Sheet -2 (Ratio and proportion)

1If p : q : r = 2 : 5 : 3 and r : s = 6 : 5, then what is the value of p : q : r : s? 4:10:6:5

2.a : b = 5 : 8 and b : c = 2 : 6. If a = 25, then find the value of c. 120

3.In a certain school, the ratio of boys to girls is 5 : 7. If there are 2400 students in the school, then how many girls are there? 1400

4.A sum of money is to be distributed among A, B, C and D in the ratio of 7 : 8 : 9 : 10. If C gets Rs. 500 more than B, then how much did D receive? 5000

5.What is the sum of mean proportional between 1.4 and 35 and the third proportional to 6 and 9?

6. If x : y = 3 : 5, then find the ratio of (10x + 3y) : (5x + 2y) 9:5

7.If A : B = 2 : 3, B : C = 6 : 7, C : D = 14 : 3, then find A : B : C : D 8:12:14:3

8.The sum of three numbers is 272. If the ratio between the first and second is 3 : 5 and that between the second and third is 5 : 8, then the third number is: 136

9.The ratio of the prices of tea to coffee is 3 : 5 and the ratio of their quantities consumed by a family is 5 : 7. Find the ratio of expenditure on tea to coffee. 3:7

10.Two numbers are, respectively, 17% and 50% more than a third number. The ratio of the two numbers is?

LEVEL-2

1.The ratio of the third proportion of 5 and 12 with the fourth proportion of 5, 8 and 9 is:

2.The value of a stone is proportional to the square of its weight. A stone worth Rs. 1,20,000 is broken into two pieces in the ratio of 2 : 3. What is the total price of the two small stones?

3.A and B invested money in a business in the ratio of 7 : 5. If 15% of the total profit goes for charity, and A's share in the profit is Rs. 5,950, then what is the total profit? 1200

4. In a partnership business. A and B invested in the ration of 5 : 6. At the end of 8 months A withdrew his capital. If they shared the eventual profit in the ratio of 5 : 9, then what is the number of months for which B invested his capital? 12 Moths

5.A basket consists of Apples and oranges in the ratio of 6: 5. If x apples and (x + 2) oranges were rotten then the ratio of the fresh apples and oranges is 4: 3. Find the total number of rotten apples and oranges in the basket and difference between apples and oranges in the basket is 8. 18

6.A and B possess books in the ratio of 3 : 4. B and C possess them in the ratio 2 : 3. If C gives 20 books to A, then A, B and C possess books in the ratio 4 : 4 : 5. Find how many books A, B and C originally had? 60, 80, 120

7.A, B and C started a business. A and B invest in the ratio of 3 : 7 and C invests Rs 8,000, which is the same amount as the difference between the investments of A and B. What is the amount invested by B? 140000

8. The ratio of two numbers is 5 : 4. A number y is then subtracted from each of the two given numbers so that the ratio of the resultant numbers becomes 2 : 1. What would be the ratio of the resultant numbers when the same number y is added to each of the two initial numbers? $\frac{5x-y}{4x-y}=\frac{2}{1}$ y = 3x => $\frac{5x+3x}{4x+3x}=\frac{8x}{7x}=\frac{8}{7}$

8 : 7

9. A and B have some toffees. If A gives one toffee to B, then they have equal number of toffees. If B gives one toffee to A, then the toffees with A are double with B. The total number of toffees with A and B are 12 .

A Have x Toffies
b ahve y Toffies

Condition 1: x -1 = y+1 => x-y =2

x -5 = 2 => x =7 x+y =12

Condition2: x + 1 = 2(y -1) => y = 5

10.Investments made by A, B and C in a craft business is Rs.47,000. If A invest Rs.7,000 more than B and B invest Rs.5,000 more than C, then find the amount C gets out of the total profit Rs.4700. 1) a + b + c =47000 => 2) (7000+b) + (5000+c) +c = 47000 => 3) b + 2c = 35000

4) (c + 5000) + c = 35000 => 5) 3c = 30000 => 6)c = 10000, b = 15000, a = 23000 7)c =10, b = 15, a =23

LEVEL-3 8) $\frac{4700}{47}$ 1- 100 9) 100 * 10 = 1000

1.There are 3 containers of equal capacity which are equally filled where 1/4 part of liquid from the first container was shifted into the second container and 1/2 part of initial quantity from the second container was shifted into the third container then what will be the ratio of final quantity of liquid in all the containers after the shifting has been stopped?

