

5/1/2025

1. Ratio and Proportion

PAGE NO.:
DATE: / /

Ratio	proportion
a, b	$a:b$
$a:b$	$c:d$
$\frac{a}{b}$	$a:b :: c:d$
'a' is to 'b'	$\frac{a}{b} : \frac{c}{d}$
	$\frac{a}{b} = \frac{c}{d}$
	$ad = bc$
	Fourth Proportion
	$d = \frac{bc}{a}$

(#) A B $\xrightarrow{\text{HCF}} 100$
 200 300
 2 : 3 base

(#) A B $(A+B)$
 2 : 3 5 $\rightarrow 55$
 2 3 1 $\rightarrow 11$
 22 33 22

(#) A B (diff)
 2 : 7 5 $\rightarrow 65$
 2 7 1 $\rightarrow 13$
 26 91

(iii)

$$A : \boxed{B} = 2 : 3$$

$$\boxed{B} : C = \boxed{3} : 4$$

$$A : B : C = ?$$

$$2 : 3 : 4$$

(iv)

$$A : B = 2 : 3$$

$$B : C = 4 : 5$$

$$A : B : C = ?$$

method 1 :- ~~cross multiplication~~ ^N(W) multiplication

$$A : B = 2 : 3$$

$$B : C = 4 : 5$$

$$A : B : C$$

$$8 : 12 : 15$$

method 2 :- Basic maths Logic

A	B	C
2×4	3×4	5×3
multiply	$\cancel{4} \times 3$	
$8 : 12$:	15

(multiply 4 by 3
and 3 by 4)

1) A and B together have Rs. 1210. If $\frac{4}{15}$ of A's amount is equal to $\frac{2}{5}$ of B's amount, how much amount does B have?

- A) RS. 460 B) RS. 484 C) RS. 550 D) RS. 664

$$A + B = 1210$$

$$\frac{2}{3} \frac{4}{15} A = \frac{2}{5} B$$

$$\frac{A}{B} = \frac{3}{2}$$

$$(A + B) = 3 + 2 \\ = 5$$

$$5 \rightarrow 1210$$

$$1 \rightarrow 242$$

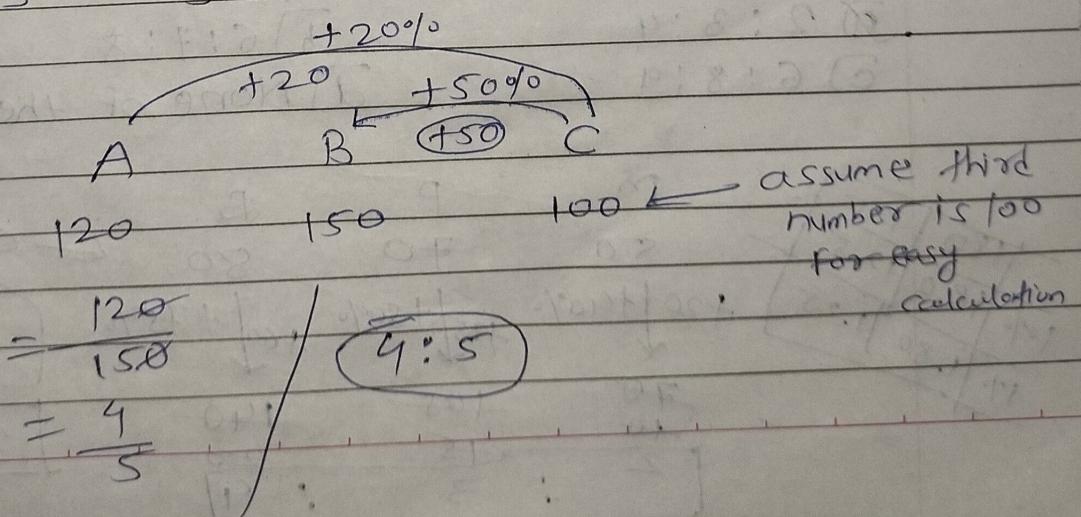
$$\frac{242}{1210}$$

$$B = 2 \times 242$$

$$\boxed{B = 484 \text{ Rs.}}$$

2) Two numbers are respectively 20% and 50% more than a third number. The ratio of the two numbers is

- a) 2:5 b) 3:5 c) 4:5 d) 6:7



③ A sum of money is to be distributed among A, B, C, D in the proportion of 5:2:4:3. If C gets Rs. 1000 more than D, what is B's share?

