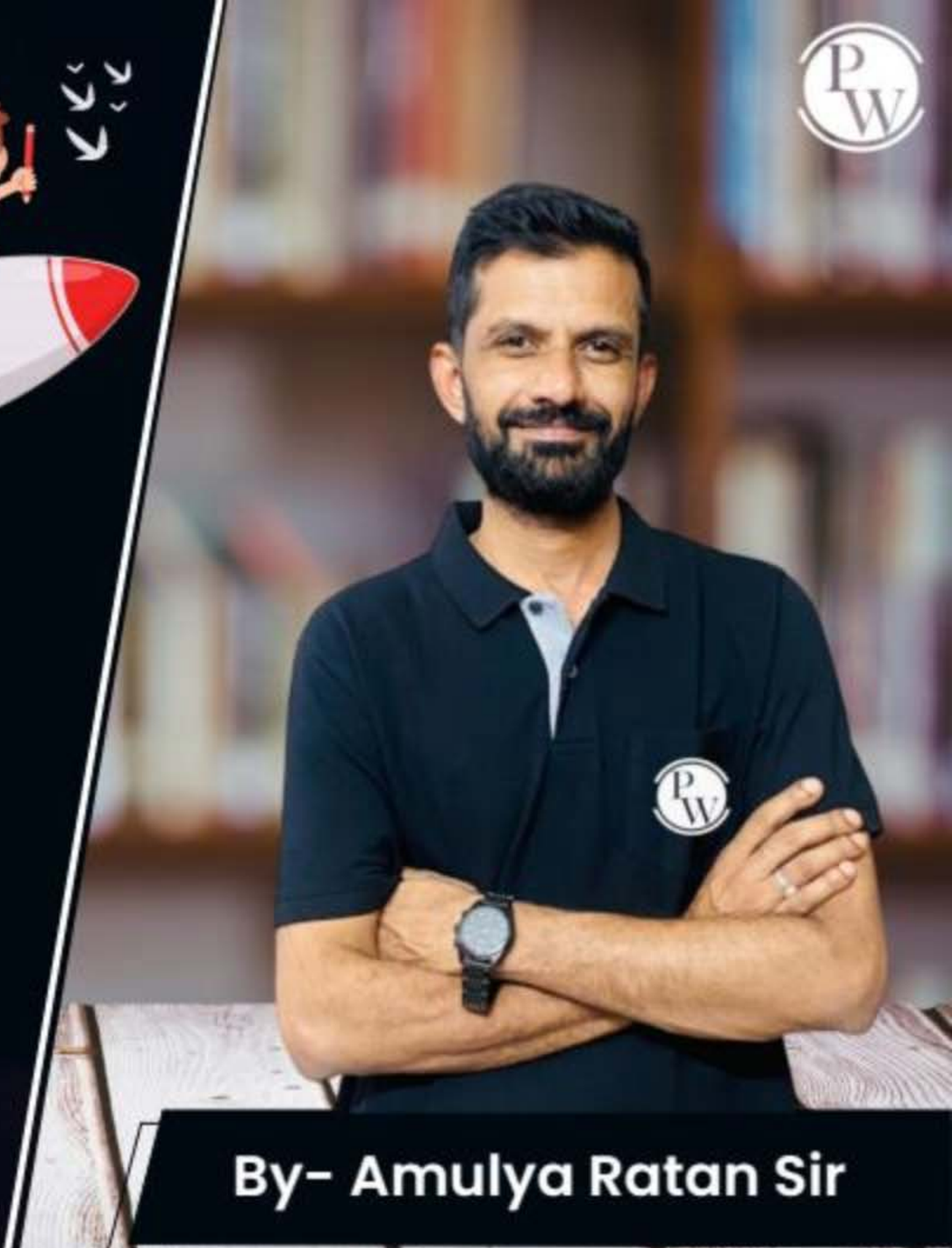
GATE

ALL BRANCHES

General Aptitude

QUANTITATIVE APTITUDE

Lecture No.- 08



By- Amulya Ratan Sir

Recap of Previous Lecture

Topic Number System

Topics to be Covered

Topic-1 Counting Theory

Topic-2 Time and Work & Pipes & Cistern

[MCQ]

#Q. Which largest number of 5 digits is divisible by 99 ?

