	m		w		
A	1_{x5}	:	2_{x5}	=	3_{x5}
B	2_{x3}	:	3_{x3}	=	5_{x3}
	11	:	19		

CLASS 25 RATIO & PROPORTION

(65) Two vessel contain milk & water in the ratio 7:5 and 7:9 if both vessel are mixed in ratio 1:1, find the ratio of milk and water in new mixture?

	M		W		
A	7_{x4}	:	5_{x4}	=	12_{x4}
B	7_{x3}	:	9_{x3}	=	16_{x3}
	49	:	47		

(66) Three vessel each of ~~10~~ 10 litre capacity contain a mixture of milk & water in the ratio 2:1, 3:1 and 3:2. if all the three vessels are emptied into a large vessel, find the ratio of milk & water in new mixture?

	m		w		
A	2_{x20}	:	1_{x20}	=	3_{x20}
B	3_{x15}	:	1_{x15}	=	4_{x15}
C	3_{x12}	:	2_{x12}	=	5_{x12}
	121	:	59		

(67) Two vessel A & B contain a mixture of milk & water in the ratio 4:5 and 5:1. ~~In what ratio should quantities of mixture be taken~~ If both vessel are mixed in the ratio 5:2. find the ratio of milk & watter in new mixture.

	M		W			
A	4_{x10}	:	5_{x10}	=	9_{x2} =	18_{x5}
B	5_{x6}	:	1_{x6}	=	6_{x3} =	18_{x2}
	70	:	56	⇒	5 : 4	

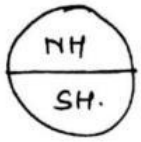
(68) If 2 kg of metal of w/c $\frac{1}{3}$ is zinc and rest is copper be mixed with 3 kg of metal of w/c $\frac{1}{4}$ is zinc and rest is copper. What is the ratio of zinc to copper in new mixture.

	Z	C	
A	1×8	$2\times8 = 3\times4 = 12\times2$	2kg
B	1×9	$3\times9 = 4\times3 = 12\times3$	3kg
	17	43	

---

(69) Ratio of Land : water on earth is 1:2 and ratio of Land : water in northern hemisphere is 2:3. find the ratio of Land : water in southern hemisphere.

	L	W	
Earth	1×10 :	$2\times10 = 3\times5 = 15\times2$	Earth
NH	2×3 :	$3\times3 = 5\times3 = 15\times1$	NH
SH.	4 :	11	



Earth → 2
NH → 1

Earth : NH = 2:1

---

(70) Rs 5600 is to be divided among A, B, C & D in such a way that the ratio of share of A:B is 1:2, B:C is 3:1, C:D is 2:3. find share of (A+B)

a	:	b	:	c	:	d
1	:	2		2		2
3		3	:	1		1
2		2		2	:	3
~~6~~	:	~~12~~	:	~~4~~	:	~~6~~
3	:	6	:	2	:	3

3+6+2+3 = 14

14 —— 5600

1 —— 400

(A+B) = 9 × 400

= 3600 Rs.

---

(71) The ratio of expenditure of A, B and C is 16:12:9 and their total income is 1530. find the share of B's income. if they save 20%, 25% and 40% of their income?

	A	B	C
Income →	20 :	16 :	15
Exp →	16 :	12 :	9

51 → 1530

1 → 30

B = 16 × 30 = 480 Rs.

20% = $\frac{1}{5}$ S / I

E = 4 → 16

1 → 4

5 → 20

(72) The total income of A, B & C is Rs 6060. A spend 80% B spend 85% and C spend 75%. and the ratio of their saving is 5:6:9. find the income of A ?

	A	B	C
Saving	5	6	9
Income	25	40	36

$80\% = \frac{4}{5}$ — 4 — I

$85\% = \frac{17}{20}$

$5 = 3 \rightarrow 6$

$1 \rightarrow 2$

$20 \rightarrow 40$

$101 \rightarrow 6060$

$1 \rightarrow 60$

$A = 25 \times 60 = 1500$ Rs.

---

(73) Rs 2366 is divided among 8 men, 10 women & 10 children Each men get 25% more than each ~~me~~ women and each women get 25% more than each child. find the amount received by each women.

m	w	c
5 :	4	4
5	5 :	4
25 :	20 :	16
$\times 8$	$\times 10$	$\times 10$
~~200~~ :	~~200~~ :	~~160~~
5	5	4

$14 \longrightarrow 2366$

$1 \longrightarrow 169$

$5 \rightarrow 169 \times 5 = 845$

Each women $= \frac{845}{10} = 84.5$

---

(74) Rs 500 is divided among A, B, C in such a way that Rs 16 more $\frac{2}{5}$ of A's share, Rs 70 less than $\frac{3}{4}$ of B's share, and Rs 4 less than $\frac{3}{5}$ of C's share are equal. find B's share.