2. The weight of Ayush and Abhishek are in the ratio of 8 : 5. Abhishek's weight increases by 40 percent and the total weight of Ayush and Abhishek both increase by 60 percent. If the total weight becomes 104 kg, then what is the weight of Ayush after the increment?

3.P and Q are two alloys of aluminum and copper. The ratios of aluminum and copper in P and Q are 5 : 11 and 3 : 5, respectively. If a third alloy is formed by mixing alloys P and Q in the ratio of 1 : 3, then aluminum is what percentage (rounded off to the nearest integer) of the copper in the third alloy?

4.In a party hall, there are people in blue and red dresses. The ratio of number of men in blue to the number of Women in red is 3 : 7, The ratio of men in red to the number of women in blue is 2 : 1. If the ratio of number of people in blue to the number of people in red is 35 : 76, then what is the ratio of number of men to the number of women?

5.Three friends A, B and C divide Rs. 5525 amongst them in such a way that if Rs. 50, Rs. 100 and Rs. 75 are removed from the sums that A, B and C received respectively, then the share of the sums that they get would have been in the ratio of 11 : 18 : 24. How much did C initially receive?

6.A student obtained equal marks in english and history. The ratio of marks in history and maths is 3 : 4. He scored an aggregate of 60 percent in the three subjects. Maximum marks for each subject is 100. How much did he score in history?

7.If ratio of investment of A, B and C are in the ratio 6 : 5 : 8 and the time of investment of A, B and C are 200/3%, 80% and 75% respectively of their investment, and profit of A is 7800 then what will be the profit of C. (in Rs.)

8.A sum of Rs. 1250 has to distributed among A, B, C and D. Total share of B and D is equal to (14/11) of total share of A and C. Share of D is half of share of A. Share of C is 1.2 of share of A. What are the shares of A, B, C and D respectively ?

9.Mohan distributed his total wealth among his wife, three sons, two daughters and 5 grandchild (grandsons and granddaughters) in such a way that each grandchild should get 1/8 of each son or 1/10 of every daughter. His wife gets 40% of the total of his sons and daughters. If each daughter got ₹1.25 lakh, then how much money his wife and five grandchild (grandsons and granddaughters) got?

10. The ratio of the present age of Chinky and Minky is 4 : 5 and the present age of Chinky's mother is 9/2 times Minky's age 5 years ago and the present age of Minky's mother is 7/3 times of Chinky's age after 3 years. If after 15 years the average age of Minky's mother and Chinky's mother is 55, then find the Difference between Chinky's and Minky's present age.

11. The price of two articles are in the ratio of 5 : 6 respectively. The price of first article is increased by 30% and the price of second article is decreased by X%. If the new ratio is 13 : 11 respectively, then what is the value of X?

12. The ratio of male workers to the female worker in factory A is 3 : 4 and that in factory B is 5 : 4. The percentage of the females who got increment in factory A is 70 percent and that in factory B is 85 percent. If 12 females in factory A did not get the increment and 68 females in factory B get the increment, then what can be the ratio of total workers in factory A to total workers in factory B?

13. The amount Neeta and Geeta together earn in a day equals what Sita alone earns in 5 days. The amount Sita and Neeta together earn in a day equals what Geeta alone earns in 4 days. The ratio of the daily earnings of the one who earns the most to that of the one who earns the least is

14. A 2-digit number is such that the sum of the number and the number obtained by reversing the order of the digits of the number is 55. Further, the difference of the given number and the number obtained by reversing the order of the digits of the number is 45. What is the product of the digits?

15. In a school library, the ratio of Science to English books is 10 : 13. If there are 400 Science books and due to increase in demand of Science books, few Science books are added by school authority and the ratio becomes 25 : 26. What is the number of Science books added?

