GATE

Data Science & AI

General Aptitude

QUANTITATIVE APTITUDE

Lecture No.- 03

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Recap of Previous Lecture

Topic Clock

Banes

Topics to be Covered

Topic-1 More on Clocks

Topic-2 Averages

Dial of Clock

$$\frac{360^\circ}{12} = 30^\circ$$

M.H.

$$\frac{30^\circ}{5} = 6^\circ/\text{minute}$$

H.H

$$\frac{30^\circ}{60} = \frac{1}{2}^\circ/\text{minute}$$

OR

$0.5^\circ/\text{minute}$

To be Noted:

Relative Speed

- ✓ Minute Hand Covers 30° in 5 minutes 30°/5 =

  6°/min.

  5.5°/minute

- ✓ Hour Hand Covers 30° in 60 minutes 30°/60

  = ½ ° / min

  or

  0.5°/min

Different Patterns of Questions:

S : S/min

1. Time ⇒ Angle?
2. Angle ⇒ Time?
3. Gain OR lose

First Pattern:

2:00

60°

210°

7:00

5:00

150°

9:00

270°

Random time given:

282.5°

9:56 → 38°

9 → 270°

56 × 5.5 → 308°

38°

2:25 → 77.5°

2 → 60°

25 × 5.5 → 137.5°

77.5°

Questionnaire:

5:30 → 15° W

345° W

5 ⇒ 150°

30 × 5.5 ⇒ 165°

15°

Questionnaire:

3:15 ⇒ 7.5° or 352.5°

3 ⇒ 90°

15 × 5.5 ⇒ 82.5°

7.5°

Questionnaire:

4:40 ⇒ 100°

260°

4 ⇒ 120°

40 × 5.5 ⇒ 220°

100°

[MCQ]

#Q. At 9:45, the two hands of a clock make an angle of?

A 60°

B 45°

C 33 ⅓°

D 22 ½°

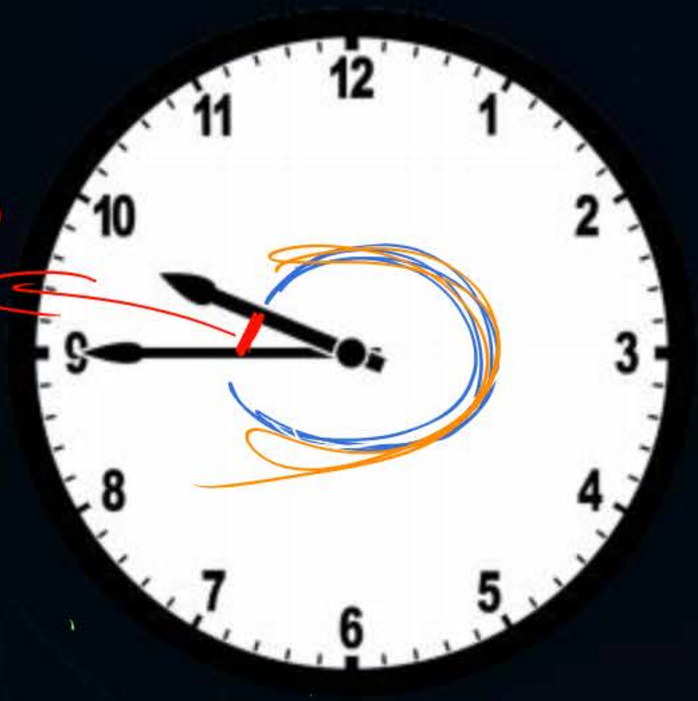
$9 \Rightarrow 270°$

$45 \times 5.5 \Rightarrow 247.5°$

$22.5°$

$337.5°$

Two Answers:



22.5°

$360 - 22.5^\circ$

$= 337.5^\circ$

Second Pattern:

Angle → Time?

