27/01/26.

TIME AND WORK :-

1, Core idea :-

Work = Efficiency x Time

2, Basic Golden Rule :-

If A can do a work in x days then A's 1 day work = $\frac{1}{x}$

(This is Most ⭐).

Example :- A can do a work in 10 days
so A's 1 day work = 1/10.

Problems (Basic problems to solve) :-

1, Person A can complete a piece of work in 10 days person B can complete a same piece of work in 15 days. How long will it take for both of them working together to complete the work ?

Method 1 (Fraction but little bit complicated).

A = 10 days then A = 1/10

B = 15 days then B = 1/15.

They work together :-

$A+B = \frac{1}{10} + \frac{1}{15}$ (Take LCM then)

$A+B = \frac{3+2}{30} = \frac{5}{30} = \frac{1}{6} = 6$.

Ans : 6 days.

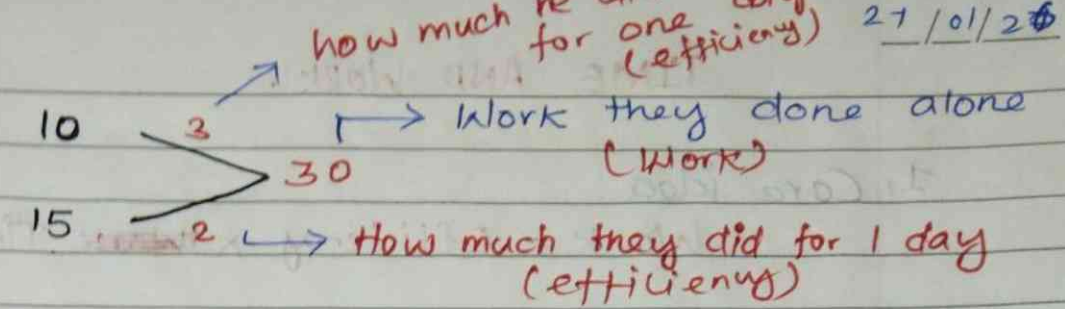
Method 2 (concept wise more easy).

Work = Efficiency x Time.

A = 10 days B = 15 days.

(They given time so we need to find out the Efficiency and Work).

21/01/2[illegible]



*) Ippo A Vanthu oru Velaya mudika 10 days aguthu, avan oru nalaiku 3 unit work mudipan Total avan complete ponnathu 30 unit work.

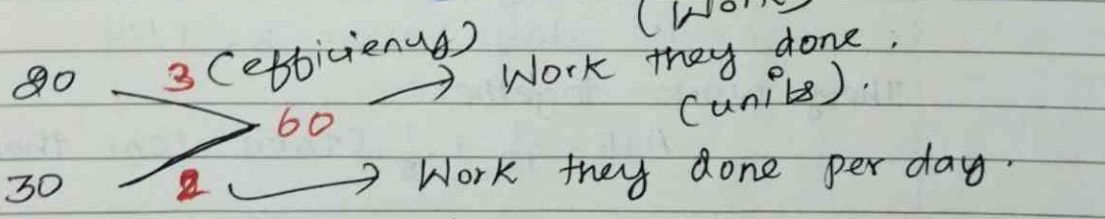
*) IPPO Inga paaru avanga 2 perum sernthu Mudikora 3+2 = 5 unit of Work. per day.

$= \frac{30}{5} = 6$ ans = 6 days

Ippo → Work = time x efficiency then
Time = work / efficiency

Q) A person A can complete a piece of work in 20 days, person B can complete a same piece of work in 30 days. How long will it take for both of them working together?

A = 20 B = 30.



Time = Work / efficiency.

$= 60/3+2 \Rightarrow 60/5 = 12.$

Ans: 12 days.

