Chapter 6
Fractions

Exercise 6.1

Question 1.

Write the following division as fractions:

(i) $3 \div 7$

(ii) $11 \div 78$

(iii) $113 \div 128$

Solution:

(i) $3 \div 7 = \frac{3}{7}$

(ii) $11 \div 78 = \frac{11}{78}$

(iii) $113 \div 128 = \frac{113}{128}$

Question 2.

Write the following fractions in words.

(i) $\frac{2}{7}$

(ii) $\frac{3}{10}$

(iii) $\frac{15}{28}$

Solution:

(i) $\frac{2}{7}$ = Two-seventh

(ii) $\frac{3}{10}$ = Three-Tenth

(iii) $\frac{15}{28}$ = fifteen – Twenty eighth

Question 3.

Write the following fractions in number form:

(i) one-sixth

(ii) three-eleventh,

(iii) seven – fortieth

(iv) thirteen – one hundred twenty fifth

Solution:

(i) one-sixth = $\frac{1}{6}$

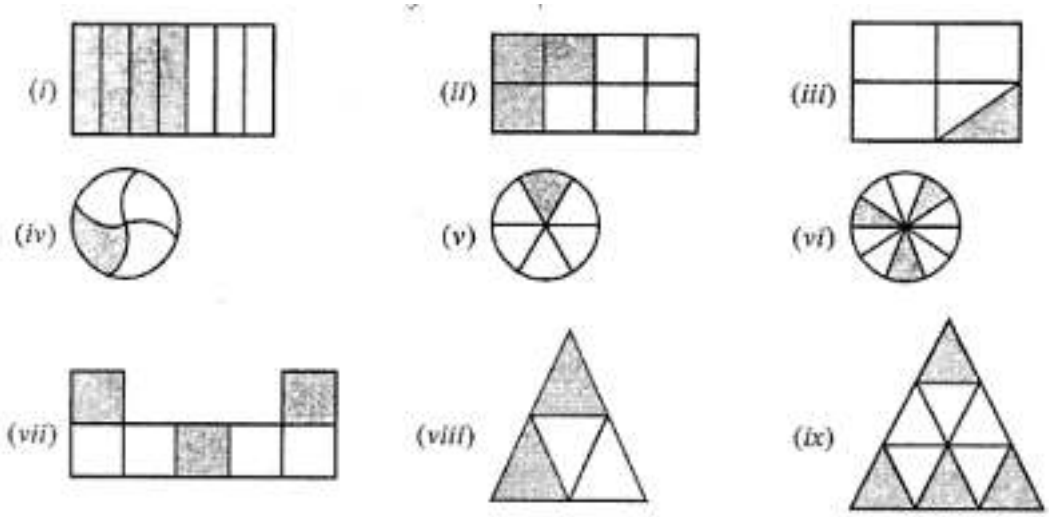
(ii) three-eleventh, = $\frac{3}{11}$

(iii) seven – fortieth = $\frac{7}{40}$

(iv) thirteen – one hundred twenty fifth = $\frac{13}{125}$

Question 4.

What fraction of each of the following is shaded part ?



Solution:

(i) $\frac{4}{7}$

(ii) $\frac{3}{8}$

(iii) $\frac{1}{8}$

(iv) $\frac{1}{4}$

(v) $\frac{1}{6}$

(vi) $\frac{3}{10}$

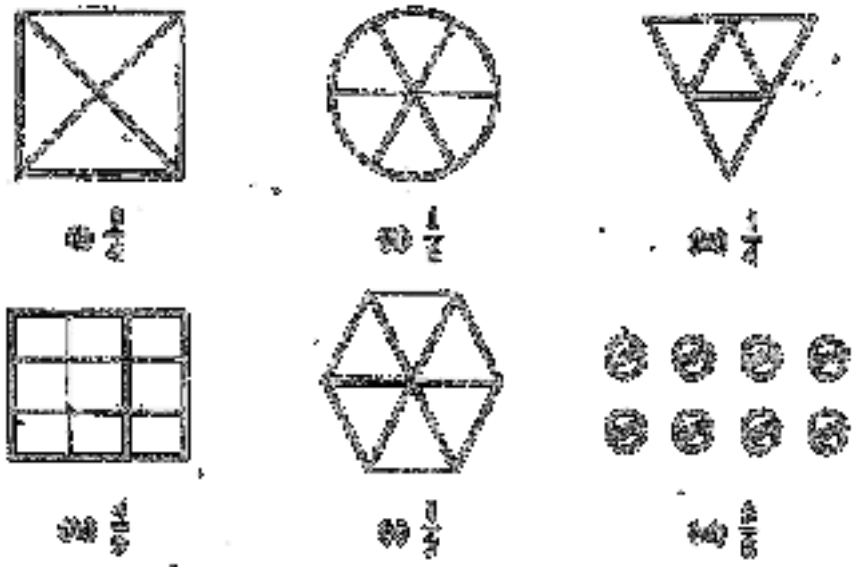
(vii) $\frac{3}{7}$

(viii) $\frac{2}{4}$

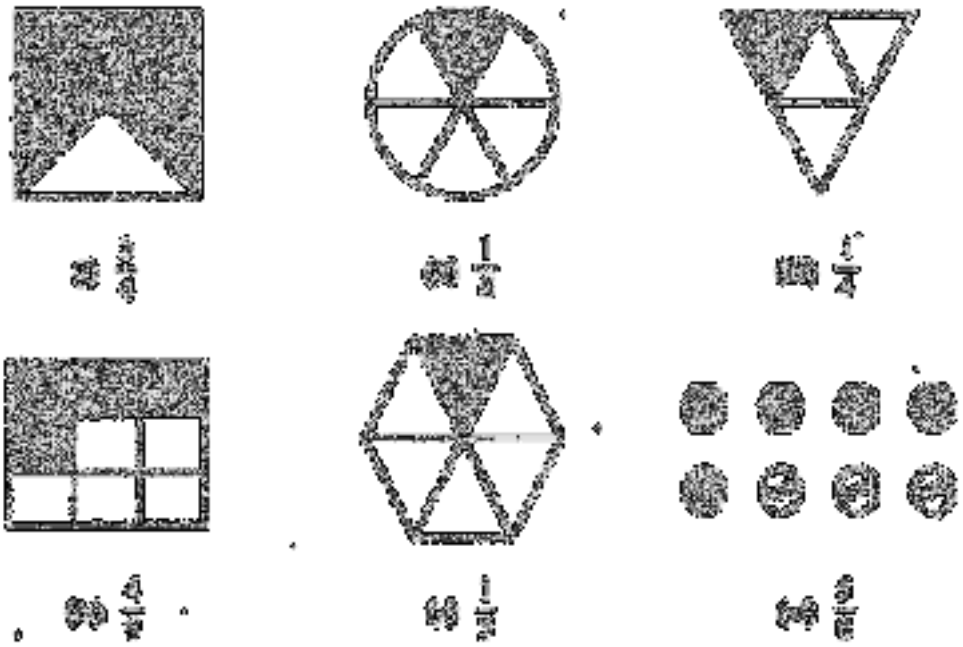
(ix) $\frac{4}{9}$

Question 5.

Shade the parts of the following figures according to given fractions:

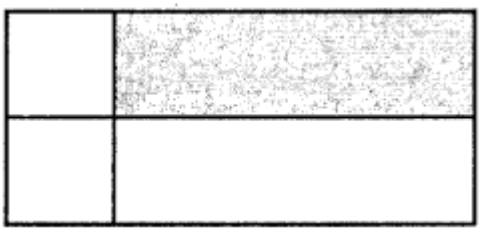


Solution:



Question 6.

In the adjoining figure, if we say that the shaded region is $\frac{1}{4}$ of the whole region, then identity the error in it.



Solution:

The whole rectangle is not divided into four equal parts.

Question 7.

Write the fraction in which

(i) Numerator = 5 and denominator = 13

(ii) denominator = 23 and numerator = 17

Solution:

(i) $\frac{5}{13}$

(ii) $\frac{17}{23}$

Question 8.

Shabha has to stitch 35 dresses. So, ar she has stitche 21 dresses. What fraction of dresses has she stitched ?

Solution:

Number of dresses she had to stiches = 35

Number of dresses she has finished = 21

∴ Fraction of dresses she has finished = $\frac{21}{35} = \frac{3}{5}$

Question 9.

What fraction of a day is 8 hours ?

Solution:

Number of hours in a day = 24 hours

∴ Required fraction = $\frac{8}{24}$

Question 10.

What fraction of an hour is 45 minutes?

Solution:

An hour (1 hour) = 60 minutes

∴ Required fraction = $\frac{45}{60}$

Question 11.

How many natural numbers are there from 87 to 97 ? What fraction of them are prime numbers ?

Solution:

The natural numbers from 87 to 97 are 87, 88, 89, 90, 91, 92, 93, 94, 95, 96 and 97. Total number of natural number = 11 out of these,

the prime numbers are 87 and 97

Total number of these prime numbers = 2

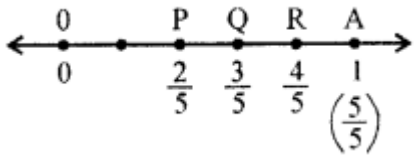
∴ Required fraction = $\frac{2}{11}$

Exercise 6.2

Question 1.

