Class

1. TIME & WORK

(1) A & B can complete a work in 10 and 12 days respectively. A and B start working together and after 3 days, A left the work, find in how many days work will be completed?

A — 10 days, B — 12 days

+6, +5

60

A+B — 3 days

$3 \times 11 = 33$

B

$60 - 33 = \frac{27}{5}$

$= 5\frac{2}{5}$ days

work will be finished in $= 3 + 5\frac{2}{5} = 8\frac{2}{5}$ days.

OR

A → $3 \times 6 = 18$

B → $\frac{42}{5} = 8\frac{2}{5}$ days

(2) A and B started working together but after some days A left the work and the whole work will complete in 9 days. find after how many days A left. if A & B complete the work in 10 & 15 days resp.

A — 10 days, B — 15 days

+3, +2

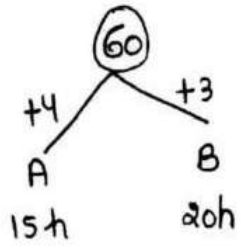
30

A → $\frac{12}{3}$

4 days

B → $9 \times 2 = 18$

(3) 2 men can build a wall in 15 and 20 hour resp. but if they work together they use 280 less bricks per hour and build a wall in 12 hours. find the no. of bricks in the wall.



$A+B = 7$ unit
$A+B = 5$ unit
-2 unit $\longrightarrow$ 280
1 unit $\longrightarrow$ 140

Total bricks $= 60 \times 140$
$= 8400$ Bricks Ans

$A+B = \frac{60}{12} = 5$ (Given)

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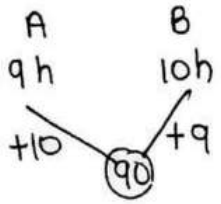
(4) 2 men can build a wall in 9 hrs and 10 hrs resp. But if they work together then they use 10 less bricks per hours and build a wall in 5 hrs. find the no. of bricks in the wall?



$A+B = 19$ unit
$A+B = 18$ unit
1 unit $\longrightarrow$ 10

Total bricks $= 90 \times 10 = 900$ Ans

$A+B = \frac{90}{5} = 18$

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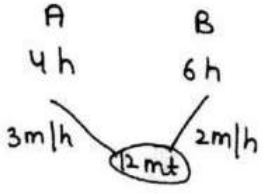
(5) Two candles of same height can burn completely in 4 hrs and 6 hrs resp. If both start burning at same time at their respective constant speed, then find after how much time ratio of their height become 2:3.



$$\frac{12-3t}{12-2t} = \frac{2}{3}$$

$36-9t = 24-4t$

$5t = 12$

$t = \frac{12}{5} = 2\frac{2}{5} = 2$ hr, 24 min

Ans

⑥ Three men A, B, C complete the work 10, 12, 15 days.

i) if A, B and C starts work together. After 2 days A left the work and next after 2 days C also left. Then find in how many days the whole work will complete.

ii) A, B, C starts work together, A and B left the work 2 days before the completion of the work, then the whole work will finish in how many days.

iii) if A left the work 2 days before the completion of the work and B left the work 3 days before the completion. work will finish in how many days?

i)

A	B	C
10	12	15
6	5	4
	60	

A+B+C — 2 days → 15×2 = 30

B+C — 2 days → 9×2 = 18

B — $\frac{12}{5} = 2\frac{2}{5}$ days

work will finish in = $2 + 2 + 2\frac{2}{5} = 6\frac{2}{5}$ days

OR

60
−12 (A's 2 days)
−16 (C's 4 days)

$\frac{32}{5} = 6\frac{2}{5}$ days (Becoz B works for all time.)

Ans.

ii) A+B+C — 2 days → 60 − 8 = 52

$\frac{52}{15} = 3\frac{7}{15}$

C — 2 days → 4×2 = 8

work will finish in = $3\frac{7}{15} + 2 = 5\frac{7}{15}$ days

OR

60
+22 (A+B's 2 days work)

$\frac{82}{15} = 5\frac{7}{15}$ days

Ans

iii) 60
+12 (A's 2 more days work)
+15 (B's 3 more days work)
$\frac{87}{15} = \frac{29}{5} = 5\frac{4}{5}$ days

(iv) A, B, C starts work together but A left the work after two days. and B left the work 1 day before the completion of the work. In how much time the whole work will be completed?

60
−12 (A's 2 days work)
48 B+C
+5 (B's 1 day work)
$\frac{53}{9} = 5\frac{8}{9}$ days

A+B+C	B+C	C
2d		1d
↓		↓
30	$\frac{26}{9}$	4
	$= 2\frac{8}{9}$	

$2 + 2\frac{8}{9} + 1 = 5\frac{8}{9}$ days.

(v) A, B and C starts work together but after 3 days A left the work, and B left the work 4 day before the completion of work. In how much time the whole work be completed?

X

A+B+C	B+C	B
3d		4d
↓		↓
45		36

This method fails. & conceptually wrong Becoz we can't justify that C work for 3 days.

✓

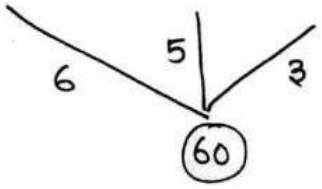
60
−18
42
+16
$\frac{58}{9} = 6\frac{4}{9}$ days.

(7) A+B, B+C, C+A can complete a work in 10, 12, 20 days respectively. In how much they alone do the work.

A+B	B+C	C+A
10	12	20

$2(A+B+C) = 14$ हमेशा Add करके Half कर दो।

$A+B+C = 7$



$A = 2$ $B = 4$ $C = 1$

$A = \frac{60}{2} = 30$ days

$B = \frac{60}{4} = 15$ days

$C = \frac{60}{1} = 60$ days Ans.

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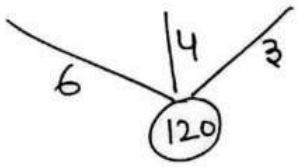
(8) A+B, B+C, C+A can do a work in 20d, 30d and 40 days respectively. In how much time they alone do the work.