0° OR Coincide:

~~12 times~~

12 hrs ⇒ 11 times

24 hrs ⇒ 22 times

180° OR Opposite:

12 ~~times~~

Except 0° & 180°

1 hr ⇒ 2 times

12 hrs ⇒ 11 times

24 hrs ⇒ 22 times

90° OR Right angle:

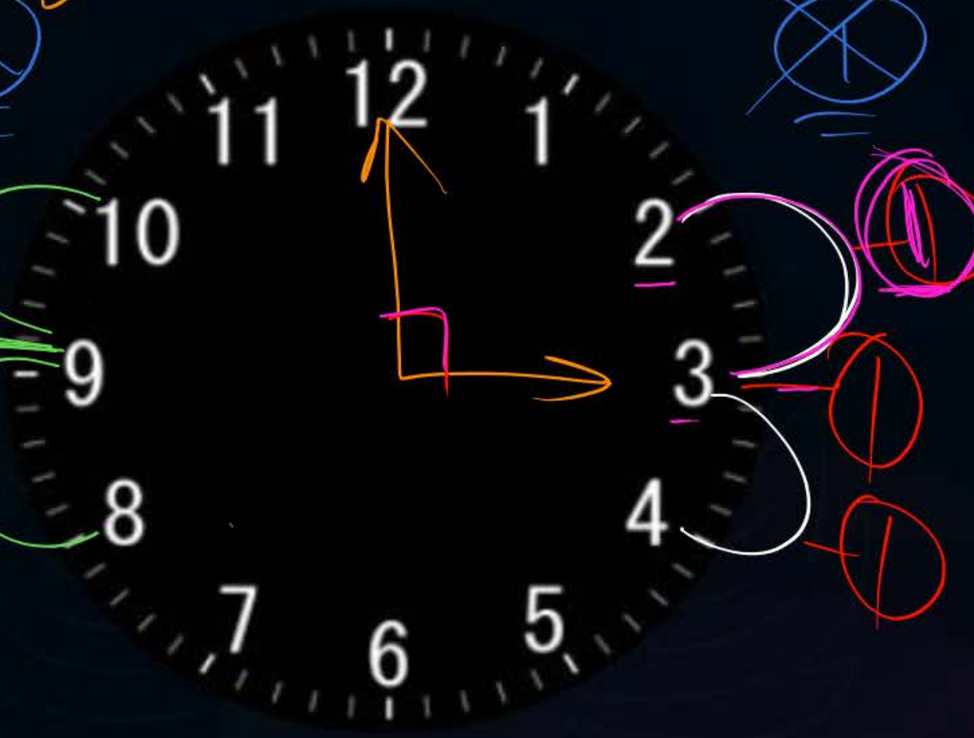
~~24 times~~

Any angle except

0° & 180°

12 hrs ⇒ 22 times

24 hrs ⇒ 44 times



Questionnaire:

$2:27\frac{3}{11}$

#Q. In between 2 O' clock and 3 O' clock at what time the hands of clock form 90°?

$\frac{150^\circ}{5.5} \xrightarrow{\times 2} = \frac{300}{11}$

$= 27\frac{3}{11}$ min

Questionnaire:

$4:03\frac{7}{11}$

$4:40$

#Q. In between 4 0' clock and 5 0' clock at what time the hands of clock form 100°?

$$\frac{20}{5.5} = \frac{40}{11} = 3\frac{7}{11}$$

$$\frac{220}{5.5} = \frac{440}{11} = 40$$

Questionnaire:

$6:21\frac{9}{11}$ ✓

$6:43\frac{7}{11}$ ✓

#Q. In between 6 0' clock and 7 0' clock at what time the hands of clock form 60°?

$11)240(21$

22

20

11

9

$\frac{120}{5.5} = \frac{240}{11} = 21\frac{9}{11}$

$\frac{240}{5.5} = \frac{480}{11} = 43\frac{7}{11}$

Questionnaire:

