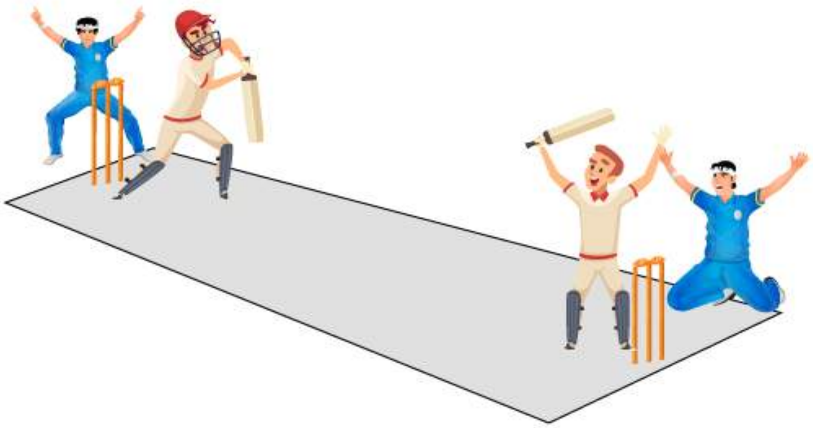
EXERCISE 12.1 PAGE NO: 251

1. There are 20 girls and 15 boys in a class.
(a) What is the ratio of number of girls to the number boys?
(b) What is the ratio of number of girls to the total number of students in the class?
Solutions:

Given
Number of girls = 20 girls
Number of boys = 15 boys
Total number of students = 20 + 15
= 35
(a) Ratio of number of girls to number of boys = 20 / 15 = 4 / 3
(b) Ratio of number of girls to total number of students = 20 / 35 = 4 / 7

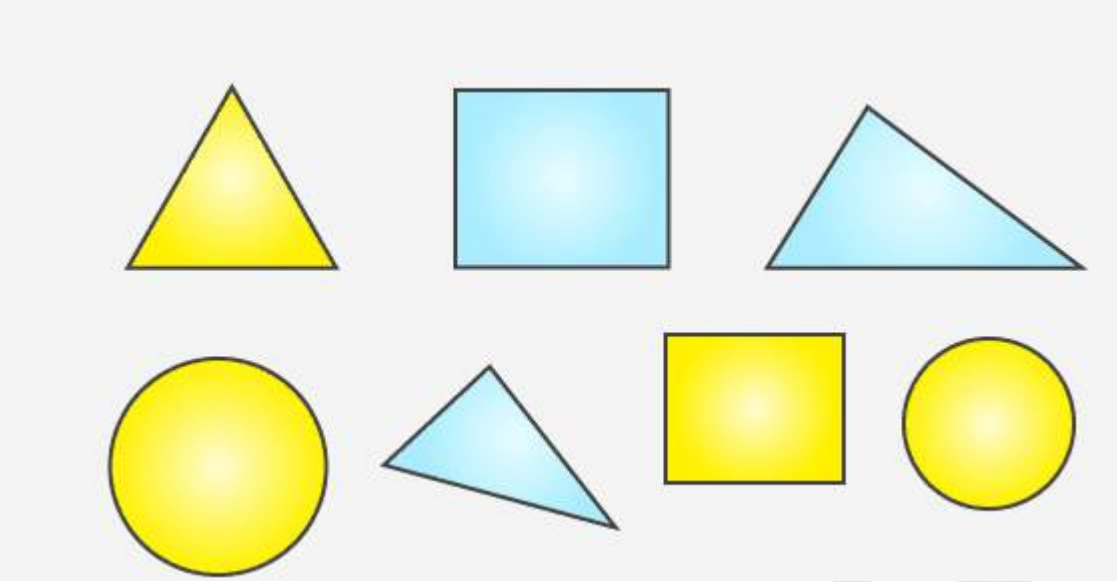
2. Out of 30 students in a class, 6 like football, 12 like cricket and remaining like tennis. Find the ratio of



(a) Number of students liking football to number of students liking tennis.
(b) Number of students liking cricket to total number of students.
Solutions:

Given
Number of students who like football = 6
Number of students who like cricket = 12
Number of students who like tennis = 30 – 6 – 12
= 12
(a) Ratio of number of students liking football to the number of students liking tennis
= 6 / 12 = 1 / 2
(b) Ratio of number of students liking cricket to total number of
= 12 / 30
= 2 / 5

