



Mission ISRO 2023  
(CS/EC/ME)

General Aptitude  
Logical Reasoning  
Lecture No. 01



Amulya Ratan Sir



# Today's Targets



1, 2, 3, 4, 5, 6, 7

- 1 Understanding Series
- 3 Questionnaire on the Topic

# Brainstorming: 1

$x^1$   $x^2$   $x^3$   $x^4$   $x^5$

Q.  $2, 2, 4, 12, 48, \underline{\hspace{2cm}}$

A 96

B 250

C 240

D 230

$$48 \times 5 = \underline{\hspace{2cm}} 240$$

# Brainstorming: 2

Q.

1, 2, 10, 37,

$$\begin{array}{r} 1 \\ + 8 \\ \hline 27 \end{array}$$

$$\begin{array}{r} 27 \\ + 64 \\ \hline 91 \end{array}$$

A

101

$$\begin{array}{r} 1^3 \\ + 2^3 \\ \hline 3^3 \end{array}$$

$$\begin{array}{r} 4^3 \\ = 64 \end{array}$$

B

100

C

102

D

103

$$\begin{array}{r} 37 \\ \times 6^4 \\ \hline 101 \end{array}$$

# Brainstorming: 3

Q. 979, 330, \_\_\_\_ 40, 15, 6



$$(6 \times 3) - 3 = 15$$

$$(15 \times 3) - 5 = 40$$

$$(40 \times 3) - 7 = 113$$

$$(113 \times 3) - 9 = 330$$

$$(330 \times 3) - 11 = 990 - 11 = 979$$

A 76

B 113

C 89

D 100

# Brainstorming: 4

Q. 391, 204,   , 40, 15, 6

- A 88
- B 113
- C 96
- D 101

$$\begin{aligned}6 &= \overbrace{2 \times 3}^1 \\15 &= \overbrace{3 \times 5}^2 \\40 &= \overbrace{5 \times 8}^3 \\96 &= \overbrace{8 \times 12}^4 \\204 &= \overbrace{12 \times 17}^5\end{aligned}$$

$$\begin{aligned}17 \times \overbrace{2^3}^6 \\&= \underline{\underline{391}}\end{aligned}$$

# Brainstorming: 5

Q.  $21, 23, 26, \underline{\quad}, 35$

$$\begin{array}{cccc} +2 & +3 & +4 \\ \curvearrowright & \curvearrowright & \curvearrowright \\ 21, 23, 26, & \underline{\quad}, 35 \end{array}$$

$$\begin{array}{cc} 30 & \\ & \curvearrowright \\ & +5 \end{array}$$

A 28

B 30

C 37

D 29

# Brainstorming: 6

Q.  $1, 5, 11, 19, 29, \underline{\quad}, 55 \checkmark$

$+4 +6 +8 +10 +12$

A 45

B 39

C 41

D 47

$$\begin{array}{r} 29 \\ +12 \\ \hline 41 \end{array}$$

# Brainstorming: 7

Q.

 $6, 10, 18, 34, \underline{\quad}$  $+4 +8 +16 +32$ 

A 44

B 55

C 66 ✓

D 80

$$\begin{array}{r} 34 \\ +32 \\ \hline 66 \end{array}$$

# Brainstorming: 8

Q.  $1, 8, 16, 25, \underline{\quad}$

$$\begin{array}{cccc} +7 & +8 & +9 & +10 \\ \swarrow & \searrow & \swarrow & \searrow \\ 1 & 8 & 16 & 25 \end{array}$$

A 30

B 35

C 49

D 36

$$\begin{array}{r} 25 \\ + 10 \\ \hline 35 \end{array}$$

# Brainstorming: 9

Q.

$$37, 38, 34, 43, 27, 52, \underline{16}$$
$$+1, -4, +9, -16, +25, -36$$

A

16

B

64

C

74

D

18

$$\begin{array}{r} 52 \\ -36 \\ \hline 16 \end{array} \quad +1, -4, +9, -16, +25, \quad \begin{array}{r} 6^2 \\ 36 \end{array}$$
$$+1^2, 2^2, 3^2, 4^2, 5^2$$

# Brainstorming: 10

Q.

10, 15, 40, 165, \_

$$\begin{array}{cccc} +5 & +25 & +125 & +625 \\ \hline \end{array}$$

A 700

B 725

C 760

D 790

$$5^4 = 625$$

$$\begin{array}{r} 165 \\ + 625 \\ \hline 790 \end{array}$$

# Brainstorming: 11

Q.

$$\begin{array}{l} 2, 6, 6, 24, 12, 60, \dots, 120 \\ \text{---} \\ \times 3 \quad \times 4 \quad \times 5 \quad \times 6 \end{array}$$

A

$$14, 84$$

$$12, 60 \times$$

C

$$12, 72$$

$$20, 120$$

D

$$\frac{6}{1} = 6$$

$$\frac{24}{2} = 12$$

$$\frac{60}{3} = 20$$

# Brainstorming: 12



Q. Find out missing one in the given series: 2, 12, 60, 240, 720,

1440, ....., 0

A 2880

B 1440

C 720

D 0

$$720 \times 2 = 1440$$

$$1440 \times 1 = \underline{1440}$$

$$1440 \times 0 = 0$$

# Brainstorming: 13

Q.