A+B	B+C	C+A
20	30	40



$A+B+C = \frac{13}{2} = 6\frac{1}{2}$

$C = \frac{1}{2} \Rightarrow \frac{120}{1/2} = 240$ days

$A = \frac{5}{2} \Rightarrow \frac{120}{5/2} = 48$ days

$B = \frac{7}{2} \Rightarrow \frac{120}{7/2} = 34\frac{2}{7}$ days

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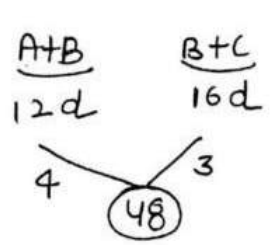
(9) A+B, B+C do a work in 12 and 16 days. if A work for 5 days and B work for 7 days and C complete the remaining work in 13 days. Then find C would complete the work in how many days?



A | B | C
5d | 7d | 13d

A+B | B+C | C
5d | 2d | 11d
↓ | ↓
20 | 6

$48-26 = \frac{22}{11} = 2$ → efficiency of C

C would complete the work $= \frac{48}{2} = 24$ day Ans.

B alone $= \frac{B+C}{1} = \frac{48}{1} = 48$ day

(1) → B's efficiency

A alone $= \frac{A+B}{3} = \frac{48}{3}$ days.

(3) → A's efficiency.

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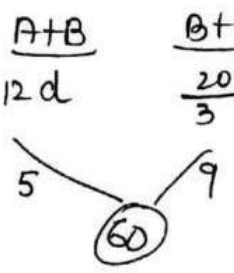
(10) A+B can do a work in 12 days while B+C in $6\frac{2}{3}$ day ~~so~~ work is completed by A, B, C by working 3, 4 and 7 days. find in how many days A alone would complete the whole work.



A | B | C
3d | 4d | 7d

A+B | B+C | C
3d | 1d | 6d
↓ | ↓
5×3 = 15 | 9×1 = 9

C = 6

$60-24 = \frac{36}{6} = 6$ → Efficiency of C

B+C = 9 ∴ B = 3

A+B = 5 ∴ A = 2

A alone do the work $= \frac{60}{2} = 30$ days. Ans.

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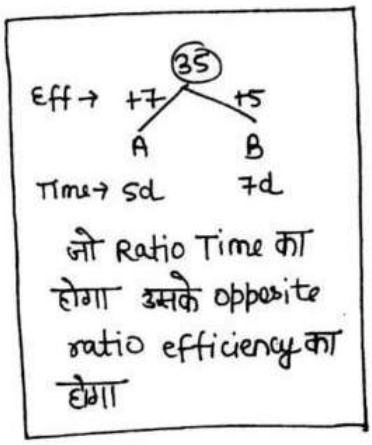
(11) 3 men A, B, C complete a work in such a way that A works for all the day, B works for 1st & 2nd day and C works for 3rd, 4th and 5th day. if B+C can do as much work in 2 days as A alone does in 3 days in how many days. A, B and C alone do the work if B+C can complete the whole work without the help of A in 6 days.



$\underbrace{A}_{5d}$ $\underbrace{B}_{2d}$ $\underbrace{C}_{3d}$

$(B+C) \times 2 = A \times 3$

$\frac{A}{B+C} = \frac{2}{3}$ (Efficiency का Ratio)

→ B+C complete the work in 6 days and efficiency of B+C is 3

Hence, Total work = $6 \times 3 = 18$

$\underbrace{A}_{5d}$ $\underbrace{B}_{2d}$ $\underbrace{C}_{3d}$

$\underbrace{A}_{5d}$ $\underbrace{B+C}_{2d}$ $\underbrace{C}_{1d}$ $\boxed{C=2}$

$5 \times 2 = 10$ $2 \times 3 = 6$ $18 - 16 = \frac{2}{1} = (2)$ → Efficiency of C

$B+C = 3$ ∴ $\boxed{B=1}$, $\boxed{A=2}$.

A alone = $\frac{18}{2} = 9$ days

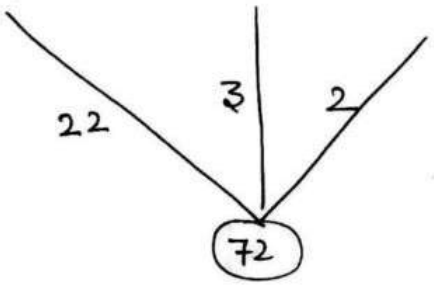
B alone = $\frac{18}{1} = 18$ days

C alone = $\frac{18}{2} = 9$ days Ans

(12) A man has 3 sons. 1st one and 2nd one can complete a work in 24 days and 36 days respectively. In how many days the 3rd son will complete the work, if the man could alone complete the whole work in $3\frac{3}{11}$ days. The man can do double the work in same time. In what time all his sons together can complete the work.

M A B

$\frac{36}{11}$ d 24 d 36 days



M (A+B+C)

T→ 1 : 2

Eff→ 2 : 1

↓ ↓

22 11

1 → 11

$A + B + C = 11$

↓ ↓

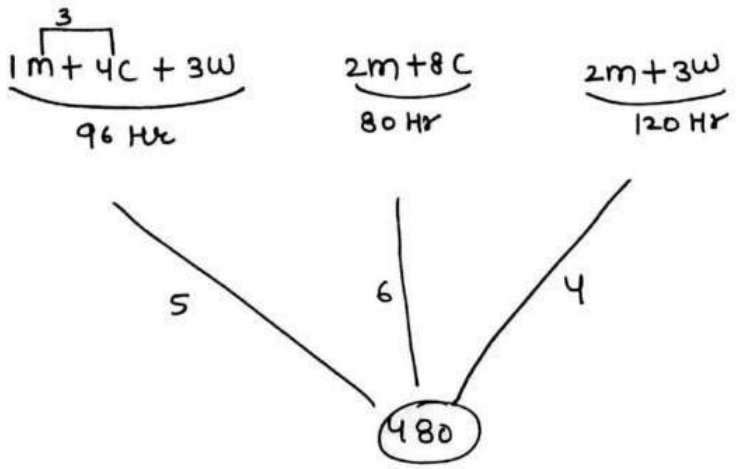
3 2

$\boxed{C = 6}$

C complete the work

$= \frac{72}{6} = 12$ days.

(13) 1m+3w+4c does a work in 96 hours while 2m+8c can complete the same work in 80 Hrs. and 2m+3w can complete the same work in 120 Hrs.. find in how much time will 10 men + 5 women complete the work.