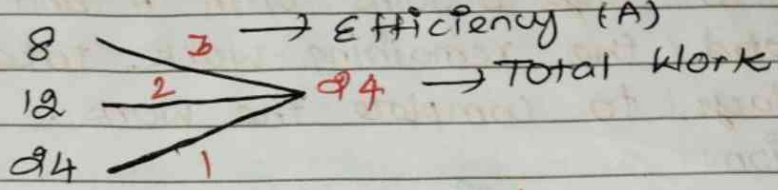
3- person A can complete a piece of work in 8 days, person B can compleate a piece of work in 12 days, person C can complete a work in 24 days. How long they take to complete it

27/01/26.

Working together to complete the Work?

Solution:.

A = 8 days B = 12 days C = 24 days.



Time = Work / efficiency.

Time = 24 / 3+2+1 = 24/6 = 4.

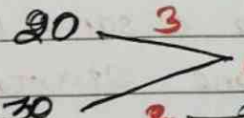
Ans: 4 days.

PART-II PERSON LEFT AFTER SOME DAYS:.

Question 1: Person A can complete a piece of work in 20 days. person B can complete a same piece of work in 30 days?. They both started the work together After 4 days 'A' left the job and remaining work done by B alone. How long will it take to complete the remaining work? Total number of days to complete the work?

Solution:.

A = 20 days B = 30 days



$\Rightarrow \frac{60}{5} = 12$ → They work Both

A and B work together = 24

Total Work done → 20 + 4

*) After 4 days A left the job (means they work 4 days together).

A = 3 units B = 2 unit 4 × 5 = 20.

60 − 20 = 40 Remaining. 20 × 2 = 40 → remaining Work (pending).

↳ B efficiency

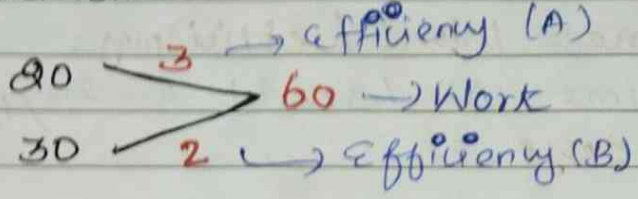
↙ days to complete remaining work

Remaining work done in 20 days.

__/__/__

2) Person A can complete a piece of work in 20 days, person B can complete a piece of work in 30 days, A' alone started the work, after 10 days B joins with A and together completed the remaining work. Total number of days to complete the work.

Solution:



A+B = 5 units.

A' Alone started the work 10 days.

$10 \times 3 = 30$ $60 - 30 = 30$ (remaining)

Ippo in the remaining 30 units of work is did by the A and B

$= 30/5 = 6$ days.

A' alone work for 10 days they the both complete the remaining work in 6 days

$10 + 6 = 16$ days.

ANS: 16 days.

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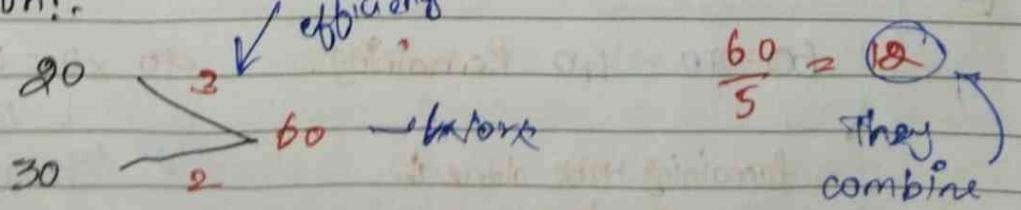
3) Person A can complete a piece of work in 20 days, person B can complete a same piece of work in 30 days. A' alone started the work and working for 8 days. then left B complete the remaining work by working alone. Find the days to complete by B.

Solution:



29/01/26.

A' Started to working alon for 8 days!.

→ 3 × 8 = 24. ⇒ 60 − 24

A's unit ↑ 8 days 36 remaining

(A' left and B Working alone)

★) 36/2 = 18 days.

↳ remaining work to done.