Show the fractions 25, 35, 45 and 55 on a number line.

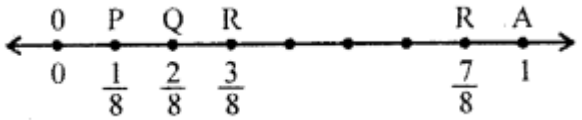
Solution:



Question 2.

Show $\frac{1}{8}$, $\frac{2}{8}$, $\frac{3}{8}$ and $\frac{7}{8}$ on a number line.

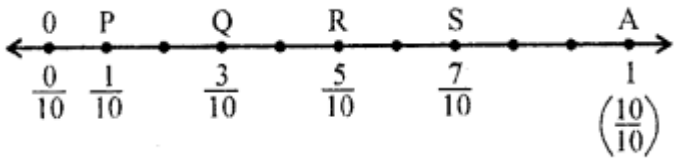
Solution:



Question 3.

Show $\frac{0}{10}$, $\frac{1}{10}$, $\frac{3}{10}$, $\frac{5}{10}$, $\frac{7}{10}$ and $\frac{10}{10}$ on a number line.

Solution:



Exercise 6.3

Question 1.

State which of the following fractions are proper, improper or mixed :

Solution:

(i) $\frac{15}{26}$

(ii) $\frac{17}{12}$

(iii) $5\frac{2}{3}$

(iv) $\frac{6}{8}$

(v) $11\frac{5}{7}$

(vi) $\frac{117}{8}$

(vii) $\frac{222}{333}$

(viii) $\frac{531}{247}$

Solution:

(i) $\frac{15}{26}$ = proper

(ii) $\frac{17}{12}$ = improper

(iii) $5\frac{2}{3}$ = mixed

(iv) $\frac{6}{8}$ = proper

(v) $11\frac{5}{7}$ = mixed

(vi) $\frac{117}{8}$ = improper

(vii) $\frac{222}{333}$ = proper

(viii) $\frac{531}{247}$ = improper

Question 2.

Convert the following improper fractions into mixed number:

(i) $\frac{17}{3}$

(ii) $\frac{119}{15}$

(iii) $\frac{961}{13}$

(iv) $\frac{117}{32}$

Solution:

(i) $\frac{17}{3} = 5\frac{2}{3}$

(ii) $\frac{119}{15} = 7\frac{14}{15}$

(iii) $\frac{961}{13} = 73\frac{12}{13}$

(iv) $\frac{117}{32} = 3\frac{21}{32}$

Question 3.

Convert the following mixed number into improper fractions:

(i) $7\frac{2}{11}$

(ii) $3\frac{5}{48}$

(iii) $13\frac{7}{64}$

(iv) $7\frac{2}{3}$

Solution:

(i) $7\frac{2}{11} = \frac{11 \times 7+2}{11}$

$= \frac{79}{11}$

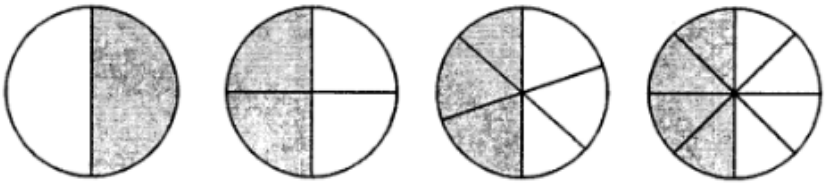
(ii) $3\frac{5}{48} = \frac{48\times3+5}{48} = \frac{149}{48}$

(iii) $13\frac{7}{64} = \frac{64\times13+7}{64} = \frac{832+7}{64} = \frac{839}{64}$

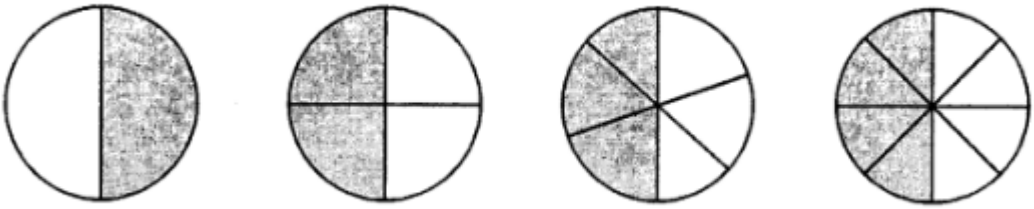
(iv) $7\frac{2}{3} = \left(7\frac{2}{3}\right) = \left(\frac{3\times7+2}{3}\right) = \frac{23}{3}$

Question 4.

Write the fractions representing the shaded regions. Are all these fractions equivalent ?



Solution:

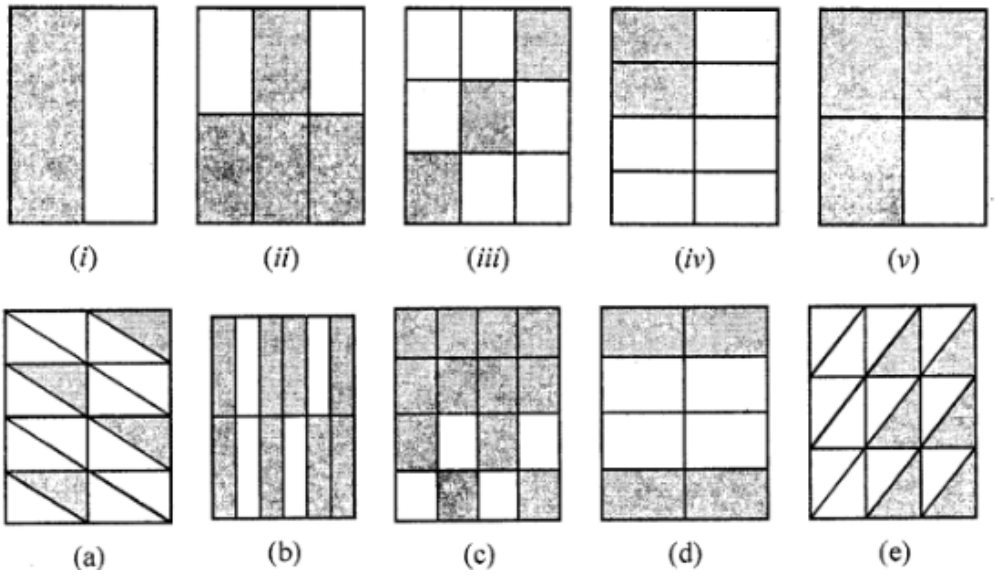


$\frac{1}{2}$ $\frac{2}{4} = \frac{2\div2}{4\div2} = \frac{1}{2}$ $\frac{3}{6} = \frac{3\div3}{6\div3} = \frac{1}{2}$ $\frac{4}{8} = \frac{4\div4}{8\div4} = \frac{1}{2}$

Yes, all the fractions are equivalent.

Question 5.

Write the fractions representing the shaded regions and pair up the equivalent fractions from each row:



Solution:

(i) $\frac{1}{2}$

(ii) $\frac{4}{6} = \frac{2}{3}$

(iii) $\frac{3}{9} = \frac{1}{3}$

(iv) $\frac{2}{8} = \frac{1}{4}$

(v) $\frac{3}{4}$

(a) $\frac{4}{16} = \frac{1}{4}$

(b) $\frac{8}{12} = \frac{2}{3}$

(c) $\frac{12}{16} = \frac{3}{4}$

(d) $\frac{4}{8} = \frac{1}{2}$

(e) $\frac{6}{18} = \frac{1}{3}$

Equivalent fractions are:

(i) ↔ (d)

(ii) ↔ (b)

(iii) ↔ (e)

(iv) ↔ (a)

(v) ↔ (c)

Question 6.

(i) Find the equivalent fraction of $\frac{15}{35}$ with denominator 7.

(ii) Find the equivalent fraction of $\frac{2}{9}$ with denominator 63.

Solution:

(i) $\frac{15}{35} = \frac{....}{7}$

Let the numerator be a

$\Rightarrow 15 \times 7 = 35 \times a$

$a = \frac{15 \times 7}{35}$

$\Rightarrow a = 3$

$\therefore \frac{15}{35} = \frac{3}{7}$

(ii) $\frac{2}{9} = \frac{....}{63}$

Let the numerator, which needs to be calculated as x

$\Rightarrow 2 \times 63 = 9 \times x$

$x = \frac{2 \times 63}{9}$

$\Rightarrow x = 14$

$\therefore \frac{2}{9} = \frac{14}{63}$

Question 7.

Find the equivalent fraction of $\frac{3}{5}$ having

(i) denominators 30

(ii) numerator 27.

Solution:

(i) $\frac{3}{5}$ having denominator 30

Multiply and divide the fraction by 6, we get

$\frac{3}{5} \times \frac{6}{6} = \frac{18}{30}$

(ii) $\frac{3}{5}$ having numerator 27

Multiply and divide the fraction by 9, we get

$\frac{3}{5} \times \frac{9}{9} = \frac{27}{45}$

Question 8.

Replace '……' in each of the following by the correct number.

(i) $\frac{2}{3} = \frac{....}{15}$

(ii) $\frac{7}{18} = \frac{42}{...}$

(iii) $\frac{4}{....} = \frac{12}{15}$

(iv) $\frac{...}{11} = \frac{70}{154}$

Solution:

(i) $\frac{2}{3} = \frac{2\times5}{3\times5} = \frac{10}{15}$

Hence '……' is replaced by 10.