$2m+8c = 6$

$\therefore 1m+4c = 3$

$1m+4c+3w = 5$ (3)

$3w = 2$

$w = \frac{2}{3}$

$2m+3w = 4$ (2)

$2m = 2$

$m = 1$

$10m + 5w$

$10 + 5 \times \frac{2}{3} = \frac{40}{3}$

10m+5w complete the work $= \frac{480}{40/3} = \frac{\overset{12}{\cancel{480}} \times 3}{\cancel{40}} = 36$ Hrs.

(14) A, B, C can complete a work in 30 days by working together. A+C are twice efficient than B and A+B are thrice efficient than C. find in how many days A alone complete the work.

$\frac{A+C}{B} = \frac{2}{1} \Rightarrow \frac{8}{4}$

$\frac{A+B}{C} = \frac{3}{1} \Rightarrow \frac{9}{3}$

दोनो जगह A, B, C है, so दोनो जगह (A+B+C) की efficiency same होनी चाहिए.

B	C	A
4	3	5

Total work = $12 \times 30 = 360$ units

A alone = $\frac{360}{5} = 72$ days. Ans

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(15) A+B can complete a work in half the time of C, while B+C can complete the same work in 1/3rd time than A. If they together complete the work in 20 days. m how many days they alone do the work.

	Time	Eff.	
$\frac{A+B}{C}$	$= \frac{1}{2}$	$= \frac{2}{1}$	$= \frac{8}{4}$
$\frac{B+C}{A}$	$= \frac{1}{3}$	$= \frac{3}{1}$	$= \frac{9}{3}$

C	:	B	:	A
4		5		3

Total work = 12×20
= 240 unit

A alone = $\frac{240}{3} = 80$ days

B alone = $\frac{240}{5} = 48$ days.

C alone = $\frac{240}{4} = 60$ days

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(16) A+B can complete a work in 40% lesser time than C while B+C can complete the same work in 60% lesser time than A, if they together can complete the whole work in 20 days, then in how many days will they alone complete the same work.

$$\frac{A+B}{C} = \frac{\text{Time}}{\cancel{60}\,3} \quad \frac{\text{Eff.}}{\cancel{100}\,5} = \frac{5}{3} = \frac{35}{21}$$

$$\frac{B+C}{A} = \frac{\cancel{40}\,2}{\cancel{100}\,5} = \frac{5}{2} = \frac{40}{16}$$

A	:	B	:	C
16		19		21

Total work = $56 \times 20 = 1120$ unit

A alone = $\frac{\cancel{1120}\,70}{\cancel{16}} = 70$ days Ans

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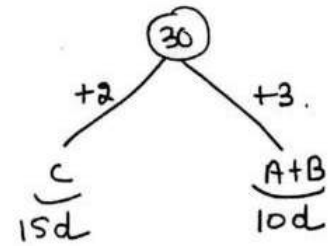
(17) A takes as much time as B+C take to finish a job, A+B finish the job in 10 days, C can alone do the same job in 15 days. In how many days B alone can do the work.

	A	:	B+C
Time -	1	:	1
Eff -	1	:	1
	↓		↓
	$2\frac{1}{2}$		$2\frac{1}{2}$



Eff. (A+B+C) = 5

B alone = $\frac{30}{1/2} = 60$ days Ans

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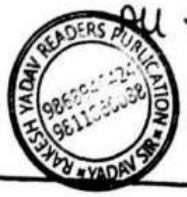
(18) A complete half as much work as B in equal time. C complete half as much work as A & B together in equal time. If C alone can complete the work in 40 days. Then in how many days they all together complete the work.

	A	:	B		C
Time	1	:	2		
Eff.	1	:	2	:	$\frac{3}{2}$
	2	:	4	:	3

Total work = 3×40 = 120

All together = $\frac{120}{9}$ days.



(19) In a factory there are 3 shifts of work for a day. During the 3 shift the avg. working efficiency of workers is 80%, 70% and 50% respectively. A work is complete in 60 days by the group working in the 1st shift. If the work is done in all the shift then how many days less are required to complete the work.

	I	II	III
E→	~~80~~	~~70~~	~~50~~
	8	7	5

Total work = 8 × 60 = 480

if work in all shifts work will complete in $\frac{480}{20}$ = 24 day.

less days = 60 − 24 = 36 days Ans

(20) Two workers A & B working together can complete a job in 5 days. if A work twice as efficiently as he actually did and B work $\frac{1}{3}$ efficiently as he actually did, then the work would have been completed in 3 days. A alone can complete the work in how many days.

$(A+B) \times 5 = \left(2A + \frac{B}{3}\right) \times 3$

$5A + 5B = 6A + B$

$A = 4B$

$\frac{A}{B} = \frac{4}{1}$

Eff. (A+B) = 5 & they complete the work in 5 days

∴ Total work = 5×5 = 25 unit

A alone = $\frac{25}{4} = 6\frac{1}{4}$ days.

(21) A+B can complete a work in 8 days but if A & B work twice & $\frac{1}{3}$ of their respective efficiency, then the work is completed in 6 days. In how many days A alone can complete the work ?

$(A+B) \times 8 = \left(2A + \frac{B}{3}\right) \times 6$

$8A + 8B = 12A + 2B$

$4A = 6B$

$\frac{A}{B} = \frac{6}{4} = \frac{3}{2}$

Total work $= (3+2) \times 8 = 40$ unit

A alone $= \frac{40}{3}$ days.

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(22) A started a work and left working 4 days. B finished the remaining work in next 18 days. Had A left the work after working for 6 days then B would have finished the remaining work in next 12 days. Then find in how many days A & B alone can complete the work.

A	B
4 day	18 day
6 day	12 day

$+2$ -6

$A \times 2 = B \times 6$

$\frac{A}{B} = \frac{3}{1}$

Total work $=$ A: $4 \times 3 = 12$ + B: $18 \times 1 = 18$

$= 30$

A alone $= \frac{30}{3} = 10$ days

B alone $= \frac{30}{1} = 30$ days

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(23) P, Q, R are 3 typists working simultaneously can type 216 pages in 4 Hrs. In one Hr R can type as many pages more than Q as Q can type more than P. R can type as many pages in 5 Hrs as P in 7 Hrs. How many pages does much of them type per hour.

$R \times 5 = P \times 7$

$\frac{R}{P} = \frac{7}{5}$

P	Q	R	
5x	6x	7x	$\frac{5+7}{2} = 6$
	1	1	

$18x \times 4 = 216$

$x = 3$

$P = 5 \times 3 = 15$ page / hour

$Q = 6 \times 3 = 18$ page / hour

$R = 7 \times 3 = 21$ page / hour.

