**Ratio and Proportion**

**Type 1: Numbers and Ratios**

1. If a:b = 2:3 and b:c = 4:5, then a:b:c = ?

A) 8:12:15 B) 2:3:5 C) 2:4:5 D) 8:12:20

**Soln:**

A: B = 2 : 3

B: C = 4 : 5

Therefore A : B : C = 2\*4 : 3\* 4 : 3\* 5

= 8:12 :15

1. If 0.6 of a number is equal to 0.08 of another number. The ratio of the numbers will be?

A) 3:4 B) 4:3 C) 2:15 D) 2:19

**Soln:**

0.6 \* a = 0.08 \* b  
∴ a/b = 0.08 / 0.6 = 8 / 60 = 2 / 15 = 2 : 15

1. When 7 is added to the numerator and denominator of the fraction, then the new ratio of numerator and denominator becomes 13:19, what is the original ratio?

A) 11:13 B) 7:9 C) 4:7 D) Can’t be determined

**Soln:**

In X+7/y+7 = 13/19 x and y are different variable ,so original fraction cannot be determined

**Dividing into parts:**

1. The sum of the squares of three numbers is 5000. The ratio between the first and the second number is 3:4 and that of the second and third number is 4:5. Find the difference between the first and the third number.

A) 20 B) 30 C) 40 D) 50

**Soln:**

a:b = 3:4 ; b:c = 4:5 => a:b:c = 3:4:5

Given, a^2 + b^2 + c^2 = 5000 => (3x)^2 + (4x)^2 + (5x)^2 = 5000

Therefore, x = 10, a = 30 ; b = 40 ; c = 50

c – a = 20

1. A sum of money is to be distributed among P, Q, R and S in the proportion 2:5:6:7, If R get Rs.500 more than S. What is P’s share?

A) 500 B) 700 C) 1000 D) 1200

**Soln:**

S – R = 7 – 6 = 1 => 500  
2 × 500 = 1000

1. The sum of the three numbers is 68. If the ratio of the first to second is 3:2 and that of the second to the third is 5:3, then the second number is

A) 21 B) 22 C) 23 D) 24

**Soln:**

Let the three numbers be a, b and c

a:b= 2:3

b:c = 5:3

If we calculate a: b: c then there is nothing left in the question.

a:b:c comes out to be 10:15:9

Adding all the ratios and equating it to 68

34x=68

X=2

Hence second number will be 15\*2=30

1. 180 sweets are divided among friends A, B, C and D in which B and C are brothers also such that sweets divided between A and B are in the ratio 2 : 3, between B and C in the ratio 2 : 5 and between C and D in ratio 3 : 4. What is the number of sweets received by the brothers together?

A) 78 B) 84 C) 92 D) 102

**Soln:**

A : B : C : D = 2\*2\*3 : 3\*2\*3 : 3\*5\*3 : 3\*5\*4 = 4 : 6 : 15 : 20

B and C together = [(6+15)/(4+6+15+20)] \* 180 = 84

Top of Form

Bottom of Form

**Type 3: Increase or decrease in ratio**

1. A, B and C divide Rs 4200 among themselves in the ratio 7 : 8 : 6. If Rs 200 is added to each of their shares, what is the new ratio in which they will receive the money?

A) 9 : 8 : 7 B) 8 : 9 : 7 C) 8 : 9 : 8 D) 9 : 10 : 8

**Soln:**

7X + 8X + 6X = 21X = 4200 => X= 200

A = (7 \* 200) + 200 = 1600

B = (8 \* 200) + 200 = 1800

C = (6 \* 200) + 200 = 1400

Now, A:B:C = 1600 : 1800 : 1400 = 8:9:7

1. The ratio of boys and girls in the school is 7:9 when 22 new boys are joined in this school then the ratio becomes 9:10. How many girls are there?

A) 180 B) 200 C) 160 D) 220

**Soln:**

Given: The ratio of boys and girls = 7 : 9

Number of new boys = 22

New boys to girls ratio = 9 ∶ 10

Calculation: Let be boys = 7x and girls be = 9x

⇒ {(7x+ 22)/9x} = 9/10

⇒ 70x + 220 = 81x

⇒ 11x = 220

⇒ x = 20

Then put the value in Girls ⇒ Girls = 20× 9 = 180 ∴ Girls are 180

1. The students in 3 classes are in the ratio 3:4:5.If 20 students added in each class, the ratio becomes 5:6:7.Find the total no of students in all the 3 classes now ?