- [a] Rs. 500 [b] Rs. 1500 [c] Rs. 2000 [d] None of these

$$A : B : C : D$$

$$5 : 2 : 4 : 3$$

C gets Rs. 1000 more than D

$$\boxed{C - D = 1000}$$

difference of ratios

$$C - D = 4 - 3$$

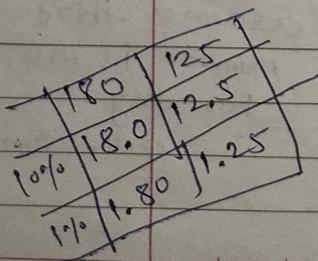
$$= 1 \rightarrow 1000$$

than

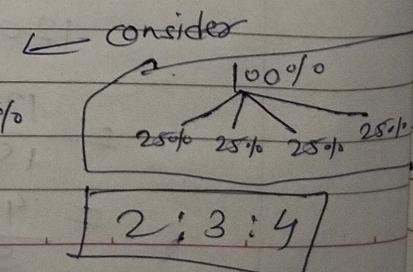
$$B = 2 \rightarrow 1000 \times 2 = \underline{\underline{2000}}$$

4 Seats for Mathematics, Physics and Biology in a school are in the ratio 5:7:8. There is a proposal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats?

- [a] 2:3:4 [b] 6:7:8
 [c] 6:8:9 [d] None of these



M	P	B
50	70	80
+20	+40%	+35
70	105	115
2	3	4



5) In a mixture 60 litres, the ratio of milk and water 2:1. if this ratio is to be 1:2, then the quantity of water to be further added is:

- a) 20 litres
- b) 30 litres
- c) 40 litres
- d) 60 litres

(same) $m : w + \text{mix}$

Both Same

$$\begin{array}{c} 2 : 1 \\ 1 \times 2 : 2 \times 2 \\ 2 : 4 \end{array}$$

$2+1=3 \rightarrow 60L$

$3 \xrightarrow{20} 60L$

$3 \times 20 = 60L$

6) The ratio of the number of boys and girls in a college is 7:8. if the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio?

- a) 8:9
- b) 17:18
- c) 21:22
- d) cannot be determined

B Given 70 : 80

~~70 | 80
7 | 8~~

$70 : 80$

$\downarrow 14 \quad \downarrow 20\%$

$84 : 88$

$21 : 22$

$21 : 22$

* TYPES - ratio Difference same

- 7) Ratio of two no. is 3:5 if 18 is added to both the no., then new ratio will be 5:7. Find the both no.

Concept \Rightarrow

$$\begin{array}{c|cc|cc} \text{Ex - } & A & B & A & B \\ & 50 & 70 & 5 : 7 & 2 \xrightarrow{10} 20 \\ \text{(Same)} & \downarrow +20 & \downarrow +20 & \downarrow +2 & \downarrow +2 \\ & 70 & 90 & 7 : 9 & \text{Same} \end{array}$$

- ④ If \uparrow or \downarrow in any two numbers same then diff of ratio must be same.

$$\begin{array}{c} \text{A} \quad \text{B} \\ 27 \xleftarrow{xg} 3 : 5 \xrightarrow{xg} 45 \\ \text{②} \downarrow \quad \text{②} \downarrow \text{diff} \\ 5 : 7 \quad 2 \rightarrow 18 \rightarrow \text{add} \\ , \quad \rightarrow 9 \end{array}$$

Numbers are 27 and 45

Type - 2 - ratio Difference not same

- 8) 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. 34,000

$$\begin{array}{cccc}
 & R & S & \\
 & 2 & 3 & \\
 38 & \downarrow & \downarrow & 54 \\
 40 & ; & ; & 57 \\
 & 40 & 57 & \underline{\underline{4000}}
 \end{array}$$

Ratio difference same :-

Ratio Difference multiply 2010
 ratio ~~difference~~ and 2010 Ratio Difference
 multiply 2010 ratio

$$2 - 3 = 1$$

$$40 - 57 = 17$$

$$\begin{array}{ccc}
 & R & S \\
 34 & \xleftarrow{2 \times 17} & 3 \times 17 \rightarrow 54 \\
 \cancel{6} & \downarrow \cancel{6} & \xrightarrow{\frac{3}{54}} \text{same} \\
 40 \xrightarrow{40} & 57 \xrightarrow{57} & 6 \rightarrow 4000
 \end{array}$$

$$3 \rightarrow 2000$$

$$\text{sumit} \rightarrow 3 \times 17 \rightarrow 2000$$

$$\text{sumit} \rightarrow 54 \rightarrow 34000$$

- 8) If $0.75 : x :: 5 : 8$, then x is equal to
 a) 1.12 b) 1.2 c) 1.25 d) 1.30

$$\frac{0.75}{x} = \frac{5}{8}$$

$$0.75x = 0.75 \times 8$$

$$8x = 6$$

$$x = \frac{6}{8}$$

$$x = 1.2$$

10) The sum of three numbers is 98. If the ratio of the first to second is 2:3 and that of the second to the third is 5:8, then the second number is;

