

RD SHARMA

Solutions

Class 7 Maths

Chapter 9

Ex 9.1

Q1. If $x:y=3:5$, find the ratio $3x+4y:8x+5y$.

$$x:y=3:5$$

$$\frac{x}{y} = \frac{3}{5}$$

$$5x=3y$$

$$x = \frac{3y}{5}$$

$$\begin{aligned} 3x + 4y : 8x + 5y &= \frac{3 \times 3y}{5} + 4y : \frac{8 \times 3y}{5} + 5y \\ &= \frac{9y+20y}{5} : \frac{24y+25y}{5} \\ &= \frac{29y}{5} : \frac{49y}{5} \\ &= 29y : 49y = 29 : 49 \end{aligned}$$

Q2. If $x:y=8:9$, find the ratio $(7x-4y):3x+2y$.

$$x:y=8:9$$

$$\frac{x}{y} = \frac{8}{9}$$

$$9x=8y$$

$$x = \frac{8y}{9}$$

$$\begin{aligned} 7x - 4y : 3x + 2y &= \frac{7 \times 8y}{9} - 4y : \frac{3 \times 8y}{9} + 2y \\ &= \frac{56y-36y}{9} : \frac{42y}{9} \\ &= 20 : 42 \\ &= 10 : 21 \end{aligned}$$

Q3. If two numbers are in the ratio 6:13 and their L.C.M is 312, find the numbers.

Let the required numbers be $6x$ and $13x$

Then their L.C.M is $78x$

$$78x=312$$

$$x = \frac{312}{78}$$

$$x=4$$

Thus,

The numbers are

$$6x = 6 \times 4 = 24 \quad 13x = 13 \times 4 = 52$$

Q4. Two numbers are in the ratio 3:5. If 8 is added to each number, the ratio becomes 2:3. Find the numbers

Let the required numbers be $3x$ and $5x$

If 8 is added to each other

$$3x+8:5x+8=2:3$$

$$\frac{3x+8}{5x+8} = \frac{2}{3}$$

$$3(3x+8)=2(5x+8)$$

$$9x+24=10x+16$$

$$10x-9x=24-16$$

$$x=8$$

Thus the numbers are $3x=3(8)=24$

$$5x=5(8)=40$$

Q5. What should be added to each term of the ratio 7: 13 so that the ratio becomes 2: 3

Let the number to be added be x

Then

$$\frac{7+x}{13+x} = \frac{2}{3}$$

$$(7+x)3=2(13+x)$$

$$3x-2x=26-21$$

$$x=5$$

Hence the required number is 5

Q6. Three numbers are in the ratio 2: 3: 5 and the sum of these numbers is 800. Find the numbers

Given that

Three numbers are in ratio 2:3:5

Sum of these numbers=800

Sum of the terms of the ratio=2+3+5=10

$$\begin{aligned}\text{First number} &= \frac{2}{10} \times 800 \\ &= 160 \\ \text{Second number} &= \frac{3}{10} \times 800 \\ &= 240 \\ \text{Third number} &= \frac{5}{10} \times 800 \\ &= 400\end{aligned}$$

Q7. 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.

Let the required ages be $5x$ and $7x$

18 years ago their age ratios

$$\frac{5x-18}{7x-18} = \frac{8}{13} \quad 65x - 13 \times 18 = 8 \times 7x - 8 \times 18$$

$$65x - 234 = 56x - 144$$

$$65x - 56x = 234 - 144$$

$$9x = 90$$

$$x = 10$$

Thus the ages are $5x = 5 \times 10 = 50$ years

$7x = 7 \times 10 = 70$ years

Q8. 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.

Let the required numbers be $7x$ and $11x$

If 7 is added to each of the numbers it becomes

$$\frac{7x+7}{11x+7} = \frac{2}{3}$$

$$21x + 21 = 22x + 14$$

$$X = 21 - 14 = 7$$

Thus

The numbers are $7x = 7 \times 7 = 49$

$11x = 11 \times 7 = 77$

Q9. Two numbers are in the ratio 2: 7. The sum of the numbers is 810. Find the numbers.

Two numbers are in the ratio=2:7

Sum of the numbers=810

We have,

Sum of the terms in the ratio=2+7=9

$$\text{First number} = \frac{2}{9} \times 810$$

$$= 2 \times 90$$

$$= 180$$

$$\text{Second number} = \frac{7}{9} \times 810$$

$$= 7 \times 90$$

$$= 630$$

Q10. Divide Rs 1350 between Ravish and Shikha in the ratio 2: 3.

We have

Sum of the terms of the ratio= $2+3=5$

$$\text{Ravish money} = \frac{2}{5} \times 1350$$

$$= 2 \times 270$$

$$= \text{Rs.}540$$

$$\text{Shikha money} = \frac{3}{5} \times 1350$$

$$= 3 \times 270$$

$$= \text{Rs.}810$$

Q11. Divide Rs 2000 among P, Q, R in the ratio 2:3:5.