A) 160 B) 170 C) 180 D) 200

**Soln:**

While comparing the ratios the difference in the proportions of both ratio is 2.

Therefore, 2 parts = 20 => 1 part = 10

Present ratio = 5:6:7 => 18 parts

18 \* 10 = 180 students

1. An amount is to be divided between A, B and C in the ratio 2:3:5 respectively. If C gives 200 of his share to B the ratio among A, B and C becomes 3:5:4. What is the total sum?

A) 5000 B) 6000 C) 7000 D) 8000

**Soln:**

A:B:C = 2:3:5 => total parts = 10

New A:B:C = 3:5:4 => total parts = 12

Therefore, the answer must be LCM of total parts of both the ratios and its multiples.

**Type 4: Based on coins and money**

1. In a bag there are coins of 25p, 10p and 5p in the ratio 1:2:3.If there are Rs.45 in all then find how many 25p coins are there ?

A) 60 B) 65 C) 70 D) 75

**Soln:**

[(25x) + (10x × 2) + (5x × 3)] / 100 = 45  
[25x + 20x + 15x] / 100 = 45  
60 x = 4500  
X = 4500/60 = 75

1. A bag contains 25p, 50p and 1Re coins in the ratio of 2 : 4 : 5 respectively. If the total money in the bag is Rs 75, find the number of 50p coins in the bag.

A) 45 B) 50 C) 25 D) 40

**Soln:**

(25/100)\*2x + (50/100)\*4x + 1\*5x = 75

x = 10,

so 50 p coins = 4x = 40

1. A bag contains 25p coins, 50p coins and 1 rupee coins whose values are in the ratio of 8:4:2.If the total values of coins is X and the total amount in rupees is Y, then which of the following is true

A) X = 840; Y = 260 B) X = 966; Y = 345

C) X = 840; Y = 280 D) X = 740; Y = 260

**Soln:**

(8x/0.25) + (4x/0.5) + (2x/1) = 840.

X = 20. Total amount = 14\*20 = 280

1. If Shubhangi has twice as many 20 rupee notes as she has 50 rupee notes and altogether she has 2,700 rupees, then how many 50 rupee notes does she have?

A) 30 B) 35 C) 40 D) 45

**Soln:**

50\*x+2x\*20 = 2700

90x = 2700

x = 30

1. A man has ₹480 in the denominations of 1 rupee notes, 5 rupee notes and 10 rupee notes. The number of notes of each denomination is equal. What is the total number of notes that he has?

A) 30 B) 35 C) 40 D) 45

**Soln:**

1X +5X + 10X = 480 => X=30

**Income/Expenditure**

1. The ratio of monthly income of A and B in the ratio is 6:5 and the ratio of their expenditure is 9:7.If each saves Rs.1500.Then the sum of their salary is?

A) 11,000 B) 9,000 C) 1,0000 D) 12,000

**Soln:**

6X - 1500 = 9

5X – 1500 = 7

X = 1000

Now, 11X = 11000

1. The salaries of A, B and C are in the ratio 5:3:2.If the increments of 20% ,10% and 20% are allowed in their salaries, then what will be the new ratio of their salaries ?

A) 22:11:9 B) 22:10:8 C) 20:11:8 D) 20:10:9

**Soln:**

Let, 5:3:2 = 500:300:200  
500×(20/100) = 100 => 500+100 = 600  
300×(10/100) = 30 => 300+33 = 330  
200×(20/100) = 40 => 200+40 = 240  
600:330:240 = 20:11:8

1. Salaries of Ravi and Sumit are in the ratio 2 : 3. If the salary of each is increased by Rs. 4000, the new ratio becomes 40 : 57. What is Sumit's salary?

