

**EXERCISE 9.1****PAGE: 9.5****1. Express each of the following in the language of ratios:**

- (i) In a class, the number of girls in the merit list of the board examination is two times that of boys.  
(ii) The number of students passing mathematics test is  $\frac{2}{3}$  of the number that appeared.

**Solution:**

- (i) Ratio of the number of girls to that of boys in the merit list is 2: 1.  
(ii) Ratio of the number of students passing a mathematics test to that of total students appearing in the test is 2: 3.

**2. Express the following ratios in language of daily life:**

- (i) The ratio of the number of bad pencils to that of good pencils produced in a factory is 1: 9.  
(ii) In India, the ratio of the number of villages to that of cities is about 2000: 1.

**Solution:**

- (i) The number of bad pencils produced in a factory is  $\frac{1}{9}$  of the number of good pencils produced in the factory.  
(ii) The number of villages is 2000 times that of cities in India.

**3. Express each of the following ratios in its simplest form:**

- (i) 60: 72  
(ii) 324: 144  
(iii) 85: 391  
(iv) 186: 403

**Solution:**

(i) 60: 72

It can be written as  $\frac{60}{72}$ 

We know that the HCF of 60 and 72 is 12

By dividing the term by 12 we get

$$(\frac{60}{72}) \times (\frac{12}{12}) = \frac{5}{6}$$

So we get 60: 72 = 5: 6

(ii) 324: 144

It can be written as  $\frac{324}{144}$ 

We know that the HCF of 324 and 144 is 36

By dividing the term by 36 we get

$$(\frac{324}{144}) \times (\frac{36}{36}) = \frac{9}{4}$$

So we get 324: 144 = 9: 4

(iii) 85: 391

It can be written as  $\frac{85}{391}$ 

We know that the HCF of 85 and 391 is 17

By dividing the term by 17 we get

$$(\frac{85}{391}) \times (\frac{17}{17}) = \frac{5}{23}$$

So we get 85: 391 = 5: 23

(iv) 186: 403

It can be written as  $\frac{186}{403}$

We know that the HCF of 186 and 403 is 31

By dividing the term by 31 we get

$$(186/31) \times (31/31) = 6/13$$

So we get 186: 403 = 6: 13

**4. Find the ratio of the following in the simplest form:**

(i) 75 paise to Rs 3

(ii) 35 minutes to 45 minutes

(iii) 8 kg to 400 gm

(iv) 48 minutes to 1 hour

(v) 2 metres to 35 cm

(vi) 35 minutes to 45 seconds

(vii) 2 dozen to 3 scores

(viii) 3 weeks to 3 days

(ix) 48 min to 2 hours 40 min

(x) 3 m 5 cm to 35 cm

**Solution:**

(i) 75 paise to Rs 3

It can be written as

$$75 \text{ paise to Rs } 3 = 75 \text{ paise: Rs } 3$$

We know that 1 Rs = 100 paise

So we get

$$75 \text{ paise to Rs } 3 = 75 \text{ paise: } 300 \text{ paise}$$

Dividing the two terms by HCF 75

$$75 \text{ paise to Rs } 3 = 1: 4$$

(ii) 35 minutes to 45 minutes

It can be written as

$$35 \text{ minutes to } 45 \text{ minutes} = 35 \text{ minutes: } 45 \text{ minutes}$$

Dividing the two terms by HCF 5

$$35 \text{ minutes to } 45 \text{ minutes} = 7: 9$$

(iii) 8 kg to 400 gm

It can be written as

$$8 \text{ kg to } 400 \text{ gm} = 8 \text{ kg: } 400 \text{ gm}$$

We know that 1 kg = 1000 gm

So we get

$$8 \text{ kg to } 400 \text{ gm} = 8000 \text{ gm: } 400 \text{ gm}$$

Dividing the two terms by HCF 400

$$8 \text{ kg to } 400 \text{ gm} = 20: 1$$

(iv) 48 minutes to 1 hour

It can be written as

$$48 \text{ minutes to } 1 \text{ hour} = 48 \text{ minutes: } 1 \text{ hour}$$

We know that 1 hour = 60 minutes

So we get

$$48 \text{ minutes to } 1 \text{ hour} = 48 \text{ minutes: } 60 \text{ minutes}$$