$$1, 8, 9, \underline{16}, 25, 216, 49$$

$\Sigma$      $6^3$     ?<sup>2</sup>

A

64

B

16

C

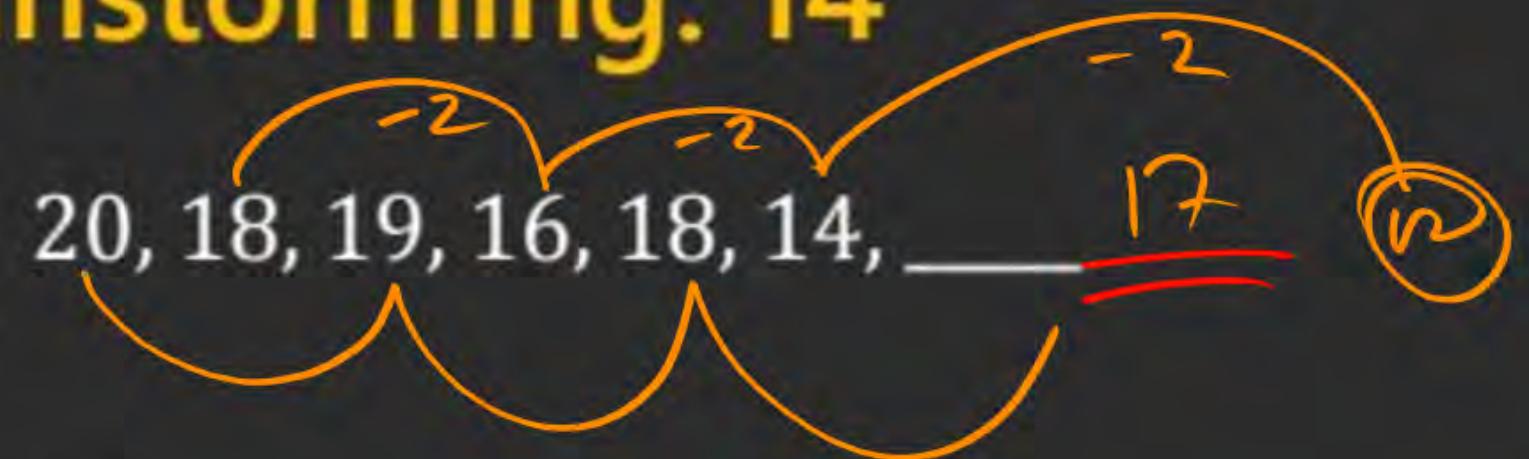
70

D

75

# Brainstorming: 14

Q.



A 16

B 17 ✓

C 15

D 13

# Brainstorming: 15

Q.

$$840, \underbrace{168, 42, 14, 7, \frac{x}{\text{?}}}_{\longrightarrow}$$

A 1

B 7

C 9

D 12

$$\frac{840}{\textcircled{5}} = 168$$

$$\frac{168}{\textcircled{4}} = 42$$

$$\frac{42}{\textcircled{3}} = 14$$

$$\frac{14}{\textcircled{2}} = 7$$

$$\frac{7}{\textcircled{1}} = 7$$

# Brainstorming: 16

Q.

1, 1, 1, 2, 4, 8, 3, 9, ?

A 18

B 17

C 15

D 27

$$\begin{array}{r} 1 \\ - 1^2 \\ \hline 1 \end{array}$$
$$\begin{array}{r} 2 \\ - 2^2 \\ \hline 2 \end{array}$$
$$\begin{array}{r} 3 \\ - 3^2 \\ \hline 3 \end{array}$$

# Brainstorming: 17

Q. 10, 40, 90, 61, 52, 63? 94

- A 54
- B 94
- C 14
- D 72

01, 04, 69, 16, 25, 36, 49

# Brainstorming: 18

Q.

01, 49, 1625, 3649, 6481, \_\_

A 81100

B 4916

C 100121

D 100144

$$0^2 \ 1^2 = 01$$

$$2^2 \ 3^2 = 49$$

$$4^2 \ 5^2 = 1625$$

$$6^2 \ 7^2 = 3649$$

$$8^2 \ 9^2 = 6481$$

$$10^2 \ 11^2 = 100121$$

# Brainstorming: 19

Q. 3, 9, 5, 25, 7, 49, 9, 8 |

- A 81    3     $3^2$
- B 64    5     $5^2$
- C 100    7     $7^2$
- D 121

# Brainstorming: 20

Q.  $6, 8, 11, 16, 23, 34, \underline{\hspace{2cm}}$

$\begin{array}{r} +2 \\ - \\ +3 \\ - \\ +5 \\ - \\ +7 \\ - \\ +11 \\ \hline \end{array}$

A 44

B 46

C 49

D 47

$$\begin{array}{r} 34 \\ +13 \\ \hline 47 \end{array}$$

# Brainstorming: 21

Q.

$$6, 12, 36, 180, 1260, \underline{\quad}$$

$\times 2$      $\times 3$      $\times 5$      $\times 7$      $\times 11$

- A 11340
- B 13860
- C 15120
- D 12110

$$\begin{array}{r} 1260 \\ \times 11 \\ \hline 13860 \end{array}$$

# Brainstorming: 22

Q. 4, 9, 25, 49, \_\_

A 121

B 81

C 100

D 144

$$\underline{2^2}, \underline{3^2}, \underline{5^2}, \underline{7^2}$$

$$\textcircled{11^2}$$

# Brainstorming: 23

Q.

$$20, 18, 19, 16, 18, 14, \underline{\quad}$$

$-2$        $-2$

A 16

B 17

C 15

D 13

# Brainstorming: 24

Q.  $5, 4, 10, 8, 15, 12, 20, \underline{\hspace{1cm}}, 25$

$$\textcircled{5} \rightarrow \cancel{+} \quad \cancel{-}^3 \quad \cancel{\times}^4$$

A 13

B 18

C 15

D 16

# Brainstorming: 25

Q. V, VIII, XI, XIV, \_\_\_, XX

- A IX
- B XXIII
- C XV
- D XVII

$$\begin{aligned}V &\rightarrow 5 \\VIII &\rightarrow 8 \\XI &\rightarrow 11 \\XIV &\rightarrow 14 \\XXI &\rightarrow 17 \\XX &\rightarrow 20\end{aligned}$$

THANK  
YOU!



Mission ISRO 2023  
(CS/EC/ME)