16. In a school, 3/8 of the number of students are girls and the rest are boys. One-third of the number of boys are below 10 years and 2/3 of the number of girls are also below 10 years. If the number of students of age 10 or more years is 260, then the number of boys in the school is:

17. In a school, there are 200 students. If the ratio of the number of boys and the number of girls is 9 : 1, then find the mean proportion between the number of boys and that of girls in the school.

18. When k > 0, is subtracted from each of 11, 15, 20 and 30, the numbers so obtained in this order are in proportion. What is the mean proportional between (2k + 2) and 3k2?

19. Three numbers are in the ratio 1/2 : 2/3 : 3/4. The difference between the greatest and the smallest number is 27. The smallest number is:

20. If the denominator of a fraction is multiplied by 2 and the numerator is increased by 2, the fraction becomes 1212. If instead, the numerator is multiplied by 2 and the denominator is increased by 2, it becomes 6/7 What is the sum of the numerator and the denominator of the original fraction (in the lowest form) ?

SOLUTIONS

1.p : q : r = 2 : 5 : 3

r : s = 6 : 5

The ratio p: q: r can be joined with the ratio r: s when the common term r is the same in both.Make r the same in both ratios by multiplying p: q: r by 2 and r: s by 1:

⇒ 2(2 : 5 : 3) : 1(6 : 5)

⇒ 4 : 10 : 6 : 5

Simplifying we get 4 : 10 : 6 : 5

2.a : b = 5 : 8

b : c = 2 : 6

a = 25

Concept: If a : b = x : y and b : c = m : n, then a : b : c = xm : ym : yn.

⇒ a : b : c = (5 × 2) : (8 × 2) : (8 × 6) = 10 : 16 : 48

⇒ When a is 25, c = 25 × (48 / 10) = 120

Therefore, when a is 25, the value of c is 120.

3.Solution:

Given:

Total number of students = 2400

Calculation

Number of girls = 2400 × 7/12 = 1400

The answer is 1400

4.Proportion of money distributed among A, B, C, D = 7: 8 : 9 : 10.

Money C gets more than B = 500.

Calculation:

Let the shares of A, B, C, D be Rs.7x, Rs.8x, Rs.9x and Rs.10x.

Then, 9x - 8x = 500.

⇒ x = 500.

∴ D's share = Rs.10x = Rs. (10 × 500) = Rs.5000

5.Mean proportional of 1.4 and 35 is -

⇒ x = √(1.4 × 35)

⇒ x = √(49)

⇒ x = 7

Third proportional of 6 and 9 is -

y = 92/6

⇒ y = 81/6

⇒ y = 13.5

Sum of the above two = 7 + 13.5 = 20.5

6.x ∶ y = 3 ∶ 5

Now, (10x + 3y) ∶ (5x + 2y)

⇒ (10x+3y):(5x+2y) ⇒⇒ (10×3+3×5):(5×3+2×5)

(30+15):(15+10)

45:25

∴ (10x + 3y) ∶ (5x + 2y) = 9 : 5

7. A : B = 2 : 3 .....(i)

B : C = 6 : 7. .....(ii)

C : D = 14 : 3. .....(iii)

Calculation:

Multiply by 2 in eq(ii) to make C equal

B : C = 12 : 14

Multiply by 4 in eq(i) to make B equal

A : B = 8 : 12

A : B : C : D = 8 : 12 : 14 : 3

8.Ratio of three numbers = 3 × 5 ∶ 5 × 5 ∶ 5 × 8

⇒15 ∶ 25 ∶ 40

⇒3 ∶ 5 ∶ 8

3x + 5x + 8x = 272

⇒16x = 272

⇒x = 272/16

⇒x = 17

Third number = 8 × 17

⇒136

∴ Third number is 136

9.expenditure =price ××quantities

$E1/E2$=P1/P2 X Q1/Q2

$E1/E2$ =3/7

10. Let the third number be Y

First Number =Y x117/100 =117Y/100

Second Number =Y x150/100=150Y/100

Ratio = 117 : 150

⇒ 39 : 50

∴ The correct answer is 39 : 50.