3. See the figure and find the ratio of



(a) Number of triangles to the number of circles inside the rectangle.
(b) Number of squares to all the figures inside the rectangle.
(c) Number of circles to all the figures inside the rectangle.
Solutions:

Given in the figure
Number of triangles = 3
Number of circles = 2
Number of squares = 2
Total number of figures = 7
(a) Ratio of number of triangles to the number of circles inside the rectangle
= 3 / 2
(b) Ratio of number of squares to all the figures inside the rectangle
= 2 / 7
(c) Ratio of number of circles to all the figures inside the rectangle
= 2 / 7

4. Distance travelled by Hamid and Akhtar in an hour are 9 km and 12 km. Find the ratio of speed of Hamid to the speed of Akhtar.
Solutions:

We know that the speed of a certain object is the distance travelled by that object in an hour
Distance travelled by Hamid in one hour = 9 km
Distance travelled by Akhtar in one hour = 12 km
Speed of Hamid = 9 km/hr
Speed of Akhtar = 12 km/hr
Ratio of speed of Hamid to the speed of Akhtar = 9 / 12 = 3 / 4

5. Fill in the following blanks:
15 / 18 = ☐ / 6 = 10 / ☐ = ☐ / 30 [Are these equivalent ratios?]
Solutions:
15 / 18 = (5 × 3) / (6 × 3)

= 5 / 6
5 / 6 = (5 × 2) / (6 × 2)
= 10 / 12
5 / 6 = (5 × 5) / (6 × 5)
= 25 / 30
Hence, 5, 12 and 25 are the numbers which come in the blanks respectively.
Yes, all are equivalent ratios.

6. Find the ratio of the following:
(a) 81 to 108
(b) 98 to 63
(c) 33 km to 121 km
(d) 30 minutes to 45 minutes
Solutions:
(a) 81 / 108 = (3 × 3 × 3 × 3) / (2 × 2 × 3 × 3 × 3)
= 3 / 4
(b) 98 / 63 = (14 × 7) / (9 × 7)
= 14 / 9
(c) 33 / 121 = (3 × 11) / (11 × 11)
= 3 / 11
(d) 30 / 45 = (2 × 3 × 5) / (3 × 3 × 5)
= 2 / 3
7. Find the ratio of the following:
(a) 30 minutes to 1.5 hours
(b) 40 cm to 1.5 m
(c) 55 paise to ₹ 1
(d) 500 ml to 2 litres
Solutions:
(a) 30 minutes to 1.5 hours
30 min = 30 / 60
= 0.5 hours
Required ratio = (0.5 × 1) / (0.5 × 3)
= 1 / 3
(b) 40 cm to 1.5 m
1.5 m = 150 cm
Required ratio = 40 / 150
= 4 / 15
(c) 55 paise to ₹ 1
₹ 1 = 100 paise
Required ratio = 55 / 100 = (11 × 5) / (20 × 5)
= 11 / 20
(d) 500 ml to 2 litres
1 litre = 1000 ml
2 litre = 2000 ml
Required ratio = 500 / 2000 = 5 / 20 = 5 / (5 × 4)
= 1 / 4

8. In a year, Seema earns ₹ 1,50,000 and saves ₹ 50,000. Find the ratio of
(a) Money that Seema earns to the money she saves
(b) Money that she saves to the money she spends.
Solutions:

Money earned by Seema = ₹ 150000
Money saved by her = ₹ 50000
Money spent by her = ₹ 150000 - ₹ 50000 = ₹ 100000
(a) Ratio of money earned to money saved = 150000 / 50000 = 15 / 5
= 3 / 1
(b) Ratio of money saved to money spent = 50000 / 100000 = 5 / 10
1 / 2

9. There are 102 teachers in a school of 3300 students. Find the ratio of the number of teachers to the number of students.
Solutions:

Given
Number of teachers in a school = 102
Number of students in a school = 3300
Ratio of number of teachers to the number of students = 102 / 3300
= (2 × 3 × 17) / (2 × 3 × 550)
= 17 / 550

10. In a college, out of 4320 students, 2300 are girls. Find the ratio of
(a) Number of girls to the total number of students.
(b) Number of boys to the number of girls.
(c) Number of boys to the total number of students.
Solutions:

Given
Total number of students = 4320
Number of girls = 2300
Number of boys = 4320 – 2300
= 2020
(a) Ratio of number of girls to the total number of students = 2300 / 4320
= (2 × 2 × 5 × 115) / (2 × 2 × 5 × 216)
= 115 / 216
(b) Ratio of number of boys to the number of girls = 2020 / 2300
= (2 × 2 × 5 × 101) / (2 × 2 × 5 × 115)
= 101 / 115
(c) Ratio of number of boys to the total number of students = 2020 / 4320
= (2 × 2 × 5 × 101) / (2 × 2 × 5 × 216)
= 101 / 216

11. Out of 1800 students in a school, 750 opted basketball, 800 opted cricket and remaining opted table tennis. If a student can opt only one game, find the ratio of
(a) Number of students who opted basketball to the number of students who opted table tennis.