(ii) $\frac{7}{18} = \frac{7\times6}{18\times6} = \frac{42}{108}$

Hence '……' is replaced by 108.

(iii) $\frac{4}{5} = \frac{4\times3}{5\times3} = \frac{12}{15}$

Hence '……' is replaced by 5.

(iv) $\frac{5}{11} = \frac{5\times14}{11\times14} = \frac{70}{154}$

Hence '…….' is replaced by 5.

Question 9.

Check whether the given pairs of fractions are equivalent :

(i) $\frac{3}{10}, \frac{12}{40}$

(ii) $\frac{5}{8}, \frac{30}{48}$

(iii) $\frac{4}{6}, \frac{30}{20}$

(iv) $\frac{7}{13}, \frac{5}{11}$

Solution:

(i) $\frac{3}{10}, \frac{12}{40}$

$= 3 \times 40 = 120$

$= 10 \times 12 = 120$

$= 120 = 120$

∴ The given fractions $\frac{3}{10}$ and $\frac{12}{40}$ are equivalent.

(ii) $\frac{5}{8}, \frac{30}{48}$

$= 5 \times 48 = 240$

$= 30 \times 8 = 240$

$= 240 = 240$

∴ The given fractions $\frac{5}{8}$ and $\frac{30}{48}$ are equivalent.

(iii) $\frac{4}{6}, \frac{30}{20}$

Solutions :

$= 4 \times 20 = 80$

$= 6 \times 30 = 180$

$80 \neq 180$

$\therefore$ The given fractions $\frac{4}{6}$ and $\frac{30}{20}$ are equivalent.

(iv) $\frac{7}{13}, \frac{5}{11}$

$= 7 \times 11 = 77$

$= 5 \times 13 = 65$

$77 \neq 65$

$\therefore$ The given fractions $\frac{7}{13}$ and $\frac{5}{11}$ are equivalent.

Question.10

Reduce the following fractions to simplest form:

(i) $\frac{12}{27}$

(ii) $\frac{150}{350}$

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

(iv) $\frac{276}{115}$

Solution:

(i) $\frac{12}{27} = \frac{12 \div 3}{27 \div 3} = \frac{4}{9}$

(ii) $\frac{150}{350} = \frac{150 \div 50}{350 \div 50} = \frac{3}{7}$

(iii) $\frac{18}{81} = \frac{18\div9}{81\div9} = \frac{2}{9}$

(iv) $\frac{276}{115} = \frac{276\div23}{115\div23} = \frac{12}{5}$

Question 11.

Convert the following fractions into equivalent like fractions:

(i) $\frac{7}{8}, \frac{5}{14}$

(ii) $\frac{5}{6}, \frac{7}{16}$

(iii) $\frac{3}{4}, \frac{5}{6}, \frac{7}{8}$

Solution:

(i) $\frac{7}{8}, \frac{5}{14}$

The LCM of 8 and 14

2	8 , 14
2	4, 7
2	2, 7
7	1, 7
	1, 1

$= 2 \times 2 \times 2 \times 7 = 56$

To write $\frac{7}{8}$ with denominator 56, multiply the numerator and denominator by 7

$= \frac{7\times7}{8\times7} = \frac{49}{56}$

Similarly, $\frac{5}{14} = \frac{5\times4}{14\times4} = \frac{20}{56}$

Thus, $\frac{7}{8}$, $\frac{5}{14}$ can be written as $\frac{49}{56}$ and $\frac{20}{56}$ respectively which are equivalent like fractions.

(ii) $\frac{5}{6}, \frac{7}{16}$

The LCM of 6 and 16

2	6, 16
2	3, 8
2	3, 4
2	3, 2
3	3, 1
	1, 1

$= 2 \times 2 \times 2 \times 2 \times 3 = 48$

To write $\frac{5}{6}$ with denominator 48, multiply the numerator and denominator by 8

$= \frac{5\times8}{6\times8} = \frac{40}{48}$

Similarly, $\frac{7}{16} = \frac{7\times3}{16\times3} = \frac{21}{48}$

Thus, $\frac{5}{6}$, $\frac{7}{16}$ can be written as $\frac{40}{48}$ and $\frac{21}{48}$ respectively with equivalent like fractions.

(iii) $\frac{3}{4}, \frac{5}{6}, \frac{7}{8}$

The LCM of 4, 6 and 8

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

$= 2 \times 2 \times 2 \times 3 = 24$

To write $\frac{3}{4}$ with denominator = 24 we need to multiply numerator and denominator by 6

$= \frac{3}{4} \times \frac{6}{6} = \frac{18}{24}$

Similarly, $\frac{5}{6}$ and $\frac{7}{8}$ can be written as

$\frac{5}{6} \times \frac{4}{4} = \frac{20}{24}$

and

$\frac{7}{8} \times \frac{3}{3} = \frac{21}{24}$

Hence, $\frac{3}{4}, \frac{5}{6}, \frac{7}{8}$ can be written as $\frac{18}{24}, \frac{20}{24}, \frac{21}{24}$ respectively.

Which are equivalent like terms.

Exercise 6.4

Question 1. Show the fractions $\frac{1}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}, \frac{6}{6}$ and $\frac{8}{6}$ on the number line. Replace '……' byy an appropriate sign " between given fractions:

(i) $\frac{5}{6} \ldots . \frac{3}{6}$

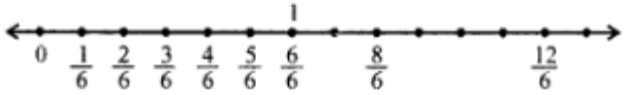
(ii) $\frac{2}{6} \ldots .0$

(iii) $\frac{4}{6} \ldots . \frac{6}{6}$

(iv) $\frac{8}{6} \ldots . \frac{5}{6}$

Solution:

Number line



(i) $\frac{5}{6} > \frac{3}{6}$

(ii) $\frac{2}{6} > 0$

(iii) $\frac{4}{6} < \frac{6}{6}$

(iv) $\frac{8}{6} > \frac{5}{6}$

Question 2.

Compare the given fractions and replace '…..' by an appropriate sign"

(i) $\frac{3}{6}$ ……..$\frac{5}{6}$

(i) $\frac{3}{6}$ … . $\frac{5}{6}$

(ii) $\frac{2}{7}$ … . . $\frac{2}{5}$

(iii) $\frac{3}{5}$ … . $\frac{4}{5}$

(iv) $\frac{4}{7}$ … . . $\frac{4}{9}$

Solution:

(i) $\frac{3}{6}$ ……..$\frac{5}{6}$

[As these are like fractions with denominator 6]

Since 3 < 5

$\therefore \frac{3}{6} < \frac{5}{6}$]

(ii) $\frac{2}{7} < \frac{2}{5}$

[Since these are unlike fractions with same numerator 2]

Since 5 < 7

$\therefore \frac{2}{7} < \frac{2}{5}$]

(iii) $\frac{3}{5} < \frac{4}{5}$

[As these are like fractions with denominator 5]

Since 3 < 4

$\therefore \frac{3}{5} < \frac{4}{5}]$

(iv) $\frac{4}{7} \ldots\ldots \frac{4}{9}$

[As these are unlike fractions with 4 as numerator]

Since 7 < 9

$\therefore \frac{4}{7} \ldots\ldots \frac{4}{9}]$

Question : 3

Replace '….' by an appropriate sing '<, = or >' between the given fractions:

(i) $\frac{1}{2} \ldots\ldots \frac{1}{5}$

(ii) $\frac{2}{4} \ldots\ldots \frac{3}{6}$

(iii) $\frac{7}{9} \ldots\ldots \frac{3}{9}$

(iv) $\frac{3}{4} \ldots\ldots \frac{2}{8}$

Solution:

(i) $\frac{1}{2} > \frac{1}{5}$

As in denominator $2 > 5$; $\therefore \frac{1}{2} > \frac{1}{5}$

(ii) $\frac{2}{4} = \frac{3}{6} \Rightarrow \frac{1}{2} = \frac{1}{2}$

$$\left[\because \frac{2}{4} = \frac{1}{2} \ and \ \frac{3}{6} = \frac{1}{2}\right]$$

(iii) $\frac{7}{9} > \frac{3}{9}$ $\quad [\because As \ \ in \ Numerator \ \ 3 < 7]$

(iv) $\frac{3}{4} > \frac{2}{8}$

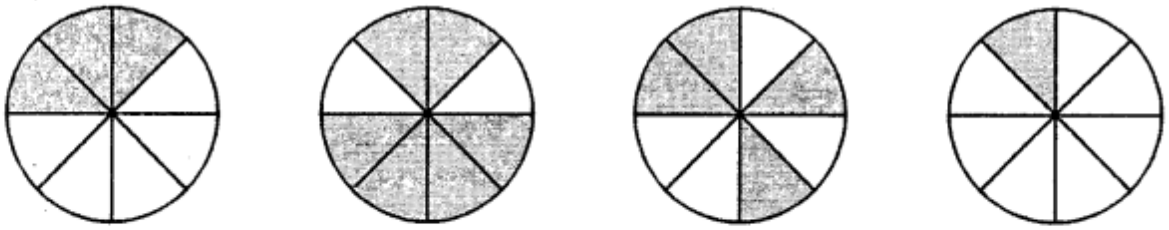
[As $\frac{2}{8} = \frac{1}{4}$ and in Numerator $3 > 1$]

$\frac{3}{4} > \frac{1}{4}$ i.e. $\frac{3}{4} > \frac{2}{8}$]

Question 4.