Dividing the two terms by HCF 12

$$48 \text{ minutes to } 1 \text{ hour} = 4: 5$$

(v) 2 metres to 35 cm

It can be written as

2 metres to 35 cm = 2 metres: 35 cm

We know that 1 m = 100 cm

So we get

2 metres to 35 cm = 200 cm: 35 cm

Dividing the two terms by HCF 5

2 metres to 35 cm = 40: 7

(vi) 35 minutes to 45 seconds

It can be written as

35 minutes to 45 seconds = 35 minutes: 45 seconds

We know that 1 minute = 60 seconds

So we get

35 minutes to 45 seconds = 2100 seconds: 45 seconds

Dividing the two terms by HCF 15

35 minutes to 45 seconds = 140: 3

(vii) 2 dozen to 3 scores

It can be written as

2 dozen to 3 scores = 2 dozen: 3 scores

We know that 1 dozen = 12 score = 20

So we get

2 dozen to 3 scores = 24: 60

Dividing the two terms by HCF 12

2 dozen to 3 scores = 2: 5

(viii) 3 weeks to 3 days

It can be written as

3 weeks to 3 days = 3 weeks: 3 days

We know that 1 week = 7 days

So we get

3 weeks to 3 days = 21 days: 3 days

Dividing the two terms by HCF 3

3 weeks to 3 days = 7: 1

(ix) 48 min to 2 hours 40 min

It can be written as

48 min to 2 hours 40 min = 48 min: 2 hours 40 min

We know that 1 hour = 60 minutes

So we get

48 min to 2 hours 40 min = 48 min: 160 min

Dividing the two terms by HCF 16

48 min to 2 hours 40 min = 3: 10

(x) 3 m 5 cm to 35 cm

It can be written as

3 m 5 cm to 35 cm = 3 m 5 cm: 35 cm

We know that 1 m = 100 cm

So we get

3 m 5 cm to 35 cm = 305 cm: 35 cm

Dividing the two terms by HCF 5

3 m 5 cm to 35 cm = 61: 7

**5. Find the ratio of**

**(i) 3.2 metres to 56 metres**

**(ii) 10 metres to 25 cm**

**(iii) 25 paise to Rs 60**

**(iv) 10 litres to 0.25 litre**

**Solution:**

(i) 3.2 metres to 56 metres

It can be written as

3.2 metres to 56 metres = 3.2 metres: 56 metres

Dividing the two terms by HCF 1.6

3.2 metres to 56 metres = 2: 35

(ii) 10 metres to 25 cm

It can be written as

10 metres to 25 cm = 10 m: 25 cm

We know that 1 m = 100 cm

10 metres to 25 cm = 1000 cm: 25 cm

Dividing the two terms by HCF 25

10 metres to 25 cm = 40: 1

(iii) 25 paise to Rs 60

It can be written as

25 paise to Rs 60 = 25 paise: Rs 60

We know that 1 Rs = 100 paise

25 paise to Rs 60 = 25 paise: 6000 paise

Dividing the two terms by HCF 25

25 paise to Rs 60 = 1: 240

(iv) 10 litres to 0.25 litre

It can be written as

10 litres to 0.25 litre = 10 litres: 0.25 litre

Dividing the two terms by HCF 0.25

10 litres to 0.25 litre = 40: 1

**6. The number of boys and girls in a school are 1168 and 1095 respectively. Express the ratio of the number of boys to that of the girls in the simplest form.**

**Solution:**

No. of boys = 1168

No. of girls = 1095

So the ratio of the number of boys to that of the girls = 1168: 1095

Dividing the two terms by HCF 73

Ratio of number of boys to that of the girls = 16: 15

Hence, the ratio of the number of boys to that of girls in simplest form is 16: 15.

