EXERCISE 9.1 PAGE NO: 9.6

1. If x: y = 3: 5, find the ratio 3x + 4y: 8x + 5y

Solution:
Given x: y = 3: 5
We can write above equation as
x/y = 3/5
5x = 3y
x = 3y/5
By substituting the value of x in given equation 3x + 4y: 8x + 5y we get,
3x + 4y: 8x + 5y = 3 (3y/5) + 4y: 8 (3y/5) + 5y
= (9y + 20y)/5: (24y + 25y)/5
= 29y/5: 49y/5
= 29y: 49y
= 29: 49

2. If x: y = 8: 9, find the ratio (7x - 4y): 3x + 2y.

Solution:
Given x: y = 8: 9
We can write above equation as
x/y = 8/9
9x = 8y
x = 8y/9
By substituting the value of x in the given equation (7x - 4y): 3x + 2y we get,
(7x - 4y): 3x + 2y = 7 (8y/9) – 4y: 3 (8y/9) + 2y
= (56y – 36y)/9: (24y + 18y)/9
= 20y/9: 42y/9
= 20y: 42y
= 20: 42
= 10: 21

3. If two numbers are in the ratio 6: 13 and their L.C.M is 312, find the numbers.

Solution:
Given two numbers are in the ratio 6: 13

Let the required number be 6x and 13x
The LCM of 6x and 13x is 78x
= 78x = 312
x = (312/78)
x = 4
Thus the numbers are 6x = 6 (4) = 24
13x = 13 (4) = 52

4. Two numbers are in the ratio 3: 5. If 8 is added to each number, the ratio becomes 2:3. Find the numbers.

Solution:
Let the required numbers be 3x and 5x
Given that if 8 is added to each other then ratio becomes 2: 3
That is 3x + 8: 5x + 8 = 2: 3
(3x + 8)/ (5x + 8) = 2/3
3 (3x + 8) = 2 (5x + 8)
9x + 24 = 10x + 16
By transposing
24 – 16 = 10x – 9x
x = 8
Thus the numbers are 3x = 3 (8) = 24
And 5x = 5 (8) = 40

5. What should be added to each term of the ratio 7: 13 so that the ratio becomes 2: 3

Solution:
Let the number to be added is x
Then (7 + x) / (13 + x) = (2/3)
(7 + x) 3 = 2 (13 + x)
21 + 3x = 26 + 2x
3x – 2x = 26 – 21
x = 5
Hence the required number is 5

6. Three numbers are in the ratio 2: 3: 5 and the sum of these numbers is 800. Find the numbers

Solution:
Given that three numbers are in the ratio 2: 3: 5 and sum of them is 800
Therefore sum of the terms of the ratio = 2 + 3 + 5 = 10
First number = (2/10) × 800
= 2 × 80
= 160
Second number = (3/10) × 800
= 3 × 80
= 240
Third number = (5/10) × 800
= 5 × 80
= 400
The three numbers are 160, 240 and 400

7. The ages of two persons are in the ratio 5: 7. Eighteen years ago their ages were in the ratio 8: 13. Find their present ages.

Solution:
Let present ages of two persons be 5x and 7x
Given ages of two persons are in the ratio 5: 7
And also given that 18 years ago their ages were in the ratio 8: 13
Therefore (5x – 18)/ (7x – 18) = (8/13)
13 (5x – 18) = 8 (7x – 18)
65x – 234 = 56x – 144
65x – 56x = 234 – 144
9x = 90
x = 90/9
x = 10
Thus the ages are 5x = 5 (10) = 50 years
And 7x = 7 (10) = 70 years

8. Two numbers are in the ratio 7: 11. If 7 is added to each of the numbers, the ratio becomes 2: 3. Find the numbers.

Solution:
Let the required numbers be 7x and 11x
If 7 is added to each of them then

(7x + 7)/ (11x + 7) = (2/3)
3 (7x + 7) = 2 (11x + 7)
21x + 21 = 22x + 14
22x – 21x = 21 – 14
x = 21 – 14 = 7
Thus the numbers are 7x = 7 (7) =49
And 11x = 11 (7) = 77

9. Two numbers are in the ratio 2: 7. 11 the sum of the numbers is 810. Find the numbers.

Solution:
Given two numbers are in the ratio 2: 7
And their sum = 810
Sum of terms in the ratio = 2 + 7 = 9
First number = (2/9) × 810
= 2 × 90
= 180
Second number = (7/9) × 810
= 7 × 90
= 630

