

EXERCISE 3E

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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

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

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

It can be written as

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

LCM of 1, 4 and 2 is 4

$$\begin{aligned} &= (24 + 21 + 38 + 39) / 4 \\ &\text{By further calculation} \\ &= 122/4 \\ &= 61/2 \text{ kg} \\ &= 30 \frac{1}{2} \text{ kg} \end{aligned}$$

(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:

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

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:

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

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:

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