac{17}{2}+5\right]$$

$$=\frac{25}{2}-\frac{17}{2}-\frac{5}{1}=\frac{25-17-10}{2}$$

$$=\frac{25-27}{2}=-\frac{2}{2}=-1 \text{ Ans.}$$

Solution:

$$12\frac{1}{2}-\left[8\frac{1}{2}+\left\{9-(5-\overline{3-2})\right\}\right]$$

Question 6.

$$1\frac{1}{5}\div\left\{2\frac{1}{3}-(5+\overline{2-3})\right\}-3\frac{1}{2}$$

Solution:

$$1\frac{1}{5}\div\left\{2\frac{1}{3}-(5+\overline{2-3})\right\}-3\frac{1}{2}$$

$$=\frac{6}{5}\div\left\{\frac{7}{3}-(5-1)\right\}-\frac{7}{2}$$

$$=\frac{6}{5}\div\left\{\frac{7}{3}-4\right\}-\frac{7}{2}=\frac{6}{5}\div\left\{\frac{7-12}{3}\right\}-\frac{7}{2}$$

$$=\frac{6}{5}\div\frac{-5}{3}-\frac{7}{2}=\frac{6}{5}\times\frac{3}{-5}-\frac{7}{2}$$

$$=-\frac{18}{25}-\frac{7}{2}=\frac{-36-175}{50}=\frac{-211}{50}$$

$$=-4\frac{11}{50} \text{ Ans.}$$

Question 7.

$$\left(\frac{1}{2}+\frac{2}{3}\right) \div \left(\frac{3}{4}-\frac{2}{9}\right)$$

Solution:

$$\left(\frac{1}{2}+\frac{2}{3}\right) \div \left(\frac{3}{4}-\frac{2}{9}\right)$$

$$= \frac{3+4}{6} \div \frac{27-8}{36} \qquad \text{(Using BODMAS)}$$

$$= \frac{7}{6} \div \frac{19}{36}$$

$$= \frac{7}{6} \times \frac{36}{19} = \frac{42}{19} = 2\frac{4}{19}$$

Question 8.

$$\frac{6}{5} \text{ of } \left(3\frac{1}{3}-2\frac{1}{2}\right) \div \left(2\frac{5}{21}-2\right)$$

Solution:

$$\frac{6}{5} \text{ of } \left(3\frac{1}{3} - 2\frac{1}{2}\right) \div \left(2\frac{5}{21} - 2\right)$$

$$= \frac{6}{5} \text{ of } \left(\frac{10}{3} - \frac{5}{2}\right) \div \left(\frac{47}{21} - \frac{2}{1}\right)$$

(Using BODMAS)

$$= \frac{6}{5} \text{ of } \left(\frac{20-15}{6}\right) \div \left(\frac{47-42}{21}\right)$$

$$= \frac{6}{5} \text{ of } \frac{5}{6} \div \frac{5}{21}$$

$$= 1 \div \frac{5}{21}$$

$$= 1 \times \frac{21}{5} = \frac{21}{5} = 4\frac{1}{5}$$

Question 9.

$$10\frac{1}{8} \text{ of } \frac{4}{5} \div \frac{35}{36} \text{ of } \frac{20}{49}$$

Solution:

$$10\frac{1}{8} \text{ of } \frac{4}{5} \div \frac{35}{36} \text{ of } \frac{20}{49}$$

Using BODMAS

$$\frac{81}{8} \text{ of } \frac{4}{5} \div \frac{35}{36} \text{ of } \frac{20}{49}$$

$$= \frac{81}{10} \div \frac{25}{63}$$

$$= \frac{81}{10} \times \frac{63}{25} = \frac{5103}{250}$$

$$= 20\frac{103}{250}$$

Question 10.

$$5\frac{3}{4} - \frac{3}{7} \times 15\frac{3}{4} + 2\frac{2}{35} \div 1\frac{11}{25}$$