A ✗ 99999 −27, 18, 9

B ✗ 99981 −19, 17, 2

C ✗ 99909 27, 9, 18

D 99990 −18, 18, 0

[MCQ]

#Q. Find the least perfect cube divisible by 2, 3, 4 and 6.

Assignment

A 216 → 6^3

B 1728 → 12^3

C 512 → 8^3

D 360

[MCQ]

#Q. How many natural numbers up to 100 are divisible by both 2 and 3?

Assignment

$6 \times 1 = 6$

A 13

B 14

C 17

D 16

16

$6 \times 16 = 96$

[MCQ]

#Q. Find the largest four-digit number that is exactly divisible by 88.

Assignment

$88 = 8 \times 11$

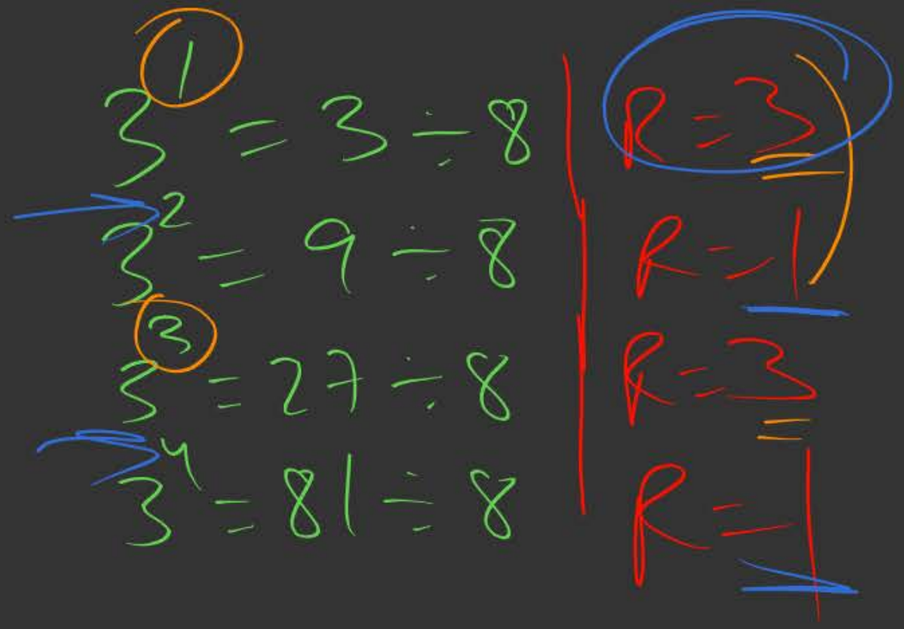
A 9844

B 9768

C 8894

D 9944

8) 3 ©
0
1
3



Counting Theory

Counting

(ATM)

PIN

The no. of ways to do a particular work.