LEVEL-2

1.⇒ Third proportion of 5 and 12 = $(12^2)/5$ = 28.8

⇒ Fourth proportion of 5, 8, and 9 = (8 × 9/5) = 14.4

⇒ Ratio = 28.8/14.4 = 2:1

Therefore, the ratio of the third proportion of 5 and 12 with the fourth proportion of 5, 8 and 9 is 2:1

2. The value of a stone is proportional to the square of its weight.

A stone worth Rs. 1,20,000 is broken into two pieces in the ratio of 2 ∶ 3.

Calculation:

Let's suppose, the weights of the small pieces are 2k and 3k units.

Initial total weight of the stone = 3k + 2k = 5k units

According to the concept,

$(5k)^2 \propto 120000$

$\Rightarrow 25k^2 \times F = 120000$ (F = constant)

$\Rightarrow k^2F = 4800$ ....(1)

So,The value of the piece of the stone weighing 2k units

$\Rightarrow (2k)^2 \times F$

$\Rightarrow 4k^2F$

$\Rightarrow 4 \times 4800$ (From 1)

⇒ ₹19200

The value of the piece of the stone weighing 3k units

$\Rightarrow (3k)^2 \times F$

$\Rightarrow 9k^2F$

$\Rightarrow 9 \times 4800$ (From 1)

⇒ ₹43200

Now, the total price of the two small stones = 43200 + 19200 = ₹62,400

∴ The total price of the two small stones is ₹62,400.

3.A and B invested money in a business in the ratio of 7∶ 5.

15% of the total profit goes for charity, and A's share in the profit is Rs. 5,950

Calculation:

The total profit of A and B will be 5950 × 12 / 7 = Rs 10200

The total profit including charity is 10200 × 100/85 = Rs 12000

∴ The correct option is 2

4.A's capital : B's capital = 5 : 6

A's time = 8 months

A's profit : B's profit = 5 : 9

Formula used:

A's profit : B's profit = A's capital × A's time : B's capital × B's time

Calculation:

A's profit : B's profit = 5 × 8 : 6 × t

⇒ 5 : 9 = 40 : 6t

⇒ 5 : 9 = 20 : 3t

⇒ t = (20 × 9)/(5 × 3)

⇒ t = 12

∴ The number of months B's capital was used in the business is 12 month

5.Number of apples in the basket = 6a

Number of oranges in the basket = 5a

difference between apples and oranges in the basket is 8

6a - 5a = 8

a = 8

Number of apples in the basket = 6a = 48

Number of oranges in the basket = 5a = 40

If x apples and (x + 2) oranges were rotten then,

Number of fresh apples to oranges are in the ratio 4: 3

(48 - x)/(40 - (x + 2) = 4/3

(144 - 3x) = (160 - 4x - 8)

-8 = -x

x = 8

Total number of rotten oranges and apples in the basket is (8 + 8 + 2) = 18

Hence, option(3) is correct.

6.The ratio of the number of books of A to B = 3 : 4

The ratio of the number of books of B to C = 2 : 3 = 4 : 6

Hence, the ratio of the number of books of A, B to C

⇒ 3 : 4 : 6

Let's suppose, A, B, and C originally had 3k, 4k, and 6k books respectively.

According to the question,

(3k + 20) : 4k = 4 : 4 (Taking A and B only)

⇒ 12k + 80 = 16k

⇒ 4k = 80

⇒ k = 20

Now, A, B, and C originally had (3 × 20) i.e. 60, (4 × 20) i.e. 80, and (6 × 20) i.e. 120 books respectively.

∴ A, B and C originally had 60, 80, and 120 books respectively.

7. Investment of A - Investment of B = Investment of C

Let the amount invested by A is Rs. A and amount invested by B is Rs. B

A : B = 3 : 7

A=3B/7

Investment of A - Investment of B = Investment of C = Rs. 8000

3B/7-B =8000

−4B/7=8000

B=-14000

Since money can't be negative, so neglecting the negative sign we will have

B = Rs. 14000

8. Initial ratio of two numbers is 5 : 4

y is subtracted from each of the two numbers then the ratio becomes 2 : 1

Calculation:

Let the two numbers be 5x and 4x.