Solution:

$$\frac{23}{4} - \frac{3}{7} \times \frac{63}{4} + \frac{72}{35} \div \frac{36}{25}$$

$$= \frac{23}{4} - \frac{3}{7} \times \frac{63}{4} + \frac{72}{35} \times \frac{25}{36}$$

$$= \frac{23}{4} - \frac{27}{4} + \frac{10}{7}$$

$$= \frac{161 - 189 + 40}{28} = \frac{201 - 189}{28} = \frac{12}{28} = \frac{3}{7}$$

Question 11.

$$\frac{3}{4} \text{ of } 7\frac{3}{7} - 5\frac{3}{5} \div 3\frac{4}{15}$$

Solution:

$$\frac{3}{4} \text{ of } 7\frac{3}{7} - 5\frac{3}{5} \div 3\frac{4}{15}$$

Using BODMAS

$$\frac{3}{4} \text{ of } \frac{52}{7} - \frac{28}{5} \div \frac{49}{15}$$

$$= \frac{39}{7} - \frac{28}{5} \div \frac{49}{15}$$

$$= \frac{39}{7} - \frac{28}{5} \times \frac{15}{49} = \frac{39}{7} - \frac{12}{7}$$

$$= \frac{39 - 12}{7} = \frac{27}{7} = 3\frac{6}{7}$$

EXERCISE 3 (E)

Question 1.

A line AB is of length 6 cm. Another line CD is of length 15 cm. What fraction is :

(i) The length of AB to that of CD ?

(ii) $\frac{1}{2}$ the length of AB to that of $\frac{1}{3}$ of CD ?

(iii) $\frac{1}{5}$ of CD to that of AB ?

Solution:

Length of line AB = 6 cm

and length of line CD = 15 cm

(*i*) Length of AB to length of

$$\text{CD} = \frac{6}{15} = \frac{2}{5}$$

(*ii*) $\frac{1}{2}$ of AB $= \frac{1}{2} \times 6 = 3$ cm

$\frac{1}{3}$ of CD $= \frac{1}{3} \times 15 = 5$ cm

$\therefore \frac{1}{2}$ of AB to $\frac{1}{3}$ of CD $= \frac{3}{5}$

(*iii*) $\frac{1}{5}$ of CD $= \frac{1}{5} \times 15 = 3$ cm.

$\therefore \frac{1}{5}$ of CD to that of AB $= \frac{3}{6} = \frac{1}{2}$ **Ans.**

Question 2.

Subtract $\frac{2}{7} - \frac{5}{21}$ from the sum of $\frac{3}{4}$, $\frac{5}{7}$ and $\frac{7}{12}$

Solution:

$$\left(\frac{3}{4}+\frac{5}{7}+\frac{7}{12}\right)-\left(\frac{2}{7}-\frac{5}{21}\right)$$

$$\left(\frac{63+60+49}{84}\right)-\left(\frac{6-5}{21}\right)$$

$$\frac{172}{84}-\frac{1}{21}=\frac{172-4}{84}=\frac{168}{84}=2 \text{ Ans.}$$

Question 3.

From a sack of potatoes weighing 120 kg, a merchant sells portions weighing 6 kg, $5\frac{1}{4}$ kg, $9\frac{1}{2}$ kg and $9\frac{3}{4}$ kg respectively.
(i) How many kg did he sell ?
(ii) How many kg are still left in the sack ?

Solution:

Total quantity of potatoes = 120 kg

(*i*) Quantity of potatoes he sold

$$= 6 \text{ kg} + 5\frac{1}{4}\text{kg} + 9\frac{1}{2}\text{kg} + 9\frac{3}{4}\text{kg}$$

$$= \left(6+\frac{21}{4}+\frac{19}{2}+\frac{39}{4}\right)\text{kg}$$

$$= \frac{24+21+38+39}{4}\text{kg}$$

$$= \frac{122}{4} = \frac{61}{2}\text{kg} = 30\frac{1}{2}\text{kg}.$$

(*ii*) Quantity of potatoes left

$$= 120 \text{ kg} - 30\frac{1}{2}\text{kg} = \left(\frac{120}{1}-\frac{61}{2}\right)\text{kg}$$

$$= \frac{240-61}{2} = \frac{179}{2}\text{kg} = 89\frac{1}{2}\text{kg}$$

Question 4.