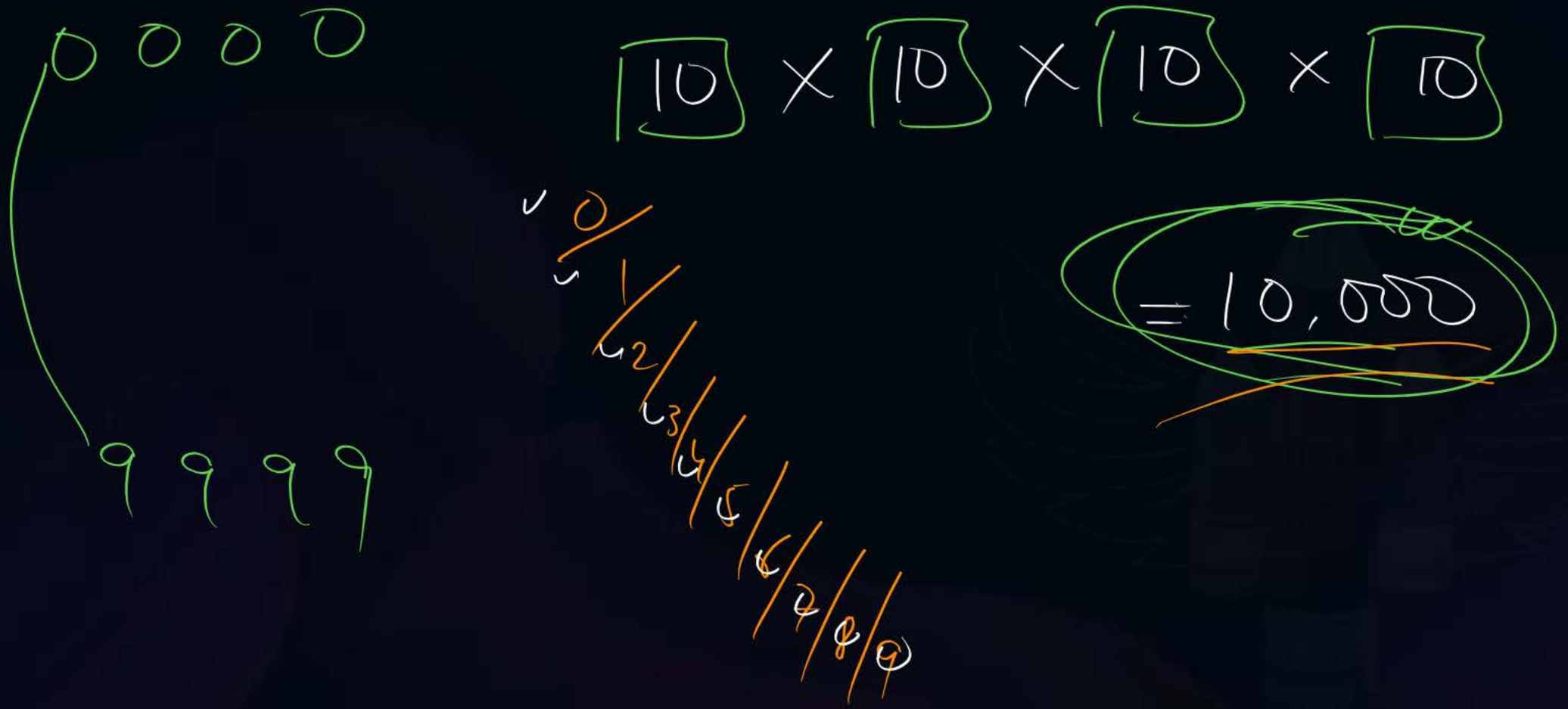
_ _ _ _ _

OR या (+)

AND और (×)

[MCQ]

#Q. In how many different ways you can choose your ATM PIN ?



[MCQ]

#Q. In how many different ways you can select a six digit phone password/passcode ?

$10 \times 10 \times 10 \times 10 \times 10 \times 10$

0-9 0-9

$= 1,000,000$

[MCQ]

#Q. How many four digits number can be formed using 1, 2, 3, 4 & 5?

Rep

Th H Ten U

5 × 5 × 5 × 5

= 625

Rep ✗

Th H Ten U

5 × 4 × 3 × 2

(5-1) (5-2) (5-3)

= 120

[MCQ]

#Q. In how many different ways you can choose your ATM PIN which is an even ?

$10 \times 10 \times 10 \times 5$

$= 5000$

0/2/4/6/8

[MCQ]

#Q. How many three digits number can be formed using digits 0 to 9?

Rep ✓

H	Ten	U
9	10	10
(10-1)		

$= 900$

Rep ✗

H	Ten	U
9	9	8
(10-1)	(10-1)	(10-2)

$= 81 \times 8 = 648$

[MCQ]

#Q. In how many ways four letters can be posted in 6 post boxes, if each box can take any number letters?

$L_1 \quad L_2 \quad L_3 \quad L_4$

$6 \times 6 \times 6 \times 6$

$= 36 \times 36 = 1296$

A. 4096

B. 1500

C. 24

D. 1296

[MCQ]

#Q. In how many ways can you arrange 5 Novels on a shelf?

A 720

B 120

C 360

D 300

$5 \times 4 \times 3 \times 2 \times 1$

$5 \times (5-1) \times (5-2) \times (5-3) \times (5-4)$

$= 120$

[MCQ]