According to the question,

(5x - y)/(4x - y) = 2/1

⇒ 5x - y = 8x - 2y

⇒ 3x = y -----(1)

Now, The ratio when y is added to the two numbers,

⇒ (5x + y) : (4x + y)

Take the value of y from equation (1), we get

⇒ (5x + 3x) : (4x + 3x)

⇒ 8x : 7x

⇒ 8 : 7

∴ The ratio of the two numbers when y added to them is 8 : 7

9.let the number of toffee with A be x and with B be y.

If A gives one toffee to B, then:

⇒ x - 1 = y + 1

⇒ x = y + 2 .....(1)

Now when B gives one toffee to A, then the toffees with A are double with B:

⇒ x + 1 = 2 (y - 1) .....(2)

Putting the value of eq.(1) in eq. (2).

$\Rightarrow y + 3 = 2y - 2$

$\Rightarrow y = 5$

If $y = 5$ then $x = 7$.

$\Rightarrow x + y = 12$

The total number of toffees with A and B are 12.

10. Let the investment of C be x.

B's investment = $x + 5000$

A's investment = $x + 5000 + 7000$

(A + B + C)'s investment = 47000

$\Rightarrow x + x + 5000 + x + 5000 + 7000 = 47000$

$\Rightarrow 3x + 17000 = 47000$

$\Rightarrow 3x = 47000 - 17000$

$\Rightarrow 3x = 30000$

$\Rightarrow x = 30000/3$

$\Rightarrow x = 10000$

A's investment = 10000 + 12000 = 22000

B's investment = 10000 + 5000 = 15000

C's investment = 10000

Ratio of investment of A, B and C = 22000 : 15000 : 10000

$\Rightarrow 22 : 15 : 10$

Share of C = $(10/47) \times 4700$

$\Rightarrow 10 \times 100$

$\Rightarrow 1000$

$\therefore$ The correct answer is Rs 1000 which is the share of C.

LEVEL-3

1.3 equal containers of equal volume.

1/4 part was shifted from 1st to 2nd container.

1/2 part was shifted from 2nd to 3rd container.

Calculation:

According to question,

Since, all containers are equally filled and possess same volume.

So, let the amouint filled in all the containers be unity.

Initially,

1st container = 1

2nd container = 1

3rd container = 1

During shifting,

1st container = 1 - 1/4 = 3/4

2nd container = 1 + 1/4 = 5/4

Since 1/2 part of initial quantity is taken out from the 2nd container

∴ 5/4 - 1/2 = 3/4

3rd container = 1 + 1/2 = 3/2

After shifting,

1st container = 3/4

2nd container = 3/4

3rd container = 3/2

Ratio = 3/4 : 3/4 : 3/2

⇒ 3 : 3 : 6

⇒ 1 : 1 : 2

∴ The correct answer is 1 : 1 : 2.

2.Let's assume:

The weight of Ayush = 8x

The weight of Abhishek = 5x

Abhishek's weight after the increase:

Increase in weight = 5x × 40/100

Increase in weight = 2x

New weight of Abhishek = 5x + 2x = 7x

Total weight of Ayush and Abhishek after the increase:

Increase in weight = (8x + 5x) × 60/100

Increase in weight = 13x × 60/100

Increase in weight = 7.8x

Total weight after the increase:

Total weight = 8x + 5x + 7.8x

Total weight = 20.8x

Given that the total weight becomes 104 kg, we can set up the equation:

20.8x = 104

To solve for x, we divide both sides of the equation by 20.8:

x = 104/20.8

x = 5

Now that we know x, we can find the weight of Abhishek after the increment:

Weight of Abhishek = 7x

Weight of Abhishek = 7 × 5

Weight of Abhishek = 35 kg

The total weight after the increment is 104.

So, the weight of Ayush after the increment is 104 - 35 = 69

Therefore, the weight of Ayush after the increment is 69 kg.