General Aptitude  
Logical Reasoning  
Lecture No. 02



Amulya Ratan Sir

# Today's Targets

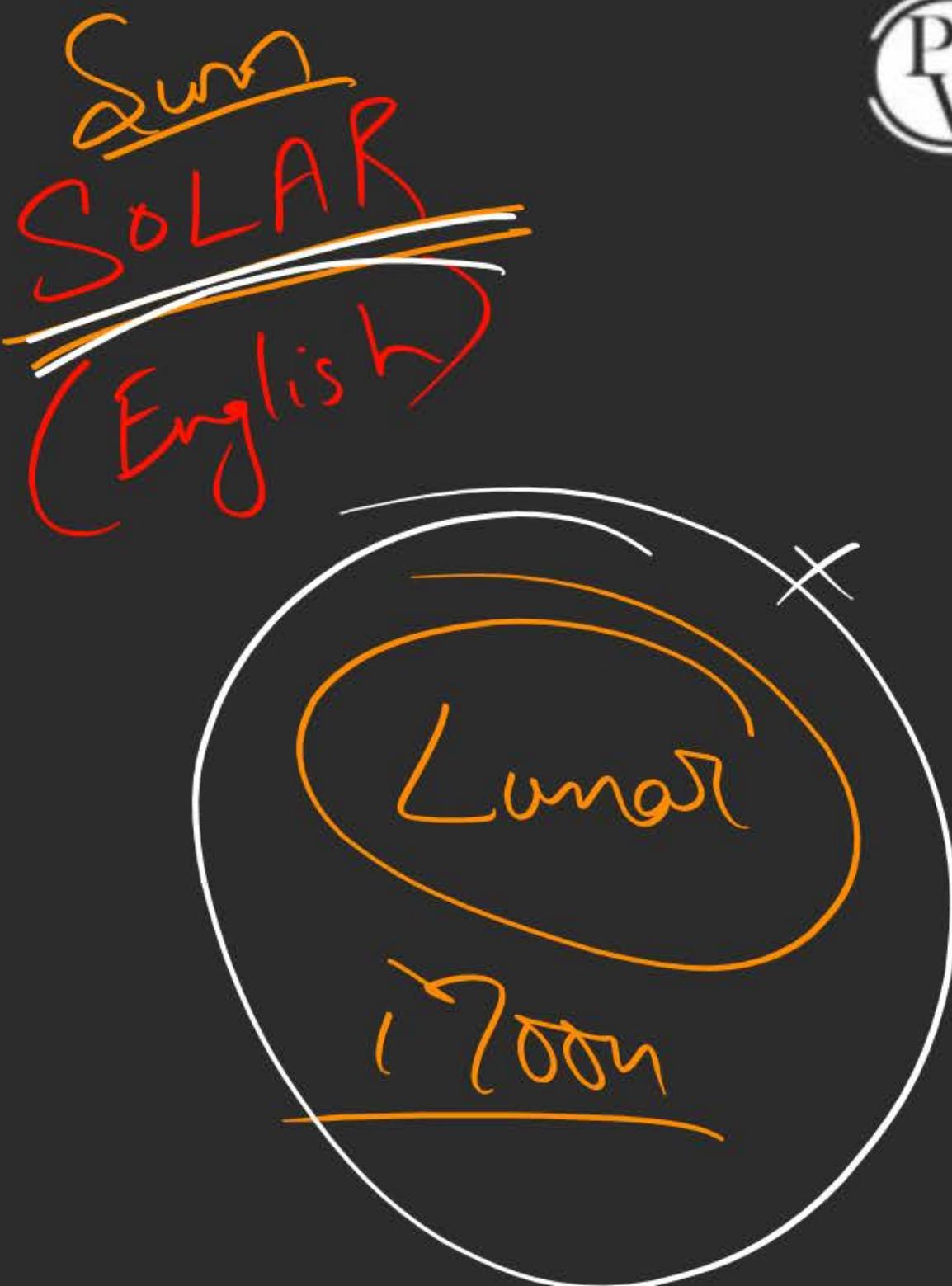


- 1 Understanding SOLAR CALENDAR ✓
- 2 Concept of Odd Days ✓
- 3 Questions on the Topic



## Use of CALENDAR

Date → Day?





## Questionnaire

How many months in a year consist of 30 days?

Jan - 31

Feb - 28/29

March - 31

May - 31

July - 31

Aug - 31

(Only) exactly 30 days  $\Rightarrow$  4 months

Oct - 31

Dec - 31

11 months

e

April

June

Sep

Nov



## Questionnaire



DD - DD - DD

Which is the first day of a week?

01 - 01 - 01

SUNDAY ↘

Working Day

Monday



## Questionnaire



What is the difference between A.D. & B.C.?

Holy Year

Before Christ



## Questionnaire

How many months in a year consist of 30 days?

11 months





## Questionnaire



8 years

How many years maximum a person has to wait  
to celebrate his or her birthday ?

Leap Year?

29<sup>th</sup> Feb



## Questionnaire



How do you know a given year is a leap year or not?

1732 

16 12 

1642 

1796  → 29<sup>th</sup> Feb

Q.

Aravind celebrated his birthday on 29th February 1796, do he get his birthday after 4 years?

P  
W

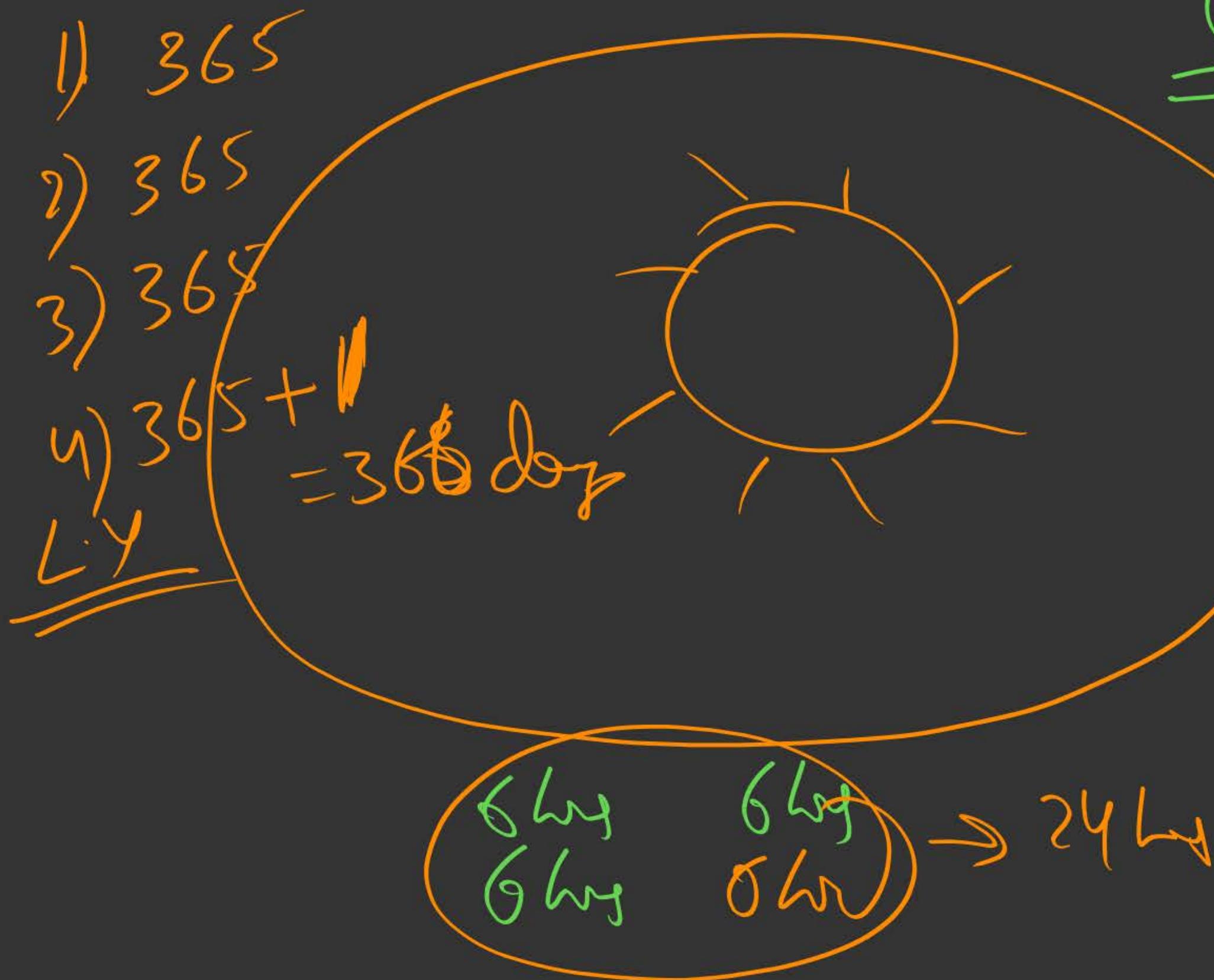
400

8 yrs

29<sup>th</sup> Feb, 1796

1800 X

29<sup>th</sup> Feb 1804



400  
 365 days slow  
 48 min -- sees  
 $365 \frac{1}{4}$  days  
 OR  
~~365 days 6 hrs~~

Q.

