

EXERCISE 9.3

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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 = $33 \times 88 = 2904$ Product of means = $44 \times 66 = 2904$

Therefore product of extremes = product of means

Hence given numbers are in proportion.

(ii) Given 46, 69, 69, 46

Product of extremes = $46 \times 46 = 2116$ Product of means = $69 \times 69 = 4761$

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 = $72 \times 217 = 15624$ Product of means = $84 \times 186 = 15624$

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

$$x = (18 \times 96) / 16$$

$$x = 256/3$$

(ii) Given $x: 92 = 87: 116$

In proportion we know that product of extremes = product of means

$$x/92 = 87/116$$

On cross multiplying

$$x = (87 \times 92)/116$$

$$x = 69$$

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 $x = 200$

$$\text{Expenditure} = 6x = 6 \times 200 = \text{Rs.}1200$$

$$\text{Savings} = \text{Income} - \text{Expenditure}$$

$$= 1400 - 1200$$

$$= \text{Rs.}200$$

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

$$1: 4000000 = 5: x$$

$$x = 5 \times 4000000$$

$$x = 20000000 \text{ cm}$$

We know that $1\text{km} = 1000 \text{ m}$

$$1\text{m} = 100 \text{ cm}$$

Therefore

$$x = 200 \text{ km}$$

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

$x = 500 \times 10$

$x = 5000$

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