PYQ

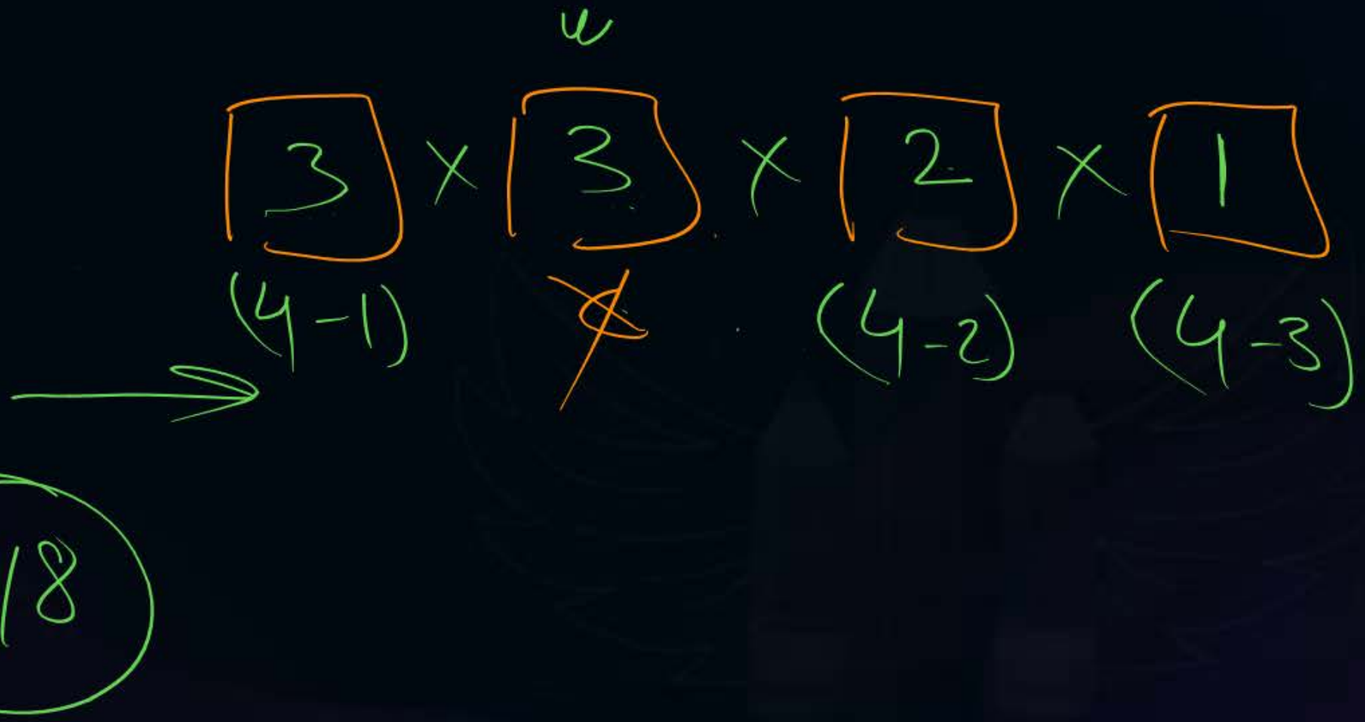
#Q. Four persons A, B, C and D are to be seated in a row. C should not be seated at the second position from the left end of the row. The number of distinct seating arrangements possible is?

A 6

B 9

C 18

D 24



[MCQ]

Assignment

#Q. Five different book (P, Q, R, S, T) are to be arranged on a shelf. The books R and S are to be arranged first and second, respectively from the right side of the shelf. The number of different orders in which P, Q and T may be arranged is?

A 12

B 120

C 6

D 2

[MCQ]

Assignment

#Q. A license plate begins with 3 letters. If the possible letters are A, B, C, D and E, how many different ways these letters can be written if no letter is used more than once?

A 720

B 120

C 60

D 30

[MCQ]

Assignment

#Q. In how many different ways can the letters of the word 'PLEADING' be arranged in such a way that the vowels always come together?

A 720

B 4320

C 5040

D 3600

Direct & Inverse:

Time & Work

Direct

TIME | WORK | MEN

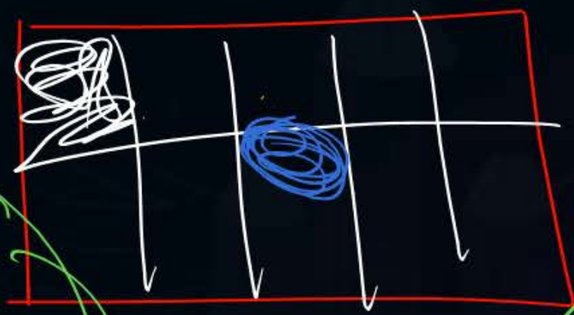
Inversely

Direct

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

$\because \frac{1}{20}$ B = 20 days

A & B $\Rightarrow \frac{1}{10} + \frac{1}{20} = \frac{3}{20} \Rightarrow \frac{20}{3}$ days $= 6.\overline{6}$ OR $6\frac{2}{3}$



Let's Try:

1. P ⇒ 20 days ; Q ⇒ 30 days

   12 days

2. A ⇒ 25 days ; B ⇒ 40

   $15\frac{5}{13}$ OR 15.3...