1 : $23\frac{7}{11}$

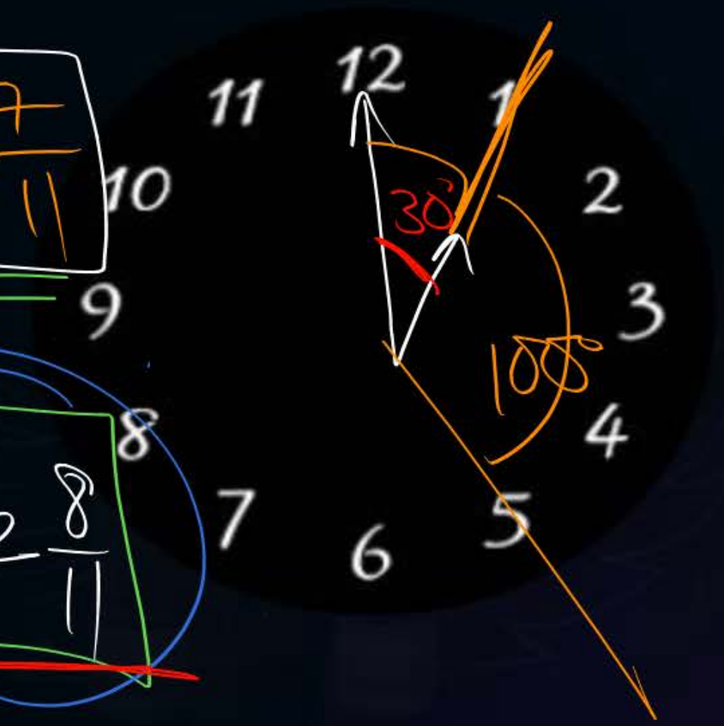
1 : $52\frac{8}{11}$

#Q. In between 1 0' clock and 2 0' clock at what time the hands of clock form 100°?

260°

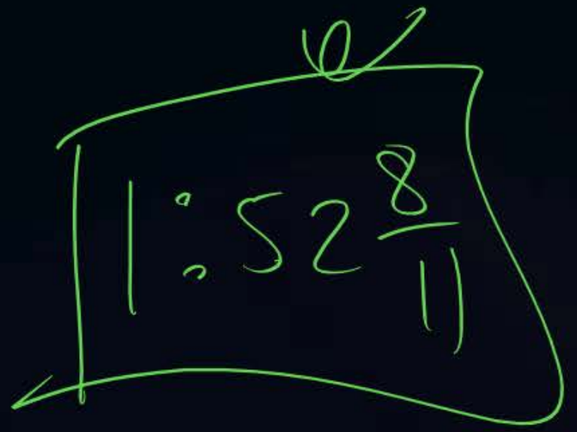
$\frac{130^\circ}{5.5} = \frac{260}{11} = 23\frac{7}{11}$

$\frac{290}{5.5} = \frac{580}{11} = 52\frac{8}{11}$



Questionnaire:

Q. 1 - 2 @ 100



$$\frac{40}{5.5} = \frac{80}{11} = 7\frac{3}{11}$$

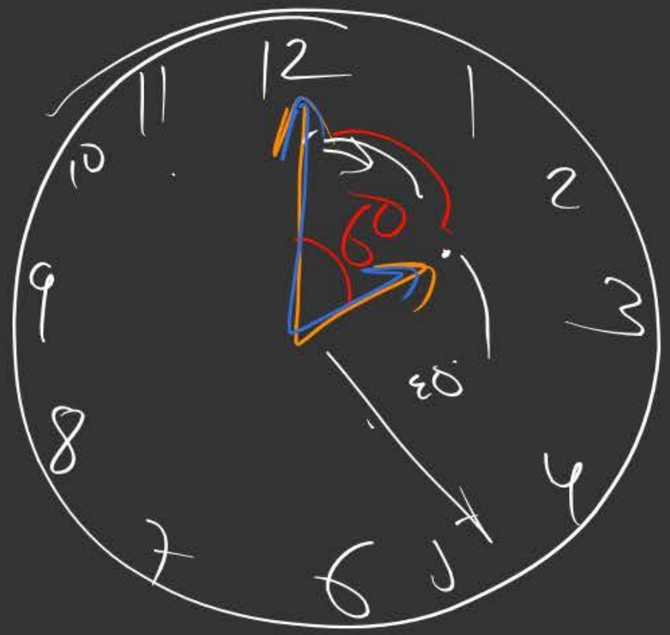
$2:27\frac{3}{11}$

$2:60$

Q. 2 – 3 @ 90°

270°

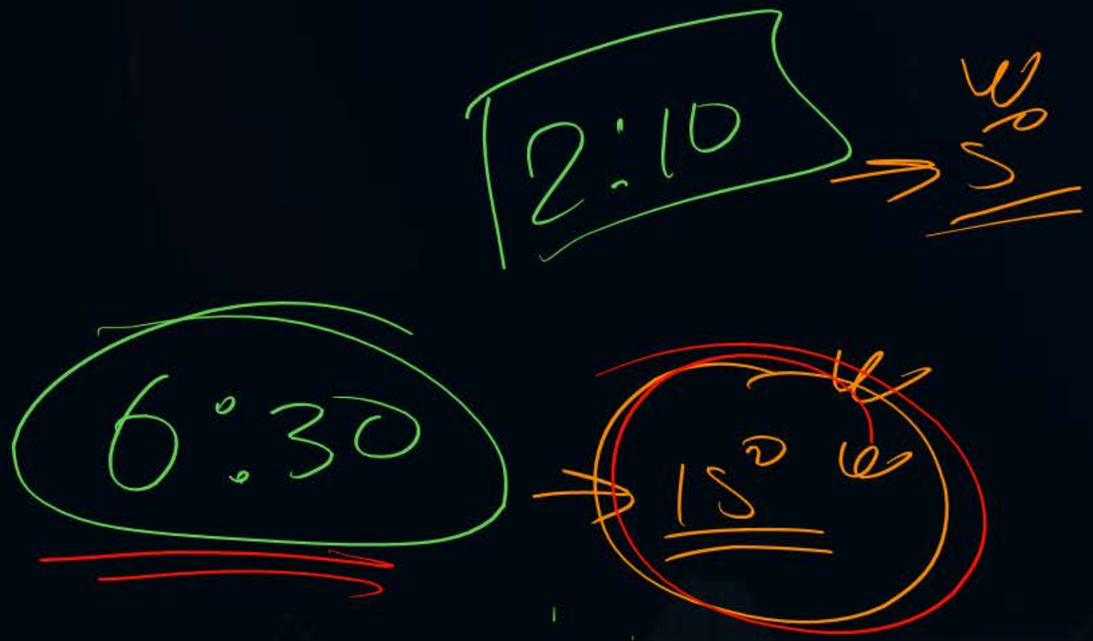
$$\frac{150^\circ}{5.5} = \frac{300}{11} = 27\frac{3}{11}$$



$$\frac{330}{5.5} = \frac{660}{11} = 60$$

Third Pattern:

Gain OR loss



Questionnaire:

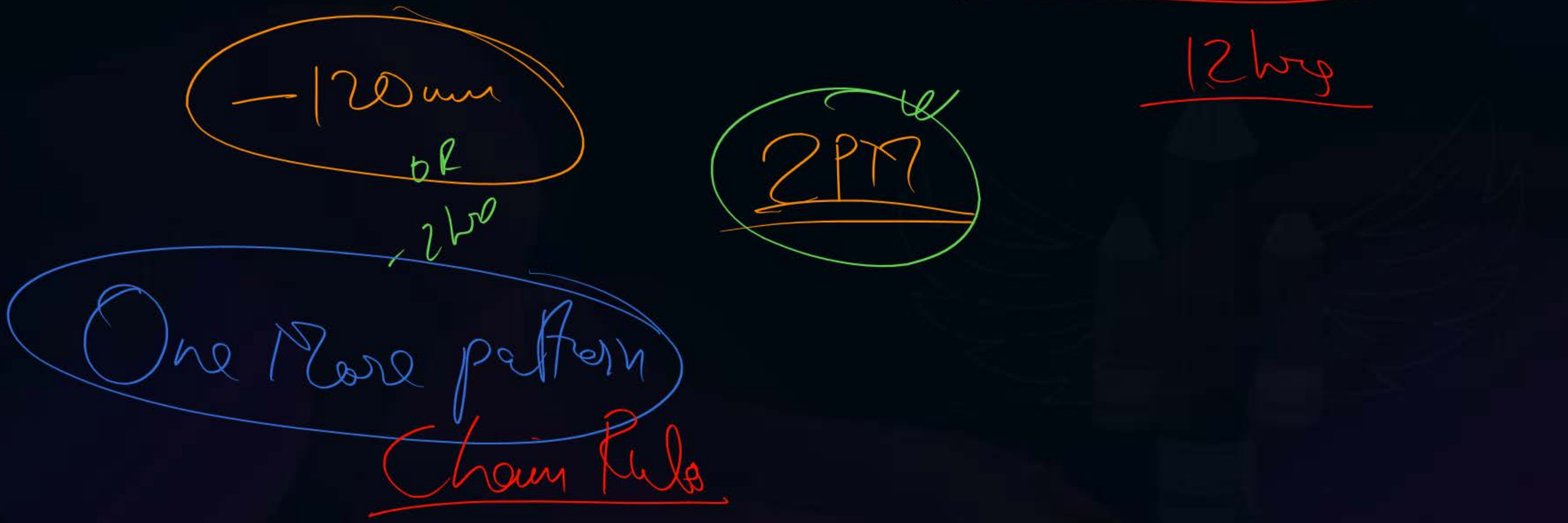
#Q. A Clock which gains 5 minutes in every one hour was set correct at 5am. What would be the time shown by that clock at 1pm the same day?