Today is 13th July, 2023. The day is Thursday. Then what would be the day on 23rd July, 2023? +3

P  
W

54 days

$\boxed{0-6}$

13<sup>th</sup> on

Sunday

7

x) 54 ~~7 weeks~~ 10  
49  
5 → odd day?  
3 → odd day?

ODD DAYS

20  
6 odd days



## Normal Year & Leap Year



~~Normal Year~~  $\Rightarrow \underline{365} \Rightarrow \frac{1 \text{ odd day}}{\text{year}}$

Normal Year  $\Rightarrow \underline{365} \Rightarrow \frac{1 \text{ odd day}}{\text{year}}$

Leap Year  $\Rightarrow \underline{366} \Rightarrow \frac{2 \text{ odd days}}{\text{year}}$



100 YEARS

O-6

P  
W

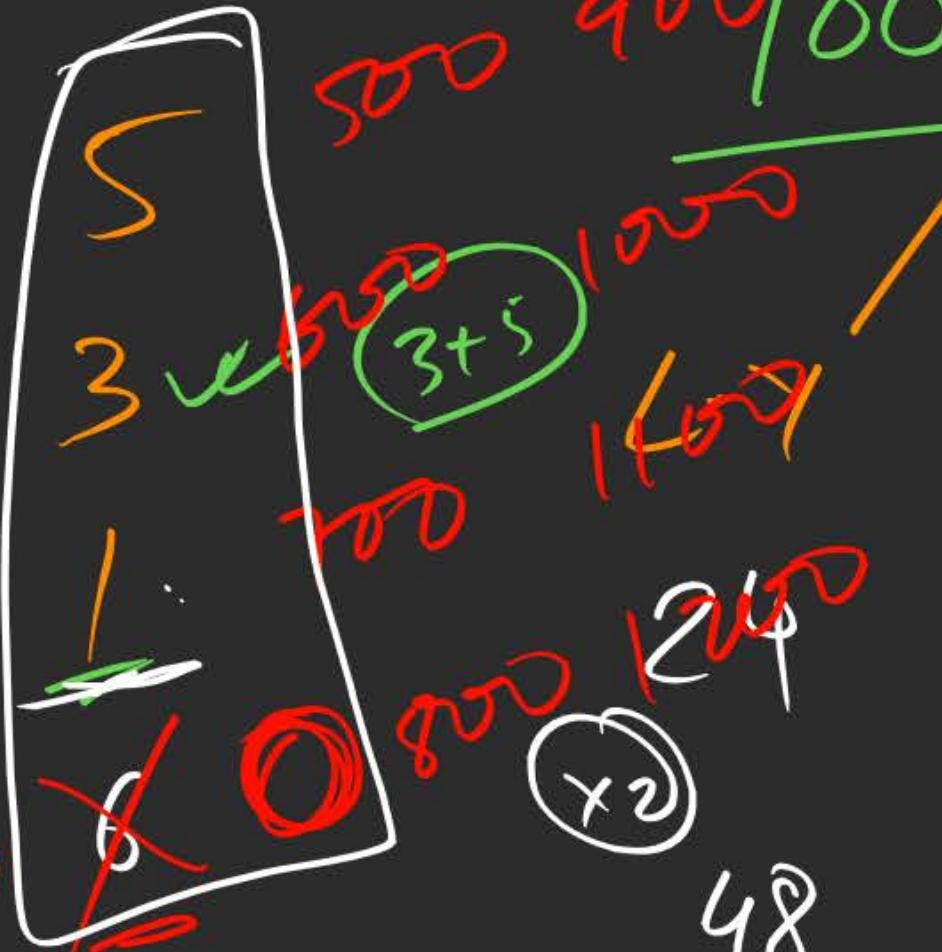
100 yrs  $\rightarrow$

(10) 200 yrs  $\rightarrow$

(15) 300 yrs  $\rightarrow$

400 yrs  $\rightarrow$

~~(7)~~  $\rightarrow$  5



500 900 / 100 years  $\rightarrow$

1000

3+5

700

800

1200

X1

X2

48

76

76

6

6

6

= 12

96

96

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## Questionnaire



1997 > 3  
1997 = 0  
26 Nov, 1998

J-3 M-3 S-2  
F-0 J-2 O-3 97 → 2  
A-3 J-3 N-5

4-Tue 0-Sun  
1-Mon 5-Thu  
2-Tue 3  
3-Wed 6-Sat

A-2 A-3 6 48 24  
73 3  
73



## Questionnaire



What will be the day of the week on 3rd June 1947?

2 odd days

TUESDAY

1946  $\Rightarrow$  2 + 0

1900  $\Rightarrow$  1

46  $\Rightarrow$  1

09  
XII  
46

J-S M-S

F-D J-S  
M-S

A-X

C-X N-Y

35  
35  
0

1 22 11



## Questionnaire



Lal Bahadur Shastri was born on 2nd October 1904.  
What would be the week Day?

