

## EXERCISE 11(B)

### Question 1.

The monthly salary of a person is Rs. 12,000 and his monthly expenditure is Rs 8,500. Find the ratio of his:

- (i) salary to expenditure
- (ii) expenditure to savings
- (ii) savings to salary

### Solution:

Monthly salary of a person = Rs 12,000

Monthly expenditure = 8,500

Saving of the person = (12,000 - 8500) = Rs 3,500

(i) Ratio between salary and expenditure

$$\begin{aligned} 12,000 : 8500 &= \frac{12,000}{8,500} = \frac{120}{85} = \frac{24}{17} \\ &= 24 : 17 \end{aligned}$$

(ii) Ratio between expenditure and savings

$$\begin{aligned} 8500 : 3500 &= \frac{8500}{3500} = \frac{85}{35} = \frac{17}{7} \\ &= 17 : 7 \end{aligned}$$

(iii) Ratio between savings and salary

$$\begin{aligned} 3,500 : 12,000 &= \frac{3,500}{12,000} = \frac{35}{120} = \frac{7}{24} \\ &= 7 : 24 \end{aligned}$$

### Question 2.

The strength of a class is 65, including 30 girls. Find the ratio of the number of:

- (i) girls to boys
- (ii) boys to the whole class
- (iii) the whole class to girls.

### Solution:

Total strength of class (including boys and girls) = 65

Number of girls = 30

Number of boys = (65 - 30) = 35

Ratio between girls and boys =  $30 : 35 = \frac{30}{35} = \frac{6}{7} = 6 : 7$

(ii) Ratio between boys and whole class

$$35 : 65 = \frac{35}{65} = \frac{7}{13} = 7 : 13$$

(iii) Whole class and girls

$$65 : 30 = \frac{65}{30} = \frac{13}{6} = 13 : 6$$

### Question 3.

The weekly expenses of a boy have increased from ₹ 1,500 to ₹ 2,250. Find the ratio of:

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

**Solution:**

Original expenses = ₹ 1500

Increased expenses = ₹ 2250

Increase in expenses = ₹ 2250 - ₹ 1500 = ₹ 750

Now,

(i) Ratio in increase in expenses to original expenses = ₹ 750 : ₹ 1500 = 1 : 2

(ii) Original expenses to increased expenses = ₹ 1500 : ₹ 2250

$$\frac{1500}{750} = \frac{2250}{750} = 2 : 3$$

(iii) Increased expenses to increased in expenses = ₹ 2250 : ₹ 750 = 3 : 1 (Dividing by 750)

### Question 4.

Reduce each of the following ratios to their lowest terms :

- (i) 1 hour 20 min : 2 hours
- (ii) 4 weeks : 49 days
- (iii) 3 years 4 months : 5 years 5 months.
- (iv) 2 m 40 cm : 1 m 44 cm
- (v) 5 kg 500 gm : 2 kg 750 gm

**Solution:**

(i) 1 hour 20 min : 2 hour

= (1 x 60 + 20) minutes : 2 x 60 minutes

= 80 minutes : 120 minutes

( $\because$  1 hour of = 60 minutes)

$$= \frac{80}{120} = \frac{2}{3}$$
$$= 2 : 3$$

(ii) 4 weeks : 49 days =  $(4 \times 7)$  days : 49 days

( $\because$  1 week = 7 days)

$$= 28 : 49 = \frac{28}{49} = \frac{4}{7} = 4 : 7$$

(iii) 3 years 4 months : 5 years 5 month

$$= (3 \times 12 + 4) : (5 \times 12 + 5)$$

( $\because$  1 year = 12 months)

$$= 40 : 65$$

$$= \frac{40}{65} = \frac{8}{13} = 8 : 13$$

(iv) 2 m 40 cm : 1 m 44 cm

$$(2 \times 100 + 40) : (1 \times 100 + 44)$$

( $\because$  1m = 100 cm)

$$240 : 144$$

$$= \frac{240}{144} = \frac{10}{6} = \frac{5}{3} = 5 : 3$$

(v) 5 kg 500 gm : 2 kg 750 gm

$$(5 \times 1000 + 500) : (2 \times 1,000 + 750)$$

( $\because$  1 kg = 1,000 gm)

$$= 5500 : 2750 = \frac{5,500}{2,750} = \frac{2}{1} = 2 : 1$$

### Question 5.

Two numbers are in the ratio 9 : 2. If the smaller number is 320, find the larger number.

#### Solution:

Let the larger number =  $9x$

and smaller number =  $2x$

If smaller number is 320,

then, larger number will be =  $\frac{9x \times 320}{2x} = 1440$

**Question 6.**

A bus travels 180 km in 3 hours and a train travels 450 km in 5 hours. Find the ratio of speed of train to speed of bus.

