EXERCISE 9.3 PAGE NO: 9.13

1. Find which of the following are in proportion?
(i) 33, 44, 66, 88
(ii) 46, 69, 69, 46
(iii) 72, 84, 186, 217

Solution:
(i) Given 33, 44, 66, 88
Product of extremes = 33 × 88 = 2904
Product of means = 44 × 66 = 2904
Therefore product of extremes = product of means
Hence given numbers are in proportion.

(ii) Given 46, 69, 69, 46
Product of extremes = 46 × 46 = 2116
Product of means = 69 × 69 = 4761
Therefore product of extremes is not equal to product of means
Hence given numbers are not in proportion.

(iii) Given 72, 84, 186, 217
Product of extremes = 72 × 217 = 15624
Product of means = 84 × 186 = 15624
Therefore product of extremes = product of means
Hence given numbers are in proportion.

2. Find x in the following proportions:
(i) 16: 18 = x: 96
(ii) x: 92 = 87: 116

Solution:
(i) Given 16: 18 = x: 96
In proportion we know that product of extremes = product of means
16/18 = x/96
On cross multiplying
x = (16 × 96)/ 18
x = 1536/18
Dividing both numerator and denominator by 6, we get,

x = 256/3

(ii) Given x: 92 = 87: 116
In proportion we know that product of extremes = product of means
x/ 92 = 87/116
On cross multiplying
x = (87 × 92)/ 116
x = 69

3. The ratio of income to the expenditure of a family is 7: 6. Find the savings if the income is Rs.1400.

Solution:
Given that income = 1400
Given the ratio of income and expenditure = 7: 6
7x = 1400
Therefore x = 200
Expenditure = 6x = 6 × 200 = Rs.1200
Savings = Income - Expenditure
= 1400 -1200
= Rs.200

4. The scale of a map is 1: 4000000. What is the actual distance between the two towns if they are 5cm apart on the map?

Solution:
Given that the scale of map = 1: 4000000
Let us assume the actual distance between towns is x cm
1: 4000000 =5: x
x = 5 × 4000000
x = 20000000 cm
We know that 1km = 1000 m
1m = 100 cm
Therefore
x = 200 km

5. The ratio of income of a person to his savings is 10: 1. If his savings for one year is

Rs.6000, what is his income per month?

Solution:

Given that the ratio of income of a person to his savings is 10: 1

Savings per year = 6000

Savings per month = 6000/12

= Rs.500

Then let income per month be x

x: 500 = 10:1

x = 500 × 10

x = 5000

Income per month is Rs. 5000

6. An electric pole casts a shadow of length 20 meters at a time when a tree 6 meters high casts a shadow of length 8 meters. Find the height of the pole.

Solution:

Given that length electric pole shadow is 20m

Height of the tree: Length of the shadow of tree

Height of the pole: Length of the shadow of pole

x: 20 = 6: 8

x = 120/8

x = 15

Therefore height of the pole is 15 meters