1:40

8 hrs

Questionnaire:

#Q. A clock which looses 10 minutes in every one hour was set correct at 4am, what would be the time shown by that clock at 4pm the same day?



#Q. At what time between 6AM and 7AM will the minute hand and hour hand of a clock make an angle closest to 60°?

A. 6:22 AM

B. 6:27 AM

C. 6:38 AM

D. 6: 45 AM

$\frac{120^\circ}{5.5} = \frac{240}{11} = 21\frac{9}{11}$

$6:21\frac{9}{11}$

$\frac{240}{5.5} = \frac{480}{11} = 43\frac{7}{11}$

$6:43\frac{7}{11}$

#Q. A worker noticed that the hour hand on the factory clock had moved by 225 degrees during her stay at the factory. For how long did she stay in the factory?

A 3.75 hours

B 4 hours 15 minutes

C 8.5 hours

D 7.5 hours

420 min

H.H ⇒ 0.5°/min

$\frac{225}{0.5} = 225 \times 2$

1° ⇒ 2 min

= 450 min

7 hrs 30 min

or

7.5

#Q. It is quarter past three in your watch. The angle between the hour hand and the minute hand is?

3:15

A 0°

B 15°

C 7.5°

D 22.5°

$3 \Rightarrow 90^\circ$

$15 \times 3.5 \Rightarrow 82.5^\circ$

7.5

AVERAGE

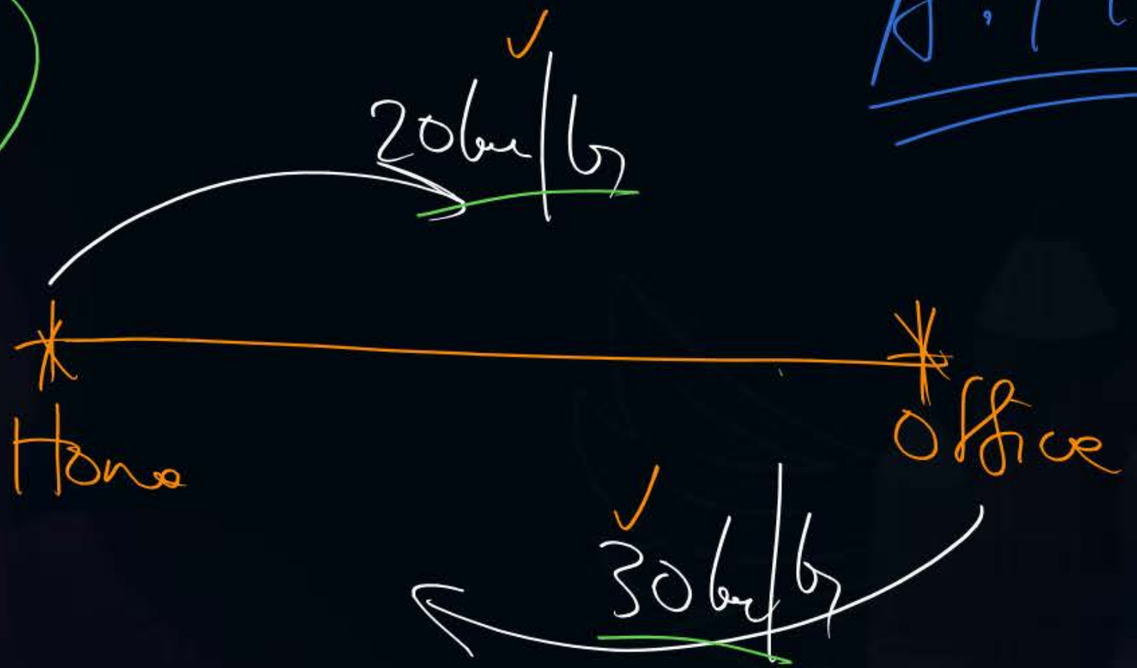
What?