We have

Sum of the terms of the ratio= $2+3+5=10$

P-share=

$$\begin{aligned} & \frac{2}{10} \times \text{total money} \\ &= \frac{2}{10} \times 2000 \\ &= 2 \times 200 \\ &= \text{Rs.}400 \end{aligned}$$

Q-share=

$$\begin{aligned} & \frac{3}{10} \times \text{total money} \\ &= \frac{3}{10} \times 2000 \\ &= 3 \times 200 \\ &= \text{Rs.}600 \end{aligned}$$

R-share=

$$\begin{aligned} & \frac{5}{10} \times \text{total money} \\ &= \frac{5}{10} \times 2000 \\ &= 5 \times 200 \\ &= \text{Rs.}1000 \end{aligned}$$

Q12. 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.

We have,

The boys and girls is in the ratio 7:4

Sum of the terms in the ratio= $7+4=11$

Total strength=550

Boys strength=

$$\begin{aligned} & \frac{7}{11} \times 550 \\ &= 7 \times 50 \\ &= 350 \text{ boys} \end{aligned}$$

Girls strength=

$$\begin{aligned} & \frac{4}{11} \times 550 \\ &= 4 \times 50 \\ &= 200 \text{ girls} \end{aligned}$$

Q13. 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.

It is given that

The ratio of income and savings is 7:2

Savings

$$2x=500$$

$$\text{So, } x=250$$

Therefore,

$$\begin{aligned} \text{Income} &= 7 \times 250 \\ &= 1750 \end{aligned}$$

Expenditure=Income-savings

$$=1750-500$$

$$=\text{Rs.}1250$$

Q14. The sides of a triangle are in the ratio 1 : 2 : 3. If the perimeter is 36cm, find its sides.

The sides of the triangle are in the ratio 1:2:3

Sum of the terms in the ratio=1+2+3=6

Perimeter=36cm

First side=

$$\begin{aligned} &\frac{1}{6} \times 36 \\ &= 6\text{cm} \end{aligned}$$

Second side=

$$\begin{aligned} &\frac{2}{6} \times 36 \\ &= 12\text{cm} \end{aligned}$$

Third side=

$$\begin{aligned} &\frac{3}{6} \times 36 \\ &= 18\text{cm} \end{aligned}$$

Q15. A sum of Rs 5500 is to be divided between Raman and Amen in the rate 2: 3. How much will each get ?

We have,

Sum of the terms in the ratio=2+3=5

Raman share=

$$\begin{aligned} &\frac{2}{5} \times 5500 \\ &= 2 \times 1100 \\ &= \text{Rs.}2200 \end{aligned}$$

Aman share=

$$\begin{aligned} &\frac{3}{5} \times 5500 \\ &= 3 \times 1100 \\ &= \text{Rs.}3300 \end{aligned}$$

Q16. The ratio of zinc and copper in an alloy is 7 : 9. If the weight of the copper in the alloy is 11.7 kg, find the weight of the zinc in the alloy.

We have,

The ratio of zinc and copper in an alloy=7:9

Weight of copper in the alloy=11.7kg

$$9x=11.7\text{kg}$$

$$x = \frac{11.7}{9}$$

Weight of zinc in the alloy= 1.3×7

$$=9.10\text{kg}$$

Therefore weight of zinc =9.10kg

Q17. In the ratio 7: 8. if the consequent is 40, what is the antecedent

Given ratio=7:8

Consequent

$$8x=40$$

$$x = \frac{40}{8}$$

$$x=5$$

$$\text{antecedent}=7x=7 \times 5=35$$

Q18. Divide Rs 351 into two parts such that one may be to the other as 2 : 7.

$$\text{Ratio}=2:7$$

$$\text{The sum of the terms in the ratio}=2+7=9$$

$$\text{First ratio}=\frac{2}{9} \times 351$$

$$= 2 \times 39$$

$$= \text{Rs.}78$$

$$\text{Second ratio}=\frac{7}{9} \times 351$$

$$= 7 \times 39$$

$$= \text{Rs.}273$$

Q19. 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.

$$\text{One score}=20$$

It is Rs.16 per score for pencil

$$\text{Pencil cost}=\frac{16}{20}$$

$$=\text{Rs.}0.80$$

Cost of one dozen ball pen=Rs. 8.40

$$\text{Cost of one ball pen}=\frac{8.40}{12}$$

$$=\text{Rs.}0.70$$

$$\text{Ratio of price of pencil to that of ball pen}=\frac{0.80}{0.70}$$

$$=\frac{8}{7}$$

Q20. In a class, one out of every six students fails. If there are 42 students in the class, how many pass?

Given,

One out of 6 student fails

X out of 42 students

$$\frac{1}{6} = \frac{x}{42} \quad x = \frac{42}{6}$$

$$x=7$$

Number of students who fail=7 students

No of students who pass=Total students- number of students who fail=42-7=35 students.