Write the shaded portions as fractions. Arrange them in ascending order using appropriate sign between fractions:

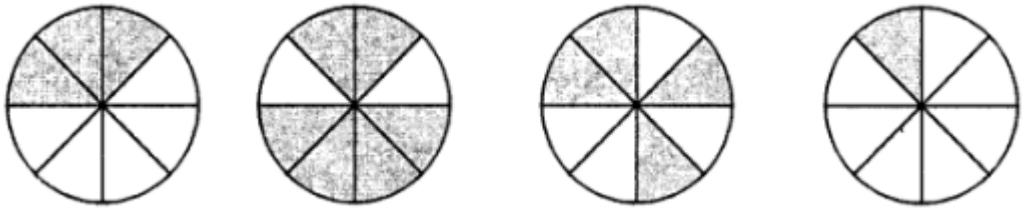
(i)



(ii)

Solution:

(i)

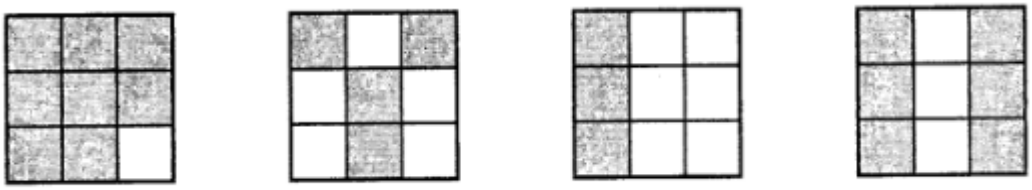


$\frac{3}{8}$ $\frac{6}{8}$ $\frac{4}{8}$ $\frac{1}{8}$

In ascending Order, these are

$\frac{1}{8}, \frac{3}{8}, \frac{4}{8}, \frac{6}{8}$ i.e. $\frac{1}{8} < \frac{3}{8} < \frac{4}{8} < \frac{6}{8}$

(ii)



$\frac{8}{9}$ $\frac{4}{9}$ $\frac{3}{9}$ $\frac{6}{9}$

In ascending Order, these are

$\frac{3}{9}, \frac{4}{9}, \frac{6}{9}, \frac{8}{9}$ i.e., $\frac{3}{9} < \frac{4}{9} < \frac{6}{9} < \frac{8}{9}$

Question 5.

Compare the following pairds of fractions

(i) $\frac{5}{9}$ and $\frac{4}{5}$

(ii) $\frac{9}{16}$ and $\frac{5}{9}$

Solution:

(i) $\frac{5}{9}$ and $\frac{4}{5}$

LCM of and $5 = 9 \times 5 = 45$

Write given fraction as like fraction

Now, $\frac{5}{9} \Rightarrow \frac{5\times5}{9\times5} = \frac{25}{45}$

and $\frac{4}{5} \Rightarrow \frac{4\times9}{5\times9} = \frac{36}{45}$

Here, $\frac{25}{45} < \frac{36}{45}$

$\therefore \quad \frac{5}{9} < \frac{4}{5}$

(ii) $\frac{9}{16}$ and $\frac{5}{9}$

LCM of 16 and 9 = 144

Write given fraction as like fraction

Now, $\frac{9}{16} \Rightarrow \frac{9\times9}{16\times9} = \frac{81}{144}$

and $\frac{5}{9} \Rightarrow \frac{5\times16}{9\times16} = \frac{80}{144}$

Here, $\frac{81}{144} > \frac{80}{144}$

$\therefore \quad \frac{9}{16} > \frac{5}{9}$

Question 6.

Fill in the boxes by the symbol < or > to make the given statements true :

(i) $\frac{5}{11} \ldots \frac{3}{7}$

(ii) $\frac{8}{15} \ldots \frac{3}{5}$

(iii) $\frac{11}{14} \ldots \frac{29}{35}$

(iv) $\frac{13}{27} \ldots \frac{15}{48}$

Solution:

(i) $\frac{5}{11} > \frac{3}{7}$

(ii) $\frac{8}{15} < \frac{3}{5}$

(iii) $\frac{11}{14} < \frac{29}{35}$

(iv) $\frac{13}{27} > \frac{15}{48}$

Question 7.

Arrange the given fractions in descending order:

(i) $\frac{5}{17}, \frac{4}{9}, \frac{7}{12}$

(ii) $\frac{7}{12}, \frac{11}{36}, \frac{37}{72}$

Solution:

(i) $\frac{5}{17}, \frac{4}{9}, \frac{7}{12}$

The LCM of 17, 9 and 12

$= 3 \times 3 \times 17 \times 4 = 612$

Make above fractions as like fractions

$\frac{5}{17} \Rightarrow \frac{5 \times 36}{17 \times 36} = \frac{180}{612}$

$\frac{4}{9} \Rightarrow \frac{4 \times 68}{9 \times 68} = \frac{272}{612}$

$\frac{7}{12} \Rightarrow \frac{7\times51}{12\times51} = \frac{357}{612}$

Here, $\frac{357}{612} > \frac{272}{612} > \frac{180}{612}$

Hence, in descending order, these are

$\frac{7}{12} > \frac{4}{9} > \frac{5}{17}$

(ii) $\frac{7}{12}, \frac{11}{36}, \frac{37}{72}$

The LCM of 12, 36, 76

$= 2 \times 2 \times 3 \times 3 \times 2 = 72$

Make above fractions as like fractions

$\frac{7}{12} \Rightarrow \frac{7\times6}{12\times6} = \frac{42}{72}$

$\frac{11}{36} \Rightarrow \frac{11\times2}{36\times2} = \frac{22}{72}$

$\frac{37}{72} \Rightarrow \frac{37\times1}{72\times1} = \frac{37}{72}$

In descending, order these are

Hence, $\frac{42}{72} > \frac{37}{72} > \frac{11}{36}$

Question 8.

Arrange the given fractions in the ascending order:

(i) $\frac{7}{8}, \frac{15}{16}, \frac{5}{6}$

(ii) $\frac{3}{4}, \frac{15}{22}, \frac{26}{33}$

(iii) $\frac{5}{12}, \frac{1}{4}, \frac{7}{8}, \frac{5}{6}$

Solution:

(i) $\frac{7}{8}, \frac{15}{16}, \frac{5}{6}$

LCM of 8, 16, 6 = 48

Making them in like fractions

$\frac{7}{8} \Rightarrow \frac{7\times6}{8\times6} = \frac{42}{48}$

$$\frac{15}{16} \Rightarrow \frac{15 \times 3}{16 \times 3} = \frac{45}{48}$$

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

In ascending order, these are

Hence, $\frac{40}{48}, \frac{42}{48}, \frac{45}{48}$

$$\frac{5}{6} < \frac{7}{8} < \frac{15}{16}$$

(ii) $\frac{3}{4}, \frac{15}{22}, \frac{26}{33}$

LCM of 4, 22 and 33 = 132, So Making them in like fractions

$\frac{3}{4} \Rightarrow \frac{3\times33}{4\times33} = \frac{99}{132}$

$\frac{15}{22} \Rightarrow \frac{15\times6}{22\times6} = \frac{90}{132}$

$\frac{26}{33} \Rightarrow \frac{26\times4}{33\times4} = \frac{104}{132}$

$\frac{90}{132} < \frac{99}{132} < \frac{104}{132}$

Hence, $\frac{15}{22} < \frac{3}{4} < \frac{26}{33}$

(iii) $\frac{5}{12}, \frac{1}{4}, \frac{7}{8}, \frac{5}{6}$

The LCM of 12, 4, 8, 6 = 24

Hence, Making them in like fractions

$\frac{5}{12} \Rightarrow \frac{5\times2}{12\times2} = \frac{10}{24}$

$\frac{1}{4} \Rightarrow \frac{1\times6}{4\times6} = \frac{6}{24}$

$\frac{7}{8} \Rightarrow \frac{7\times3}{8\times3} = \frac{21}{24}$

$\frac{5}{6} \Rightarrow \frac{5\times4}{6\times4} = \frac{20}{24}$

As $\frac{6}{24} < \frac{10}{24} < \frac{20}{24} < \frac{21}{24}$

Hence the given fraction in ascending order are

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

Exercise 6.5

Question 1.

Work out the following:

(i) $\frac{8}{15} + \frac{3}{15}$

(ii) $\frac{12}{15} - \frac{7}{15}$

(iii) $1 - \frac{2}{3}$

(iv) $\frac{7}{13} + \frac{2}{13} - \frac{5}{13}$

(v) $2\frac{4}{5} + 3\frac{3}{5}$

(vi) $3\frac{2}{7} - 1\frac{4}{7}$.