- (A) 20 (B) 30 (C) 48 (D) 58

$$\begin{array}{ccc} A & B & C \\ 2 \times 5 & \xrightarrow{\substack{3 \times 5 \\ \downarrow \\ 5 \times 3}} & 8 \times 3 \\ 10 & : 15 & : 24 \end{array}$$

sum of three numbers = 98. Then
ratio sum = $10 + 15 + 24 = 49$

$$\begin{array}{ccc} 49 & \xrightarrow{\text{ratio}} & 98 \\ \text{Second number} & \xrightarrow{\text{1}} & \xrightarrow{\text{2}} \\ B \rightarrow 15 \times 2 & = \boxed{30} & \end{array}$$

11) If Rs. 782 be divided into three parts, proportional to $1/2 : 2/3 : 3/4$ then the first part is:

- (A) Rs. 182 (B) Rs. 190 (C) Rs. 196 (D) Rs. 204

$$\begin{array}{ccc} A & B & C \\ \frac{1}{2} \times 12 & \frac{2}{3} \times 12 & \frac{3}{4} \times 12 \\ 6 & : 8 & : 9 \end{array} \quad \begin{array}{l} \text{ratio cannot} \\ \text{be fraction} \\ \text{from} \\ \text{convert into} \\ \text{real number.} \end{array}$$

$$\text{sum} = 6 + 8 + 9 = \underline{\underline{23}}$$

$$\begin{array}{l} 23 \rightarrow 782 \\ 1 \rightarrow 34 \end{array}$$

$$\begin{array}{l} \text{First Part} = 6 \times 34 \\ = \boxed{204} \end{array}$$

Find the number
that divide by
denominator and

12) 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 new ratio of their salaries?

- a) 3:3:10
- b) 10:11:20
- c) 23:33:60
- d) Cannot be determined

$$\begin{array}{c}
 \text{A} \quad \text{B} \quad \text{C} \quad \text{consider} \\
 20 : 30 : 50 \\
 +3 \downarrow \quad +15\% \quad +3 \downarrow \quad +10\% \quad +10 \downarrow \quad +20\% \\
 23 : 33 : 60 \\
 \boxed{23 : 33 : 60} \\
 \end{array}$$

(20)

$10\% \rightarrow 2$
 $5\% \rightarrow 1$

13) If 40% of a number is equal to two-third of another number, what is the ratio of first number to the second number?

- a) 2:5
- b) 3:7
- c) 5:3
- d) 7:3

$$40\% \text{ of } A = \frac{2}{3} B$$

$$\frac{2}{5} \frac{40}{100} A = \frac{2}{3} B$$

$$\frac{2}{5} A = \frac{2}{3} B$$

$$\frac{A}{B} = \frac{5}{3}$$

$$\boxed{A:B = 5:3}$$

14) The fourth proportional to 5, 8, 15 is

- a) 18 b) 24 c) 19 d) 20

a, b, c, d

a b c
5 8 15

$$\frac{a}{b} = \frac{c}{d}$$

$$\boxed{d = \frac{bc}{a}} \Rightarrow d = \frac{8 \times 15}{5} = \boxed{24}$$

15) Two numbers are in the ratio 3:5. If 9 is subtracted from each the new numbers are in the ratio 12:23. The small number is:

- a) 27 b) 33 c) 49 d) 55

$$\begin{array}{rcl} A & & B \\ 3 & : & 5 \\ 9 \downarrow & & \downarrow 18 \\ 12 & : & 23 \end{array} \qquad 9$$

Difference not same so make difference same
342 का DIFF निचे multiply or निचे का diff 3542

$$\begin{array}{rcl} A & & B \\ 33 & \leftarrow 3 \times 11 & : 5 \times 11 \rightarrow 55 \\ \cancel{-9} & & +9 \text{ same} \\ 12 \times 2 & : 23 \times 2 & \end{array} \qquad \begin{array}{l} 5 - 3 = 2 \\ 23 - 12 = 11 \end{array}$$

$$9 \rightarrow 9 \\ 1 \rightarrow 1$$

$$\begin{array}{l} A \rightarrow 33 \rightarrow 33 \times 1 = 33 \\ \text{Smaller} \\ \text{number} \end{array}$$

16) In a bag, there are coins of 25P, 10P and 5P in the ratio of 1:2:3. If there is Rs.30 in all, how many 5P coins are there?

- A) 50 B) 100 C) 150 D) 200

$$\begin{array}{ccccccc}
 & 25P & & 10P & & 5P & \\
 \text{coin} \rightarrow & 1 & : & 2 & : & 3 & \xrightarrow{\text{Total}} \boxed{\quad} \\
 & 25 + & 20 + & 15 & & & \\
 \cancel{2} \rightarrow & & & & & & \text{Rs. } 30 \downarrow \\
 & & & & & & \text{30 convert} \\
 & & & & & & \text{in Peise} \\
 & & & & & 60 \rightarrow = 3000P \\
 & & & & & 1 \rightarrow 50 \downarrow \\
 \underline{5P} = 3 \times 50 = \boxed{150} & & & & & &
 \end{array}$$