★) Hence the remaining work 18 days to complete

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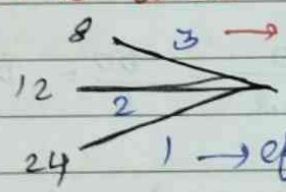
4) person A can complete a piece of work in 8 days, person B can complete a work in 12 days and person C can complete a work in 24 days. All of them working together. After 2 days A left the job. In how many days the remain work to be done.



$\frac{24}{6} = 4.$

All working togethe (2 days) = 2 × 9 = 6 24 − 6 = 18.

Remaining Work = 18/3 = 6

The remaining work done in 6 days.

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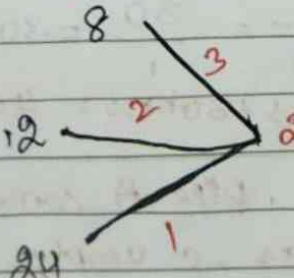
5) person A complete in 8 days, person B can complete a piece of work 12 days, person C complete 24 days. A alone started the work after 2 days B and C joins with the A. Find total?



A Alone 2 × 3 = 6 24 − 6 = 18

B and C join.

$\frac{18}{6} = 3$

Total number of days = 3 + 2 = 5 days.

3/2/26.

CISTREN SUMS:

1) A cistren has 3 pipes A,B,C pipeA can fill a tank in 5 hours, pipe B can fill a tank in 6 hours. Pipe C can empty a filled tank in 3 hours. How long will it take if all the three pipes are opened together to fill the tank?

A = 5 → 6
B 6 → 5 → 30
C 3 → 10

A+B-C

5+6-10

1

$\frac{30}{1} = 30$ hrs.

$\frac{\text{Total work}}{EA+EB-EC} = \frac{30}{1} = 1$

↳ Because it empty the tank.

2) A cistren can filled by a pipe A in 20 hours it can empty by B in 30 hours, if both opened together how long will it take to fill the tank?

20 → 3
30 → 2
→ 60

$\frac{W}{EA-EB} = \frac{60}{3-2} = \frac{60}{1} = 60$ hrs.

3) A cistren can be filled by a pipe A in 20 hours, while it can empty by pipe B in 30 hours, If pipe A opened first, after 10 hours pipe B also opened, Find the total time taken to fill the whole tank?

20 → 3
30 → 2
→ 60

A/S 10 hours = $10 \times 3 = 30$

Remaining = $60 - 30 = 30$.

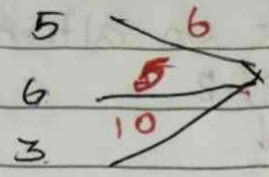
Now Both A and B pipes are opened.

$\frac{30}{3-2} = \frac{30}{1} = 30$ hrs.

Then total = 10 hrs + 30 hrs = 40 hrs.

4) A cistren has 3 pipes A,B,C. pipe A can fill tank in 5 hours, pipe B in 6 hours, c empty a tank 3 hours. pipe A and B: opened for 2 hours. after that C also opened. Find total time taken

3/2/26.



A = 6 litres per hour
B = 5 litres per hour
C = 10 litres per hour

A and B for two hours = 6+5=11 for 2 hours
2×11=22.

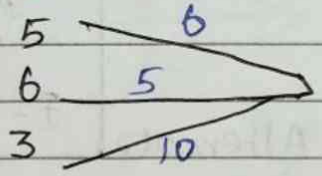
Balance = 30 - 22 = 8 litr. , C also opened

$= \frac{8}{6+5-10} = \frac{8}{1} = 8$ ~~litres~~ hours.

Total time taken = 2 + 8 = 10 hrs.

---

5) A cistren has 3 pipes A, B, C, A fill 5 hours, B fill in 6 hours, C empty in 3 hours. pipe A opened first, after 3 hours pipe B also opened after 1 hour pipe C also opened. Total time taken to fill the tank?



i) A opened first 3 hrs
3×6 = 18 Bal = 30 - 18 = 12

ii) A and B both 1 hour
1×11 = 11 Bal = 12 - 11 = 1

iii) All three opened :.