औसत

Equal Distribution

24 km/hr

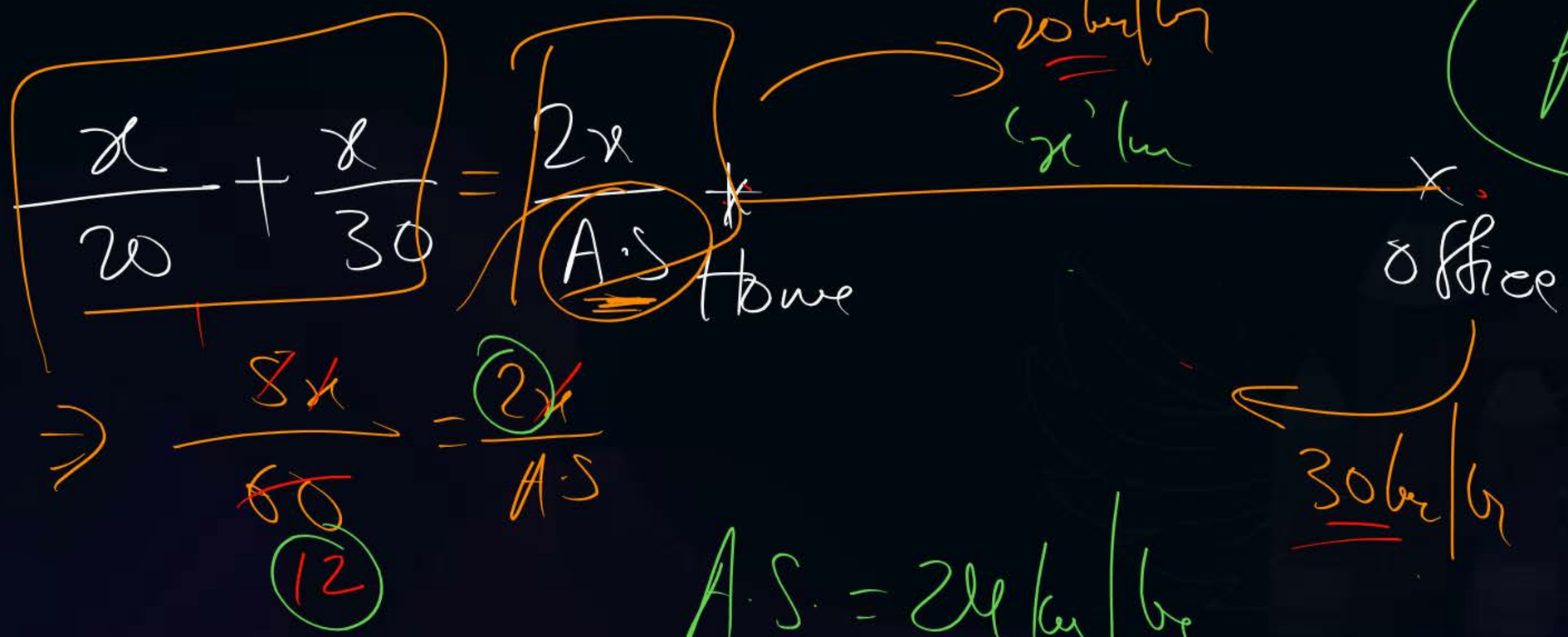
A.M.