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(24) Three typist working together 8 Hrs per day can type 900 pages in 20 days. The no. of pages typed by A in 4 Hrs equal to the no. of pages typed by C in 1 Hr. How many page typed by C in 1 Hr if in a day B types as many pages more than A as C types as many pages more than B.

$A \times 4 = C \times 1$

$\frac{A}{C} = \frac{1}{4}$

A	B	C	
1x	2.5x	4x	$\frac{1+4}{2} = 2.5$
	1.5	1.5	

$\frac{\cancel{5}}{\cancel{7.5}\ \cancel{10}\ 2} \times \frac{4}{\cancel{8} \times 2\cancel{0}} = \frac{\cancel{45}\ 3}{90\cancel{0}}$

$x = \frac{3}{4}$

$C = 4 \times \frac{3}{4} = 3$ Page / Hr. Ans.

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(25) A+B can complete a work in 30 days. They start work together and after 23 days B left the work and whole work complete in 33 days. Find the time in w/c A alone can complete the work.

A + B → 30 day

↓ ↓

33 day 23 day

$A \times 3 = B \times 7$

$\frac{A}{B} = \frac{7}{3}$

Total work = $(7+3) \times 30 = 300$ unit

A alone = $\frac{300}{7}$ days

B alone = $\frac{300}{3} = 100$ days.

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(26) A+B can complete a work in 24 days. In how many days A alone does the 2/3 of the total work if they start working together after 20 days A left the work, work is completed in 26 days.

A + B → 24 day

↓ ↓

20 day 26 day

$A \times 4^{2} = B \times 2^{1}$

$\frac{A}{B} = \frac{1}{2}$

Total work = $(1+2) \times 24 = 72$ unit

$\frac{2}{3}$ of total work = $72 \times \frac{2}{3} = 48$ unit

$\frac{2}{3}$ of work completed by A alone = $\frac{48}{1} = 48$ days

Ans

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(27) A+B can complete a work in 12 days. A alone works for 8 days & B completes the remaining work in 20 days. by doing alone. In how much time B alone does the complete work.

A + B → 12 days

↓ 8d ↓ 20d

$A \times 4 = B \times 8$

$\frac{A}{B} = \frac{2}{1}$

Total work = $3 \times 12 = 36$ unit

A alone = $\frac{36}{2} = 18$ days

B alone = $\frac{36}{1} = 36$ days.

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(28) P & R complete a work in 10 days doing together. if P works for 2.5 days and R for 8.5 days, they finish half work. In How much time P alone complete the work.

P + R → 10 days

↓ 2.5d ↓ 8.5d

$P \times 2.5 = R \times 3.5$

(they complete half work in 5 days)

$\frac{P}{R} = \frac{7}{5}$

Total work = $(7+5) \times 10 = 120$ unit

P alone = $\frac{120}{7}$ days.

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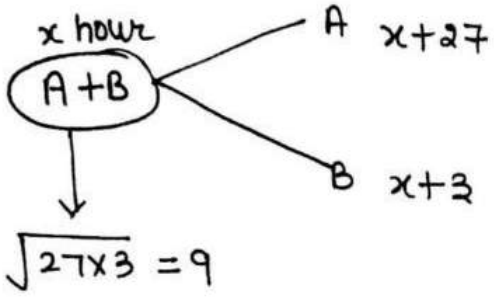
(29) A alone would take 27 Hrs more to complete a work than A & B work together. B takes 3 Hrs more to complete a work alone than A&B work together. In how many days A alone can do it.



$\sqrt{27 \times 3} = 9$

$x = 9$ Hr

A alone = $9 + 27 = 36$ Hrs

B alone = $9 + 3 = 12$ Hrs.

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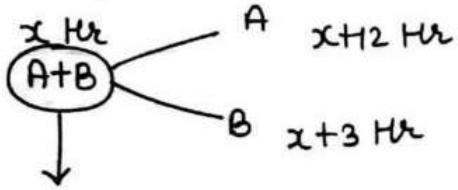
(30) A and B alone complete a work in 12 days and 3 days more days respectively than A+B, then find in how many days A alone does the work.



$\sqrt{12 \times 3} = 6$

$x = 6$ Hrs

A alone = $6 + 12 = 18$ Hrs

B alone = $6 + 3 = 9$ Hrs.

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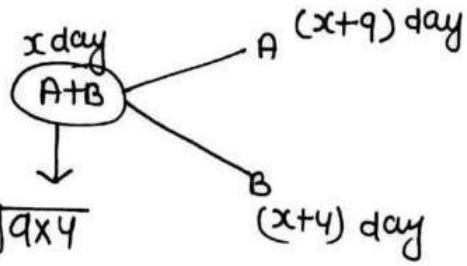
(31) A can complete a work in 5 more days than B while A does the same work in 9 more days than C. If A+B can complete the whole work in same time in w/c C alone does the whole work. In how many days A alone could complete the same work.

A (x+9) B (x+4) C x day

A	B	C
95	90	86
↓	↓	↓
x+9.	x+4	x

A+B = C

x day x day



$\sqrt{9 \times 4}$

$= 6$

$x = 6$ day

$A = 6+9 = 15$ day

$B = 6+4 = 10$ day

$C = 6$ day.

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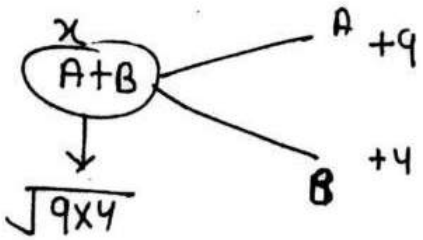
(32) A swimming pool is fitted with 3 pipes, the 1st two pipes working simultaneously fill the pool in the same time as the 3rd pipe alone, the 2nd pipe alone fills the pool 5 hrs faster than the 1st pipe & 4 Hrs slower than 3rd pipe. In what time 2nd & 3rd pipe together fill the pool.