10. Divide Rs 1350 between Ravish and Shikha in the ratio 2: 3.

Solution:
Given total amount to be divided = 1350
Sum of the terms of the ratio = 2 + 3 = 5
Ravish share of money = (2/5) × 1350
= 2 × 270
= Rs. 540
And Shikha's share of money = (3/5) × 1350
= 3 × 270
= Rs. 810

11. Divide Rs 2000 among P, Q, R in the ratio 2: 3: 5.

Solution:

Given total amount to be divided = 2000
Sum of the terms of the ratio = 2 + 3 + 5 = 10
P's share of money = (2/10) × 2000
= 2 × 200
= Rs. 400
And Q's share of money = (3/10) × 2000
= 3 × 200
= Rs. 600
And R's share of money = (5/10) × 2000
= 5 × 200
= Rs. 1000

12. The boys and the girls in a school are in the ratio 7:4. If total strength of the school be 550, find the number of boys and girls.

Solution:
Given that boys and the girls in a school are in the ratio 7:4
Sum of the terms of the ratio = 7 + 4 = 11
Total strength = 550
Boys strength = (7/11) × 550
= 7 × 50
= 350
Girls strength = (4/11) × 550
= 4 × 50
= 200

13. The ratio of monthly income to the savings of a family is 7: 2. If the savings be of Rs. 500, find the income and expenditure.

Solution:
Given that the ratio of income and savings is 7: 2
Let the savings be 2x
2x = 500
So, x = 250
Therefore,
Income = 7x
Income = 7 × 250 = 1750

Expenditure = Income - savings
= 1750 - 500
= Rs.1250

14. The sides of a triangle are in the ratio 1: 2: 3. If the perimeter is 36 cm, find its sides.

Solution:
Given sides of a triangle are in the ratio 1: 2: 3
Perimeter = 36cm
Sum of the terms of the ratio = 1 + 2 + 3 = 6
First side = (1/6) × 36
= 6cm
Second side = (2/6) × 36
= 2 × 6
= 12cm
Third side = (3/6) × 36
= 6 × 3
= 18cm

15. A sum of Rs 5500 is to be divided between Raman and Amen in the rate 2: 3. How much will each get?

Solution:
Given total amount to be divided = 5500
Sum of the terms of the ratio = 2 + 3 = 5
Raman's share of money = (2/5) × 5500
= 2 × 1100
= Rs. 2200
And Aman's share of money = (3/5) × 5500
= 3 × 1100
= Rs. 3300

16. The ratio of zinc and copper in an alloy is 7: 9. It the weight of the copper in the alloy is 11.7 kg, find the weight of the zinc in the alloy.

Solution:

Given that ratio of zinc and copper in an alloy is 7: 9
Let their ratio = 7x: 9x
Weight of copper = 11.7kg
9x = 11.7
x = 11.7/9
x = 1.3
Weight of the zinc in the alloy = 1.3 × 7
= 9.10kg

17. In the ratio 7: 8. If the consequent is 40, what a the antecedent

Solution:
Given ratio = 7: 8
Let the ratio of consequent and antecedent 7x: 8x
Consequent = 40
8x = 40
x = 40/8
x = 5
Antecedent = 7x = 7 × 5 = 35

18. Divide Rs 351 into two parts such that one may be to the other as 2: 7.

Solution:
Given total amount is to be divided = 351
Ratio 2: 7
The sum of terms = 2 + 7
= 9
First ratio of amount = (2/9) × 351
= 2 × 39
= Rs. 78
Second ratio of amount = (7/9) × 351
= 7 × 39
= Rs. 273

19. Find the ratio of the price of pencil to that of ball pen, if pencil cost Rs.16 per score and ball pen cost Rs.8.40 per dozen.

Solution:
One score contains 20 pencils
And cost per score = 16
Therefore pencil cost = 16/20
= Rs. 0.80
Cost of one dozen ball pen = 8.40
1 dozen = 12
Therefore cost of pen = 8.40/12
= Rs 0.70
Ratio of the price of pencil to that of ball pen = 0.80/0.70
= 8/7
= 8: 7

20. In a class, one out of every six students fails. If there are 42 students in the class, how many pass?

Solution:
Given, total number of students = 42
One out of 6 student fails
x out of 42 students
1/6 = x/42
x = 42/6
x = 7
Number of students who fail = 7 students
No of students who pass =Total students - Number of students who fail
= 42 – 7
= 35 students.