EXERCISE 12(C)

Question 1.

Are the following numbers in proportion:

(i) 32, 40, 48 and 60 ?

(ii) 12,15,18 and 20 ?

Solution:

(i) 32, 40, 48 and 60 are in proportion

if 32 : 40 = 48 : 60

if 32 x 60 = 40 x 48

$\left\{\frac{a}{b}=\frac{c}{d} \Longrightarrow \quad ad=bc\right\}$

if 1920 = 1920

Which is true.

32, 40, 48 and 60 are in proportion

(ii) 12, 15, 18 and 20 are in proportion

if 12 : 15 = 18 : 20

if 12 x 20 = 15 x 18 {ad = bc}

if 240 = 270

which is not true.

12, 15, 18 and 20 are not in proportion.

Question 2.

Find the value of x in each of the following such that the given numbers are in proportion.

(i) 14, 42, x and 75

(ii) 45, 135, 90 and x

Solution:

14, 42, x and 75 are in proportion

$\frac{14}{42}=\frac{x}{75}$

=> 14 x 75 =x x 42

$$\Rightarrow x=\frac{14\times 75}{42}=25$$

$$\therefore x=25$$

(ii) $\because$ 45, 135, 90 and x are in proportion

$$\therefore \frac{45}{135}=\frac{90}{x} \Rightarrow 45\times x=90\times 135$$

$$\Rightarrow x=\frac{90\times 135}{45}=270$$

$$\therefore x=270$$

Question 3.
The costs of two articles are in the ratio 7 : 4. If the cost of the first article is Rs. 2,800 ; find the cost of the second article.
Solution:
Ratio in the cost of two articles = 7 : 4
Cost of first article = Rs. 2800
Let cost of the second article = x
7 : 4 = 2800 : x

$$\Rightarrow \frac{7}{4} = \frac{2800}{x} \Rightarrow 7 \times x = 2800 \times 4$$

$$\Rightarrow x = \frac{2800 \times 4}{7} = 1600$$

$\therefore$ Cost of second article = Rs. 1600

Question 4.
The ratio of the length and the width of a rectangular sheet of paper is 8 : 5. If the width of the sheet is 17.5 cm; find the length.
Solution:
Let length of sheet = x cm
Ratio in length and breadth = 8 : 5
and width = 17.5 cm
8 : 5 = x : 17.5

$$\Rightarrow \frac{8}{5} = \frac{x}{17.5} \Rightarrow 8 \times 17.5 = x \times 5$$

$$\Rightarrow x = \frac{8 \times 17.5}{5} = 8 \times 3.5 = 28$$

Length of sheet = 28 cm

Question 5.
The ages of A and B are in the ratio 6 : 5. If A's age is 18 years, find the age of B.
Solution:
Ratio in the ages of A and B = 6 : 5
A's age = 18 years
Let B's age = x years
6 : 5 = 18 : x

$$\Rightarrow \frac{6}{5} = \frac{18}{x} \Rightarrow 6 \times x = 18 \times 5$$

$$\Rightarrow x = \frac{18 \times 5}{6} = 15$$

$\therefore$ B's age = 15 years.

Question 6.
A sum of Rs. 10, 500 is divided among A, B and C in the ratio 5 : 6 : 4. Find the share of each.
Solution:
Total amount = Rs. 10, 500
Ratio in A, B, and C = 5 : 6 : 4

Sum of ratio = 5 + 6 + 4 = 15

$\therefore$ A's share = Rs. $\frac{10500}{15} \times 5$

= Rs. 700 × 5 = Rs. 3500

B's share = Rs. $\frac{10500 \times 6}{15}$

= Rs. 700 × 6

= Rs. 4200

and C's share = Rs. $\frac{10500 \times 4}{15}$

= Rs. 700 × 4 = Rs. 2800

Question 7.
Do the ratios 15 cm to 2 m and 10 sec to 3 minutes form a proportion?
Solution:
15 cm : 2 m : : 10 sec : 3 min
15 cm : 2 x 100 cm :: 10 sec : 30 x 60 sec
15 : 200 :: 10 : 1800
3 : 40 :: 1 : 180
No, they donot form a proportion

Question 8.
Do the ratios 2 kg : 80 kg and 25 g : 625 g form a proportion ?
Solution:
2 kg : 80 kg : : 25 g : 625 g
2 : 80 :: 25 : 625
1 : 40 :: 1 : 25
No, they do not form a proportion.

Question 9.
10 kg sugar cost ₹ 350. If x kg sugar of the same kind costs ₹ 175, find the value of x
Solution:
10 kg of sugar costs = ₹ 350
and x kg of sugar cost = ₹ 175
A.T.Q.
10 kg : x kg :: 350 : 175
=> 10 x 175 = 350 x x
=> 350x= 1750
=> x = $\frac{1750}{350}$ = 5
Hence, 5 kg of sugar costs ₹ 175

Question 10.

The length of two ropes are in the ratio 7 : 5. Find the length of:
(i) shorter rope, if the longer one is 22.5 ni
(ii) longer rope, if the shorter is 9.8 m.

Solution:

Length of the ropes are in the ratio = 7 : 5
(i) Let the length of shorter rope = x
Length of longer rope = 22.5 m
A.T.Q.

$$7 : 5 = 22.5 : x$$

$$\Rightarrow 7x = 22.5 \times 5$$

$$\Rightarrow x = \frac{22.5 \times 5}{7}$$

$$\Rightarrow x = 16.07 \text{ m}$$

(ii) Let length of the longer side = x
length of shorter rope = 9.8 m
A.T.Q.

$$7 : 5 = x : 9.8$$

$$\Rightarrow 5 \times x = 9.8 \times 7$$

$$\Rightarrow x = \frac{9.8 \times 7}{5}$$

$$\Rightarrow x = 13.72 \text{ m}$$

Question 11.

If 4, x and 9 are in continued proportion, find the value of x.

Solution:

4, x and 9 are in continued proportion
=> 4 : x = x : 9
=> $x^2 = 9 \times 4$
=> $x = \sqrt{36}$
x = 6

Question 12.

If 25, 35 and x are in continued proportion, find the value of x.

Solution:

25, 35 and x are in continued proportion
=> 25 : 35 = 35 : x
=> 25 x x = 35 x 35

$$\Rightarrow x = \frac{35 \times 35}{25}$$