If a boy works for six consecutive days for 8 hours, $7\frac{1}{2}$ hours, $8\frac{1}{4}$ hours, 6 $\frac{1}{4}$4 3hours, $6\frac{3}{4}$ hours and 7 hours respectively. How much money will he earn at the rate of Rs. 36 per hour ?

Solution:

No. of hours, a boy worked in 6 days

$$= 8 \text{ hrs} + 7\frac{1}{2} \text{ hrs} + 8\frac{1}{4} \text{ hrs} + 6\frac{1}{4} \text{ hrs} + 6\frac{3}{4} \text{ hrs} + 7 \text{ hrs}$$

$$= \left(8 + \frac{15}{2} + \frac{33}{4} + \frac{25}{4} + \frac{27}{4} + 7\right) \text{hours}$$

$$= \frac{32 + 30 + 33 + 25 + 27 + 28}{4} \text{ hours}$$

(LCM of 2, 4 = 4)

$$= \frac{175}{4} \text{ hours} = 43\frac{3}{4} \text{ hours}$$

Earning per hour = Rs. 36

$$\therefore \text{ Total earnings} = \text{Rs. } \frac{175}{4} \times 36$$

$$= \text{Rs. } 175 \times 9 = \text{Rs. } 1575$$ **Ans.**

Question 5.

A student bought $4\frac{1}{3}$ m of yellow ribbon, $6\frac{1}{6}$ m of red ribbon and $3\frac{2}{9}$ m of blue ribbon for decorating a room. How many metres of ribbon did he buy ?

Solution:

$$\text{Length of yellow ribbon} = 4\frac{1}{3}\text{ m} = \frac{13}{3}\text{ m}$$

$$\text{Length of red ribbon} = 6\frac{1}{6}\text{ m} = \frac{37}{6}\text{ m}$$

$$\text{Length of blue ribbon} = 3\frac{2}{9}\text{ m} = \frac{29}{9}\text{ m}$$

$$\text{Total length of ribbon} = \frac{13}{3} + \frac{37}{6} + \frac{29}{9}$$

$$= \frac{78 + 111 + 58}{18} \quad (\text{LCM of } 3, 6, 9 = 18)$$

$$= \frac{247}{18} = 13\frac{13}{18} \text{ metres } \textbf{Ans.}$$

Question 6.

In a business, Ram and Deepak invest $\frac{3}{5}$ and $\frac{2}{5}$ of the total investment. IfRs. 40,000 is the total investment, calculate the amount invested by each ?

Solution:

$$\text{Total investment} = \text{Rs. } 40{,}000$$

$$\text{Ram's investment} = \frac{3}{5} \text{ of Rs. } 40{,}000$$

$$= \text{Rs. } \frac{3}{5} \times 40.000$$

$$= \text{Rs. } 3 \times 8000 = \text{Rs. } 24{,}000$$

$$\text{Deepak's investment} = \frac{2}{5} \text{ of Rs. } 40000$$

$$= \text{Rs. } \frac{2}{5} \times 40000$$

$$= \text{Rs. } 2 \times 8000 = \text{Rs. } 16{,}000 \textbf{ Ans.}$$

Question 7.

Geeta had 30 problems for home work. She worked out $\frac{2}{5}$ of them. How many problems were still left to be worked out by her ?

Solution:

No. of problems of Geeta = 30

No. of problems worked out = $\frac{2}{3}$ of 30

$= \frac{2}{3} \times 30 = 20$

No. of problems left out = 30 – 20

= 10 **Ans.**

Question 8.