3.The ratio of P is 5 : 11, a total of 16

The ratio of Q is 3 : 5, a total of 8

Now multiply the second ratio by 2 to make the quantity equal.

The ratio of Q is 6 : 10, a total 16

If a third alloy is formed by mixing alloys P and Q in the ratio of 1 : 3.

Now multiply the first ratio by 1 and the second ratio by 3, as the third alloy is formed by mixing in 1 : 3 ratio

The final ratio in third alloy Al : Cu = 23 : 41

Required percentage = (23/41) × 100 = 56.09 ≈ 56%

∴ The correct answer is 56%.

4. Men in Blue (MB) = 3x

Women in Red (WR) = 7x

Men in Red (MR) = 2y

Women in Blue (WB) = y

People in Blue (PB) = Men in Blue + Women in Blue = 3x + y

People in Red (PR) = Men in Red + Women in Red = 2y + 7x

(3x + y)/(7x + 2y) = 35/76

76(3x + y) = 35(7x + 2y)

228x + 76y = 245x + 70y

17x = 6y

x = 6y/17 ----(1)

Men = MB + MR = 3x + 2y = 3(6y/17) + 2y = 18y/17 + 2y

Women = WR + WB = 7x + y = 7(6y/17) + y = 42y/17 + y

Men/Women = (18y/17 + 2y)/(42y/17 + y)

(18y + 34y)/(42y + 17y)

Men/Women = 52/59

So, the ratio of men to women is 52 : 59.

5.Let the common ratio be Q.

Original shares,

A's share = 11Q + 50

B's share = 18Q + 100

C's share = 24Q + 75

According to the question,

(11Q + 50) + (18Q + 100) + (24Q + 75) = 5525

⇒ 53Q + 225 = 5525

⇒ 53Q = 5525 - 225

⇒ Q = 5300 ÷ 53

⇒ Q = 100

Now, C initially received

⇒ 24Q + 75

⇒ 24 × 100 + 75

⇒ 2475

∴ C initially received Rs. 2475.

6.Let the marks obtained in history and maths be 3x and 4x respectively.

Marks obtained in English = marks obtained in history = 3x.

Combined maximum marks of all 3 subjects = 100 × 3 = 300.

Total marks scored by candidate in all 3 subjects

= 60% of 300

= (60 / 100) × 300

= 180 marks.

Thus,

3x + 3x + 4x = 180

10x = 180

x = 180 / 10

x = 18.

Score in history = 18 × 3 = 54 marks.

7. Let, investment of A = 6x

Investment of B = 5x

Investment of C = 8x

∴ Time of investment of A = 6x × 200/300 = 4x

∴ Time of investment of B = 5x × 80/100 = 4x

∴ Time of investment of C = 8x × 75/100 = 6x

∴ Effective ratio of investment of A, B and C,

⇒ 6x × 4x : 5x × 4x : 8x × 6x

⇒ 24 : 20 : 48

⇒ 6 : 5 : 12

Let, C's share of profit = Rs. y

According to problem,

⇒ 6/12 = 7800/y

⇒ y = 7800 × 2

⇒ y = 15600

∴ Profit of C = Rs. 15600

8.Here, we have D = A/2 , C = 12/10 A = 6/5 A

Also, we have

⇒ B + D = 14/11 (A + C)

⇒ 11B + 11D = 14 (A + 6/5 A)

⇒ 11B + 11A/2 = 14 × 11A/5

⇒ 11 B = 154A/5 - 11A/2

⇒ 11B = 253 A/10

⇒ B = 23/10 A

Now, total sum of A, B ,C and D = Rs1250

⇒ A + B + C + D = 1250

⇒ A + 23/10 A + 6/5 A + A/2 = 1250

⇒ (20A + 46A + 24A + 10A)/20 = 1250

⇒ 100A/20 = 1250

⇒ 5A = 1250

⇒ A = 250

⇒ B = 23/10 A = 23/10 × 250 = 575

⇒ C = 6/5 A = 6/5 × 250 = 300

⇒ D = A/2 = 250/2 = 125

Hence, share of A = Rs250, B = Rs575, C = Rs300, D = Rs125 .