Solution:

(i) $\frac{8}{15} + \frac{3}{15}$

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

$= \frac{11}{15}$

(ii) $\frac{12}{15} - \frac{7}{15}$

$= \frac{12-7}{15} = \frac{5}{15} = \frac{1}{3}$

(iii) $1 - \frac{2}{3}$

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

$= \frac{1}{3}$

(iv) $\frac{7}{13} + \frac{2}{13} - \frac{5}{13}$

$= \frac{7+2-5}{13}$

$= \frac{4}{13}$

(v) $2\frac{4}{5} + 3\frac{3}{5} = \frac{14}{5} + \frac{18}{5}$

$= \frac{14+18}{5}$

$= \frac{32}{5}$

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

(vi) $3\frac{2}{7} - 1\frac{4}{7}$

$= \frac{23}{7} - \frac{11}{7}$

$= \frac{23-11}{7}$

$= \frac{12}{7}$

$= 1\frac{5}{7}$

Question 2.
Find in the missing fractions:

(i) $\frac{7}{10}$ - □ $= \frac{3}{10}$

(ii) □ $+ \frac{5}{27} = \frac{12}{27}$

(iii) □ $- \frac{5}{7} = \frac{2}{7}$

solution:

(i) $\frac{7}{10}$ - □ $= \frac{3}{10}$

Let the missing number be x.

$\Rightarrow \frac{7}{10} - x = \frac{3}{10}$

$\Rightarrow - x = \frac{3}{10} - \frac{7}{10}$

$\Rightarrow - x = \frac{-4}{10}$

$\Rightarrow x = \frac{4}{10}$

(ii) $x + \frac{5}{27} = \frac{12}{27}$

Let the missing number be x.

$\Rightarrow x + \frac{5}{27} = \frac{12}{27}$

$\Rightarrow x = \frac{12}{27} - \frac{5}{27}$

$\Rightarrow x = \frac{7}{27}$

(iii) $\square - \frac{5}{7} = \frac{2}{7}$

Let the missing number be x.

$\Rightarrow x - \frac{5}{7} = \frac{2}{7}$

$\Rightarrow x = \frac{2}{7} + \frac{5}{7}$

$\Rightarrow x = \frac{2+5}{7}$

$\Rightarrow x = \frac{7}{7}$

$\Rightarrow x = 1$

Question 3.

Work out the following:

(i) $\frac{2}{3} + \frac{3}{4}$

(ii) $\frac{5}{7} - \frac{4}{9}$

(iii) $\frac{1}{2} + \frac{3}{5}$

(iv) $1\frac{4}{9} + 3\frac{5}{12}$

(v) $2\frac{1}{4} - 1\frac{7}{10}$

(vi) $3\frac{5}{6} - 2\frac{7}{15}$

Solution:

(i) $\frac{2}{3} + \frac{3}{4}$ (L.C.M. of 3 and 4 = 12)

$= \frac{(2\times4) \times (3\times3)}{12}$

$= \frac{8+9}{12}$

$= \frac{17}{12}$

$= 1\frac{5}{12}$

(ii) $\frac{5}{7} - \frac{4}{9}$

(L.C.M. of 7 and 9 = 63)

$= \frac{(5\times9)-(7\times4)}{63}$

$= \frac{45-28}{63}$

$= \frac{17}{63}$

(iii) $\frac{1}{2} + \frac{3}{5}$

(L.C.M. of 2 and 5 = 10)

$= \frac{(1\times5)+(3\times2)}{10} = \frac{5+6}{10}$

$= \frac{11}{10}$

$= 1\frac{1}{10}$

(iv) $1\frac{4}{9} + 3\frac{5}{12}$

$\Rightarrow \frac{13}{9} + \frac{41}{12}$

(L.C.m. of 9 and 12 =36)

$= \frac{(13 \times 4)+(41 \times 3)}{36}$

$= \frac{52+123}{36}$

$= \frac{175}{36}$

$= 4\frac{31}{36}$

(v) $2\frac{1}{4} - 1\frac{7}{10}$

$\Rightarrow \frac{9}{4} - \frac{17}{10}$ (L.C.M. of 4 and 10 =20)

$= \frac{(9\times5)-(17\times2)}{20}$

$= \frac{45-34}{20}$

$= \frac{11}{20}$

(vi) $3\frac{5}{6} - 2\frac{7}{15}$

$\Rightarrow \frac{23}{6} - \frac{37}{15}$

(L.C.M. of 6 and 15 = 30)

$= \frac{(23 \times 5) - (37 \times 2)}{30}$

$\Rightarrow \frac{115 - 74}{30}$

$= \frac{41}{30}$

$= 1\frac{11}{30}$

Question 4.

Simplify the following:

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

(ii) $3\frac{2}{9} + 2\frac{1}{3} + 2\frac{7}{12}$

(iii) $\frac{7}{12} + \frac{8}{9} - \frac{5}{6}$

(iv) $1\frac{3}{25} + \frac{7}{20} - \frac{2}{5}$

(v) $1\frac{13}{14} - 2\frac{5}{6} + 1\frac{6}{7}$

(vi) $\frac{3}{1} - 1\frac{1}{6} - \frac{7}{15}$

(vii) $5 - 4\frac{3}{8} + \frac{17}{18}$

(viii) $2\frac{3}{14} - 3\frac{5}{6} - \frac{2}{5} + 2\frac{1}{2}$

Solution:

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

3	3 – 2 - 4
2	1 – 2 – 4
	1 – 1 – 2

L.C.M. of 3, 2 and 4 = 12

$\Rightarrow \frac{5}{3} + \frac{5}{2} + \frac{3}{4}$

$\Rightarrow \frac{5\times4+5\times6+3\times3}{12}$

$\Rightarrow \frac{20+30+9}{12}$

$\Rightarrow \frac{59}{12}$

$\Rightarrow 4\frac{11}{12}$

(ii) $3\frac{2}{9} + 2\frac{1}{3} + 2\frac{7}{12}$

(L. C. M. of 9, 3 and 12 = 36)

$= \frac{29}{9} + \frac{7}{3} + \frac{31}{12}$

3	9 – 3 – 12
3	3 – 1 – 4
	1 – 1 – 4

$= \frac{29 \times 4 + 7 \times 12 + 31 \times 3}{36}$

$= \frac{116 + 84 + 93}{36}$

$= \frac{293}{36}$

$= 8\frac{5}{36}$

(iii) $\frac{7}{12} + \frac{8}{9} - \frac{5}{6}$

(L.C.M. of 12, 9, 6 = 36)

3	12 – 9 – 6
2	4 – 3 – 2
2	2 – 3 – 1
3	1 – 3 – 1
	1 – 1 – 1

$= \frac{7\times3 + 8\times4 - 5\times6}{36}$

$= \frac{53-30}{36}$

$= \frac{23}{36}$

(iv) $1\frac{3}{25} + \frac{7}{20} - \frac{2}{5}$

(L.C.M. 25, 20,5 = 100)

$\Rightarrow \frac{28}{25} + \frac{7}{20} - \frac{2}{5}$

$\Rightarrow \frac{28\times4+7\times5-2\times20}{100}$

$\Rightarrow \frac{112+35-40}{100}$

$= \frac{147-40}{100}$

$= \frac{107}{100}$

$= 1\ \frac{7}{100}$

(v) $1\frac{13}{14} - 2\frac{5}{6} + 1\frac{6}{7}$

Solution:

(L.C.M. of 14, 6 ,7 = 42)

$= \frac{27}{14} - \frac{17}{6} + \frac{13}{7}$

2	14, 6, 7
7	7, 3, 7
3	1, 3, 1
	1,1, 1

$= \frac{27 \times 3 - 17 \times 7 + 13 \times 6}{42}$

$\Rightarrow \frac{81-119+78}{42}$

$= \frac{159-119}{42}$

$= \frac{40}{42}$

$= \frac{20}{21}$

(vi) $\frac{3}{1} - 1\frac{1}{6} - \frac{7}{15}$ (L.C.M. of 1, 6, 15 = 30)

$= \frac{3}{1} - \frac{7}{6} - \frac{7}{15}$

3	6 – 15
2	2 – 5
5	1 – 5
	1 – 1

$= \frac{3\times30-7\times5-7\times2}{30}$

$= \frac{90-35-14}{30}$

$= \frac{41}{30}$

$= 1\frac{11}{30}$

(vii) $5 - 4\frac{3}{8} + \frac{17}{18}$

(L.C.M. of 8, 18, = 72)

$= \frac{5}{1} - \frac{35}{8} + \frac{17}{18}$

2	8 – 18
2	4 – 9
2	2 – 9
3	1 - 9
3	1 – 3
	1 – 1

(viii) $2\frac{3}{14} - 3\frac{5}{6} - \frac{2}{5} + 2\frac{1}{2}$

(L.C.M. of 14, 6, 5, 2 = 210)

Solution:

$= \frac{31}{14} - \frac{23}{6} - \frac{2}{5} + \frac{5}{2}$

2	14, 6, 5, 2
7	7, 3, 5, 1
	1, 3, 5, 1

$= \frac{31 \times 15 - 23 \times 35 - 2 \times 42 + 5 \times 105}{210}$

$= \frac{465 - 805 - 84 + 525}{210}$

$= \frac{990 - 889}{210}$

$= \frac{101}{210}$

Question 5.

(i) What number should be addded to 512 to get 238 ?

(ii) What number should be subtracted from 5 to get 1513 ?