A	B	C
x+9	x+4	x

A	B	C
100	95	91
↓	↓	↓
x+9	x+4	x

A+B = C

x x



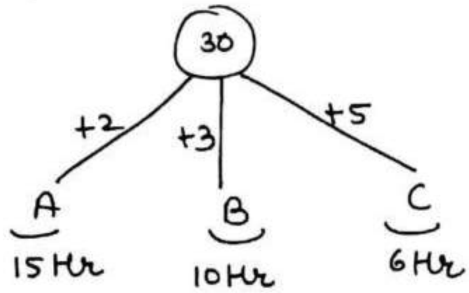
$\sqrt{9 \times 4}$

$A = 15$ Hrs

$B = 6+4 = 10$ Hrs

$C = 6$ Hrs.

Ans



$B+C = \frac{30}{8}$ Hrs.

Class 3.

By [illegible] Chhoker
72[illegible]446[illegible]

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(33) 3 men A, B and C working together can do a job 6 Hrs less time than A alone did, 1 Hr less time than B alone and half the time needed by C. In how many days will A finish the work alone?

	A+B+C	A	B	C
	x hr	x+6	x+1	2x

	A + B + C		C
T	1	:	2
Eff.	2	:	1

C = 1

$\underbrace{A+B}_{1} + C = 2$: $C \to 1$

(A+B) 2x → A: x+6 (6−x hr more than A+B) → x+6 − 2x = 6−x

(A+B) 2x → B: x+1 (1−x Hr more than A+B) → x+1 − 2x = 1−x

$A+B = \sqrt{(6-x)(1-x)} = 2x$

$(6-x)(1-x) = 4x^2$

$4x^2 = 6 - 7x + x^2$

$3x^2 + 7x - 6 = 0$

$+9 \quad -2$

$3x^2 + 9x - 2x - 6 = 0$

$3x(x+3) - 2(x+3) = 0$

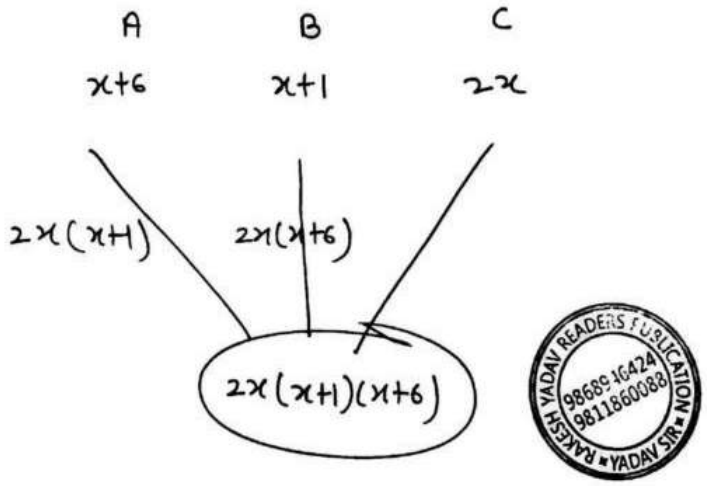
$(3x-2)(x+3) = 0$

$3x = 2$ | $x = -3$

$x = \frac{2}{3}$ | $\times$

A will finish the work $= \frac{2}{3} + 6 = \frac{20}{3}$ days. Ans.

(OR)



$$\frac{2x(x+6)(x+1)}{2x^2+2x+2x^2+12x} = \frac{2x}{1}$$

$x^2 + x + 6x + 6 = 4x^2 + 14x$

$x^2 + 7x + 6 = 4x^2 + 14x$

$3x^2 + 7x - 6 = 0$ (same eqn as above)

(34) 3m and 4w can complete a work in 16 days while 4m and 3w can complete the same work in 12 days. Then find 7m & 7w can complete the same work in how many days.

$(3m+4w)\times 16 = (4m+3w)\times 12$

$48m + 64w = 48m + 36w$

$28w = 0$

$w = 0$

$(3m+0)\times 16 = (4m+0)\times 12$

T.W $= 16\times 3 = 48$

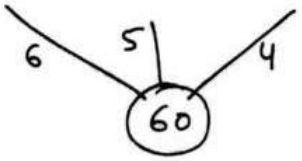
$7m+7w = 7+0 = 7$

Hence $7m+7w = \frac{48}{7}$ days.

---

(35) A, B, & C can complete a work in 10, 12 and 15 days respectively. if they start work together till the whole work complete, find the share of wages of A, B & C out of the total wages of Rs 750.

A	B	C
10	12	15



$\frac{60}{15} = 4d$

$15 \rightarrow 750$

$1 \text{ unit} \rightarrow 50$

wages are distributed in the ratio of the work

A	B	C
$6\times 4d$:	$5\times 4d$:	$4\times 4d$
6 :	5 :	4

$A = 6\times 50 = 300$ Rs

$B = 5\times 50 = 250$ Rs

$C = 4\times 50 = 200$ Rs.

अगर सारे मिलकर खत्म होने तक काम करते रहे तो उनके काम का ratio और efficiency का ratio same होता है।

---

(36) B+C can complete a work in 50% more time than A+B+C. If they work together on a job till the whole work completes then B earns 120 out of total earning of Rs 450. Then find in how many days they together complete the whole work while A+B takes $\frac{8}{3}$ more no. of days to complete the work than A+B+C.

$$\frac{B}{A+B+C} \xrightarrow{E} \frac{4}{15}$$

$$\frac{B}{A+B+C} = \frac{\cancel{120}\,4}{\cancel{450}\,15}$$

$$\frac{B+C}{A+B+C} = \frac{2\times5}{3\times5} = \frac{10}{15}$$

	B+C	A+B+C
T	~~150~~ 3	~~100~~ 2
E	2	3

	A	B	C
E→	5	4	6

	A+B	A+B+C
E	~~9~~ 3	~~15~~ 5

Time→ 5x : 3x

$2x = \frac{8}{3}$

$x = \frac{4}{3}$

A+B+C = 3x days = $3\times\frac{4}{3}$ = 4 days Ans

---

(37). A & B complete a work in 12 and 15 days. They started the work alternatively for 1 day each & A started the work first. In how much time 60% of work will be completed.

A	B
12	15
5	4

60

60% of work = $\frac{60\times60}{100}$ = 36

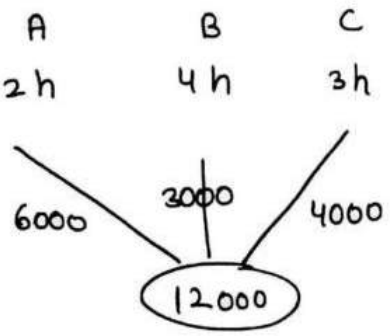
1 cycle (2 days) = 5+4 = 9

×4 ↓ ×4

8 days 36

Ans

(38) 3 men A, B, C can make 12,000 pens in 2 Hrs, 4 Hrs 3 Hrs respectively. If they work half hr every time, but they do not work together and A starts the work first. find in how much time they can make 18500 pens.