9.Share of 1 grandchild

= 1/10 × 1.25 = 0.125 lakh

Each son gets = 8 x 0.125

= Rs. 1 lakh

Share of 3 sons = Rs. 3 lakhs

Share of 2 daughters = 2 × 1.25

= Rs. 2.5 lakhs

The total share of sons and daughters = Rs. 5.5 lakhs

Wife's share = 2/5 x 5.5

= Rs. 2.2 lakhs

Share of five grandchildren

= 5 × 0.125

= Rs. 0.625 lakh

Required amount

= Rs. (2.2 + 0.625) lakh

= Rs. 2.825 lakhs

= Rs. 282500

10. Let the present age of Chinky be 4x and Minky be 5x

5 year ago Minky's age = 5x – 5

The present age of Chinky's mother = (9/2) × Minky's age 5 years ago

So, the present age of Chinky's mother = (9/2) × (5x – 5)

⇒ (45x – 45)/2

After 15 years, Chinky's mother age = ((45x – 45)/2) + 15

⇒ (45x – 15)/2

Chinky's age after 3 years = 4x + 3

The present age of Minky's mother = (7/3) × Chinky's age after 3 year

So, the present age of Minky's mother = (7/3) × (4x + 3)

⇒ (28x/3) + 7

After 15 years, Minky's mother age = (28x/3) + 7 + 15

⇒ (28x + 66)/3

Total age of Chinky's mother and Minky's mother after 15 years = ((45x – 15)/2) + ((28x + 66)/3)

⇒ (135x – 45 + 56x + 132)/6

⇒ (191x + 87)/6

Average age of Chinky's mother and Minky's mother after 15 years = Sum of total age/Total person

⇒ (191x + 43)/(6 × 2)

⇒ (191x + 87)/12 = 55

⇒ 191x = 573

⇒ x = 3

The present age of Chinky = 4x = 4 × 3 = 12

The present age of Minky = 5x = 5 × 3 =15

The Difference between Chinky's and Minky's present age = 15 – 12 = 3 years

The Difference between Chinky's and Minky's present age is 3 years

11. Let the price of the articles initially be 50 and 60 respectively

The price of first article is increased by 30%

⇒ 50 + (30/100) × 50 = 65

The price of second article is decreased by X%

⇒ 60 - {(X/100) × 60} = 60 × (100 - X)/100

So the Ratio becomes 13 : 11

⇒ 65/{60× (100 - X)/100} = 13/11

⇒ 715 = 780 × (100 - X)/100

⇒ 71500 = 78000 - 780X

⇒ 780X = 6500

∴ X = 8.33

12. In Factory A, the ratio of male workers to female workers is 3 : 4.

In Factory B, the ratio of male workers to female workers is 5 : 4.

70% of female workers in Factory A got an increment, so 30% did not get an increment.

Since 12 females did not get the increment in Factory A,

⇒ 0.30F_A = 12, where F_A is the number of female workers in Factory A. ⇒ F_A = 12 / 0.30 = 40.

85% of female workers in Factory B got an increment. Given that 68 females in Factory B got the increment

⇒ 0.85F_B = 68, where F_B is the number of female workers in Factory B.

⇒ F_B = 68 / 0.85 = 80.

The total number of workers in Factory A is (3 + 4) × (40 / 4) = 7 × 10 = 70.

The total number of workers in Factory B is (5 + 4) × (80 / 4) = 9 × 20 = 180.

Therefore, the ratio of total workers in Factory A to total workers in Factory B is 70 : 180 = 7 : 18.

Hence, the correct option is 4.

13. Let Neeta, Geeta, and Sita earn N, G, and S in one day

According to the question,

N + G = 5S ----(i)

S + N = 4G ----(ii)

By subtracting (ii) from (i) we get

G - S = 5S - 4G

⇒ 5G = 6S

So, G/S = 6/5

So the ratio of daily earnings of Geeta and Sita = 6 : 5

Let earnings of Geeta and Sita be 6x and 5x

So,

N + 6x = 5 × 5x

⇒ N + 6x = 25x

⇒ N = 19x

So, Neeta's daily earning is the most, and Sita's is the least

So, required ratio = 19x : 5x

⇒ 19 : 5

∴ The Required answer is 19 : 5.