Solution:

(i) Let the number to be added = x

$\therefore \frac{5}{12} + x = 2\frac{3}{8}$

$\therefore$ Required number $(x) = 2\frac{3}{8} - \frac{5}{12}$

$x = \frac{19}{8} - \frac{5}{12}$

$= \frac{57 - 10}{24}$

$= \frac{47}{24}$

$= 1\frac{23}{24}$

(ii) Let the number to be subtracted = x

$\therefore \quad 5 - x = 1\frac{5}{13}$

Required number (x) = 5 – $1\frac{5}{13}$

$x = \frac{5}{1} - \frac{18}{13}$

$= \frac{65-18}{13}$

$= \frac{47}{13}$

$= 3\frac{8}{13}$

Exercise 6.6

Question 1.

Evaluate the following:

(i) $\frac{2}{5} \times \frac{3}{7}$

(ii) $\frac{3}{5} \times \frac{8}{9}$

(iii) $7 \times 1\frac{2}{3}$

Solutioin:

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

(ii) $\frac{3}{5} \times \frac{8}{9} = \frac{8}{15}$

(iii) $7 \times 1\frac{2}{3}$

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

$= \frac{7}{1} \times \frac{5}{3}$

$= \frac{35}{3}$

$= 11\frac{2}{3}$

Question 2:

Evaluate the following:

(i) $\frac{2}{3} \times 60$

(ii) $\frac{4}{7} \times 280$

(iii) $\frac{2}{3}$ of $1\frac{4}{9}$

Solution:

(i) $\frac{2}{3} \times 60 = 2 \times 20 = 40$

(ii) $\frac{4}{7} \times 280$

$= 4 \times 40 = 160$

(iii) $\frac{2}{3}$ of $1\frac{4}{9}$

$= \frac{2}{3} \times \frac{13}{9}$

$= \frac{2 \times 13}{3 \times 9} = \frac{26}{27}$

Question 3.

Find the reciprocal of each of the following

(i) $\frac{9}{13}$

(ii) $2\frac{3}{8}$

Solution:

(i) reciprocal of $\frac{9}{13}$ is $\frac{13}{9}$. $1\frac{4}{9}$

(ii) reciprocal of $2\frac{3}{8}$ or $\frac{19}{8}$ is $\frac{8}{19}$

Question 4:

Evaluate the following:

(i) $\frac{8}{21} \div 4$

(ii) $\frac{4}{15} \div \frac{2}{5}$

(iii) $8 \div \frac{5}{6}$

(iv) $5\frac{1}{4} \div \frac{7}{8}$

(v) $5\frac{1}{3} \div 1\frac{1}{9}$.

Solution:

(i) $\frac{8}{21} \div 4 = \frac{8}{21} \times \frac{1}{4} = \frac{2}{21}$

(ii) $\frac{4}{15} \div \frac{2}{5}$

$= \frac{4}{15} \times \frac{5}{2} = \frac{2}{3}$

(iii) $8 \div \frac{5}{6}$

$= 8 \times \frac{6}{5}$

$= \frac{48}{5}$

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

(iv) $5\frac{1}{4} \div \frac{7}{8}$

$= \frac{21}{4} \div \frac{7}{8}$

$= \frac{21}{4} \times \frac{8}{7}$

$= 6$

(v) $5\frac{1}{3} \div 1\frac{1}{9}$

$= \frac{16}{3} \div \frac{10}{9}$

$= \frac{16}{3} \times \frac{9}{10}$

$= \frac{24}{5}$

$= 4\frac{4}{5}$

Exercise 6.7

Question 1.

Sarita bought 25 metre of ribbon and Lalita 34 metre of ribbon. What is the totqal length of the ribbon they bought ?

Solution:

Ribbon bought by Sarita = 25m

Ribbon bought by Lalita = 34m

∴ Total length of the ribbon they bought

$= \frac{2}{5}$ m $+ \frac{3}{4}m = \left(\frac{2}{5} + \frac{3}{4}\right)m$

[L.C.M. of (5,4)= 20]

$= \left(\frac{2 \times 4 + 3 \times 5}{20}\right)$m

$= \left(\frac{8}{20} + \frac{15}{20}\right)m$

$= \left(\frac{8+15}{20}\right)m$

$= \frac{23}{20}m$

$= 1\frac{3}{20}$m

Question 2.

A bamboo of length $2\frac{3}{4}$ metre broke into two pieces. One piece was $\frac{7}{8}$ metre long. How long is the other piece ?

Solution:

Let of original piece of bamboo = $2\frac{3}{4} = \frac{11}{4}$ metre

Length of one piece = $\frac{7}{8}$ metre

Length of other piece = $\frac{7}{8}$ metre – $\frac{7}{8}$ metre

= $\left(\frac{11}{4} - \frac{7}{8}\right)\ metre$

= $\left(\frac{11\times2-7\times1}{8}\right)m$

[LCM =(4,8)=8]

= $\frac{22-7}{8}$

= $\frac{15}{8}$ metre or $1\frac{7}{8}$ metre

Question 3:

Nidhi's house is $1\frac{9}{10}$ km from her school. She walked some distance and then took a bus for $1\frac{1}{2}$ km to reach the school. How far did she walk ?

Solution:

Distance of Nidhi's house from school

= $1\frac{9}{10}$ km = $\frac{19}{10}\ km$

Distance travelled by bus = $1\frac{1}{2}$ km = $\frac{3}{2}\ km$

∴ Distance walked by nidhi

= $\left(\frac{19}{10} - \frac{3}{2}\right) km$

[LCM (10,2) = 10]

= $\left(\frac{19\times1-3\times5}{10}\right) km$

= $\frac{19-15}{10}$ = $\frac{4}{10}$ km = $\frac{2}{5}$km

Question 4.

From a rope of length $20\frac{1}{2}$ m, a piece of length $3\frac{5}{8}$ m is cut off. Find the length of the remaining rope.

Solution:

Total length of rope = $20\frac{1}{2}$ m

Length cut off = $3\frac{5}{8}$ m

Remaining rope = $\left(20\frac{1}{2} - 3\frac{5}{8}\right) m$

= $\left(\frac{41}{2} - \frac{29}{8}\right) m$

2	2, 8
4	1, 4
	1, 1

∴ L.C. M. of 2 and 8 is a 8.

$= \frac{41 \times 4 - 29 \times 1}{8} \left(\frac{164-29}{8}\right) m$

$= \left(\frac{135}{8}\right)$m = $16\frac{7}{8}\, m$

$$
\begin{array}{r|l}
 & 16 \\
\hline
8 & 135 \\
 & -\ 8 \\
\hline
 & 55 \\
 & 48 \\
\hline
 & 7
\end{array}
$$

∴ Length of the remaining rope = $16\frac{7}{8}$ m

Question 5 :

The weight of three packets are $2\frac{3}{4}$kg, $3\frac{1}{3}$ kg and $5\frac{2}{5}$ kg Find total weight of all the three packets.

Solution:

Weight of 1st packet = $2\frac{3}{4}$kg

Weight of 2nd packet = $3\frac{1}{3}$ kg

Weight of 3rd packet = $5\frac{2}{5}$ kg

∴ Total weight

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

$= \frac{11}{4} + \frac{10}{3} + \frac{27}{5}$

$(\because L.C.M.\ 4, 3, 5 = 60)$

2	4, 3, 5
2	2, 3, 5
	1, 3, 5

$= \frac{11 \times 15 + 10 \times 20 + 27 \times 12}{60}$

$= \frac{165 + 200 + 324}{60}$

$= \frac{689}{60}$

$= 11\frac{29}{60}$ kg

Question 6:

Shivani read 25 pages of a book containing 100 pages. Nandini read $\frac{2}{5}$ of the same book. Who read less ?

Solution:

Shivani read pages = $\frac{25}{100} = \frac{1}{4}$

Nandni read pages = $\frac{2}{5}$

Now, LCM of 4 and 5 = 20

Making $\frac{1}{4}$ and $\frac{2}{5}$ as like fractions

Here, $\frac{5}{20} < \frac{8}{20}$

$\therefore \frac{1}{4} < \frac{2}{5}$

$\therefore$ Shivani read less pages than Nandi.

Question 7:

Rafiq exercised for 36 of an hour, while Rohit, exercised for 34 of an hour. Who exercised for a longer time and by what fraction of an hour?

Solution :

Rafiq exercised for 36 of an hour

= 12 of an hour

Rafiq exercised for 34 of an hour

= 34 of an hour

LCM of 2 and 4 = 4

Now, $\frac{1}{2} = \frac{1\times2}{2\times2} = \frac{2}{4}$

Also, $\frac{3}{4} = \frac{3\times1}{4\times1} = \frac{3}{4}$

Here, $\frac{2}{4} < \frac{3}{4}$

i.e. $\frac{1}{2} < \frac{3}{4}$

i.e. $\frac{3}{6} < \frac{3}{4}$

Rafiq's exercise < Rohit's exercise

More exercise done by Rohit in fraction

$= \frac{3}{4} - \frac{2}{4} = \frac{1}{4}$

Rohit does exercise more then Rafiq by $\frac{1}{4}$ of an hour.

Objective Types Questions

Mental Maths

Question 1.

Fill in the blanks:

(i) A fraction is a number which represent a ……of whole.

(ii) A proper fraction lies between 0 and……

(iii) A mixed fraction can be converted into…… fraction.

(iv) Fractions having different denominations are called……

(v) In two like fractions, the fraction having smaller numerator is ……..

