

Question 1.

Express the following ratios in simplest form:

(i) 20 : 40

(ii) 40 : 20

(iii) 81 : 108

(iv) 98 : 63

Solution:

$$(i) 20 : 40 = \frac{20}{40} = \frac{1}{2} = 1:2$$

$$(ii) 40 : 20 = \frac{40}{20} = \frac{2}{1} = 2:1$$

$$(iii) 81 : 108 = \frac{81}{108} = \frac{9}{12} = \frac{3}{4} = 3:4$$

$$(iv) 98 : 63 = \frac{98}{63} = \frac{14}{9} = 14:9$$

Question 2.

Fill in the missing numbers in the following equivalent ratios:

$$(i) \frac{14}{21} = \frac{\dots}{3} = \frac{6}{\dots}$$

$$(ii) \frac{15}{18} = \frac{\dots}{6} = \frac{10}{\dots} = \frac{\dots}{30}$$

Solution:

$$(i) \frac{14}{21} = \frac{\dots}{3} = \frac{6}{\dots}$$

$$= \frac{14}{21} = \frac{2}{3} = \frac{6}{9}$$

$$(\because \frac{14 \div 7}{21 \div 7} = \frac{2}{3} \text{ and } \frac{2 \times 3}{3 \times 3} = \frac{6}{9})$$

$$(ii) \frac{15}{18} = \frac{\dots}{6} = \frac{10}{\dots} = \frac{\dots}{30}$$

$$= \frac{15}{18} = \frac{5}{6} = \frac{10}{12} = \frac{25}{30}$$

$$(\because \frac{15 \div 3}{18 \div 3} = \frac{5}{6}, \frac{5 \times 2}{6 \times 2} = \frac{10}{12} \text{ and } \frac{5 \times 5}{6 \times 5} = \frac{25}{30})$$

### Question 3.

Find the ratio of each of the following in simplest form :

- (i) 2.1 m to 1.2 m
- (ii) 91 cm to 1.04m
- (iii) 3.5 kg to 250gm
- (iv) 60 paise to 4 rupees
- (v) 1 minute to 15 seconds
- (vi) 15 mm to 2 cm

Solution:

$$(i) 2.1 \text{ m} : 1.2 \text{ m} = \frac{2.1}{1.2} = \frac{21}{12} \times \frac{10}{10} = \frac{7}{4} = 7 : 4$$

$$(ii) 91 \text{ cm} : 1.04 \text{ cm or } 1.04 \times 100 \text{ or } 104 \text{ cm}$$

$$91 \text{ cm} : 104 \text{ cm} = \frac{91}{104} = 7 : 8$$

$$(iii) 3.5 \text{ kg} : 250 \text{ gm or } 3.5 \times 1000 \text{ gm} : 250 \text{ gm}$$

$$= \frac{3500}{250} = \frac{14}{1} = 14 : 1$$

$$(iv) 60 \text{ paise} : 4 \text{ rupees}$$

$$1 \text{ rupees} = 100 \text{ paise}$$

$$\therefore 60 \text{ paise}$$

$$\frac{60}{100} = ₹ \frac{3}{5}$$

$$\frac{3}{5} \text{ rupees} : 4 \text{ rupees}$$

$$\frac{\frac{3}{5}}{4} = \frac{3}{5} \times \frac{1}{4} = \frac{3}{20} = 3 : 20$$

$$(v) 1 \text{ minute} : 15 \text{ seconds}$$

$$60 \text{ seconds} = 1 \text{ minute}$$

$$1 \text{ minute} : 15 \text{ seconds}$$

$$\frac{15}{60} = \frac{1}{4} \text{ min}$$

$$\Rightarrow 1 \text{ min} : \frac{1}{4} \text{ min}$$

$$\frac{1}{\frac{1}{4}} = \frac{1 \times 4}{1} = \frac{4}{1} = 4 : 1$$

(vi) 15 mm : 20 cm

10 mm = 1 cm

$$15 \text{ mm.} = \frac{15}{10} \text{ cm}$$

$$\frac{\frac{15}{10}}{\frac{2}{1}} = \frac{15}{10} \times \frac{1}{2} = \frac{3}{4} = 3 : 4$$

Question 4.

The length and the breadth of a rectangular park are 125 m and 60 m respectively. What is the ratio of the length to the breadth of the park?

Solution:

Length of rectangular park = 125 m

Breadth of rectangular park = 60 m

∴ Ratio of the length to the breadth of park is

$$\frac{125}{60} = \frac{25}{12} = 25 : 12$$

Question 5.

The population of village is 4800. If the numbers of females is 2160, find the ratio of males to that of females.

Solution:

Population of village = 4800

No. of females = 2160

No. of males = 4800 – 2160 = 2640

No. of males : No. of females

2640 : 2160

$$\frac{2640}{2160} = \frac{264}{216} = \frac{11}{9} = 11 : 9$$

Question 6.

In a class, there are 30 boys and 25 girls. Find the ratio of the numbers of

(i) boys to that of girls.

(ii) girls to that of total number of students.

(iii) boys to that of total numbers of students.

Solution:

Boys = 30, girls = 25

Total students = 30 + 25 = 55

$$(i) \text{ boys : girls} = 30 : 25 \Rightarrow \frac{30}{25} = \frac{6}{5} = 6 : 5$$

(ii) girls : Total No. of students

$$25 : 55 \Rightarrow \frac{25}{55} = \frac{5}{11} = 5 : 11$$

(iii) Boys : Total No. of students

$$30 : 55 \Rightarrow \frac{30}{55} = \frac{6}{11} = 6 : 11$$



Question 7.