$A \times \frac{2}{5} + 16 = B \times \frac{3}{4} - 70 = C \times \frac{3}{5} - 4 = 6K$

common $4 \times 3 = 6$

$A = (6K - 16) \times \frac{5}{2}$

$A = 15K - 40$

$B = (6K + 70)\frac{4}{3}$

$= 8K + \frac{280}{3}$

$C = (6K + 4)\frac{5}{3}$

$= 10K + \frac{20}{3}$

$\therefore 15K - 40 + 8K + \frac{280}{3} + 10K + \frac{20}{3} = 500$

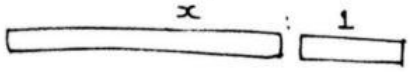
$33K = 440$

$K = \frac{40}{3}$

$B = 8 \times \frac{40}{3} + \frac{280}{3}$

$= \frac{600}{3} = 200$ Rs

(75) A boy and a girl playing with the pencil. The girl break the pencil in two parts. and the boy observe that the ratio of length of these two parts is same as the ratio of length of pencil to the larger part. find the ratio in w|c the girl break the pencil. 195



$$\frac{x}{1} = \frac{x+1}{x}$$

$$x^2 = x+1$$

$$x^2 - x - 1 = 0$$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$x = \frac{1 \pm \sqrt{5}}{2}$$

$$x = \frac{1+\sqrt{5}}{2} \Rightarrow \frac{\sqrt{5}+1}{2}$$

∴ Ratio of two parts = $\sqrt{5}+1 : 2$

Ratio a:b नहीं ले सकते | 2 variable दे जायेंगे, Relation एक दिया है | So, x:1 मान लो |

---

(76) The ratio of income of A & B is 3 : 2 and ratio of their expenditure is 4:3. if they save Rs 2000 & Rs 900. find their income.

	A		B
I →	3x	:	2x
E →	4	:	3

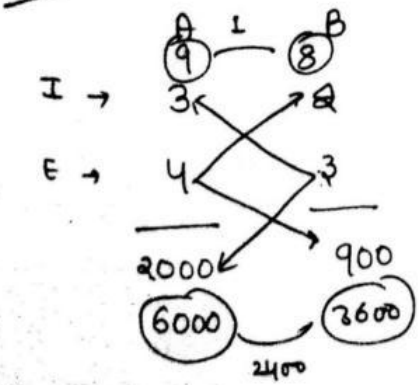
$$\frac{3x-2000}{2x-900} = \frac{4}{3}$$

$$9x - 6000 = 8x - 3600$$

$$x = 2400$$

A = 7200 Rs
B = 4800 Rs.

OR



1 → 2400

3 → 7200 (A's income)

2 → 4800 (B's income)

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CLASS 26

(22) The ratio of total amount distributed in all the male & female is salary is 6:5 while the ratio of salary of each male & each female is 2:3. find the ratio of no. of male & female ?

	M	:	W
Ratio	6	:	5
Each	2	:	3
	3	:	$\frac{5}{3}$
	9	:	5 Ans

(23) Rs 430 is divided among 45 persons such that the ratio of total amt received by all men, all women & all children are in the ratio 12:15:16. while the ratio of amount received by each men, each woman & each child is 6:5:4. Calculate the no of man, woman & child and also find the amount received by each of them.

	M	:	W	:	C
Total	12	:	15	:	16
Each	6	:	5	:	4
	2	:	3	:	4
No. of persons	×5		×5		×5
	10 men		15 women		20 child

Each child = $\frac{160}{20}$ = 8 Rs.

9 → 45
1 → 5

12+15+16 = 43 → 430
1 → 10

All man = 120
Each man = $\frac{120}{10}$ = 12 Rs
All women = 150
Each women = $\frac{150}{15}$ = 10 Rs

(24) Rs 5625 is divided among A, B & C in such a way that A receives $\frac{1}{2}$ the sum of B+C. find the amount received by C. if B receives $\frac{1}{4}$ of (A+C).