½ A	½ B	½ C
3000	1500	2000

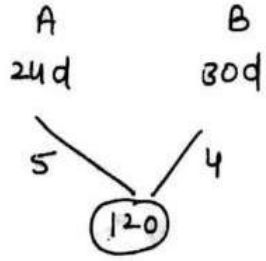
1 cycle ($\frac{3}{2}$ Hrs) → 6500 pens

1×2 1×2

3 Hrs →	13000
½ Hr →	3000
½ Hr →	1500
15 min →	1000
4 Hr 15 min	18500

Ans

(39) A & B complete a work in 24 & 30 days respectively, working 10 hrs per day the work is to be done in 2 shifts. morning shift is for 6 hrs and evening is for 4 hrs. On the 1st day A works in morning and B works in evening & they interchange their shifts everyday, find in how much time and on w/c day the work will be completed.



	1st 6 Hrs	IInd 4 Hrs
1st day	A(6)	B(4)
2nd day	B(6)	A(4)

1 cycle (2 day) ⟶ 9 (5+4)

1 cycle (2d) ——— 9
|×13 |×13
26 d ——— 117
A- 6 Hr ——— 3

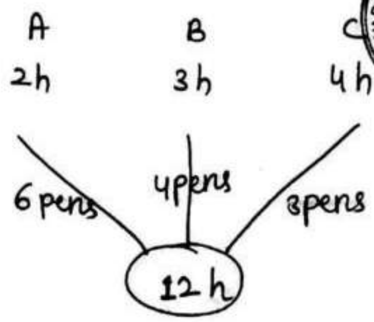
26 d 6 Hr **Ans** ——— 120

$A = \frac{5}{10} \times 6 = 3$

(A = 5 in — 10 Hrs
in 1 Hr — $\frac{5}{10} = \frac{1}{2}$
in 6 Hr — $\frac{1}{2} \times 6 = 3$)

work will finish on 27th day.

(40) A, B, C have to supply an order of 100 pens. A, B, C make a pen in 2, 3, 4 Hrs respectively. In how many days they will complete the work if each one make a complete pen himself without the help of others.



12 h ⟶ 13 pens
|×7 |×7
84 Hrs ⟶ 91 pens
9 hrs ⟶ 9 pen

93 Hrs **Ans** 100 pen

	A	B	C	
	2h	3h	4h	
8h →	4 pen	2 pen	2 pen	(8 pen) ×
9h →	4 pen	3 pen	2 pen	(9 pen) ✓

(41) A, B, C finished a work in 10 days. Initially they started work together but C works only for 3 day, & in these 3 days 37% of the work had been completed and Rest of the work is done by A&B. Find in how many days they individually complete the work if A's 5 days work = B's 4 days work.

$A + B + C$ —— 3d —— 37 Total work = 100

$A + B$ —— 7d —— 63

$(A+B)1d = \frac{63}{7} = 9$

$(A+B)3d = 9 \times 3 = 27$

$A + B + C$ —— 3d —— 37

$A + B$ = 27, C = 10

$(C)1d = \frac{10}{3}$

C will do complete work

$= \frac{100 \times 3}{10} = 30$ days

$A \times 5 = B \times 4$

$\frac{A}{B} = \frac{4}{5}) = 9$

$A = 4$

$B = 5$

9

4 : 5

A B

4 5

$A = \frac{100}{4} = 25$ days

$B = \frac{100}{5} = 20$ days

Ans

---

(42) 40 men can complete a work in 30 days. They start work together and after every 10 days 5 men left the work in how much time work will be completed ?

40 men × 30 day = 1200

40 men × 10 day = 400

35 men × 10 day = 350

30 men × 10 day = 300

1050

25 men × 6 day = 150

1200

36 days.

1 men = 1 Rs

40 " = 40 Rs.

(43) 60 men can complete a work in 40 days. They start work together but after every 10 day, 5 men leave the work. In how time the work will be completed ?

60 men x 40 day = 2400

60 men x 10 day = 600

55 men x 10 day = 550

50 men x 10 day = 500

45 men x 10 day = 450

2100

40 men x $7\frac{1}{2}$ day

$\frac{300}{40} = 7\frac{1}{2}$ d

Total days = $40 + 7\frac{1}{2} = 47\frac{1}{2}$ days.

---

(44) 33 men can do a job in 30 days. If 44 men started the work together & after every day 1 person leave the work. then what is the minimum no. of days required to complete the whole work.

33 men x 30 day = 990

maximum 44 दिन काम हो सकता है

44 + 43 + 42 - - - - - - - - -

$\frac{n}{2}[2a + (n-1)d]$

$\frac{n}{2}[88 + (n-1)(-1)] = 990$

$\frac{n}{2}[89 - n] = 990.$

Put value of n from options.

or assume yourself.

$n = 44$

$\frac{44}{2}[89-44] \Rightarrow 22 \times 45 = 990.$

$\therefore$ min. no. of days to finish the work = 44 days.

---

(45) A group of men decided to do a job in 4 days but 20 men dropped out everyday, the job was completed at the end of 7th day. find the men who are in the work initially?

Total work = $m \times 4 = 4m$

$m + (m-20) + \cdots\cdots$

$\frac{7}{2}[2m + 6(-20)] = 4m$

$\frac{7}{2}[2m - 120] = 4m$

$7m - 420 = 4m$

$3m = 420$ 140

$\boxed{m = 140}$

---

(46) 3 cooks have to make 80 burgers. They are known to make 20 pcs every minute by working together. The 1st cook began working alone and made 20 pcs having worked for sometime more than 3 min and rest work completed by 2nd & 3rd cook and it takes a total of 8 min to complete the whole work. In how much time the 1st will make 160 burgers.

$A \rightarrow (3+x)$ min — 20 burger

$A(eff) = \frac{20}{3+x}$

$(B+C) \rightarrow (5-x)$ min — 60 burger

$B+C(eff) = \frac{60}{5-x}$

$\Rightarrow \frac{20}{3+x} + \frac{60}{5-x} = 20$

Assume values of x.