$$\textcircled{1903} - \textcircled{4} + \textcircled{3} = 7$$

$$\textcircled{1900} - \textcircled{1} \quad \textcircled{\text{Sunday}}$$

$$\textcircled{J-3} + \textcircled{M-3} - \textcircled{S-2}$$

$$\textcircled{3 \text{ Normal Year}} - \textcircled{3}$$

$$\textcircled{F-1}$$

$$\textcircled{J-2} - \textcircled{O-2}$$

$$\textcircled{A-3}$$

$$\textcircled{J-3}$$

$$\textcircled{A-3}$$

$$\textcircled{A-3}$$

Q. Mahatma Gandhi was born on 2nd October 1869. What would be the week Day?

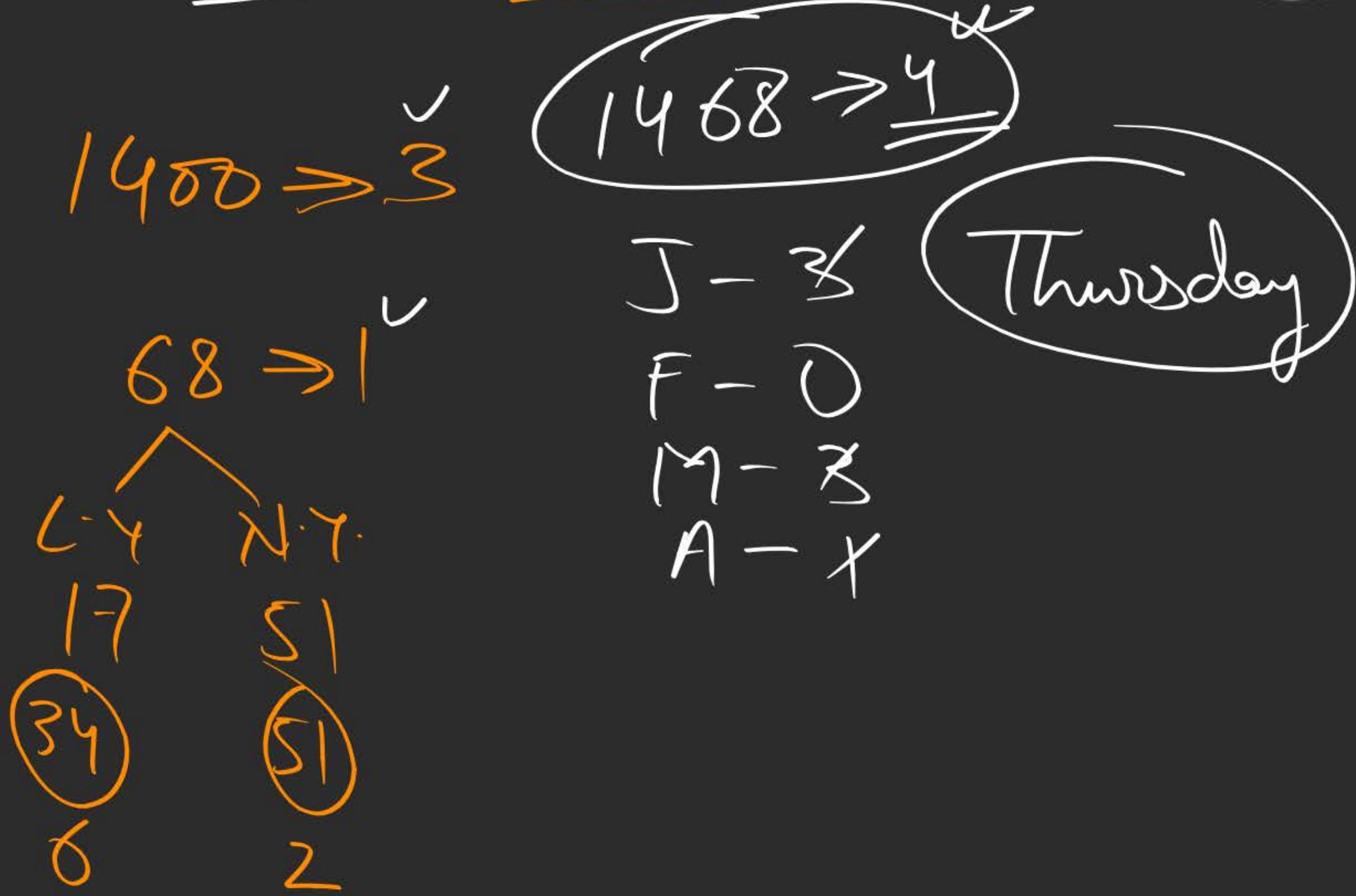
- A Tuesday
- B Saturday**
- C Thursday
- D Sunday

$$\begin{aligned}
 & 1800 \rightarrow 3+0+2 = 5 \\
 & 68 \rightarrow 1 \\
 & 1868 \rightarrow 4 \\
 & \text{J} - 3 \quad \text{M} - 3 \quad \text{S} - 2 \\
 & \text{F} - 0 \quad \text{J} - 2 \quad \text{O} - 1 \\
 & \text{N} - 3 \quad \text{J} - 3 \quad \text{A} - 5 \\
 & \text{D} - 2 \quad \text{S} - 1
 \end{aligned}$$

1869 → 5  
 1868 → 4  
 68 → 1  
 1800 → 3 + 0 + 2 = 5

Q. Guru Nanak was born on 15th April, 1469. What was the week day?

- A Tuesday
- B Saturday
- C Thursday
- D Sunday





## Fact

Date → Day?



### April 15, 1469: Day of the Week

April 15, 1469 was the 105<sup>th</sup> day of the year 1469 in the Gregorian calendar. There were 260 days remaining until the end of the year. The day of the week was Thursday.

The day of the week for April 15, 1469 under the old Julian calendar was Saturday. Did you notice the difference with the Gregorian calendar?