14. Let 1st digit = x & 2nd digit = y

2-digit number = 10x + y

Reversing the order of the digits of the number = 10y + x

According to question

The sum of the number and the number obtained by reversing the order of the digits of the number = 55

⇒ 10x + y + 10y + x = 55

⇒ 11x + 11y = 55

⇒ x + y = 5 ---------(1)

The difference of the given number and the number obtained by reversing the order of the digits of the number = 45

⇒ 10x + y - 10y - x = 45

⇒ 9x - 9y = 45

⇒ x - y = 5 ----------(2)

Adding Equation (1) & (2)

⇒ x + y + x - y = 10

⇒ 2x = 10 ⇒ x = 5

Put the value of x in equation (1)

⇒ 5 + y = 5 ⇒ y = 0

The product of the digits = 5 × 0 = 0

∴ The correct answer is 0.

15. From the given initial ratio, 10 parts of the ratio represent 400 books.

⇒ Each part represent 400/10 = 40 books

⇒ So, the number of English books = 13 parts = 40 × 13 = 520 books

Now, the ratio of Science to English books, after addition of Science books, is 25 : 26.

Given, number of English books remain the same (as no addition in English books).

1 part of the ratio is therefore equivalent to 520/26 = 20 books.

⇒ Hence, after addition, the number of Science books = 25 parts = 20 × 25 = 500 books

Number of Science books added = Final number of Science books - Initial number of Science books

⇒ 500 - 400

⇒ 100

Therefore, the number of Science books added is 100.

16. Let the total no. of students x

No. of students who are girls = (3/8) of x = (3x/8)

No. of students who are boys = (5/8) of x = (5x/8)

According to the question,

⇒ Total students with age 10 or above = 260

⇒ No. of boys above 10 years + No. of girls above 10 years = 260

⇒ (2/3) of (5x/8) + (1/3) of (3x/8) = 260

⇒ (5x/12) + (x/8) = 260

⇒ (10x + 3x)/24 = 260

⇒ 13x/24 = 260

∴ x = 480 → Total no. of students in the school

∴ Total no. of boys in the school = 5x/8 = (5/8) × 480 = 300.

17. Number of boys = 9/10 × 200 = 180

Number of girls = 1/10 × 200 = 20

Mean Proportional = √(180 × 20) = √3600 = 60

Therefore, the mean proportion between the number of boys and that of girls in the school is 60.

18. According to question,

(11 – k)/(15 – k) = (20 – k)/(30 – k)

⇒ 330 – 30k – 11k + k^2= 300 – 15k – 20k + k^2

⇒ 6k = 30

⇒ k = 5

Now,

(2k + 2) and $3k^2$ = 12 and 75

So, mean proportion = √(12 × 75)

⇒ √900 = 30

∴ Required answer is 30.

19.The ratio of the numbers = 1/2 : 2/3 : ¾

On multiplying by 12 (LCM of the denominators)

New ratio = 6 : 8 : 9

According to the question,

(9 – 6) units = 27

⇒ 3 units = 27

⇒ 1 unit = 9

∴ the smallest number = 6 × 9 = 54

20. Let the fraction is x/y

According to the problem statement,

If we multiply the denominator by 2 and increase the numerator by 2, the resulting fraction is 1/2.

⇒ (x + 2)/(2y) = 1/2

⇒ x = y - 2 -----(1)

Next, if we multiply the numerator by 2 and increase the denominator by 2, the resulting fraction is 6/7.

⇒ 2x/(y + 2) = 6/7

⇒ 7x = 3y + 6

⇒ 7(y -2) = 3y + 6 [From equation (1)]

⇒ 7y - 3y = 6 + 14

⇒ 4y = 20

⇒ y = 5

From equation (1)

x = 5 - 2 = 3

Hence,

Required sum = 5 + 3 = 8

∴ The correct answer is 8.