GATE-2023 CRASH COURSE

GENERAL APTITUDE

TIME & WORK

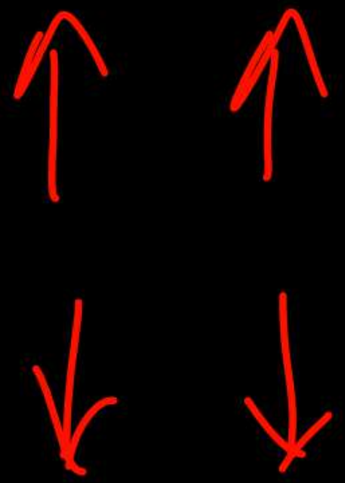
AMULYA RATAN SIR

Lecture no- 06

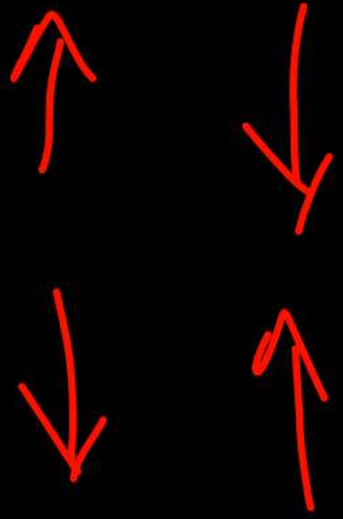
TIME AND WORK

TIME WORK MEN

DIRECT



INVERSE



TIME WORK MEN (People)

- Time & Work ('Men' constant)
- DIRECT/INVERSE

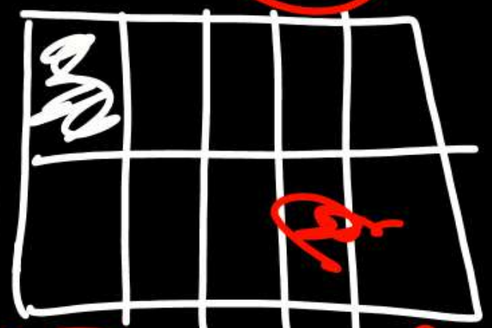
- Work & Men ('Time' constant)
- DIRECT/INVERSE

- Time & Men ('Work' constant)
- DIRECT/INVERSE

$A = \frac{10}{1}$ days

$B = 20$ days

$\frac{1}{10}$ $\frac{1}{20}$



$\frac{1}{10} + \frac{1}{20} = \frac{3}{20}$

$\frac{20}{3} = 6.\overline{6}$ OR $6\frac{2}{3}$ days

TIME AND WORK

$\frac{10}{1}$ day 20 day

$A = \frac{1}{10}$ Per day $B = \frac{1}{20}$

$\frac{1}{10} + \frac{1}{20} = \frac{3}{20}$ Per day

$\frac{20}{3} = 6.\bar{6}$ OR $6\frac{2}{3}$ days

TRY THESE

- If A can do a work in 20 days and B in 30 days, then together they will complete in how many days?
- If A can do a work in 25 days and B in 40 days, then together they will complete in how many days?
- If A and B together can complete a work in 40 days whereas A alone in 60 days, then B alone can complete that work in how many days?

Q. A can do a work in 10 days whereas B in 20 days.They started working on alternate days, i.e. 1st day 'A', 2nd day 'B', 3rd day 'A'.....so on. Then in how many days the total work would be completed ?

1 A — 2 B — 3 A — 4 B

$A = \frac{1}{10}$ $B = \frac{1}{20}$

$\frac{1}{10} + \frac{1}{20} = \frac{3}{20}$ ×6 ⇒ 2 days ×6

$\frac{18}{20} \rightarrow 12$ days

13 days

Q. A can do a work in 10 days whereas B in 20 days.They started working on alternate days, i.e. 1st day 'B', 2nd day 'A', 3rd day 'B'.....so on. Then in how many days the total work would be completed ?

$13\frac{1}{2}$

1	2	3	4
B	A	B	A

$A = \frac{1}{10}$ $B = \frac{1}{20}$

$\frac{18}{20} \rightarrow 12$ days $\frac{1}{20} + \frac{1}{10} = \frac{3}{20} \rightarrow 2$ days

$\times 6$ $\times 6$

1 work $A = 10$

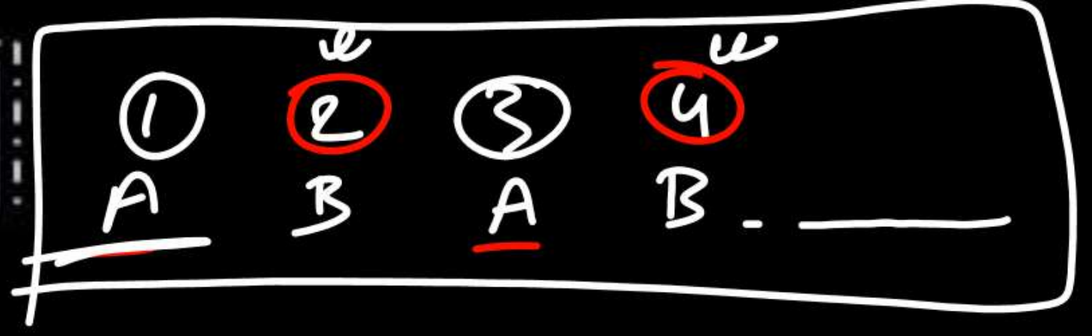
$\frac{1}{20}$ " " $= 10 \times \frac{1}{20} = \frac{1}{2}$

$\frac{x}{20} = \frac{1}{10}$?