## CALENDARS





## REPETITION OF CALENDAR



2017 - 1

2018 - 1

2019 - 1

2020 - 2

2021 - 1

~~2011~~ <sup>8</sup> > 1

2012 > 2

2013 > 1

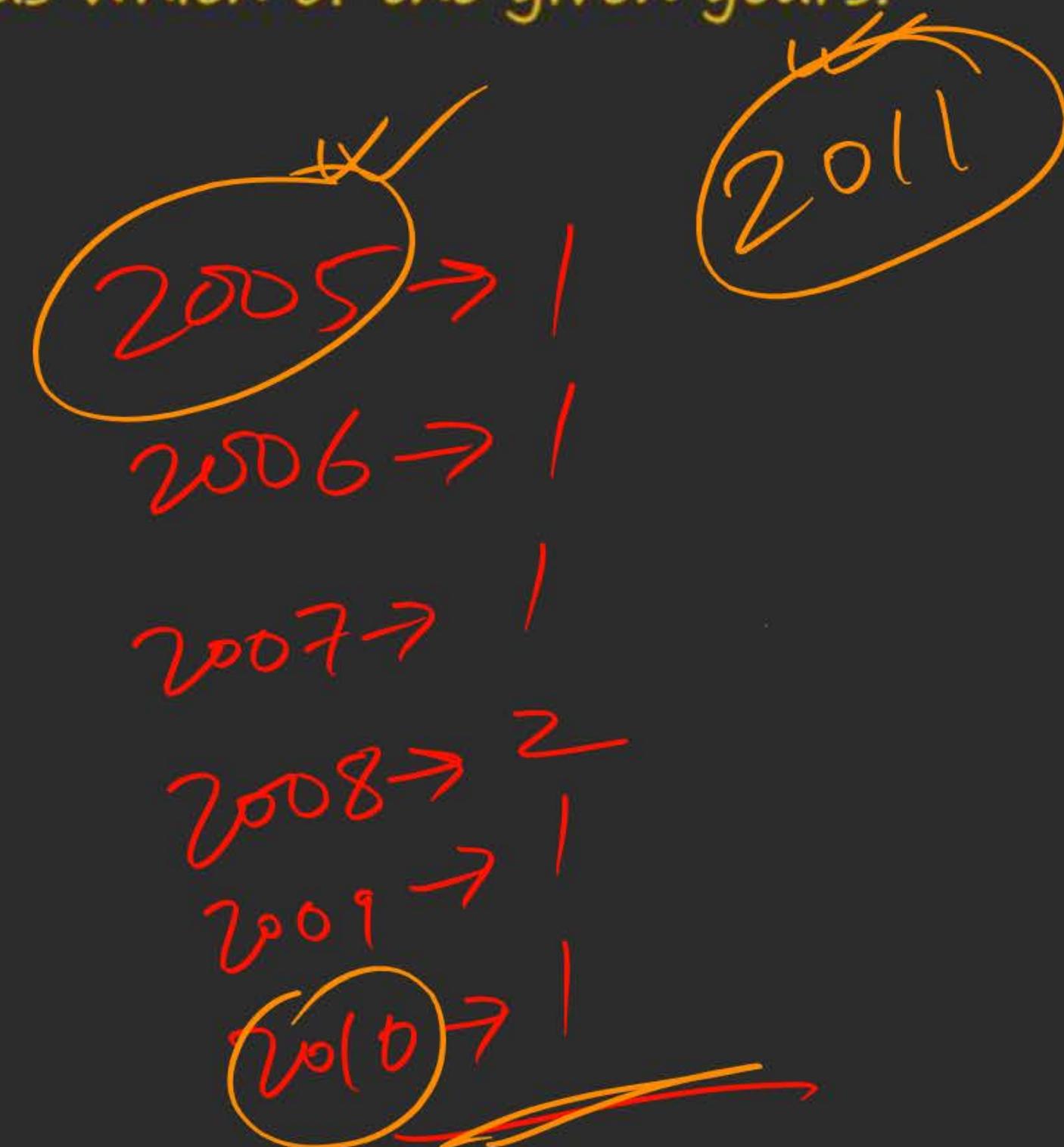
2014 > 1

2015 > 1

2016 > 2

Q. 2005 calendar is same as which of the given years?

P  
W



- A 2009
- B 2011
- C 2016
- D 2015

**THANK  
YOU!**



Mission ISRO 2023  
(CS/EC/ME)

General Aptitude  
Logical Reasoning  
Lecture No. 03



Amulya Ratan Sir



# Today's Targets



1 More Questions on Calendars

2 Concept of Relative Speed to CLOCKS

3 Questions on the Topic



## REPETITION OF CALENDAR



7, 14, 21, 28, 35 - - - -

2011  $\rightarrow$  2022  
N.Y.                  N.Y.  
2005  $\rightarrow$  2011

N.Y  $\rightarrow$  N.Y  
L.Y  $\rightarrow$  L.Y



## REPETITION OF CALENDAR



When does 2012 calendar repeats?