$\frac{1}{6+5-10} = \frac{1}{1} = 1$

Total time = 3+1+1 = 5hr

ALTERNATE DAYS:

1) person A can complete a piece of work in 20 days. person B can complete a same piece of work in 30 days. A started the work then they work on Alternate days, How long it will take to complete the work, if they work on Alternate days?

3/2/26

20 — 3
30 — 2
60

They work on alternate days.

A B A B A B
↓ ↓ ↓ ↓
3 2 3 2

1 cycle = 5 units.

$= \frac{60}{5} = 12$ cycle.

12 cycle = 60 units

1 cycle = 2 days.

12 cycle = 12 × 2 = 24 days.

ANS: 24 days.

---

2) person A can complete a piece of work in 15 days, person B can complete a same piece of work in 9 days. Starting on 'A' they worked on Alternate days. How long will it take to complete the work?

A 15 — 3
B 9 — 5
45

(*) Hint for LCM

15 : 9
5 : 3

I = A : B (small comes first)
3 : 5

They worked on Alternate

A B A B A
↓ ↓ ↓ ↓ ↓
3 5 3 5 3

1 cycle = 8 units

5 cycle = 40 units.

1 cycle = 2 days.

5 cycle = 10 days to comple comple 40u

(Bal = 5 units. A start)

11 days = 43 units. rem = 2 units

B effi = 5 units

Rem

ANS = 11 2/5 → Efficiency of B.

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3) person A can complete a piece of work in 16 days. person B can complete a same piece of work in 12 days, starting on 'A' they worked on Alternate days. How long will it take to complete the work?

3/2/26

16 → 3 → 48
12 → 4

They worked on Alternate

A B A B A B
↓ ↓ ↓ ↓ ↓ ↓
3 4 3 4 3 4.

16 : 12
8 : 6
4 : 3

1 cycle = 7 units.
6 cycle = 42 units

1 cycle = 2 days
6 cycle = 12 days (They comple 42 units).
13 days = 45 units.
(Rem 3 units)

ANS: $13\frac{3}{4}$.

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20) A, B, C can complete a piece of work in 48, 12, 24 days. A start the work Every 3rd day B and C join with 'A'. Find the total number of days to complete the work?

A = 48 → 1
B = 12 → 4
C = 24 → 2
→ 48

A Starts the work every 3rd day B and C join with A.

1 2 3rd 6th.
A A (A+B+C) A A (A+B+C)
↓ ↓ ↓ ↓ ↓ ↓
1 1 7 1 1 7

1 cycle = 9 units.
5 cycle = 45 units

1 cycle = 3 days
5 cycles = 15 days. (Rem 3 units).

16 day A comple — 1 unit
17 day A comple — 1 unit
} 47 units complete
(Rem 1 unit)

ANS: $17\frac{1}{7}$ days.

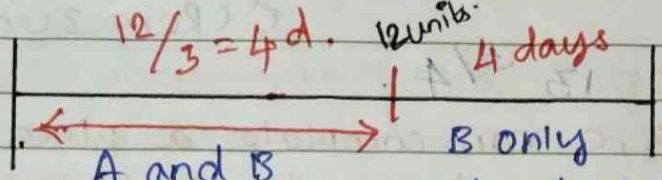
PERSON LEAVING BEFORE COMPLETION OF WORK.

3/12/96.

1, Person A and B complete the work in 8 and 16 days. They start together but A leaves 4 days before completion of the work. find the total number of days to complete the work?

8 — 2
16 — 1
16

They started together but A left 4 days before completion.