A picture was marked at Rs. 90. It was sold at $\frac{3}{4}$ of its marked price. What was the sale price ?

Solution:

Marked price = Rs. 90

Sale price = $\frac{3}{4}$ of Rs. 90 = $\frac{3}{4} \times 90$ ·

= Rs. $\frac{270}{4}$ = Rs. $67\frac{1}{2}$ = Rs. 67·50 **Ans.**

Question 9.

Mani had sent fifteen parcels of oranges. What was the total weight of the parcels, if each weighed $10\frac{1}{2}$ kg ?

Solution:

Total no. of parcels = 15

Weight of each parcel = $10\frac{1}{2}$ kg = $\frac{21}{2}$ kg

Total weight = 15 of $\frac{21}{2}$ kg = $\frac{21}{2} \times 15$ kg

= $\frac{315}{2} = 157\frac{1}{2}$ kg = 157·5 kg **Ans.**

Question 10.

A rope is $25\frac{1}{2}$ m long. How many pieces , $1\frac{1}{2}$ each of length can be cut out from it?

Solution:

$$\text{Total length of the rope} = 25\frac{1}{2}\text{ m} = \frac{51}{2}\text{ m}$$

$$\text{Length of each piece} = 1\frac{1}{2}\text{ m} = \frac{3}{2}\text{ m}$$

$$\therefore \text{No. of pieces} = \frac{51}{2} \div \frac{3}{2} = \frac{51}{2} \times \frac{2}{3}$$

$$= 17 \text{ pieces } \textbf{Ans.}$$

Question 11.

The heights of two vertical poles, above the earth's surface, are $14\frac{1}{4}$ m and $22\frac{1}{3}$ respectively. How much higher is the second pole as compared with the height of the first pole ?

Solution:

Height of one pole above earth's surface

$$= 14\frac{1}{4}\text{ m}$$

$$\text{and height of second pole} = 22\frac{1}{3}$$

$\therefore$ Second pole is higher than the first pole

$$= 22\frac{1}{3} - 14\frac{1}{4} = \frac{67}{3} - \frac{57}{4}$$

$$= \frac{268-171}{12} = \frac{97}{12}\text{ m} = 8\frac{1}{12}\text{ m}$$

Question 12.

Vijay weighed $65\frac{1}{2}$ kg. He gained $1\frac{2}{5}$ kg during the first week, $1\frac{1}{4}$ kg during the second week, but lost $\frac{5}{16}$ kg during the 16 third week. What was his weight after the third week ?

Solution:

In the beginning, weight of Vijay

$= 65\frac{1}{2}$ kg.

Gained in first week $= 1\frac{2}{5}$ kg.

Gained in the second week $= 1\frac{1}{4}$ kg

Lost in the third week $= \frac{5}{16}$ kg

$\therefore$ Weight of Vijay after third week

$$= \left(65\frac{1}{2} + 1\frac{2}{5} + 1\frac{1}{4} - \frac{5}{16}\right) \text{kg}$$

$$= \left(\frac{131}{2} + \frac{7}{5} + \frac{5}{4} - \frac{5}{16}\right) \text{kg}$$

$$= \frac{5240 + 112 + 100 - 25}{80}$$

{LCM of 2, 5, 4 and 16 = 80}

$$= \frac{5452 - 25}{80} = \frac{5427}{80} \text{kg} = 67\frac{67}{80} \text{kg}$$ **Ans.**

Question 13.

A man spends $\frac{2}{5}$ of his salary on food and $\frac{3}{10}$ on house rent, electricity, etc. What fraction of his salary is still left with him ?

Solution:

Let salary of man = Re. 1

$$\text{Amount spent on food} = \frac{2}{5} \text{ of Re. } 1 = \text{Re. } \frac{2}{5}$$

$$\text{and amount spent house rent} = \frac{3}{10} \text{ of Re. } 1$$

$$= \text{Re. } \frac{3}{10}$$

$$\text{Total amount spent} = \text{Re. } \frac{2}{5} + \frac{3}{10} = \frac{4+3}{10} = \frac{7}{10}$$

$$\therefore \text{Amount left with him} = 1 - \frac{7}{10} = \frac{10-7}{10} = \frac{3}{10}$$

Question 14.