$\frac{A}{B+C} = \frac{1}{2} = \frac{5}{10}$

$\frac{B}{A+C} = \frac{1}{4} = \frac{3}{12}$

A	:	B	:	C
5	:	3	:	7

A+B → $\frac{375}{\cancel{5625}_{15}} \times 8$ = 3000 Rs

(80) The ratio of last year income of A, B & C is 3:4:5. while the ratio of their last year income to current year income 4:5, 2:3 and 3:4. if their total current year income is Rs 98500 find the present income of B+C.

A : B : C

LYI 3×12 : 4×12 : 5×12

36 : 48 : 60

×9 L:C 4:5 | ×9

×24 L:C 2:3 | ×24

×20 L:C 3:4 | ×20

45 : 72 : 80

LCM of 2, 3, 4 → 12

45+72+80 = 197 → 98500

1 → $\frac{98500}{197}$ → 500

B+C = 152 × 500

= 76000 Rs. Ans.

(81) one year ago the ratio of income of A & B is 3:5. The ratio of their LYI to CYI is 2:3 and 4:5. if their total CYI is Rs 4300. find their present income individually?

A B

Last year Income → 3 : 5

A: L : C = 2 : 3

B: L : C = 4 : 5

2 unit → 3

1 → $\frac{3}{2}$

3 → $\frac{9}{2}$

4 → 5

1 → $\frac{5}{4}$

5 → $\frac{25}{4}$

A : B

CYI $\frac{9}{2}$: $\frac{25}{4}$

18 : 25

43 → 4300

1 → 100

A → 1800 Rs

B → 2500 Rs.

OR

A B

LYI 3×4 : 5×4

A: L : C = 2 : 3

B: L : C = 4 : 5

2 → 12

1 → 6

3 → 18

LCM of 2, 4 = 4

4 → 20

1 → 5

5 → 25

18 : 25

A = 1800 Rs

B = 2500 Rs

(82) Ratio of income of A, B, C is 3:7:4 and the ratio of their exp. is 4:3:5. if A saves $14\frac{2}{7}$% of his income. find the ratio of their saving.

	A	:	B	:	C
I	$3x$	:	$7x$	:	$4x$
E	$4y$	:	$3y$	:	$5y$
S	$(3x-4y)$	:	$(7x-3y)$	:	$(4x-5y)$

$14\frac{2}{7}\% = \frac{1}{7}$ (S : I), $E = 6$

$\frac{3x}{4y} = \frac{7}{6}$

$\frac{x}{y} = \frac{14}{9}$

$S = (42-36) : (98-27) : (56-45)$

$6 : 71 : 11$ Ans

OR

	A	B	C
I → 7 (84)	$3\times4\times7$	(196) $\times4\times7$	$4\times4\times7$ (112)
E → 6 (72)	$4\times3\times6$	(54) $3\times3\times6$	$5\times3\times6$ (90)
S ⇒	12	142	22
	6	71	11 Ans.

(A) → $\frac{1}{7}$, I → 7, E → 6

A का Income & Exp का ratio 7 : 6 करना है।

first convert in 1:1 and then in 7:6

(83) A dog chase a rabbit. The dog takes 6 leaps for every 7 leaps of the rabbit and the distance covered by rabbit in 6 leaps is equal to the distance covered by dog in 5 leaps. find the ratio of their speed.

Dog	Rabbit
6 jump	7 jump
6×6	7×5
$= 36$:	35

Dog — Rabbit

5 jump = 6 jump

6 m — 5 m

30

(84) A dog takes 7 jumps for every 10 jumps of the lion and a fox takes 12 jumps for every 10 jumps of the lion. And the distance covered by dog in 5 jumps, distance covered by lion in 15 jumps and the distance covered by fox in 20 jumps is equal. find the ratio of their speeds.

Dog	lion	fox
7	10	12
$\times12$	$\times4$	$\times3$
84 :	40 :	36

Dog = lion = fox

5 jump — 15 jump — 20 jump

12 m — 4 m — 3 m

60

Ratio of the distance covered by two objects in same time is equal to the ratio of their speeds

D = ST

(85) The price of Gold is directly proportional to square of its weight. A person broke down the Gold in the ratio of 3:2:1 and sold, incurs a loss of Rs 4620. find the initial price of Gold.

initial weight = 3+2+1 = 6

initial price = $6^2 = 36$

After breaking price = $3^2 + 2^2 + 1^2 = 14$

$36 - 14 = 22$ ₹ loss

22 —— 4620

1 —— 210

initial price = $36 \times 210 = 7560$ Rs. Ans.

CLASS 27

(86) A is inversely proportional to the cube of B.

if A = 3 then B = 2

But if $A = \frac{8}{9}$ then B = ?