$x = 4.1$.

satisfies the equation

$A(eff) = \frac{20}{3+1} = 5$ burger/min

$A \longrightarrow 160$ burger $\rightarrow \frac{160}{5} = 32$ min Ans.

$A+B+C = 20$ 2

Total time = 8 min

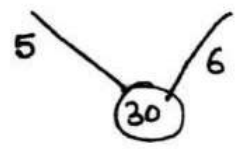
A take = $3+x$ min

$(B+C)$ take = $8-3-x$
$= (5-x)$ min

---

(47) A+B can complete a work in 6 days. In how many days they alone do the same work if A+C can complete the same work in $2\frac{1}{2}$ days lesser than B+C. They together complete the work in 5 days.

$\underbrace{A+B}_{6d}$ $\underbrace{\overset{5}{\overbrace{A+B+C}}}_{5d}$ $\overset{1}{\overbrace{\quad}}$



A+B (eff) = 5

C (eff) = 1

A+C → 3+1 → $\frac{30}{4} = 7\frac{1}{2}$

B+C → 2+1 → $\frac{30}{3} = 10$

$2\frac{1}{2}$ → True.

Hence A = 3

B = 2

C = 1.

C is same in both place.

Hence A ? B.

Assume value.

A+B = 5

A	B
3	2
4	1

C alone $= \frac{30}{1} = 30$ days

B alone $= \frac{30}{2} = 15$ days

A alone $= \frac{30}{3} = 10$ days.

---

(48) Four men can do a piece of work in 6 days while 3 women can complete the same work in 16 days. In how many days 1 men + 2 women can complete the work.

$4m \times 6 = 3w \times 16$

$m = 2w$

$\frac{m}{w} = \frac{2}{1}$

Total work $= \underline{4 \times 2} \times 6 = 48$ unit

1m + 2w

↓ ↓ ⇒ 4

2×1 2×1

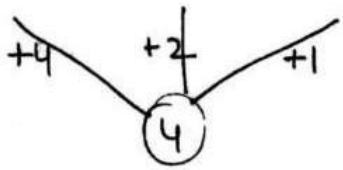
(1m + 2w) complete the work $= \frac{48}{4} = 12$ days.

---

(49) 2 men can complete a work in 3 days, while 3 women can complete the same work in 4 days & 4 children can complete the same work in 6 days. In how many days 1 men + 2 children can complete the same work.

$2m \times 3 = 3w \times 4 = 4c \times 6$

$1m = 2w = 4c$



Total work = $2m \times 3 = 2 \times 4 \times 3 = 24$ unit

$1m + 2c = 4 + 2 = 6$

$(1m + 2c)$ complete the work $= \frac{24}{6} = 4$ days Ans.

---

(50) 6 men + 8 women complete a work in 10 days while 26 men + 48 women in 2 days. In how many days 7 men + 3 women will complete the work?

$(6m + 8w) \times 10^{5} = (26m + 48w) \times 2$

$30m + 40w = 26m + 48w$

$4m = 8^{2}w$

$\frac{m}{w} = \frac{2}{1}$

T.W $= (6 \times 2 + 8 \times 1) \times 10 = 20 \times 10 = 200$ unit

$(7m + 3w) = 7 \times 2 + 3 \times 1 = 17$

$(7m + 3w)$ complete the work in $= \frac{200}{17} = 11\frac{13}{17}$ days.

---

(51) 12 men + 18 women can complete a work in 10 days while 3 men + 18 women can complete the same work in 12 days. In how many days 2 men + 3 women will complete the work?

$(12m + 18w) \times 10^{5} = (3m + 18w) \times 12^{6}$

$60m + 90w = 18m + 108w$

$^{7}42m = {}^{3}18w$

$\frac{m}{w} = \frac{3}{7}$

T.W $= (12 \times 3 + 18 \times 7) \times 10$

$= 1620$ unit

$2m+3w = 2\times3+3\times7 = 27$

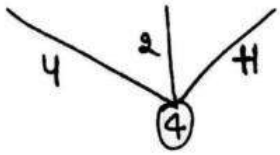
$(2m+3w)$ will finish the work $= \frac{620}{27} = 60$ days.

---

(52) 2 men can complete a piece of work in 3 days while 3w can complete the same work in 4 days and 4 children can complete the same work in 6 days. Then find in how many days 1 men + 1 women + 2 children can complete the same work.

$2m \times 3 = 3w \times 4 = 4c \times 6$

$1m = 2w = 4c$



Total work $= (2\times4)\times3 = 24$

$(1m+1w+2c) = 4+2+2 = 8$

$(1m+1w+2c)$ complete the work $= \frac{24}{8}$

$= 3$ days Ans.

---

(53) There is sufficient food for 400 soldiers for 30 days. After 28 days 280 soldiers left the camp. for how many days will the rest of the food lasts for the rest of the soldiers.

$^{10}400 \times 3 = {}^{4}120 \times D$

$D = 10$ days

(54) There is sufficient food for 1600 soldiers for 50 days and each person ~~is~~ eat 900 gm food everyday. After 40 days, 400 soldiers left the camp. Now for how many days will the rest of the food lasted for the rest of the soldiers if each soldier ate 1000 gm food everyday.

$$\overset{4}{\cancel{160}}\cancel{0} \times \overset{3}{\cancel{4}}\cancel{0}\cancel{0} \times 1\cancel{0} = \overset{4}{\cancel{12}}\cancel{0}\cancel{0} \times 1\cancel{0}\cancel{0}\cancel{0} \times D$$

$D = 12$ days Ans.

---

(55) There are sufficient food for certain no. of soldiers for certain no. of days. After 20 days 1/4 th soldier left the camp and the rest of the food will last for the same no. of days that are in starting. find the no. of days. in the starting.

$$\cancel{8} \times (D-20) = \frac{3}{4}\cancel{8} \times D$$

$$D-20 = \frac{3D}{4}$$

$$4D-80 = 3D$$

$D = 80$ days Ans.

---

(56) A complete 7/10 of a work in 15 days, then he completes the remaining work with the help of B in 4 days. find in how much time (A+B) can complete the whole work.

A —— $\frac{7}{10}$ → 15 days

(A+B) —— $\frac{3}{10}$ work = 4 days

(A+B) — complete work = $4 \times \frac{10}{3} = \frac{40}{3}$ days.