In a year, Reena earns ₹ 1,50,000 and saves ₹ 50,000.

Find the ratio of

(i) money she earns to the money she saves.

(ii) money that she saves to the money she spends.

Solution:

(i) Ratio of money that Reena earns to the money she saves

$$= \frac{1,50,000}{50,000} = \frac{1,50,000 \div 50,000}{50,000 \div 50,000}$$

$$[\text{HCF} = (1,50,000, 50,000) = 50,000]$$

$$= \frac{3}{1} = 3 : 1$$

(ii) Money that she spends

$$= ₹ 1,50,000 - ₹ 50,000 = ₹ 1,00,000$$

∴ Ratio of money she saves to the money she spends

$$= \frac{50,000}{1,00,000} = \frac{50,000 \div 50,000}{1,00,000 \div 50,000}$$

$$[\text{HCF} (50,000, 1,00,000) = 50,000]$$

$$= \frac{1}{2} = 1 : 2$$

Question 8.

The monthly expenses of a student have increased from ₹350 to ₹500. Find the ratio of

- (i) increase in expenses and original expenses.
- (ii) original expenses to increased expenses.
- (iii) increased expenses to increased in expenses.

Solution:

Original exp. = ₹350

Increased exp. = ₹500

Increased in exp. =  $500 - 350 = ₹150$

(i) Increased in exp : original exp.

$$150 : 350 \Rightarrow \frac{150}{350} = \frac{15}{35} = \frac{3}{7} = 3 : 7$$

(ii) Original exp. : Increased exp.

$$350 : 500 \Rightarrow \frac{350}{500} = \frac{35}{50} = \frac{7}{10} = 7 : 10$$

(iii) Increased exp : Increase in exp.

$$500 : 150 \Rightarrow \frac{500}{150} = \frac{50}{15} = \frac{10}{3} = 10 : 3$$

Question 9.

Mr Mahajan and his wife are both school teachers and earn ₹20900 and ₹ 18700 per month respectively. Find the ratio of

- (i) Mr Mahajan's income to his wife's income.
- (ii) Mrs Mahajan's income to the total income of both.

Solution:

(i) Ratio in Mr Mahajan's income and his wife

= 20900 : 18700

$$\frac{20900}{18700} = \frac{19}{17} = 19 : 17$$

(ii) Mrs Mahajan's income to the total income of both

Earning of Mrs Mahajan = ₹20900

and his wife = ₹ 18700

Total income = ₹39,600

Mrs Mahajan's income to the total income of both

$$\frac{18700}{39600} = \frac{17}{36} = 17 : 36$$

Question 10.

Out of 30 students in a class, 6 like football, 12 like cricket and remaining like tennis. Find the ratio of

(a) Number of students liking football to number of students liking tennis.

(b) Number of students liking cricket to total number of students.

Solution:

(a) Number of students liking tennis

$$= 30 - (6 + 12) = 30 - 18 = 12$$

∴ Ratio of number of students liking football to number of students liking tennis

$$= \frac{6}{12} = \frac{6 \div 6}{12 \div 6} \quad [\text{H.C.F. (6, 12) = 6}]$$

$$= \frac{1}{2} = 1 : 2$$

(b) Number of students liking cricket to total number of students

$$= \frac{12}{30} = \frac{12 \div 6}{30 \div 6} \quad [\text{H.C.F. (12, 30) = 6}]$$

$$= \frac{2}{5} = 2 : 5$$

Question 11.

Divide ₹ 560 between Ramu and Munni in the ratio 3 : 2.

Solution:

Total amount = ₹ 560

Ratio in Ramu and Munni = 3 : 2

Sum of ratios = 3 + 2 = 5

Ramu shares = ₹  $\frac{560 \times 3}{5}$  = ₹336

Munni shares = ₹  $\frac{560 \times 2}{5}$  = ₹224

Question 12.

Two people invested ₹ 15000 and ₹25000 respectively to start a business. They decided to share the profits in the ratio of their investments. If their profit is ₹ 12000, how much does each get?

Solution:

Total investment = 15000 + 25000 = 40000

Investment of 1 st person =  $\frac{15000}{40000} = \frac{3}{8}$

Investment of 2nd person =  $1 - \frac{3}{8} = \frac{5}{8}$

Total profit = ₹ 12000

Profit of 1st person =  $\frac{3}{8} \times ₹12000 = ₹4500$

Profit of 2nd person = ₹12000 – ₹4500 = ₹7500

Question 13.

The ratio of Ankur's money to Roma's money is 9 :

11. if Ankur has ₹540, how much money does Roma have?

Solution:

Ratio of Ankur's to Roma's money = 9 : 11

Ankur has money = ₹540

Let Roma's have = x

9 : 11 :: 540 : x

$$\Rightarrow \frac{9}{11} = \frac{540}{x}$$

$$x = \frac{540 \times 11}{9}$$

$$x = ₹660$$

∴ Roma's have = ₹660

Question 14.

The ratio of weights of tin and zinc in an alloy is 2 : 5.

How much zinc is there in 31.5g of alloy?

Solution:

Ratio of weight = 2 : 5

Sum of ratio = 2 + 5 = 7

Total weight of alloy = 31.5 g

$$\text{Part of zinc} = 31.5 \times \frac{5}{7} = \frac{315}{10} \times \frac{5}{7} = \frac{45}{2}$$

= 22.5 gm