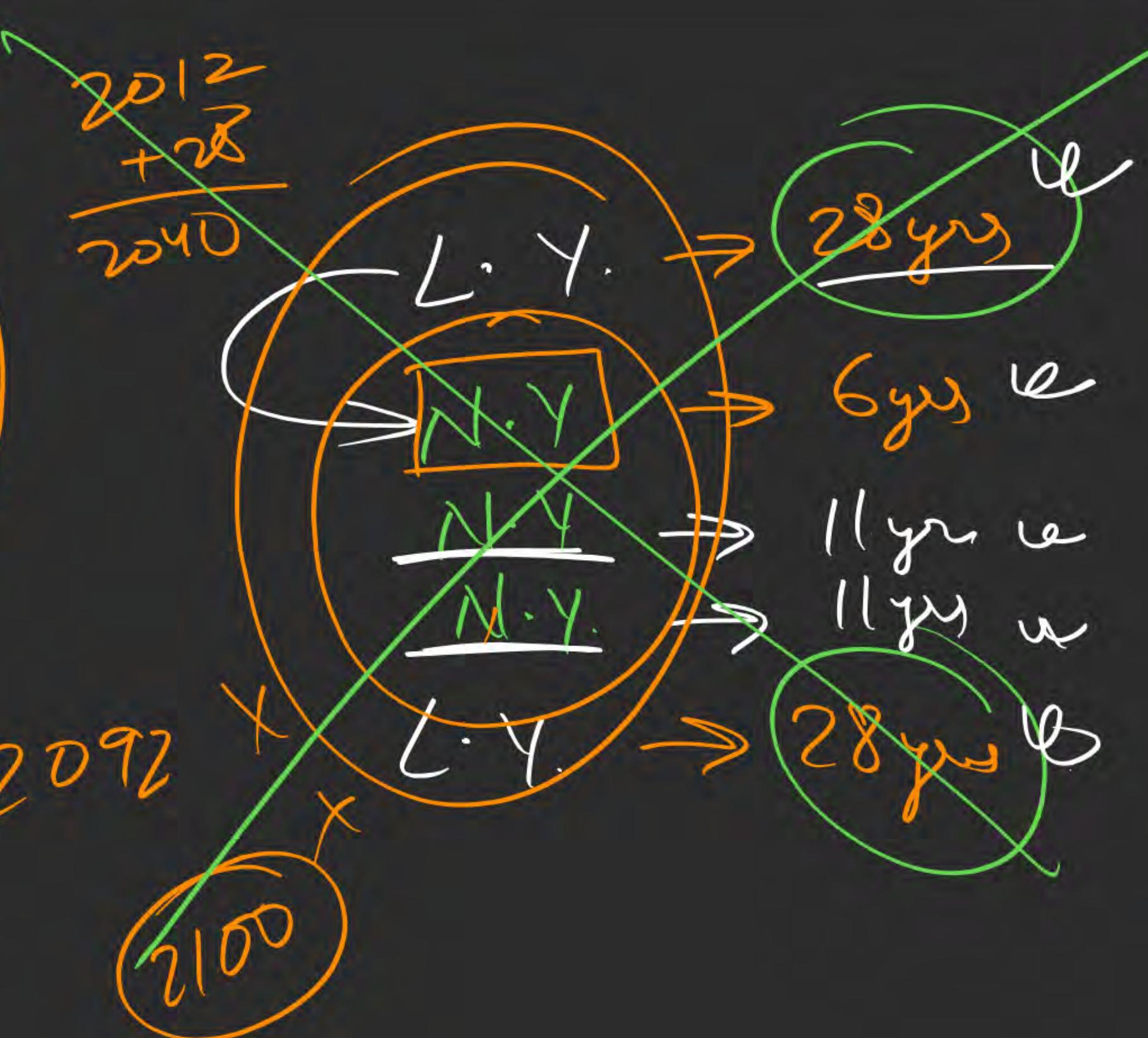
2040



## CLUES

1992  
+ 28  
 $\overline{2020}$

2092  
x  
2100



$$\begin{array}{r} 2005 \\ + 6 \\ \hline 2011 \end{array}$$

$$\begin{array}{r} 2017 \\ + 6 \\ \hline 2023 \end{array}$$



1905-1	$\rightarrow^{42}$	1907-1	1909-1	1911-1	$\rightarrow^{49}$	2092
1906-1		1908-2	1910-1	1912		
		1872	2	1912		
1881-1	$\rightarrow$	1873	1889-1	1897-1		
1882-1	$\rightarrow$	1874	1890-1	1898-1		
1883-1	$\rightarrow$	1875	1891-1	1899-1-35		
1884-2	$\rightarrow 2$	1876	1892-2	1900-1		
1885-1	$\rightarrow$	1877	1893-1 $\rightarrow 28$	1901-1		
1886-1	$\rightarrow$	1878	1894-1	1902-1		
1887-1	$\rightarrow$	1879	1895-1	1903-1		
1888-2	$\rightarrow 2$	1880	1896-2	1904-2		



## Conditional Questions

W

2101-1

2102-1

2103-1

2104-4

2092-2

2093-1

2094-1

2095-1

2096-2 → R

2097-1

2098-1

2099-1

2100-1

P  
W



## Questionnaire



If a year consist of 800 days and every week 11 days, then how many odd days that year has?

$$\begin{array}{r} 11 ) 800 \quad 72 \\ \underline{-77} \\ 30 \\ \underline{-22} \\ 8 \end{array}$$

odd days

The diagram shows a long division calculation where 800 is divided by 11. The quotient is 72, and the remainder is 8. The remainder 8 is circled in green, and an arrow points from it to the word "odd days" written in green cursive script to its right.



## Questionnaire

The last day of a century **cannot** be which day?

Tuesday

Thursday

Saturday

100	$\rightarrow$	5	Friday ✓
200	$\rightarrow$	3	Wednesday ✓
300	$\rightarrow$	1	Monday ✓
400	$\rightarrow$	0	Sunday ↗

Q. If January 1st 1992 was a Thursday. What day of the week was January 1st 2003? + 0

1992 - 2003

- A Thursday
- B Sunday
- C Wednesday
- D Friday

11  
LY      NY.  
3      8  
6 + 8 = 14  
0 odd day)



CLOCK



*Relative Speed*





## Relative Speed

opposite  $\Rightarrow$

Same  $\Rightarrow$





## Hands & it's Movement



Minimum Hands  
 $\geq \boxed{2}$

H. H & M. H.

Movement  
 $\Rightarrow$  Same

R. S.  $\Rightarrow (-)$



## Dial of Clock

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





## Dial of Clock



$$H \cdot H = \frac{30}{\cancel{60}} = \frac{1}{2}^{\circ}/\text{min}$$

$= 0.5^{\circ}/\text{min}$

$$H \cdot M = \frac{30}{\cancel{60}} = \frac{1}{2}^{\circ}/\text{min}$$

$= 0.5^{\circ}/\text{min}$





## NOTE

Minute Hand Covers  $30^\circ$  in 5 minutes

$$30^\circ/5 = 6^\circ/\text{min.}$$

Hour Hand Covers  $30^\circ$  in 60 minutes

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

or

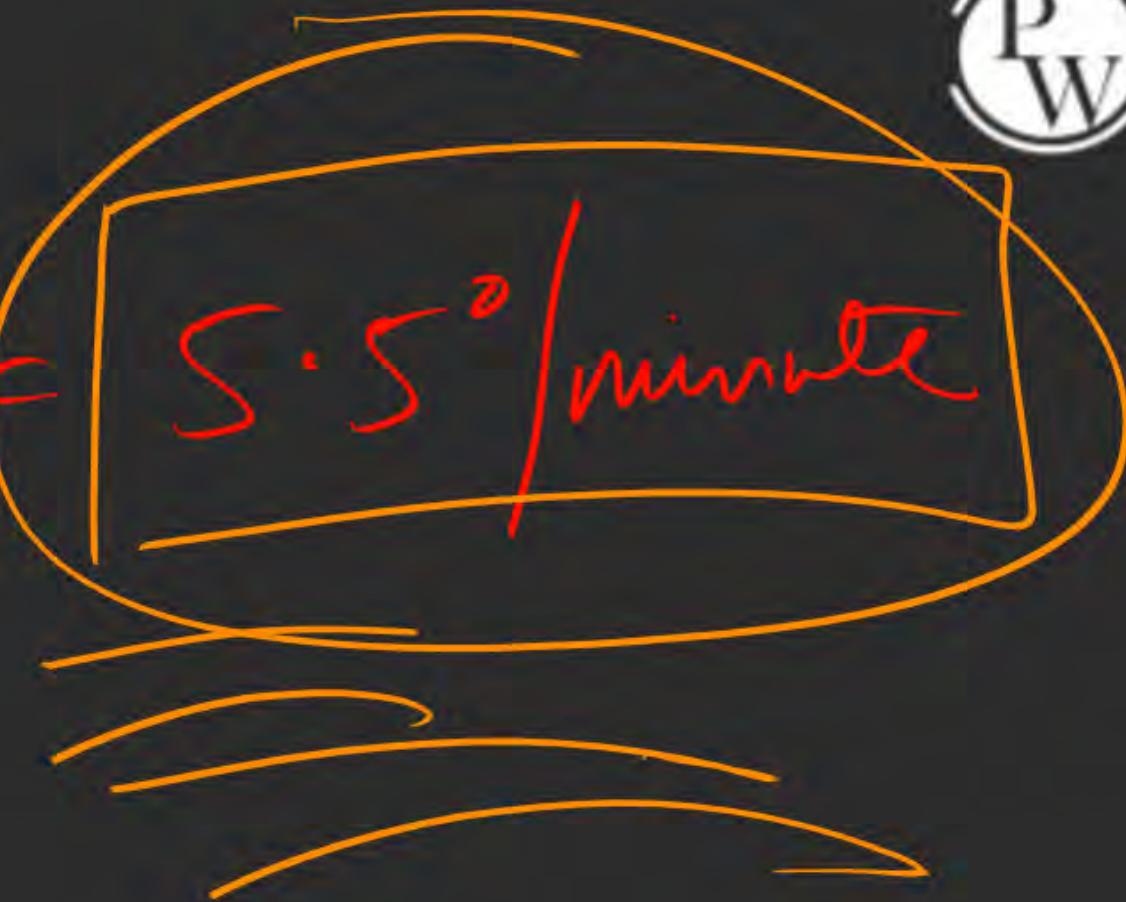
$$0.5^\circ/\text{min}$$



## RELATIVE SPEED



$$6 - 0.5 = 5.5^{\circ}/\text{minute}$$





## Pattern to be discussed



- ✓ TIME GIVEN: ANGLE BETWEEN THE TWO HANDS?