(vi) $\frac{144}{180}$ reduced to simplest form is ……

(vii) $7\frac{2}{5}$ + ….. = 12

(viii) $\frac{42}{56} = \frac{6}{\ldots\ldots}$

Solution:

(i) A fraction is a number which represent a part of whole.

(ii) A proper fraction lies between 0 and 1.

(iii) A mixed fraction can be converted into an improper fraction.

(iv) Fractions having different denominations are called unlike fractions.

(v) In two like fractions, the fraction having smaller numerator is smaller.

(vi) $\frac{144}{180}$ reduced to simplest form is $\frac{4}{5}$.

(vii) $7\frac{2}{5} + \mathbf{4\frac{3}{5}} = 12$

(viii) $\frac{42}{56} = \frac{6}{\mathbf{8}}$

Question 2.

State whether the following statements are Ture (T) or False (F):

(i) Two fractions with same numerator are called like fractions.

(ii) A fraction in which the same numerator is greater than is denominator is called an improper fraction.

(iii) Every improper fact on can be converted into a mixed fraction.

(iv) Every fraction can be represented by a point on a number line.

(v) In two unlike fraction with same numerator, the fraction having greater denominator is greater.

(vi) $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ are like fractions.

(vii) $5 - 1\frac{3}{4} = 4\frac{1}{4}$

Solution:

(i) Two fractions with same numerator are called like fractions. **False**

(ii) A fraction in which the numerator is greater than is denominator is called an improper fraction. **True**

(iii) Every improper fraction can be converted into a mixed fraction. **True**

(iv) Every fraction can be represented by a point on a number line. **True**

(v) In two unlike fractions with same numerator, the fraction having greater denominator is greater. **False**

(vi) $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$ are like fractions. **False**

(vii) $5 - 1\frac{3}{4} = 4\frac{1}{4}$ **False**

Multiple Choice Questions

Choose the correct answer from the given four options (3 to 17):

Question 3:

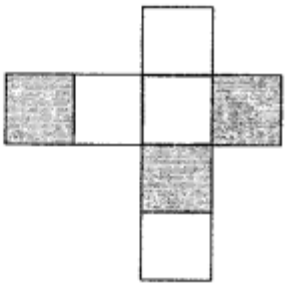
in the given figure, the shaded part is represented by the fraction

(a) $\frac{3}{8}$

(b) $\frac{3}{7}$

(c) $\frac{4}{8}$

(d) $\frac{3}{6}$



Solution:

(b) $\frac{3}{7}$

Question 4.

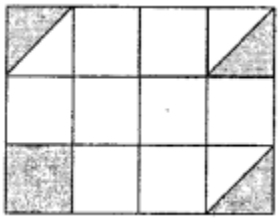
In the given figure, the shaded region is represented by the fraction:

(a) $\frac{4}{12}$

(b) $\frac{5}{12}$

(c) $\frac{5}{24}$

(d) $\frac{4}{24}$



Solution:

(c) $\frac{5}{24}$

Question 5.

The two consecutive integers between which the fraction $\frac{5}{7}$

(a) 5 and 7

(b) 5 and 6

(c) 6 and 7

(d) 0 and 1

Solution:

(d) 0 and 1

Question 6.

Which of the following pairs of fractions are not equivalent?

(a) $\frac{3}{4}, \frac{15}{20}$

(b) $\frac{14}{21}, \frac{4}{6}$

(c) $\frac{8}{10}, \frac{12}{15}$

(d) $\frac{6}{14}, \frac{10}{25}$

Solution:

(d) $\frac{6}{14}, \frac{10}{25}$

$\because$ $\frac{3}{7}, \frac{2}{5}$ not same (d).

Question 7.

The fraction equivalent to $\frac{45}{81}$ is

(a) $\frac{90}{243}$

(b) $\frac{15}{9}$

(c) $\frac{5}{27}$

(d) $\frac{5}{9}$

Solution:

$\frac{45,9}{81,9} = \frac{5}{9}(d)$

(Dividing numerator and denominator by 9)

Question 8.

The fraction which is not equal to $\frac{4}{5}$ is

(a) $\frac{40}{50}$

(b) $\frac{9}{15}$

(c) $\frac{12}{15}$

(d) $\frac{32}{40}$

Solution:

$\frac{9}{15}$ is not equal to $\frac{4}{5}$.(b)

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

Question 9.

Which of the following fractions is not in the lowest form?

(a) $\frac{27}{28}$

(b) $\frac{13}{33}$

(c) $\frac{39}{87}$

(d) $\frac{14}{9}$

Solution:

The lowest form of this can be written as

$\frac{39}{87} = \frac{13}{29}$

Question 10.

A pair of like fraction is

(a) $\frac{3}{4}, \frac{3}{5}$

(b) $\frac{3}{7}, \frac{16}{7}$

(c) $\frac{5}{6}, \frac{6}{5}$

(d) $\frac{2}{3}, \frac{2}{5}$

Solution:

(b) $\frac{3}{7}, \frac{16}{7}$

Like fractions are those fractions who have same denominator. (b)

Question. 11

Which of the following fractions is the greatest ?

(a) $\frac{5}{6}$

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

(c) $\frac{5}{8}$

(d) $\frac{5}{9}$

Solution:

(a) $\frac{5}{6}$

Question 12.

Which of the following fractions is the smallest ?

(a) $\frac{11}{7}$

(b) $\frac{11}{9}$

(c) $\frac{11}{10}$

(d) $\frac{11}{6}$

Solution:

(c) $\frac{11}{10}$

Question 13.

Which of the following is a false statement?

(a) $\frac{1}{7} < \frac{3}{14}$

(b) $\frac{5}{8} = \frac{15}{24}$

(c) $\frac{3}{4} = \frac{6}{16}$

(d) $\frac{5}{12} > \frac{2}{6}$

Solution:

(c) $\frac{3}{4} = \frac{6}{16}$

Because, if we multiply and divide the fraction with 4, we get

$\frac{3}{4} \times \frac{4}{4} = \frac{12}{16}$ (c)

Question 14.

$\frac{\mathbf{1}}{\mathbf{7}} + \frac{\mathbf{4}}{\mathbf{14}}$ **is equal to ?**

(a) $\frac{5}{14}$

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

(c) $\frac{3}{14}$

(d) $\frac{3}{7}$

Solution:

$\frac{1}{7} + \frac{4}{14}$

(L.C.M. of 7 and 14 is 14)

$\Rightarrow \frac{(1\times2)+(4\times1)}{14}$

$= \frac{2+4}{14}$

$= \frac{6}{14}$

$= \frac{3}{7}$ (d)

Question 15.

$\frac{7}{9} - \frac{5}{18}$ is equal to

(a) $\frac{2}{18}$

(b) $\frac{2}{9}$

(c) $\frac{1}{2}$

(d) $\frac{11}{18}$

Solution:

$\frac{7}{9} - \frac{5}{18}$

(L.C.M. of 9 and 18 is 18)

$\Rightarrow \frac{(7 \times 2) - (5 \times 1)}{18}$

$\Rightarrow \frac{14 - 5}{18}$

$\Rightarrow \frac{9}{18}$

$= \frac{1}{2}$ (c)

Question 16.

Anshul eats $\frac{4}{7}$ of a pizza. The fraction of pizza left is

(a) $\frac{3}{7}$

(b) $\frac{2}{7}$

(c) $\frac{5}{7}$

(d) $\frac{1}{7}$

Solution:

Let the total size of pizza be 1

Anshul has $\frac{4}{7}$ of 1 = $\frac{4}{7}$

Remaining part = 1 - $\frac{4}{7} = \frac{7-4}{7} = \frac{3}{7}$ (a)

Question. 17

The fraction whose numerator is the smallest odd prime number and denominator is the smallest composite number is

(a) $\frac{3}{4}$

(b) $\frac{2}{4}$

(c) $\frac{4}{3}$

(d) $\frac{4}{2}$

Solution:

(a) $\frac{3}{4}$

Higher Order thinking Skills (HOTS)

Question 1.

Write all proper fractions whose sum of numerator and denominator is 12.

Solution:

$\frac{1}{11}, \frac{2}{10}, \frac{3}{9}, \frac{4}{8}, \frac{5}{7}$

$\Rightarrow$ 1 + 11 = 12

$\Rightarrow$ 2 + 10 = 12

$\Rightarrow$ 3 + 9 = 12

$\Rightarrow$ 4 + 8 = 12

$\Rightarrow$ 5 + 7 = 12

Question 2.

The given figure represents the preferences of the students during breakfast in a hostel mess. If the total number of students in the mess is 540, then with reference to the given figure, answer the following questions:

(i) What is the number of students who prefer coffee ?

(ii) Whose number is greater, milk drinkers or orange juice drinkers and by what number ?

(iii) What is the total number of students who drink mango shake or coffee ? Is it equal to milk drinker ?

(iv) Is the sum of all fractions in the given figure equal to 1?

Solution:

(i) Total number of students = 540

Ratio of students who prefer coffee = 16

∴ Number of student prefer coffee

$= 540 \times \frac{1}{6} = 90$ students

(ii) milk drinkers = $\frac{1}{3}$

Orange drinkers = $\frac{1}{4}$

L.C.M. of (3,4) = 12

$\frac{1}{3} = \frac{1 \times 4}{3 \times 4} = \frac{4}{12}$

$\frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$

$\Rightarrow \frac{4}{12} > \frac{3}{12}$

Number of milk drinkers = $540 \times \frac{4}{12} = 180$

Orange drinkers = $540 \times \frac{3}{12} = 135$

= 180-135 = 45

$\therefore$ Milk drinkers are more orange drinkers by number = 45.