3. P&Q ⇒ 40 days ; P ⇒ 60 days

   Q ⇒ ? 120 days

[MCQ]

1 A | 2 B | 3 A | 4 B | 5 A - ——

#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 ?

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

$\frac{2}{20}$ $\frac{1}{10}$?

$\frac{1}{10} + \frac{1}{20} = \frac{3}{20}$ (×6) $\Rightarrow$ 2 days (×6)

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

13 days

[MCQ]

1 B 2 A 3 B 4 A 5 B ...

#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 ?

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

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

$\frac{1}{20} + \frac{1}{10} = \frac{3}{20}$ (×6) $\Rightarrow$ 2 days (×6)

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

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

work A = 10

$\frac{1}{20}$ :: $A = 10 \times \frac{1}{20}$

$= \frac{1}{2}$

$13\frac{1}{2}$ days

OR

13.5 days

[MCQ]

#Q. 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. $15\ ^{5}/_{8}$ days

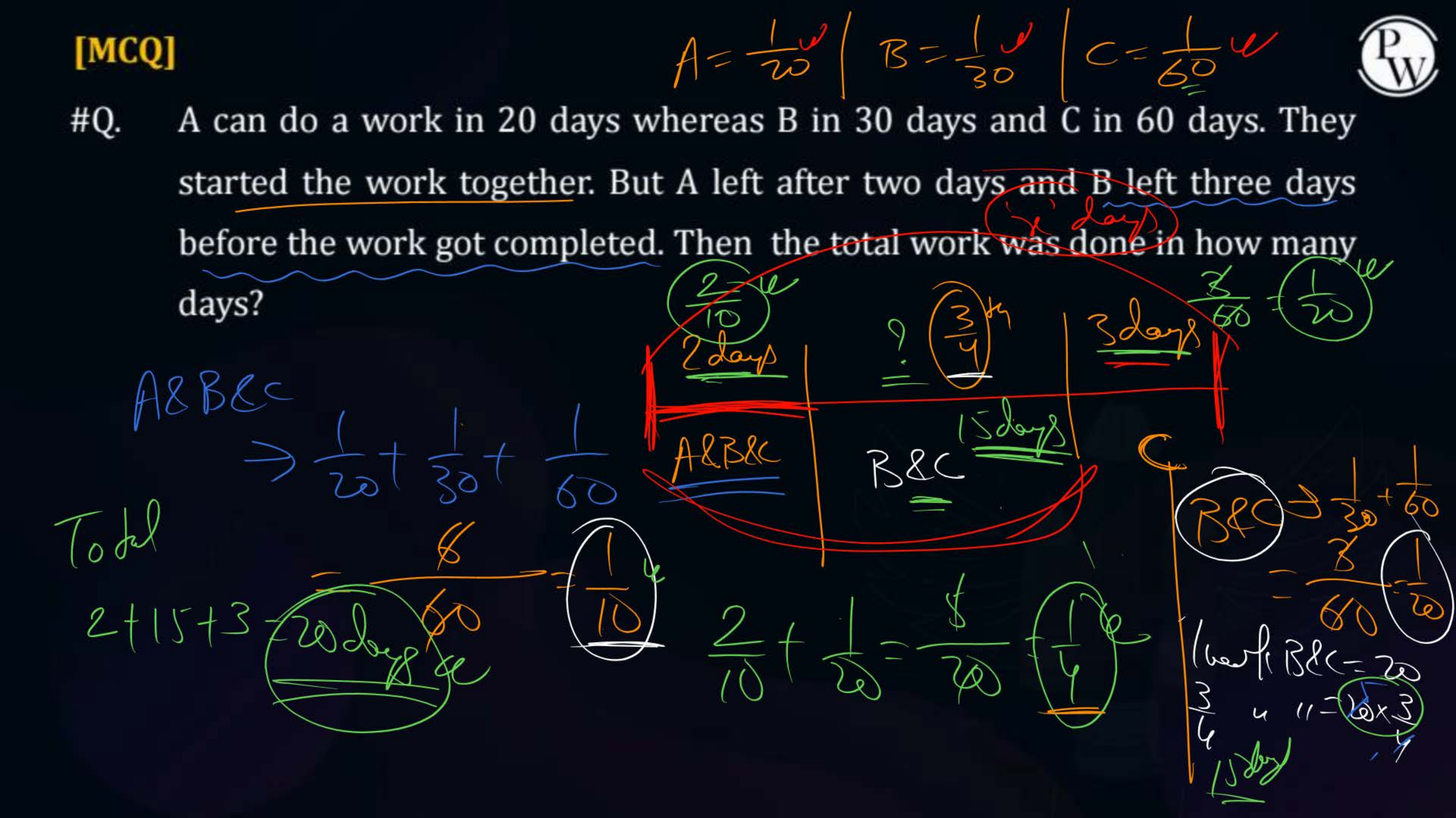
B. $30\ ^{5}/_{8}$ days

C. 31

D. 16

[MCQ]

#Q. 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?



[MCQ]

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

#Q. 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?

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

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

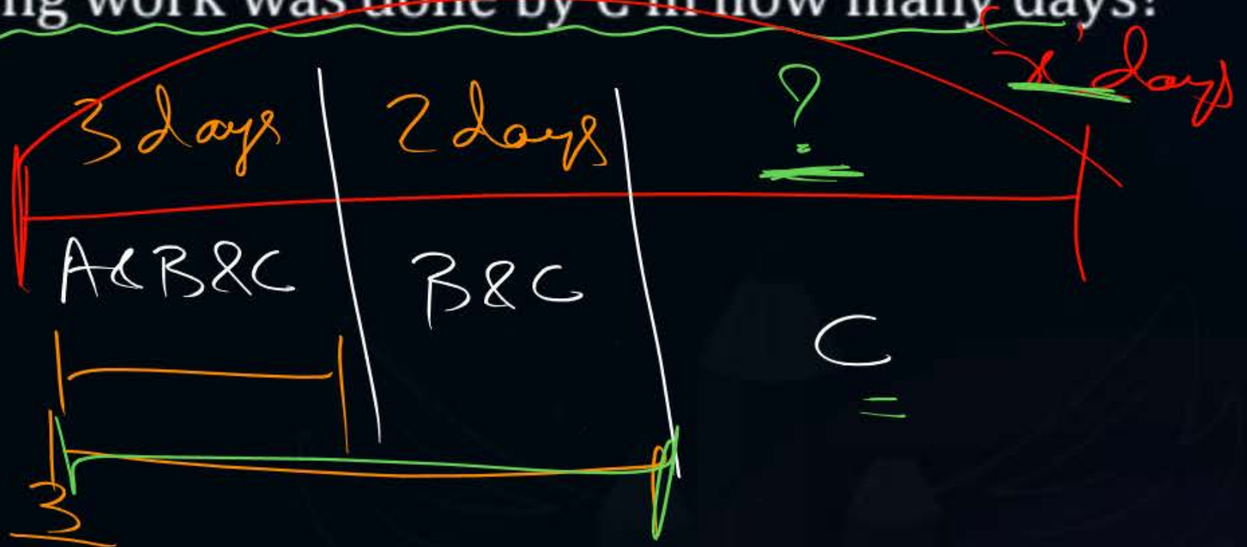
$$3x = 60$$

$$x = 20$$

[MCQ]

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

#Q. 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?