13^{th}

$\frac{1}{10} - \frac{1}{20} = \frac{1}{20}$?

Brainstorming 1



A can do a work in 25 days whereas B in 40 days. They started working on alternate days, i.e. 1st day 'A', 2nd day 'B', 3rd day 'A'.....so on. Then in how many days the work would be completed?

$A = \frac{1}{25}$ $B = \frac{1}{40}$

$\frac{5}{200} = \frac{1}{40}$

$\frac{195}{200} \rightarrow$ 30 days

$\frac{1}{25} + \frac{1}{40} = \frac{13}{200} \xrightarrow{\times 15} 2 \text{ days} \xrightarrow{\times 15}$

$30\frac{5}{8}$ days

1 work $A = 25$

$\frac{1}{40}$ " " $= 25 \times \frac{1}{40} = \frac{5}{8}$

Brainstorming 2

20 days

$A = \frac{1}{20}$ $B = \frac{1}{30}$ $C = \frac{1}{60}$

1 work B&C = ?

$B\&C = \frac{1}{30} + \frac{1}{60} = \frac{3}{60} = \frac{1}{20}$

A can do a work in 20 days whereas B in 30 days and C in 60 days. They started the work together. But A left after two days and B left three days before the work got completed. Then the total work was done in how many days?

$$\frac{x}{60} + \frac{x-3}{30} + \frac{2}{20} = 1$$

$$x + 2x - 6 + 6 = 60$$

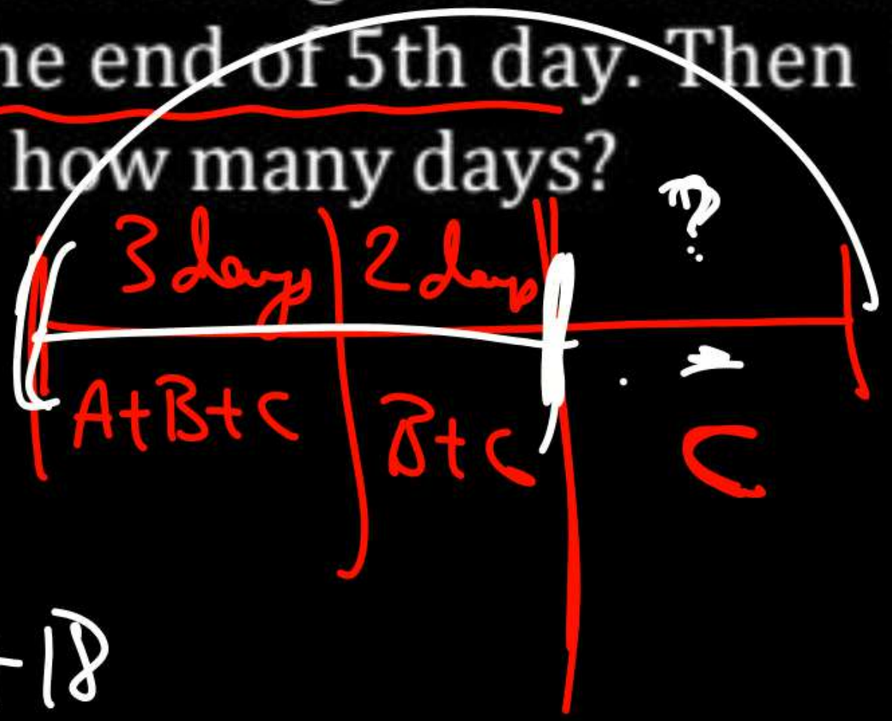
$$3x = 60$$

$$A = \frac{1}{20} \quad B = \frac{1}{30} \quad C = \frac{1}{60}$$

Brainstorming 3

$A = \frac{1}{10}$ $B = \frac{1}{20}$ $C = \frac{1}{60}$

A can do a work in 10 days whereas B in 20 days and C in 60 days. They started the work together. But A left at the end of 3rd day and B left at the end of 5th day. Then the remaining work was done by C in how many days?



$$1 = \frac{x}{60} + \frac{5}{20} + \frac{3}{10}$$

$$60 = x + 15 + 18$$

$$x = 27$$

27 - 5

= 22 days

NOW TRY THIS

$12M = \frac{1}{48}$

$M = \frac{1}{48 \times 12}$

$15W = \frac{1}{48}$

$W = \frac{1}{48 \times 15}$

If 12 men or 15 women can do a work in 48 days, then 8 men and 6 women can do the same work in how many days?

$$\frac{8}{48 \times 12} + \frac{6}{48 \times 15} = \frac{40 + 24}{48 \times 3 \times 4 \times 5}$$

$$= \frac{1}{45} \rightarrow 45 \text{ days}$$

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$5\,sk = \frac{1}{20}$ $\quad 8\,ssk = \frac{1}{25}$

$1\,sk = \frac{1}{100}$ $\quad 1\,ssk = \frac{1}{200}$

If 5 skilled workers can build a wall in 20 days, 8 semi-skilled workers in 25 days & 10 unskilled workers in 30 days. Then a team of 2 skilled 6 semi-skilled & 5 unskilled workers will build the same wall in how many days?

$10\,usk = \frac{1}{30}$

$1\,usk = \frac{1}{300}$

$\frac{\frac{600}{40}}{15}$ $\quad \frac{2}{100} + \frac{6}{200} + \frac{5}{300} = \frac{12+18+10}{600}$

15 days

NOW TRY THIS

Pipes & Cistern

If 9 MONKEYS EAT 9 BANANAS IN 9 MINUTES, THEN HOW MANY MONKEYS WILL EAT 45 BANANAS IN 45 MINUTES?

Chain Rule


thank you