

# RATIO & PROPORTION

# Ratio & Proportion

- Introduction to the topic
- Finding actual quantities from given ratios and vice- verse
- Merging of ratios from three or more different ratios
- Changing of Ratio by Increasing/decreasing values
- Coins based Questions
- Third and Fourth proportions
- Data Sufficiency Questions

# Ratio & Proportion

## Ratio

A ratio refers to the quantitative comparison of two similar things,

It can be represented as

Eg

10:5 , 10/5, 10 to 5.

Examples.

Aspect ratio. Ratio in size of a door or window

## Proportion

While proportion refers to the equality of ratios

It can be represented as

Eg

$10/5 = 2/1$

Examples.

Proportion btw hands to whole body  
Golden proportion

# Ratio & Proportion

## Merging of Ratio's

➤ If  $A:B=M:N$ ,  $B:C=P:Q$ , THEN  $A:B:C$  IS  
 $A:B:C= MP:PN:NQ$

For example:- let  $a:b :: 3:4$  and  $b:c :: 5:7$ , if we have to find the  $a:b:c$ .

So  $a:b$  become  $15:20$  and  $b:c$  become  $20:28$

So  $a:b:c = 15:20:28$ .

➤ If  $A:B=M:N$ ,  $B:C=P:Q$ ,  $C:D=R:S$ , THEN  $A:B:C:D$  IS  
 $A:B:C:D=MPR:NPR:NQR:NQS$

➤ FOR EXAMPLE,

$A:B=2:3$

$B:C=3:4$

$C:D=4:5$

$A:B:C:D=2*3*4:3*3*4:3*4*4:3*4*5$

$A:B:C:D=24:36:48:60$

# Ratio & Proportion

1. If  $a : b = 7 : 9$  and  $b : c = 15 : 7$ , then what is  $a : c$ ?

A]  $5 : 3$

B]  $3 : 5$

C]  $7 : 20$

D]  $7 : 15$

## Ratio & Proportion

2. If  $A : B = 3 : 4$ ,  $B : C = 5 : 7$  and  $C : D = 8 : 9$  then  $A : D$  is equal to

A]  $3 : 7$

B]  $7 : 3$

C]  $21 : 10$

D]  $10 : 21$

# Ratio & Proportion

3. The ratio of A to B is 4 : 5 and that of B to C is 2 : 3. If A equals 800, C equals

A] 1000

B] 1200

C] 1500

D] 2000

## Ratio & Proportion

4. If two times of A is equal to three times of B and also equal to four times of C, then  $A : B : C$  is

A]  $2 : 3 : 4$

B]  $3 : 4 : 2$

C]  $4 : 6 : 3$

D]  $6 : 4 : 3$



## Ratio & Proportion

5. Rs. 33,630 are divided among A, B and C in such a manner that the ratio of the amount of A to that of B is 3 : 7 and the ratio of the amount of B to that of C is 6 : 5. The amount of money received by B is

A] Rs. 14868

B] Rs. 16257

C] Rs. 13290

D] Rs. 12390

## Ratio & Proportion

6. If  $A : B = 4 : 9$  and  $A : C = 2 : 3$ , then  $(A + B) : (A + C)$  is

A]  $15 : 13$

B]  $10 : 13$

C]  $13 : 10$

D]  $13 : 15$

# Ratio & Proportion

7. If  $(a + b) : (b + c) : (c + a) = 6 : 7 : 8$  and  $(a + b + c) = 14$ , then the value of  $c$  is

A] 6

B] 7

C] 8

D] 14

## Ratio & Proportion

8. If  $A : B : C = 2 : 3 : 4$ , then ratio  $A / B : B / C : C / A$  is equal to

A]  $8 : 9 : 16$

B]  $8 : 9 : 12$

C]  $8 : 9 : 24$

D]  $4 : 9 : 16$

## Ratio & Proportion

9. If  $A : B = 1 / 2 : 3 / 8$ ,  $B : C = 1 / 3 : 5 / 9$  and  $C : D = 5 / 6 : 3 / 4$ , then the ratio  $A : B : C : D$  is

A]  $6 : 4 : 8 : 10$

B]  $6 : 8 : 9 : 10$

C]  $8 : 6 : 10 : 9$

D]  $4 : 6 : 8 : 10$

## Ratio & Proportion

10. A person distributes his pens among four friends A, B, C, D in the ratio  $1/3 : 1/4 : 1/5 : 1/6$ . What is the minimum number of pens that the person should have?

A] 57

B] 65

C] 75

D] 45

## Ratio & Proportion

11. By mistake, instead of dividing 117 among A, B and C in the ratio  $1/2 : 1/3 : 1/4$ , it was divided in the ratio of  $2 : 3 : 4$ . Who gains the most and by how much?