A 27

B 35

C 31

D 22

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

$$\Rightarrow x + 15 + 18 = 60$$

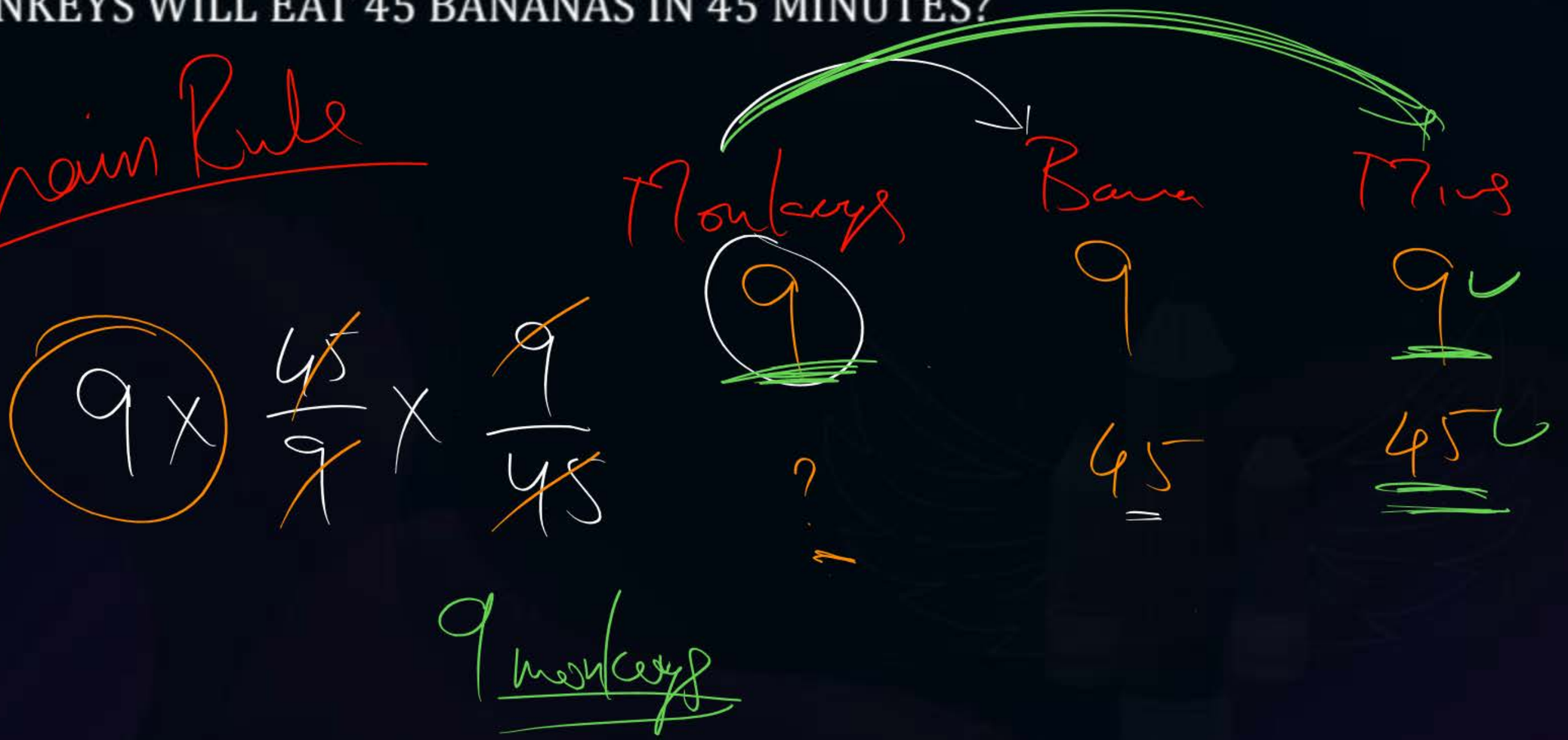
$$\therefore x = 27$$

$$27 - 5 = 22 \text{ days}$$

[MCQ]

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

Chain Rule



Chain Rule:

$98 \times \frac{63}{45}$

%	No
45%	→ 98
63%	→ ?

