CHAPTER FIVE

RATIO, PROPORTION AND SHARING

(Q1) Three children Kwabena, Esi and Yaw were given 160 oranges to share. Kwabena got $\frac{1}{4}$of them and Esi and Yaw shared the remainder in the ration 3: 2 respectively.

(i) Determine Esi`s share.

(ii) How many oranges did Yaw received more than Kwabena?

Soln:

(i) Number of oranges had by Kwabena = $\frac{1}{4}$x 160 = 40,

=> the number of oranges left to be shared (i.e. the remainder) by Esi and Yaw = 160 – 40 = 120.

This was shared by them in the ratio 3: 2 respectively.

	Esi	:	Yaw
Ratio	3	:	2

Total ratio = 3 + 2 = 5.

Esi`s share = $\frac{3}{5}$ x 120 = 72 oranges.

Yaw`s share = $\frac{2}{5}$ x 120 = 48 oranges.

(ii)Kwabena`s share = 40 oranges.

Yaw`s share = 48 oranges.

Number of oranges received by Yaw more than Kwabena = 48 – 40 = 8 oranges.

(Q2) Three numbers are in the ratio 2: 3: 4 and their average is 36.

(i) Calculate the sum of the 3 numbers.

(ii)Find the greatest number.

Soln:

(i) Since the average of the 3 numbers is 36, then their sum or total = 3 x 36 = 108.

(ii) Since the three numbers are in the ratio 2: 3: 4, then the total ratio = 2 + 3 + 4 = 9.

Since the greatest ratio = 4, then the value of the greatest number or the greatest number

$= \frac{4}{9}$ x 108 = 48.

(Q3) A number of sweets were shared among 8 children and each had 30. If 12 children are to share the same number of sweets, how many will each get?

Soln:

Since each of the 8 children had 30 sweets after the sharing, then the total number of sweets shared = 30 x 8 = 240.

If 12 children are to share these 240 sweets, then the number of sweets each will get = $\frac{240}{12} =$ 20 sweets.

(Q4) The ratio of men to women in a village is 12: 30 respectively. If there are 120 men, find

(a)how many women are there in the village?

(b) the total number of men and women in the village.

Soln:

(a) There are 120 men and this corresponded to a ratio of 12.

The ratio representing the number of women = 30.

Now if 12 = 120

then 30 = $\frac{30}{12}$ x 120 = 300,

=> there are 300 women.

(b) The total number of women and men = 300 + 120 = 420.

(Q5) The ratio of sheep to goat on a farm is 4 : 7. If there are 1,428 sheep, determine the number of goats.

Soln:

Since 4 = 1428

=>7 = $\frac{7}{4}$ x $1428 = 1799.$ $\therefore The$ number of goats $= 1799.$

(Q6) The sides of a triangle are in the ratio 6 : 8 : 10. If the perimeter of the triangle is 288cm, find the

(i) longest side.

(ii) shortest side.

(iii) difference between the longest and the shortest side.

Soln:

(i) Total ratio = 6 + 8 + 10 = 24. Perimeter of the triangle = 288cm.

Ratio corresponding to the longest side = the greatest ratio = 10.

The longest side or the actual length of the longest side

= $\frac{greatest\ ratio}{total\ ratio}$ x perimeter

= $\frac{10}{24}$ x 288 = 120cm.

(ii) Ratio corresponding to the shortest side = the lowest ratio = 6.

The shortest side or the length of the shortest side = $\frac{lowest\ ratio}{total\ ratio}$ x Perimeter

= $\frac{6}{24}$ x 288 = 72cm.

(ii) The difference between the longest and the shortest side = 120 – 72 = 48cm.

(Q7) A property worth Gh₵10,480 : 00 is shared between a widow and her 10 children in the ratio 1 : 4 respectively. If the children shared their portion equally, find the share of each.

Soln:

Property worth = Gh₵10,480. (i.e. amount shared).

	Widow	:	10 children
Ratio	1	:	4

Total ratio = 1 + 4 = 5.

Share of the widow = $\frac{1}{5}$ x 10480 = Gh₵ 2096.

Share of all the 10 children

= $\frac{4}{5}$ x 10480 = Gh₵ 8384.

Since the 10 children shared an amount of Gh₵8384, then the share of each child.

= $\frac{8384}{10}$ = Gh₵838.4.

(Q8) An amount of Gh₵4,200: 00 was shared between Aba and Kwamena. If Aba had $\frac{5}{7}$ of the amount,

(a) how much did Kwamena get?

(b)What percentage of Aba`s share did Kwamena receive?

Soln:

(a) Amount shared = Gh₵4,200: 00 = Gh₵4,200.

Since Aba had $\frac{5}{7}$ of this amount,

=>amount had by Aba or her share = $\frac{5}{7}$ x 4200 = Gh₵3,000.

Since the total amount shared by Aba and Kwamena = Gh₵4,200 and Aba had Gh₵3,000, then the share of Kwamena = 4200 – 3000 = Gh₵12,000.

(b) Kwamena`s share = Gh₵12,000

Aba's share = Gh¢3,000.

Percentage of Aba`s share which Kwamena received = $\frac{Kwamena`s\ share}{Aba`s\ share}$ x 100

= $\frac{12}{30}$ x 100 = 40%.

(Q9) A car consumes a gallon of petrol every 30km drive. The driver of the car sets out on a journey of 420km with 10 gallons of petrol in the fuel tank.

(i) How many more gallons of petrol will be needed to complete the journey?

Find the cost of the petrol for the journey of 420km, if a gallon cost Gh¢5.50

Soln:

(i) If 30km = 1 gallon

then 420km = $\frac{420}{30}$ x 1 = 14 gallons.

Therefore the car needs 14 gallons of petrol to complete the whole journey. Since it contains only 10 gallons of petrol, then the extra number of gallons of petrol it will need to complete the journey = 14 – 10 = 4 gallons.

(ii) Since 14 gallons of petrol was used for the journey and each cost Gh¢5.50, then cost of petrol needed for the journey = 14 x 5.50 = Gh¢77.