**Solution:**

Distance travelled by bus = 180 km

Time taken = 3 hours

Speed =  $\frac{\text{Distance}}{\text{Time}} = \frac{180}{3} = 60$  km/hr

Distance travelled by train = 450 km

Time taken = 5 hours

Speed =  $\frac{\text{Distance}}{\text{Time}} = \frac{450}{5} = 90$  km/hr

Ratio of speed of train to speed of bus =  $90 : 60 = 3 : 2$

**Question 7.**

In winters, a school opens at 10 a.m. and closes at 3.30 p.m. If the lunch interval is of 30 minutes, find the ratio of lunch interval to total time of the class periods.

**Solution:**

Timing of a school (10 a.m. to 3.30 p.m) = 5 hours 30 minutes

Timing for lunch interval = 30 minutes

Total time of the class periods = 5 hours 30 minutes - 30 minutes

= 5 hours =  $60 \times 5 = 300$  minutes

Ratio of lunch interval to total time of the class period =  $30 \text{ minutes} : 300 \text{ minutes} = 1 : 10$

**Question 8.**

Rohit goes to school by car at 60 km per hour and Manoj goes to school by scooty at 40 km per hour. If they both live in the same locality, find the ratio between the time taken by Rohit and Manoj to reach school.

**Solution:**

Rohit travel by car, speed of the car = 60 km/hr

Manoj travel by scooty, speed of the scooty = 40 km/hr

Since, It is given that, they live in the same locality

Hence, let the distance be k Time taken by Rohit to reach school =

$$\frac{\text{Distance}}{\text{Speed}}$$

$$= \frac{K}{60}$$

Time taken by Manoj to reach school =

$$\frac{K}{40}$$

∴ The ratio between the time taken by Rohit and Manoj to reach school

$$= \frac{K}{60} : \frac{K}{40}$$

$$= \frac{1}{3} : \frac{1}{2} = 2 : 3$$

### Question 9.

In a club having 360 members, 40 play carrom, 96 play table tennis, 144 play badminton and remaining members play volley-ball. If no member plays two or more games, find the ratio of members who play :

- (i) carrom to the number of those who play badminton.
- (ii) badminton to the number of those who play table-tennis.
- (iii) table-tennis to the number of those who play volley-ball.
- (iv) volleyball to the number of those who play other games.

### Solution:

Total members in a club = 360 members

Members who play carrom = 40

Members who play table tennis = 96

Members who play badminton = 144

Members who play volleyball =  $360 - (40 + 96 + 144) = 360 - 280 = 80$

(i) Ratio between the members who play carrom to the number of those who play badminton =  $40 : 144 \Rightarrow 5 : 18$

(ii) Ratio of members who play badminton to the number of those who play table- tennis =  $144 : 96 \Rightarrow 6 : 4 = 3 : 2$

(iii) Ratio of members who play table tennis to the number of those who play volley-ball =  $96 : 80 = 6 : 5$

(iv) Ratio of members who play volley-ball to the number of those who play other games =  $80 : 280 \Rightarrow 4 : 14 = 2 : 7$

**Question 10.**

The length of a pencil is 18 cm and its radius is 4 cm. Find the ratio of its length to its diameter.

**Solution:**

Length of a pencil = 18 cm

Radius of a pencil = 4 cm

Diameter of a pencil =  $2r = 2 \times 4 = 8$  cm

Ratio of length of a pencil to its diameter =  $18 : 8 = 9 : 4$

**Question 11.**

Ratio of distance of the school from A's home to the distance of the school from B's home is  $2 : 1$ .

(i) Who lives nearer to the school ?

(ii) Complete the following table :

**Solution:**

Ratio of distance of the school from A's home to the distance of the school from B's home =  $2 : 1$

(i) B lives nearest to the school

(ii) Let A's home is  $2x$  km from school and B's home is  $x$  km

Distance of school from A's home =  $2 \times$  Distance of school from B's home

$\Rightarrow$  If A lives at a distance of 4 km, then B lives at a distance of  $= \frac{1}{2} \times 4 = 2$  km

$\Rightarrow$  If B lives at a distance of 9 km then A lives at a distance of  $= 2 \times 9 = 18$  km

$\Rightarrow$  If A lives at a distance of 8 km then B lives at a distance  $= \frac{1}{2} \times 8 = 4$  km

$\Rightarrow$  If B lives at a distance of 8 km, then A lives at a distance  $= 2 \times 8 = 16$  km

$\Rightarrow$  If A lives at a distance of 6 km, then B lives at a distance  $= \frac{1}{2} \times 6 = 3$  km

**Question 12.**

The student-teacher ratio in a school is  $45 : 2$ . If there are 4050 students in the school, how many teachers must be there?

**Solution:**

Total number of students = 4050

Let total number of teachers =  $x$

The student-teacher ratio in a school =  $45 : 2$

$$\therefore \text{Required ratio} = \frac{\text{Total number of students}}{\text{Total number of teacher}}$$

$$\Rightarrow \frac{45}{2} = \frac{4050}{x} \Rightarrow x = \frac{4050 \times 2}{45} = 180 \text{ teachers}$$

$$\therefore \text{Number of teachers} = 180$$