↑ (1) $\times \frac{3}{2}$

↓ (1) $\times \frac{2}{3}$

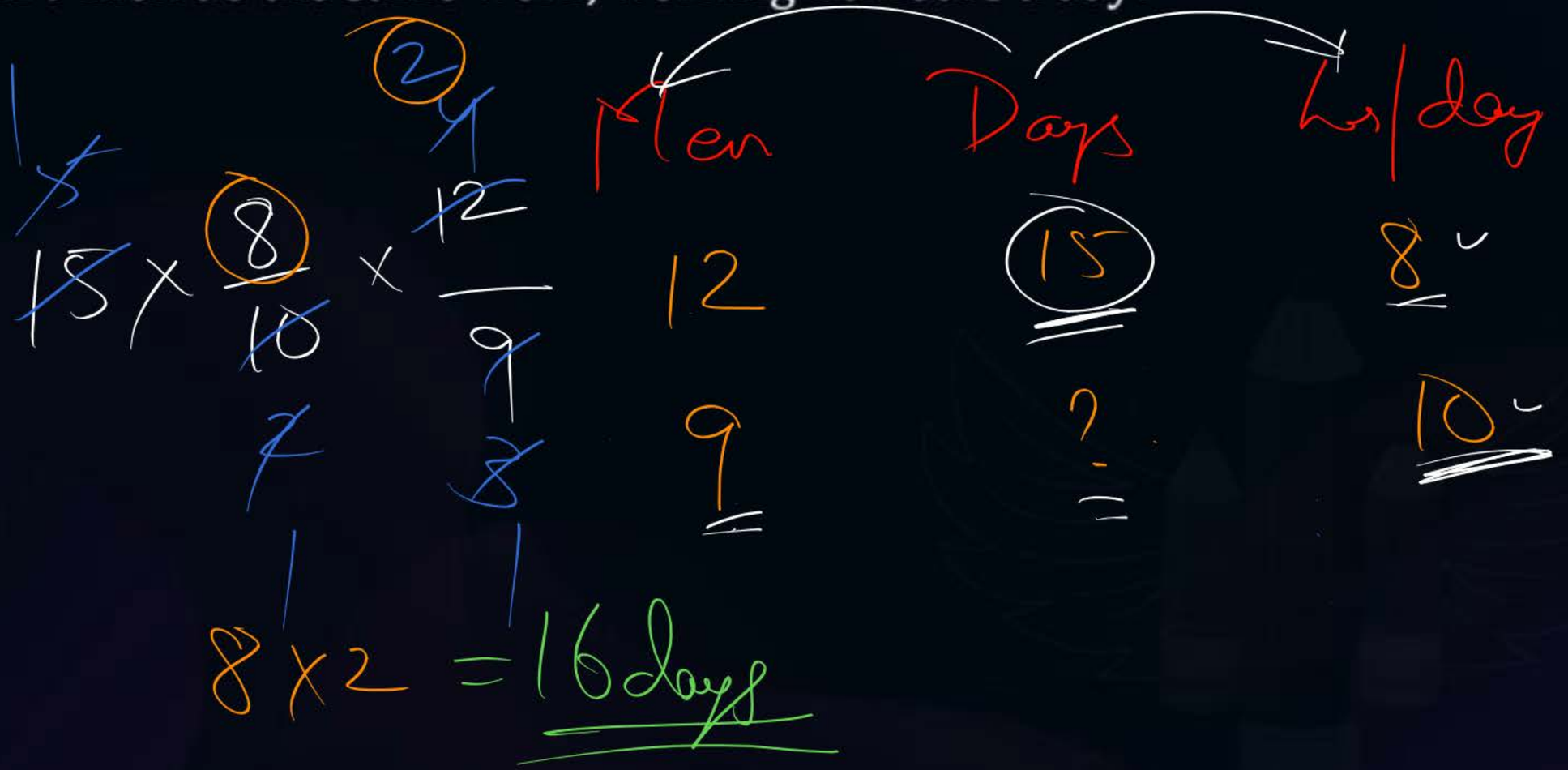
45% of $x = 98$

$\Rightarrow x = 98 \times \frac{100}{45}$

63% of $x = \frac{63}{100} \times 98 \times \frac{100}{45}$

[MCQ]

#Q. 12 men can do a work in 15 days working 8 hours a day. In how many days can 9 men do the same work, working 10 hours a day?



[MCQ]

Brainstorming

#Q. A hostel with 600 students had sufficient food for 210 days. After 30 days, 240 students left the hostel. Now the remaining food will last for how many days?

[MCQ]

Brainstorming

#Q. A Clock which gains 10 minutes in every one hour was set correct at 6 am. If that clock represents 1 pm the same day, what must be the correct time?

[MCQ]

Assignment

#Q. A contractor under takes to make a road in 40 days and employs 25 men. After 24 days, he finds that only one-third of the road is made. How many extra men should he employ so that he is able to complete the work 4 days earlier?

A 75

B 100

C 50

D None of these

[MCQ]

Assignment

#Q. A can do a work in 60 days whereas B in 20 days. If they together took a contract of ₹32000, then what would be the share of A?

A ₹ 8000

B ₹ 6000

C ₹ 1800

D ₹ 2040

2 mins Summary

Topic Counting Theory, Time and Work

e Pipes & Cistern
e Chain Rule (CLOCK)

THANK - YOU