(iii) Number of Mango shake drinkers

$= 540 \times \frac{1}{6} = 90$

Number of coffee drinkers

$= 540 \times \frac{1}{6} = 90$

Total number of mango shake and coffee drinkers = 90 + 90 = 180

Milk drinkers = 180

Yes, it is equal to milk drinkers.

(iv) Sum of all fractions are

$= \frac{1}{4} + \frac{1}{12} + \frac{1}{3} + \frac{1}{6} + \frac{1}{6}$

(L.C.M. of 4, 12, 3, 6 ,6 =12)

$= \frac{1 \times 3}{4 \times 3} + \frac{1 \times 1}{12 \times 1} + \frac{1 \times 4}{3 \times 4} + \frac{1 \times 2}{6 \times 2} + \frac{1 \times 2}{6 \times 2}$

$= \frac{3+1+4+2+2}{12}$

$= \frac{12}{12}$

$= 1$

Yes, the sum of all of the fractions are equal to 1.

Check your Progress

Question 1.

State whether the following statements are True (T) or false (F):

(i) The fraction $\frac{2}{3}$ lies between 2 and 3.

(ii) To find an equivalent fraction to a given fraction, we may add or subtract the same (non-zero) number to its numerator and denominator.

(iii) To add or subtract like fractions, we add or subtract the numerators while keeping the denominator same.

Solution:

(i) False

As $\frac{2}{3}$ lies between 0 and 1

(ii) False

We should multiply and divide by appropriate numerator keep the denominator same. And that appropriate number is obtained by the LCM of all the denominators.

(iii) True

Question 2.

How many natural numbers are there between 102 and 112 ? What fraction of them are prime number ?

Solution:

The natural numbers from 102 to 112 are : 103, 104, 105, 106, 107, 108, 109, 110, 111

Total number of natural numbers = 9

Out of these prime numbers are:

103, 107, 109 = 3

∴ Total number of these prime numbers = 3

Required fraction = $\frac{3}{9} = \frac{1}{3}$

Question 3.

Match the equivalent fractions from each row:

(i) $\frac{250}{400}$

(ii) $\frac{180}{200}$

(iii) $\frac{660}{990}$

(iv) $\frac{180}{360}$

(v) $\frac{220}{550}$

Solution:

(a) $\frac{2}{3}$

(b) $\frac{2}{5}$

(c) $\frac{1}{2}$

(d) $\frac{5}{8}$

(e) $\frac{9}{10}$

Solution:

(i) $\frac{250}{400} = \frac{25}{40} = \frac{5}{8}$

Which is equivalent to (d)

(i) ↔ (d)

(ii) $\frac{180}{200} = \frac{18}{20} = \frac{9}{10}$

Which is equivalent to (e)

(ii) ↔ (e)

(iii) $\frac{660}{990} = \frac{66}{99} = \frac{22}{3} = \frac{2}{3}$

Which is equivalent to (a)

(iii) ↔ (a)

(iv) $\frac{180}{360} = \frac{18}{36} = \frac{2}{4} = \frac{1}{2}$

Which is equivalent to (c)

(iii) ↔ (c)

(v) $\frac{220}{550} = \frac{2}{5}$

Which is equivalent to (b)

(v) ↔ (b)

Question 4.

Replace by an appropriate symbol '< or >' between the given fractions.

(i) $\frac{5}{6}$ …….$\frac{13}{15}$

(ii) $\frac{4}{5}$ ……$\frac{7}{9}$

(iii) $\frac{11}{12}$…..$\frac{13}{14}$

Solution:

(i) $\frac{5}{6}$ …….$\frac{13}{15}$

LCM of 6 and 15

$= 3 \times 2 \times 5 = 30$

Now, making them like fractions

$\frac{5}{6} = \frac{5\times5}{6\times5} =$

$\frac{13}{15} = \frac{13\times2}{15\times2} = \frac{26}{30}$

Here, $\frac{25}{30} < \frac{26}{30}$

Hence, $\frac{5}{6} < \frac{13}{15}$

(ii) $\frac{4}{5}....\frac{7}{9}$

Solution:

LCM of 5 and 9 = 45

Now, making them like fractions

$\frac{4}{5} = \frac{4\times9}{5\times9} = \frac{36}{45}$

$\frac{7}{9} = \frac{7\times5}{9\times5} = \frac{35}{45}$

Here, $\frac{36}{45} < \frac{35}{45}$

Hence, $\frac{4}{5} < \frac{7}{9}$

(iii) $\frac{11}{12}.....\frac{13}{14}$

LCM of 12 and 14 $= 2 \times 6 \times 7 = 84$
Now, making them like fractions

$\frac{11}{12} \Rightarrow \frac{11\times7}{12\times7} = \frac{77}{84}$

$\frac{13}{14} \Rightarrow \frac{13\times6}{14\times6} = \frac{78}{84}$

Here, $\frac{77}{84} < \frac{78}{84}$

i.e. $\frac{11}{12} < \frac{13}{14}$

Question 5.

Arrange the following fractions in descending order: $\frac{7}{30}, \frac{13}{15}, \frac{9}{10}, \frac{3}{5}$

Solution:

$\frac{7}{30}, \frac{13}{15}, \frac{9}{10}, \frac{3}{5}$

LCM of 30, 15, 10, 5 = 30

∴ Making all fractions as like fractions

$\therefore \frac{7}{30} = \frac{7\times1}{30\times1} = \frac{7}{30}$

$\frac{13}{15} = \frac{13\times2}{15\times2} = \frac{26}{30}$

$\frac{9}{10} = \frac{9\times3}{10\times3} = \frac{27}{30}$

$\frac{3}{5} = \frac{3\times6}{5\times6} = \frac{18}{30}$

$\frac{27}{30} > \frac{26}{30} > \frac{18}{30} > \frac{7}{30}$

OR

$\frac{9}{10} > \frac{13}{15} > \frac{3}{5} > \frac{7}{30}$

Question 6:

Simplify: $2\frac{1}{2} - 3\frac{1}{4} + 5\frac{5}{6}$

Solution:

$2\frac{1}{2} - 3\frac{1}{4} + 5\frac{5}{6} = \frac{5}{2} - \frac{13}{4} + \frac{35}{6}$

(Changing into, like fractions)

$= \frac{5\times6}{2\times6} - \frac{13\times3}{4\times3} + \frac{35\times2}{6\times2}$

(LCM of 2, 4, 6 = 12)

$= \frac{30-39+70}{12} = \frac{61}{12} = 5\frac{1}{12}$

Question 7:

Evaluate the following:

(i) $\frac{3}{5} \times 180$

(ii) $\frac{3}{7}$ of $5\frac{5}{6}$

(iii) $\frac{5}{18} \div \frac{2}{3}$

Solution:

(i) $\frac{3}{5} \times 180 = \frac{240}{5} = 108$

(ii) $\frac{3}{7}$ of $5\frac{5}{6}$

$= \frac{3}{7} \times \frac{35}{6}$

$= \frac{5}{2}$

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

(iii) $\frac{5}{18} \div \frac{2}{3}$

$= \frac{5}{18} \times \frac{3}{2}$

$= \frac{5\times1}{6\times2} = \frac{5}{12}$

Question 8.

Asha and Samuel have bookshelves of the same size partly filled with books. Asha's shelf is 56 full and Samuel's shelf is 35 full. Whose bookshelf is more full and by what fraction ?

Solution:

Asha's shelf is 56^{th} fukk of book Samuel's shelf is 35^{th} full of book.

[LCM (6,5) = 30]

Like fractions of $\frac{5}{6}$ and $\frac{3}{5}$ is:

$\Rightarrow \frac{5}{6} \times \frac{5}{5} = \frac{25}{30}$

$\Rightarrow \frac{3}{5} \times \frac{6}{6} = \frac{18}{30}$

$\therefore \frac{25}{30} > \frac{18}{30}$

$\therefore$ Asha's bookshelf is more full by fraction

$\frac{25}{30} - \frac{18}{30}$

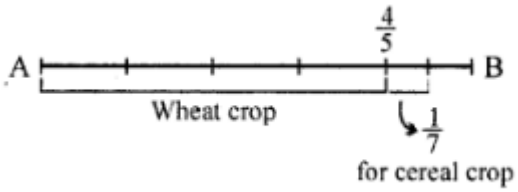
i.e. by fraction $\frac{25-18}{30} = \frac{7}{30}$

Question 9

A farmer uses four out of five equal strips of his land for wheat crop and 17 of his land for cereal crop. What fraction of his land is available for other crops ?

Solution:

A farmer has 5 equal strips of land



Land used for wheat crop = $\frac{4}{5}$

Land used for cereal crop = $\frac{1}{7}$

Total land used = $\frac{4}{5} + \frac{1}{7}$

$= \frac{4\times7+1\times5}{35} = \frac{28+5}{35} = \frac{33}{35}$

Land available = $\frac{5}{5} - \frac{33}{35}$

$\Rightarrow$ 1 - $\frac{33}{35} = \frac{35-33}{35} = \frac{2}{35}$