7. Avinash works as a lecturer and earns Rs 12000 per month. His wife who is a doctor earns Rs 15000 per month. Find the following ratios:

(i) Avinash's income to the income of his wife.

(ii) Avinash's income to their total income.

**Solution:**

Avinash salary earned per month = Rs 12000

Avinash wife salary per month = Rs 15000

(i) Avinash's income to the income of his wife =  $12000/15000 = 4: 5$

(ii) Avinash's income to their total income =  $12000/(12000 + 15000) = 4: 9$

8. Of the 72 persons working in an office, 28 are men and the remaining are women. Find the ratio of the number of:

(i) men to that of women,

(ii) men to the total number of persons

(iii) persons to that of women.

**Solution:**

No. of persons working in an office = 72

No. of men = 28

So the number of women =  $72 - 28 = 44$

(i) men to that of women = 28: 44

Multiplying and dividing the equation by HCF 4

Men to that of women =  $(28/44) \times (4/4) = 7: 11$

(ii) men to the total number of persons = 28: 72

Multiplying and dividing the equation by HCF 4

Men to the total number of persons =  $(28/72) \times (4/4) = 7: 18$

(iii) persons to that of women = 72: 44

Multiplying and dividing the equation by HCF 4

Persons to that of women =  $(72/44) \times (4/4) = 18: 11$

9. The length of a steel tape for measurements of buildings is 10 m and its width is 2.4 cm. What is the ratio of its length to width?

**Solution:**

It is given that

Length of a steel tape = 10 m

Width of steel tape = 2.4 cm

So the ratio of its length to width = 10 m/ 2.4 cm

We know that 1 m = 100 cm

Ratio of its length to width = 1000 cm/ 2.4 cm

Dividing the two terms by HCF 0.8 cm

Ratio of its length to width = 1250: 3

Hence, the ratio of its length to width is 1250: 3.

**10. An office opens at 9 am and closes at 5 pm with a lunch interval of 30 minutes. What is the ratio of lunch interval to the total period in office?**

**Solution:**

Duration of office = 9 am to 5 pm = 8 hours

Lunch interval = 30 minutes

So the ratio of lunch interval to the period in office = 30 minutes/8 hours

We know that 1 hour = 60 minutes

Ratio of lunch interval to the period in office =  $30 / (8 \times 60) = 30/480$

Dividing the two terms by HCF 30

Ratio of lunch interval to the period in office =  $(30/480) \times (30/30) = 1: 16$

Hence, the ratio of lunch interval to the total period in office is 1: 16.

**11. A bullock-cart travels 24 km in 3 hours and a train travels 120 km in 2 hours. Find the ratio of their speeds.**

**Solution:**

Distance travelled by bullock-cart = 24 km in 3 hours

Distance travelled by train = 120 km in 2 hours

It can be written as

Distance travelled by bullock-cart =  $24 \text{ km} / 3 = 8 \text{ km}$

Distance travelled by train =  $120 \text{ km} / 2 = 60 \text{ km}$

So the ratio of their speeds =  $8/60$

Dividing the two terms by HCF 4

Ratio of their speeds =  $(8/60) \times (4/4) = 2:15$

Hence, the ratio of their speeds is 2: 15.

**12. Margarette works in a factory and earns Rs 955 per month. She saves Rs 185 per month from her earnings. Find the ratio of:**

**(i) her savings to her income**

**(ii) her income to her expenditure**

**(iii) her savings to her expenditure.**

**Solution:**

Margarette monthly income = Rs 955

Margarette monthly savings = Rs 185

Margarette expenditure =  $955 - 185 = \text{Rs } 770$

(i) her savings to her income =  $185/955$

Dividing the two terms by HCF 5

Her savings to her income =  $(185/955) \times (5/5) = 37: 191$

(ii) her income to her expenditure =  $955/770 = 191: 154$

(iii) her savings to her expenditure =  $185/770 = 37: 154$