A man spends $\frac{2}{5}$ of his salary on food and $\frac{3}{10}$ of the remaining on house rent, electricity, etc. What fraction of his salary is still left with him ?

Solution:

Let total amount of salary = Re. 1

$$\text{Amount spent on food} = \frac{2}{5} \text{ of Re. 1}$$

$$= \text{Rs. } \frac{2}{5}$$

$$\text{Remaining amount} = 1 - \frac{2}{5}$$

$$= \frac{5-2}{5} = \text{Rs. } \frac{3}{5}$$

Amount spent on house rent etc.

$$= \frac{3}{10} \text{ of } \frac{3}{5} = \text{Rs. } \frac{9}{50}$$

Remaining amount left

$$= \frac{3}{5} - \frac{9}{50}$$

$$= \text{Rs } \frac{30-9}{50} = \text{Rs. } \frac{21}{50}$$

$$\therefore \text{ Fraction of amount left} = \frac{21}{50}$$

Question 15.

Shyam bought a refrigerator for Rs. 5000. He paid $\frac{1}{10}$ of the price in cash and the rest in 12 equal monthly instalments. How much had he to pay each month ?

Solution:

Total amount of the refrigerator = Rs. 5000

Amount paid in cash = $\frac{1}{10}$ of Rs. 5000

$= \frac{1}{10} \times 5000 =$ Rs. 500

Balance amount = Rs. 5000 – Rs. 500

= Rs. 4500

No. of equally instalments = 12

∴ Amount of each instalment

$= \text{Rs. } 4500 \div 12 = \text{Rs. } 4500 \times \frac{1}{12}$

= Rs. 375 **Ans.**

Question 16.

A lamp post has half of its length in mud, and $\frac{1}{3}$ of its length in water.
(i) What fraction of its length is above the water ?
(ii) If $3\frac{1}{3}$ m of the lamp post is above the water, find the whole length of the lamp post.

Solution:

(i) Let length of the post = 1 m

then length of post in mud = $\frac{1}{2}$ m

and length of post in water = $\frac{1}{3}$ m

∴ Length of post above the water

$= 1 - \left(\frac{1}{2} + \frac{1}{3}\right) = 1 - \left(\frac{3+2}{6}\right)$

$= 1 - \frac{5}{6} = \frac{6-5}{6} = \frac{1}{6}$ m

(ii) But length of post above water

$= 3\frac{1}{3}\text{ m} = \frac{10}{3}$ m

∴ $\frac{1}{6}$th of total length = $\frac{10}{3}$ m

∴ Total length = $\frac{10}{3} \times \frac{6}{1} = 20$ m **Ans.**

Question 17.

I spent $\frac{3}{5}$ of my savings and still have Rs. 2,000 left. What were my savings ?

Solution:

Let my saving = 1, Part spent = $\frac{3}{5}$ of savings

$\therefore$ part left = $1 - \frac{3}{5} = \frac{5-3}{5} = \frac{2}{5}$ of savings

But he left = Rs. 2000

$\therefore \frac{2}{5}$ of savings = Rs. 2000

$\therefore$ Total savings = Rs. $2000 \times \frac{5}{2}$

= Rs. 5000 **Ans.**

Question 18.

In a school, $\frac{4}{5}$ of the children are boys. If the number of girls is 200, find the number of boys.

Solution:

No. of boys = $\frac{4}{5}$ of the total children

$\therefore$ No. of girls = $\left(1 - \frac{4}{5}\right)$ of total children

$= \frac{5-4}{5} = \frac{1}{5}$ of total children.