A) Rs. 17,000 B) Rs. 20,000 C) Rs. 25,500 D) Rs. 38,000

**Soln:**

Let the original salaries of Ravi and Sumit be Rs. 2*x* and Rs. 3*x* respectively.

https://www.indiabix.com/_files/images/aptitude/1-sym-imp.gif 57(2*x* + 4000) = 40(3*x* + 4000)

https://www.indiabix.com/_files/images/aptitude/1-sym-imp.gif 6*x* = 68,000

https://www.indiabix.com/_files/images/aptitude/1-sym-imp.gif 3*x* = 34,000

Sumit's present salary = (3*x* + 4000) = Rs.(34000 + 4000) = Rs. 38,000.

1. The salaries A, B, C are in the ratio 2 : 3 : 5. If the increments of 15%, 10% and 20% are allowed respectively in their salaries, then what will be the new ratio of their salaries?

A) 3 : 3 : 10 B) 10 : 11 : 20 C) 23 : 33 : 60 D) Cannot be determined

**Soln:**

Consider the values as 200,300 and 500

115% of 200 = 230

110% of 300 = 330

120% of 500 = 600

Therefore ratio = 230:330:600 = 23:33:60

1. The incomes of A and B are in the ratio 1 : 2 and their expenditures are in the ratio 2 : 5. If A saves Rs 20,000 and B saves Rs 35,000, what is the total income of A and B?

A) Rs 30,000 B) Rs 90,000 C) Rs 90,000 D) Rs 60,000

**Soln:**

Income of A = x, of B = 2x

Expenditure of A = 2y, of B = 5y

Savings is (income – expenditure). So x – 2y = 20,000; 2x – 5y = 35,000

Solve the equations, x = 30,000

So total = x+2x = 3x => 3\*30,000 = 90,000

**Type 6: Based on Partnership**

1. A started a business with Rs.32,000 after 4 months B joined with the business by investing Rs.48,000.At the end of the year, in what ratio should share their profit ?

A) 8:7 B) 7:6 C) 5:7 D) 9:5

**Soln:**

32000\*12 : 48,000\*8 = 32\*12 : 42\*8384 : 384 = 1:1

1. The investment of A is twice as that of Band thrice as that of C. B invested for twice the months than A and thrice the months than C. Who will earn the highest profit?

A) B  B) C  C) A  D) Both A and B

**Soln:**

Investment ratio 6:3:2

Month ratio 3:6:2

Then 6\*3 : 6\*3 : 2\*2 => 9:9:2

Therefore, A and B get equal share.

1. Harvinder and Deepak invest in a business, Rs 8000 and Rs 8250 for 11 months and 9 months respectively. If Deepak earn Rs 2500 less profit than Harvinder. Find the difference between the amount invested and profit earn by Harvinder?

A) 5000 B)6000 C)7000 D)8000

**Soln:**

Ratio of profit earned by Harvinder and Deepak = 8000 \* 11 : 8250 \* 9 = 32 : 27Let profit earned by Harvinder and Deepak are 32x and 27x respectively.  
32x - 27x = 2500  
x = 500  
Profit earned by Harvinder = 32x = 16000  
required difference = 16000 - 8000 = Rs. 8000

1. A puts Rs 80 and B puts Rs 45 in a game. At the end of 4 months, A withdrew half of his money and at the end of 6 months B also withdrew half of his money. Now C also wants to play and puts Rs 75 and remains until the end of the year. In what ratio the profit will be divided among them?

A) 128:81:90 B)82:90:81 C) 90:81:128 D)128:90:81

**Soln:**

A's share : B's share : C's share = [(80\*4) + ((80/2)\*8)] : [(45\*6) + ((45/2)\*6)] : [75\*6]  
= [320 + 320)] : [270 + 135)] : [450]  
= 640 : 405 : 450  
= 128 : 81 : 90

1. Nitin and Krishnam invested in a business in ratio 12:5.If 15% of the total profit goes to trust and Nitin’s share is Rs1055, what is the total profit?

A) 1758.33 B) 1600 C) 1750 D) 1760

**Soln:**

Let total profit is equal to Rs 100.  
Nitin share=(85)\*(12/17)=Rs 60  
If Nitin share is Rs 60,Total profit is Rs 100.  
If Nitin share is Rs 1055,  
Total profit=(100/60)\*1055=Rs 1758.33