AVERAGE

$D = S \times T \quad | \quad S = \frac{D}{T} \quad | \quad T = \frac{D}{S}$

$A = \frac{\text{Sum}}{\text{No}}$



[MCQ]

$\frac{51}{2} = 25.5$

#Q. What would be the average of: 1, 2, 3, 4, 5, ...49, 50.

$\Sigma n = \frac{n(n+1)}{2}$

n

$\frac{n+1}{2}$ $\forall n \in N$

$A = \frac{\text{Sum}}{\text{No.}}$

$x = 1 + 2 + 3 + 4 + \cdots + 49 + 50$

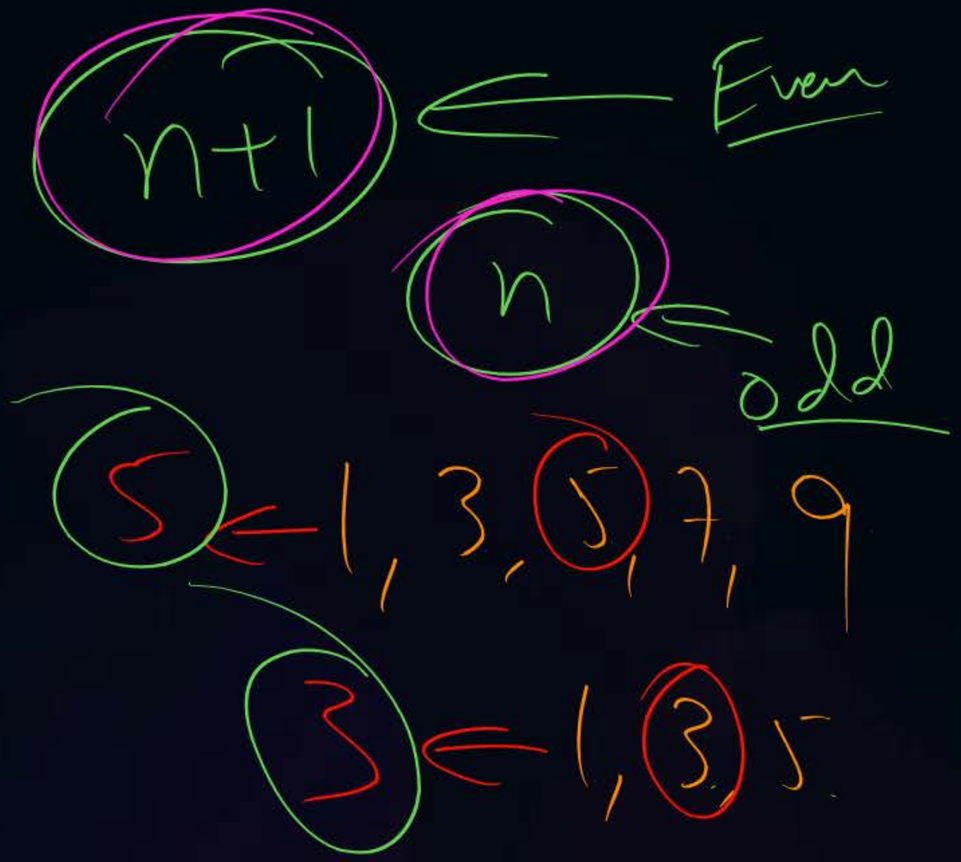
$x = 50 + 49 + 48 + 47 + \cdots + 2 + 1$

$2x = 50 \times 51$

$x = \frac{50 \times 51}{2}$

$= 1275$

Average of Even & Odd



2, 4, 6, 8, 10 ⇒ 6

2, 4, 6, 8, 10, 12 ⇒ 7

2 mins Summary

Topic Clock

THANK - YOU