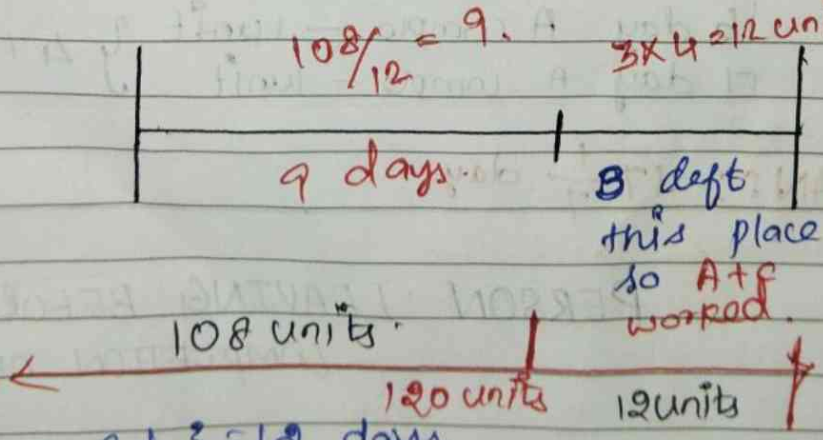
Work here because A left.
(4 × 1 = 4 units).
(16 − 4 = 12 units)

Total = 4 + 4 = 8 days.

2, A, B, C can complete the piece of work in 24, 30, 40 days. They all working began together B left 3 days before completion of work. Find the total number of days to complete the work?

24 — 5
30 — 4
40 — 3
120

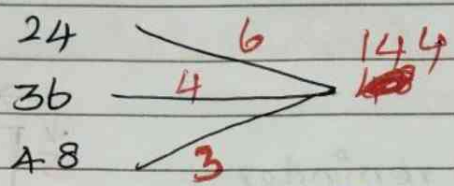
They all started togeth
B only left before
3 days.

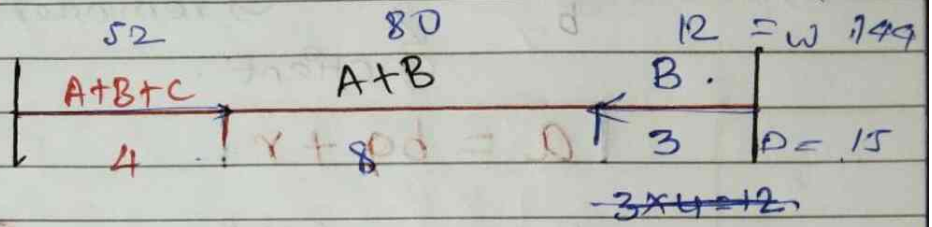


ANS: 9 + 3 = 12 days.

3) A, B, C can complete the piece of work in 24, 36, 48 days. C left 4 days of start of the work A left 3 days before completion of the work. Find the total number of days to complete the work?

C left after 4 days
A left before 3 days





4 × 13
52

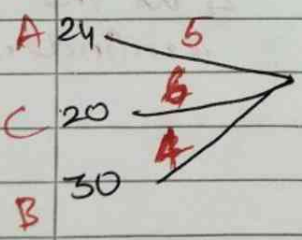
Work comple = 144 − 64

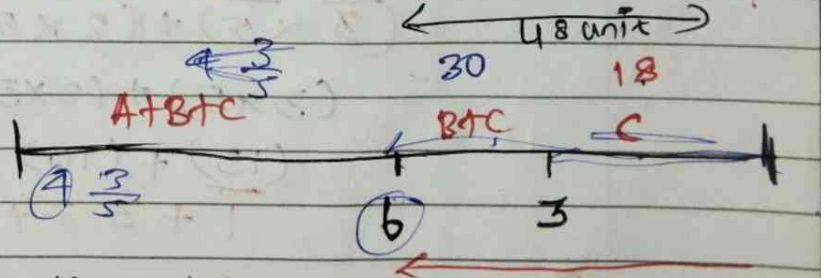
Bal = 80 ↔ This should complete by A+B.

$A+B = \frac{80}{10} = 8$

Total = 8 + 4 + 3 = 15 day.

4) A, B and C can complete a piece of work in 24, 30, 20 days. A leaves 6 days and B leaves 3 days before completion of the work. Find the total number of days to complete the work?





Total = 120 − 48
= 72

$A+B+C = \frac{72}{15} = \frac{12}{15} = \frac{3}{5}$

(4), 60

ANS = 10 3/5.