

### EXERCISE 3E

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:**

It is given that

Length of AB = 6 cm

Length of CD = 15 cm

(i) The length of AB to that of CD

$$= \frac{6}{15}$$

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

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

$$\frac{1}{2} \text{ of AB} = \frac{1}{2} \times 6 = 3 \text{ cm}$$

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

$$\text{So } \frac{1}{2} \text{ the length of AB to that of } \frac{1}{3} \text{ of CD} = \frac{3}{5}$$

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

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

$$\frac{1}{5} \text{ of CD to that of AB} = \frac{3}{6} = \frac{1}{2}$$

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

**Solution:**

We can write it as

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

LCM of 4, 7 and 12 is 84 and 7 and 21 is 21

$$= \frac{[(63 + 60 + 49) / 84] - [(6 - 5) / 21]}$$

By further calculation

$$= \frac{172}{84} - \frac{1}{21}$$

LCM of 21 and 84 is 84

$$= \frac{(172 - 4)}{84}$$

$$= \frac{168}{84}$$

$$= 2$$

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:**

Weight of potato = 120 kg

$$(i) \text{ Potatoes sold by merchant} = 6 \text{ kg} + 5\frac{1}{4} \text{ kg} + 9\frac{1}{2} \text{ kg} + 9\frac{3}{4} \text{ kg}$$

It can be written as

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

LCM of 1, 4 and 2 is 4

$$= (24 + 21 + 38 + 39) / 4$$

By further calculation

$$= 122/4$$

$$= 61/2 \text{ kg}$$

$$= 30 \frac{1}{2} \text{ kg}$$

(ii) Potatoes left in the sack =  $120 \text{ kg} - 30 \frac{1}{2} \text{ kg}$

It can be written as

$$= (120/1 - 61/2) \text{ kg}$$

By further calculation

$$= (240 - 61) / 2$$

So we get

$$= 179/2 \text{ kg}$$

$$= 89 \frac{1}{2} \text{ kg}$$

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

**Solution:**

Hours worked by a boy for six consecutive days =  $8 \text{ hours} + 7 \frac{1}{2} \text{ hours} + 8 \frac{1}{4} \text{ hours} + 6 \frac{1}{4} \text{ hours} + 6 \frac{3}{4} \text{ hours} + 7 \text{ hours}$

It can be written as

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

LCM of 2 and 4 is 4

$$= (32 + 30 + 33 + 25 + 27 + 28) / 4 \text{ hours}$$

So we get

$$= 175/4 \text{ hours}$$

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

He earned ₹ 36 per hour

So the total earnings =  $175/4 \times 36$

We get

$$= 175 \times 9$$

$$= ₹ 1575$$

**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 decorating a room. How many metres of ribbon did he buy?**

**Solution:**

It is given that

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

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

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

So the total length =  $13/3 + 37/6 + 29/9$

LCM of 3, 6 and 9 is 18

$$= (78 + 111 + 58) / 18$$

So we get

$$= 247 / 18$$

$$= 13 \frac{13}{18} \text{ m}$$

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

**Solution:**

It is given that

Total investment = ₹ 40, 000

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

It can be written as

$$= \frac{3}{5} \times 40, 000$$

By further calculation

$$= 3 \times 8000$$

$$= ₹ 24, 000$$

Deepak's investment =  $\frac{2}{5}$  of ₹ 40, 000

It can be written as

$$= \frac{2}{5} \times 40, 000$$

By further calculation

$$= 2 \times 8000$$

$$= ₹ 16, 000$$

**7. Geeta had 30 problems for home work. She worked out  $\frac{2}{3}$  of them. How many problems were still left to be worked out by her?**

**Solution:**

Number of problems Geeta had for home work = 30

Number of problems worked out by Geeta =  $\frac{2}{3}$  of 30

We can write it as

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

$$= 20$$

Number of problems still left to be worked out by her =  $30 - 20 = 10$

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

**Solution:**

It is given that

Marked price of picture = ₹ 90

Sale price of picture =  $\frac{3}{4}$  of ₹ 90

We can write it as

$$= \frac{3}{4} \times 90$$

$$= ₹ \frac{270}{4}$$

$$= ₹ 67 \frac{1}{2}$$

$$= ₹ 67.50$$

**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:**

Number of parcels = 15

Weight of each parcel =  $10 \frac{1}{2}$  kg =  $21/2$  kg  
So the total weight of parcels = 15 of  $21/2$  kg  
We can write it as  
 $= 21/2 \times 15$  kg  
By further calculation  
 $= 315/2$   
 $= 157 \frac{1}{2}$  kg  
 $= 157.5$  kg