(b) Number of students who opted cricket to the number of students opting basketball.
(c) Number of students who opted basketball to the total number of students.
Solutions:
(a) Ratio of number of students who opted basketball to the number of students who opted table tennis = 750 / 250 = 3 / 1
(b) Ratio of number of students who opted cricket to the number of students opting basketball
= 800 / 750 = 16 / 15
(c) Ratio of number of students who opted basketball to the total number of students
= 750 / 1800 = 25 / 60 = 5 / 12

12. Cost of a dozen pens is ₹ 180 and cost of 8 ball pens is ₹ 56. Find the ratio of the cost of a pen to the cost of a ball pen.
Solutions:
Cost of a dozen pens = ₹ 180
Cost of 1 pen = 180 / 12
= ₹ 15
Cost of 8 ball pens = ₹ 56
Cost of 1 ball pen = 56 / 8
= ₹ 7
Hence, required ratio is 15 / 7

13. Consider the statement: Ratio of breadth and length of a hall is 2: 5. Complete the following table that shows some possible breadths and lengths of the hall.
Solutions:
(i) Length = 50 m
Breadth / 50 = 2 / 5
By cross multiplication
5 × breadth = 50 × 2
Breadth = (50 × 2) / 5
= 100 / 5
= 20 m
(ii) Breadth = 40 m
40 / Length = 2 / 5
By cross multiplication
2 × Length = 40 × 5
Length = (40 × 5) / 2
Length = 200 / 2
Length = 100 m

14. Divide 20 pens between Sheela and Sangeeta in the ratio of 3: 2.

Breadth of the hall (in metres)	**10**		**40**
Length of the hall (in metres)	**25**	**50**	

Solutions:
Terms of 3: 2 = 3 and 2
Sum of these terms = 3 + 2
= 5

Now Sheela will get 3 / 5 of total pens and Sangeeta will get 2 / 5 total pens
Number of pens having with Sheela = 3 / 5 × 20
= 3 × 4
= 12
Number of pens having with Sangeeta = 2 / 5 × 20
= 2 × 4
= 8

15. Mother wants to divide ₹ 36 between her daughters Shreya and Bhoomika in the ratio of their ages. If age of Shreya is 15 years and age of Bhoomika is 12 years, find how much Shreya and Bhoomika will get.

Solutions:

Ratio of ages = 15 / 12
= 5 / 4
Hence, mother wants to divide ₹ 36 in the ratio of 5: 4
Terms of 5: 4 are 5 and 4
Sum of these terms = 5 + 4
= 9
Here Shreya will get 5 / 9 of total money and Sangeeta will get 4 / 9 of total money
The amount Shreya get = 5 / 9 × 36
= 20
The amount Sangeeta get = 4 / 9 × 36
= 16
Therefore Shreya will get ₹ 20 and Sangeeta will get ₹ 16

16. Present age of father is 42 years and that of his son is 14 years. Find the ratio of
(a) Present age of father to the present age of son
(b) Age of the father to the age of son, when son was 12 years old.
(c) Age of father after 10 years to the age of son after 10 years.
(d) Age of father to the age of son when father was 30 years old.
Solutions:

(a) Present age of father = 42 years
Present age of son = 14 years
Required ratio 42 / 14
= 3 / 1

(b) The son was 12 years old 2 years ago. So the age father 2 years ago will be
= 42 – 2 = 40 years
Required ratio = 40 / 12 = (4 × 10) / (4 × 3) = 10 / 3

(c) After ten years age of father = 42 + 10 = 52 years
After 10 years age of son = 14 + 10 = 22 years
Required ratio = 52 / 24 = (4 × 13) / (4 × 6)
= 13 / 6

(d) 12 years ago, age of father was 30
At that time age of son = 14 – 12
= 2 years
Required ratio = 30 / 2 = (2 × 15) / 2
= 15 / 1