---

(57) A ~~team~~ of 30 men is supposed to do a work in 38 days. After 25 days, 5 more men were employed on work due to w|c the work is completed 1 day earlier. How many days would it have been delay if 5 more men were not employed.

30 men × 38 day

30 men × 25 d = 750

35 men × 12 d = 420

1170

~~1170~~ / ~~30~~ = 39 days

1 day would delay.

(OR)

5 men × 12 d = 60

अगर 5 men ना आते तो ये 60 काम 30 men करते

~~60~~ / ~~30~~ = 2 दिन में

37 + 2 = 39 days

1 day would delay.

---

(58) A contractor undertook to finish a road in 40 days & he employ 100 men. After 35 days he employed 100 more men, the work finished on time. Then find if more men were not employed then work will complete how much late?

$100\,m \times 35d = 3500$

$200\,m \times 5d = 1000$

$T.W = 4500$

अगर इसको 100 men ही करते $\frac{4500}{100} = 45$ days

5 days would delay.

(OR)

$100\,men \times 5d = 500$

अगर 100 नहीं आते तो इस 500 को पुराने वाले 100 कर रहे होते. $\frac{500}{100} = 5$ days delay.

---

(59) 5m can prepare 10 toys in 6 days working 6 Hrs per day. In how many days can 12 m prepare 16 toys working 8 Hrs per day.

$$\frac{m_1 h_1 d_1}{w_1} = \frac{m_2 d_2 h_2}{w_2}$$

$$\frac{5 \times 3 \times 6}{10} = \frac{12 \times 8 \times D}{16}$$

$D = 3$ days Ans.

---

(60) A contractor undertook to dig a canal of 12 km long in 350 days & employed 45 men. After 200 days only 4.5 km work was completed. How many more men should he employe to complete the whole work on time.

$$\frac{45 \times 200}{3} = \frac{(m+45) \times 150}{5}$$

$m = 55$

55 men should be employed.

---

(61) 8 men working 9 hrs per day complete a work in 20 days. In how many days can 7 men working 10 Hrs a day complete the same work.

$8 \times 9 \times 20 = 7 \times 10 \times D$

$D = \frac{144}{7}$ days.

---

(62) A contractor employed 200 men for a work. They finish 5/6 of the total work in 10 days, due to rain the work was stopped & 2/5 of the work was destroyed. After rain only 150 men come on work. In how many days the whole work will be completed.

$\frac{200 \times 10}{5} = \frac{150 \times D}{3}$

$D = 8$ days

$\frac{5}{6}$ — done. / T.W

$5 \times \frac{2}{5}$ — spoiled

Left work $= 5 - 2 = 3$

or $6 - 3 = 3$

---

(63) 38 men can complete a work by working 6 Hrs per day in 12 days then calculate in how many days 51 men can do a double of the work by working 8 hrs per day. If two men of 1st group doing same work of two men of 2nd group?

$$\frac{38m \times 6 \times 12}{1} = \frac{51m \times 8 \times D}{2}$$

$2m = 2M$

$$D = \frac{228}{17} = 13\frac{7}{17} \text{ days.}$$

---

(64) 6 men + 10 women can reap 5/12 part of 360 hectare land in 15 days by working 6 Hrs per day. If now 2 more men & 4 women are employed, then the work will be finished in how many days by working 7 Hrs per day. It is also given that work of 2m = 3 women work ?

$$\frac{(6m+10w) \times 6 \times 15}{\frac{5}{12}} = \frac{(8m+14w) \times 7 \times D}{\frac{7}{12}}$$

$2m = 3w$

$\frac{m}{w} = \frac{3}{2}$

$6m+10w = 6\times3+10\times2 = 38$

$8m+14w = 8\times3+14\times2 = 52$

$$\frac{19 \quad 3}{\frac{38 \times 6 \times 15}{8}} = \frac{\frac{26}{52} \times 1 \times D}{7}$$

$$D = \frac{171}{13} = 13\frac{2}{13} \text{ days}$$

---

(65) A contractor undertook to finish a work in 150 days and he employs 20 men + 30 women + 75 children. After 60 days only 1/4 work is complete. Now he have removed all the women & 50 children and employed some more men so that the work will finish in 5 days earlier. find the extra men if 3 men = 5 women & 2 women = 3 children.

$$\frac{(20m + 30w + 75c)\times 60}{\frac{1}{4}} = \frac{(20m + 25c + x)\times 85}{\frac{3}{4}}$$

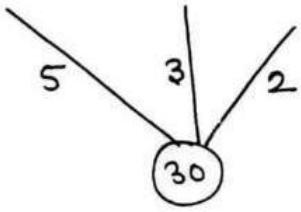
150 − 5 = 145 − 60 = 85

$x \rightarrow$ extra men.

$3m_{\times 2} = 5w_{\times 2}$

$2w_{\times 5} = 3c_{\times 5}$

$6m = 10w = 15c$



$\Rightarrow (20m + 30w + 75c) = (20\times 5 + 30\times 3 + 75\times 2) = 340$

$20m + 25c + x = 20\times 5 + 25\times 3 + x = 150 + x$

Now, $\frac{340 \times 60}{1} = \frac{(150 + x)\times 85}{3}$

$\Rightarrow 340 \times \frac{12}{60} \times 3 = (150 + x)\,85\,17 \Rightarrow x = 114$ आदमी Ans

---

(66) A does half as much work as B in 3/4th time as B. Together they took 18 days to complete the work then how much time shall B take to do it.

$\frac{A\times 3}{1} = \frac{B\times 2}{2}$

$3A = 2B$

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

Total work $= (2+3)\times 18 = 90$

A does $= \frac{90}{2} = 45$ days.

B does $= \frac{90}{3} = 30$ days.

(67) A can complete $\frac{3}{4}$th work of B in $\frac{5}{6}$ time than B. If the whole work completes in 10 days by working together. Then A alone complete the work in how many days?

$$\frac{A \times 5}{3} = \frac{B \times 6}{4} \quad (3 \text{ and } 2)$$

$$10A = 9B$$

$$\frac{A}{B} = \frac{9}{10}$$

Total work $= (9+10) \times 10 = 190$ unit

A does $= \frac{190}{9}$

$= 21\frac{1}{9}$ days.

B does $= \frac{190}{10} = 19$ days.