$A \propto \frac{1}{B^3}$

$A = \frac{K}{B^3}$

$3 = \frac{K}{(2)^3}$

$K = 24$

$A = \frac{24}{B^3}$

$\frac{8}{9} = \frac{24^3}{B^3}$

$B^3 = 27$

$B = 3$ Ans.

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(87) A bag contain 1Rs, 50P & 25P coins and the ratio of no. of coins is 5:7:9. if the total value of all coins is 430 Rs. Then find the no. of 50P coins.

	1Rs	50P	25P
No. of coins →	5	7	9
Ratio of value →	5 Rs	3.50 Rs	2.25 Rs

10.75 Rs —— 430

$1 \longrightarrow \frac{430}{10.75} = 40$

No. of 50P coins = $7 \times 40 = 280$

(88) A bag contains 1 Rs, 50P & 25P coins and the ratio of their value is 30:11:7. and the total no. of coins are 480. find the no. of 50P coins.

	1Rs	50P	25P
value →	30	11	7
coins →	30	22	28

$80 \longrightarrow 480$

$1 \longrightarrow 6$

No. of 50P coins = $22 \times 6 = 132$ Ans

(89) find the mean proportion of $\frac{1}{4}$ & $\frac{1}{9}$

$$\sqrt{\frac{1}{4} \times \frac{1}{9}} = \frac{1}{6}$$

mean proportion of $a, b = \sqrt{ab}$

(90) find the 3rd proportion of 18, 36.

$$\frac{36 \times 36^2}{18} = 72$$

3rd proportion = $\frac{b^2}{a}$

(91) find the 4th proportion of 12, 16, 18.

$$\frac{\cancel{16} \times \cancel{18}^{3}}{\cancel{12}_{2}} = 24$$

4th proportion of $a, b, c = \frac{bc}{a}$

(92) Rs 710 is divided among A, B & C in such a way that A receives Rs 40 more than B, C receives Rs 30 more than A. find the share of A.

A	B	C
$x+40$	x	$x+70$

$3x + 110 = 710$

$3x = 600$

$x = 200$

A = 240 Rs

(93) The ratio of age of Ram & Shyam 5 years ago was 2 : 3 and the ratio of their age after 5 years would be 3 : 4 find the sum of their present ages.

	R		S
	$2_{\times 10}$ (20)	:	$3_{\times 10}$ (30)
Present →	(25)		(35)
	3	:	4
	1 unit		1 unit → (10)

$25 + 35 = 60$

Ans.

(94) The ratio of ages of Ram & Shyam 5 years ago was 3 : 1 the ratio of their age after 5 year will be 2 : 1. find the present age of both.

	R		S
	$3_{\times 10}$ (30)	:	$1_{\times 10}$ (10)
P →			
	$2_{\times 10}$	:	$1_{\times 2}$
	1 unit → 10		

3 − 1 = 2 → दोनों की age का diff same करने के लिए

2 − 1 = 1

Present age of Ram = 35

Present age of Shyam = 15

(25) The age of Ram is 4 times of his daughter. The age of Ram was 9 times of her daughter five years ago. find their present ages.

पोनो की age का diff same करने के लिए पहले दोनो का diff ले लेते हैं फिर cross multipy कर देते हैं।

R D

9_{x_3} (27) : 1_{x_3} (3) = 8

(-5)

P → 4_{x_2} (12) : 1_{x_2} (4) = 3

8 unit → 5

1 → 1

Ram = 32 years

daughter = 8 years.

---

(26) The age of father is 3 times of his son. 5 years before the age of son was $\frac{1}{6}$ times of his father. find the present age of son. At the time of marriage of his mother, she was 5 years younger to his father. find the age of mother.

F S

6_{x_2} : 1_{x_2} = 5

(-5Y)

P → 3_{x_5} (25) : 1_{x_5} ($\frac{25}{5}$) = 2

(5x$\frac{5}{3}$)

25 ($\frac{25}{3}$)

3 unit — 5

1 → $\frac{5}{3}$

Present age of father = 25

Present age of son = $5 \times \frac{5}{3} = \frac{25}{3}$

mothers age → 25 - 5 = 20

---

(27) The ratio of age of meena & her mother is 3:8. find the ratio of their age after 4 years. if after 10 years their age diff will be 35 years.

M Mother

3 : 8

5 → 35

1 → 7

21 : 56 (+4 each)

~~25~~ : ~~60~~

5 : 12