A] A, Rs. 28

B] B, Rs. 3

C] C, Rs. 20

D] C, Rs. 25

## Ratio & Proportion

12. Among 132 examinees of a certain school, the ratio of successful to unsuccessful students is 9 : 2. Had 4 more students passed, then the ratio of successful to unsuccessful students would have been

A] 14 : 3

B] 14 : 5

C] 28 : 3

D] 28 : 5



## Ratio & Proportion

13. Two numbers are in the ratio 5 : 7. On diminishing each of them by 40, they become in the ratio 17 : 27. The difference of the numbers is :

- |        |       |
|--------|-------|
| A] 18  | B] 52 |
| C] 137 | D] 50 |

## Ratio & Proportion

14. The students in three classes are in the ratio  $2 : 3 : 5$ . If 20 students are increased in each class, the ratio changes to  $4 : 5 : 7$ . Originally the total number of students was :

- A] 50
- B] 90
- C] 100
- D] 150

## Ratio & Proportion

15. In a coloured picture of blue and yellow color, blue and yellow colour is used in the ratio of 4 : 3 respectively. If in upper half, blue : yellow is 2 : 3, then in the lower half blue : yellow is

A] 1 : 1

B] 2 : 1

C] 26 : 9

D] 9 : 26

## Ratio & Proportion

16. The product of two positive integers is 1575 and their ratio is 9 : 7. The smaller integer is

A] 25

B] 35

C] 45

D] 70

## Ratio & Proportion

17. Three numbers are in the ratio of 3 : 2 : 5 and the sum of their squares is 1862. The smallest of these numbers is

- |       |       |
|-------|-------|
| A] 24 | B] 21 |
| C] 14 | D] 35 |

## Ratio & Proportion

18. The income of A, B and C are in the ratio 3 : 7 : 4 and their expenses in the ratio 4 : 3 : 5. If A saves 300 out of an income of 2,400, the savings of B and C are :
- A] Rs. 4025 and 575                      B] Rs. 1575 and 225  
C] Rs. 2750 and 1525                      D] Rs. 3725 and 1525

## Ratio & Proportion

19. The salaries of A, B and C are in the ratio 1 : 3 : 4. If the salaries are increased by 5%, 10% and 15% respectively, then the increased salaries will be in the Ratio

A] 20 : 66 : 95

B] 21 : 66 : 95

C] 21 : 66 : 92

D] 19 : 66 : 92

## Ratio & Proportion

20. 180 contained in a box consists of one rupee, 50 paise and 25 paise coins in the ratio 2 : 3 : 4. What is the number of 50 paise coins?

- |        |        |
|--------|--------|
| A] 60  | B] 120 |
| C] 150 | D] 180 |



# Ratio & Proportion

## Properties of Proportion:

(i)  $a:b = c:d$

can be written as  $a/b = c/d$

which implies,  $a*d = b*c$ , or,  $ad = bc$

this property helps in solving many questions

(ii) if  $a:b = b:c$ , which means this proportions between three numbers is in the form of ‘Continued proportions’, as all three numbers are having a connection.

So,  $a/b = b/c$  or,

$ac = b.b$  or,

$ac = b^2$

## Ratio & Proportion

21. The means proportion of 3 and 12 is:

A] 6

B] 9

C] 8

D] 4.5

# Ratio & Proportion

22. If 18,  $x$  and 50 are in continued proportion, then the value of  $x$  is:

- |       |       |
|-------|-------|
| A] 30 | B] 5  |
| C] 3  | D] 32 |

## Ratio & Proportion

23. The forth proportion of 4.5, 9, 9 is:

A] 30

B] 27

C] 18

D] 24

# Ratio & Proportion

24. The number to be added to each of the numbers 7, 16, 43, 88 to make the numbers in proportion is

A] 2

B] 3

C] 5

D] 1

## Ratio & Proportion

**Directions (25-27):** Each of the questions given below consists of a statement and / or a question and two statement numbered I and II given below it. You have to decide whether the data provided in the statement is / are sufficient to answer the given question. Read both the statements and

**Give answer (a)** if the data in statement A alone are sufficient to answer the question, while the data in statement B alone are not sufficient to answer the question

**Give answer (b)** if the data in statement B alone are sufficient to answer the question, while the data in statement A alone are not sufficient to answer the question

**Give answer (c)** if the data either in statement A or in statement B alone are sufficient to the answer the question

**Give the answer (d)** if the data even in statement A and B together are not sufficient to answer the question

**Give answer (e)** if the data in both statement A and B together are necessary to answer the question

## Ratio & Proportion

25. Rohan and sachin together earn rs. 14000 per month. How much does Rohan earn?

- a) Their salaries are in the ratio 3: 4
- b) Sachin earns rs. 2000 per month more than Rohan.

## Ratio & Proportion

26. What was the ratio between the ages of P and R four years ago?

- a) The ratio between the present ages of P and Q is 3: 4
- b) The ratio between the present ages of Q and R is 4 :5.



## Ratio & Proportion

27. How many students are there in the class?

A. Boys and girls are in the ratio of 2: 3 respectively

B. Difference between the number of girls and the number of boys is 8 and 60% of the students are girls.

*Any Doubts???*