But no. of girls = 200

$\therefore \frac{1}{5}$ of total children = 200

Hence total number of children = $200 \times \frac{5}{1}$

= 1000

$\therefore$ No. of boys = $\frac{4}{5}$ of $1000 = \frac{4}{5} \times 1000$

= 800 **Ans.**

Question 19.

If $\frac{4}{5}$ of an estate is worth Rs. 42,000, find the worth of whole estate. Also, find the value of $\frac{3}{7}$ of it.

Solution:

$\frac{4}{5}$ of an estate = Rs. 42000

$\therefore$ Total value of estate = Rs. $42000 \times \frac{5}{4}$

= Rs. 10500×5 = Rs. 52500 **Ans.**

and value of $\frac{3}{7}$ of it = $\frac{3}{7}$ of its value

$= \frac{3}{7}$ of ₹52500 = ₹$\frac{3}{7} \times 52500$

= ₹3×7500 = ₹22500

Question 20.

After going $\frac{3}{4}$ of my journey, I find that I have covered 16 km. How much Journey is still left ?

Solution:

$\frac{3}{4}$ of journey = 16 km.

$\therefore$ Total Journey = 16 km $\times \frac{4}{3} = \frac{64}{3}$ km

$\therefore$ Journey Left $= \frac{64}{3} - \frac{16}{1}$

$= \frac{64 - 48}{3} = \frac{16}{3}$ km $= 5\frac{1}{3}$

Question 21.

When Krishna travelled 25 km, he found that $\frac{3}{5}$ of his journey was still left. What was the length of the whole journey.

Solution:

$\frac{3}{5}$ of the total journey was left

$\therefore$ Journey travelled by him $= 1 - \frac{3}{5}$

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

$\therefore \frac{2}{5}$ of total journey $= 25$ km

$\therefore$ Total journey $= 25 \text{ km} \times \frac{5}{2} = \frac{125}{2}$ km

$= 62\frac{1}{2}$ km

Question 22.

From a piece of land, one-third is bought by Rajesh and one-third of remaining is bought by Manoj. If 600 m² land is still left unsold, find the total area of the piece of land.

Solution:

Let the piece of land = 1 m

Land bought by Rajesh $= 1 \times \frac{1}{3} = \frac{1}{3}$ m

Remaining land $= 1 - \frac{1}{3} = \frac{3-1}{3} = \frac{2}{3}$ m

Now, Land bought by Manoj $= \frac{2}{3} \times \frac{1}{3} = \frac{2}{9}$ m

Land unsold $= \frac{2}{3} - \frac{2}{9}$

$= \frac{6-2}{9} = \frac{4}{9}$ m

Land of $\frac{4}{9}$ m remain unsold $= 600$ m^2

$\therefore$ Total area of the land $= 600 \times \frac{9}{4}$

$= 150 \times 9$ m^2 $= 1350$ m^2

Question 23.

A boy spent $\frac{3}{5}$ of his money on buying 1 cloth and $\frac{1}{4}$ of the remaining on buying shoes. If initially he has ?2,400; how much did he spend on shoes?

Solution:

Money in hand = ₹2400

Money spent on buying clothes

$= \frac{3}{5}$ of ₹2400

$= \frac{3}{5} \times 2400 = 3 \times 480 = ₹1440$

Remaining money = ₹2400 – ₹1440 = ₹960

Now, boy spent $\frac{1}{4}$ of the remaining money on buying shoes.

∴ Money spent on buying shoes

$= ₹960 \times \frac{1}{4} = ₹240$

Question 24.

A boy spent $\frac{3}{5}$ of his money on buying cloth and $\frac{1}{4}$ of his money on buying shoes.

Solution:

Money in hand = ₹2400

Money spent on buying clothes

$= \frac{3}{5}$ of ₹2400

$= \frac{3}{5} \times 2400 = ₹1440$

Remaining money = ₹2400 – ₹1440 = ₹960

Now, boy spent $\frac{1}{4}$ of the remaining money on buying shoes.

Money spent on buying shoes = $₹960 \times \frac{1}{4}$

= ₹240