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

**Solution:**

Length of rope =  $25 \frac{1}{2}$  m =  $51/2$  m  
Length of each piece =  $1 \frac{1}{2}$  m =  $3/2$  m  
So the number of pieces =  $51/2 \div 3/2$   
We can write it as  
 $= 51/2 \times 2/3$   
 $= 17$  pieces

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

**Solution:**

It is given that  
Height of first pole above the earth's surface =  $14 \frac{1}{4}$  m  
Height of second pole above the earth's surface =  $22 \frac{1}{3}$  m  
So height of second pole when compared to first pole =  $22 \frac{1}{3} - 14 \frac{1}{4}$   
We can write it as  
 $= 67/3 - 57/4$   
LCM of 3 and 4 is 12  
 $= (268 - 171)/12$   
By further calculation  
 $= 97/12$  m  
 $= 8 \frac{1}{12}$  m

**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  $5/16$  kg during the third week. What was his weight after the third week?**

**Solution:**

It is given that  
Weight of Vijay =  $65 \frac{1}{2}$  kg  
Weight gained during first week =  $1 \frac{2}{5}$  kg  
Weight gained during second week =  $1 \frac{1}{4}$  kg  
Weight lost during third week =  $5/16$  kg  
So the weight of Vijay after third week =  $65 \frac{1}{2} + 1 \frac{2}{5} + 1 \frac{1}{4} - 5/16$   
It can be written as  
 $= 131/2 + 7/5 + 5/4 - 5/16$   
LCM of 2, 5, 4 and 16 is 80  
 $= (5240 + 112 + 100 - 25)/80$   
By further calculation

$$\begin{aligned} &= (5452 - 25) / 80 \\ &= 5427 / 80 \text{ kg} \\ &= 67 \frac{67}{80} \text{ kg} \end{aligned}$$

**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:**

$$\begin{aligned} \text{Consider salary of man} &= ₹ 1 \\ \text{Salary spent on food} &= \frac{2}{5} \text{ of } ₹ 1 = ₹ \frac{2}{5} \\ \text{Salary spent on house rent} &= \frac{3}{10} \text{ of } ₹ 1 = ₹ \frac{3}{10} \\ \text{So the total salary spent} &= \frac{2}{5} + \frac{3}{10} \\ \text{LCM of 5 and 10 is 10} \\ &= \frac{(4 + 3)}{10} \\ &= \frac{7}{10} \\ \text{Salary still left with him} &= 1 - \frac{7}{10} \\ \text{LCM of 1 and 10 is 10} \\ &= \frac{(10 - 7)}{10} \\ &= \frac{3}{10} \end{aligned}$$

**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:**

$$\begin{aligned} \text{Consider } ₹ 1 \text{ as the total salary} \\ \text{Salary spent on food} &= \frac{2}{5} \text{ of } ₹ 1 = ₹ \frac{2}{5} \\ \text{So the remaining salary} &= 1 - \frac{2}{5} \\ \text{It can be written as} \\ &= \frac{(5 - 2)}{5} \\ &= ₹ \frac{3}{5} \\ \text{Salary spent on house rent} &= \frac{3}{10} \text{ of } \frac{3}{5} = ₹ \frac{9}{50} \\ \text{So the remaining salary} &= \frac{3}{5} - \frac{9}{50} \\ \text{LCM of 5 and 50 is 50} \\ &= \frac{(30 - 9)}{50} \\ &= ₹ \frac{21}{50} \end{aligned}$$

**15. Shyam bought a refrigerator for ₹ 5,000. 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:**

$$\begin{aligned} \text{Total cost of refrigerator} &= ₹ 5000 \\ \text{Cash paid} &= \frac{1}{10} \text{ of } ₹ 5000 \\ &= \frac{1}{10} \times 5000 \\ &= ₹ 500 \\ \text{So the balance amount} &= 5000 - 500 = ₹ 4500 \\ \text{Number of instalments} &= 12 \\ \text{So the amount to be paid each month} &= 4500 \div 12 \\ \text{We can write it as} \\ &= 4500 \times \frac{1}{12} \\ &= ₹ 375 \end{aligned}$$