2:00

7:00

5:00

- ✓ ANGLE GIVEN: TIME?

210°

150°

- ✓ GAIN OR LOOSE

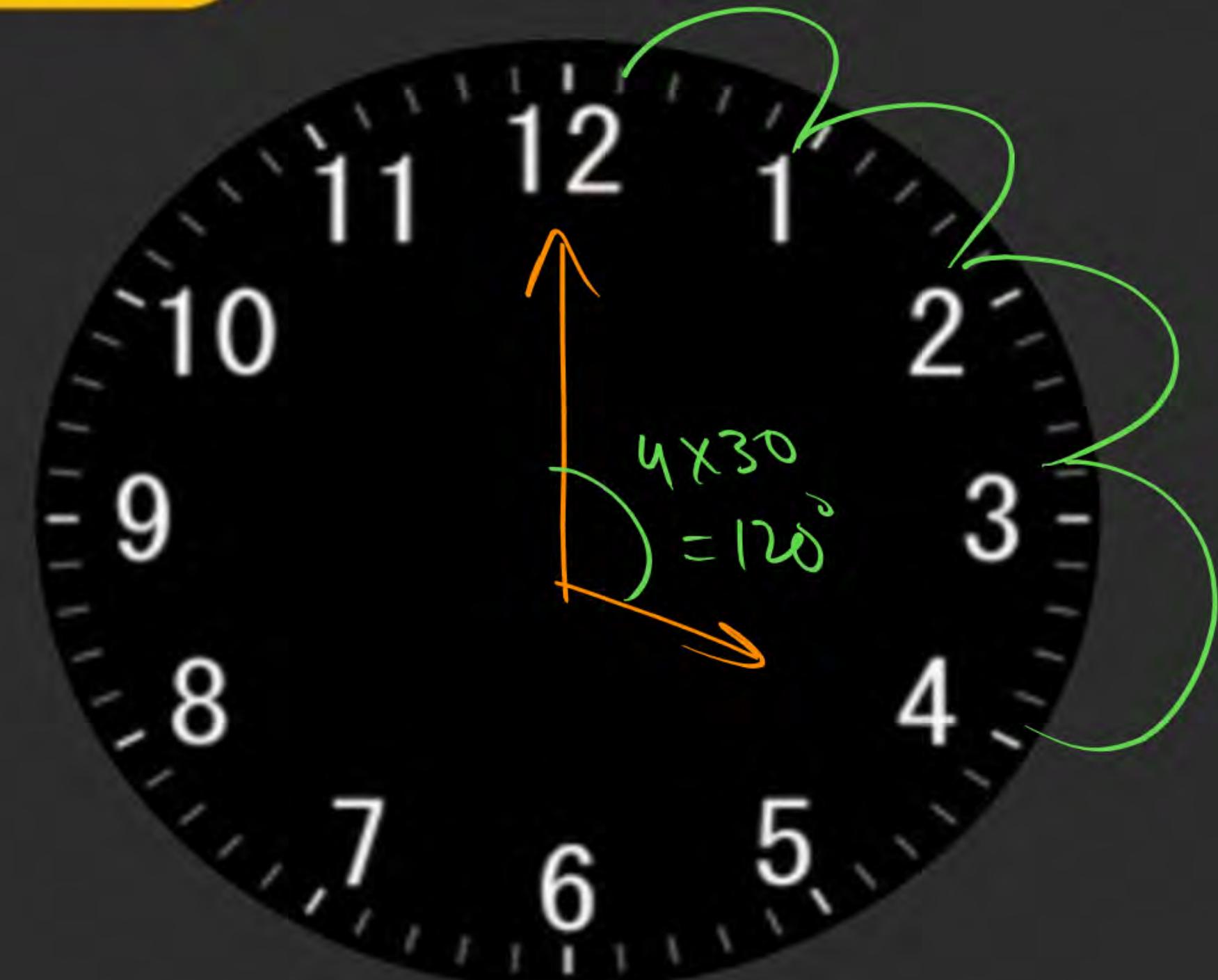


TIME given: ANGLE?

P  
W

2:00

→ 60°





Random Time

8:32

64°<sup>W</sup>

8 > 240°

32 × 5.5 > 176°

64°



350°  
8:50

$$\begin{aligned} 8 &> 240^\circ \\ 50 \times 5.5 &\rightarrow 275^\circ \\ &\hline 350^\circ \end{aligned}$$

P  
W



## Questionnaire



5.30

5 > 150°

30 x 5.5 > 165°

15°

345°





## Questionnaire



3:15

$$3 \geq 90^\circ$$

$$15 \times 5.5 \rightarrow 82.5^\circ$$

7.5°

352.5°

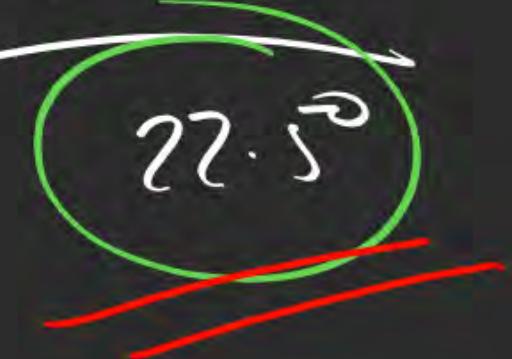


Q. At 9:45 the two hands of a clock make an angle of?

P  
W

$$9 \rightarrow 270^\circ$$

$$45 \times 5.5 \rightarrow 247.5^\circ$$



$$\cancel{337.5^\circ}$$

- A  $60^\circ$
- B  $45^\circ$
- C  $33\frac{1}{3}^\circ$
- D  $22\frac{1}{2}^\circ$



## Two Answers

①  $22.5^\circ \text{ N}$        $360^\circ - 22.5^\circ \text{ N}$   
 $337.5^\circ \text{ W}$

②  $337.5^\circ \text{ W}$        $360^\circ - 337.5^\circ \text{ W}$   
 $22.5^\circ \text{ N}$

Handwritten notes: A green circle highlights the answer  $9.45$ . A green oval highlights the answer  $337.5^\circ \text{ W}$ .

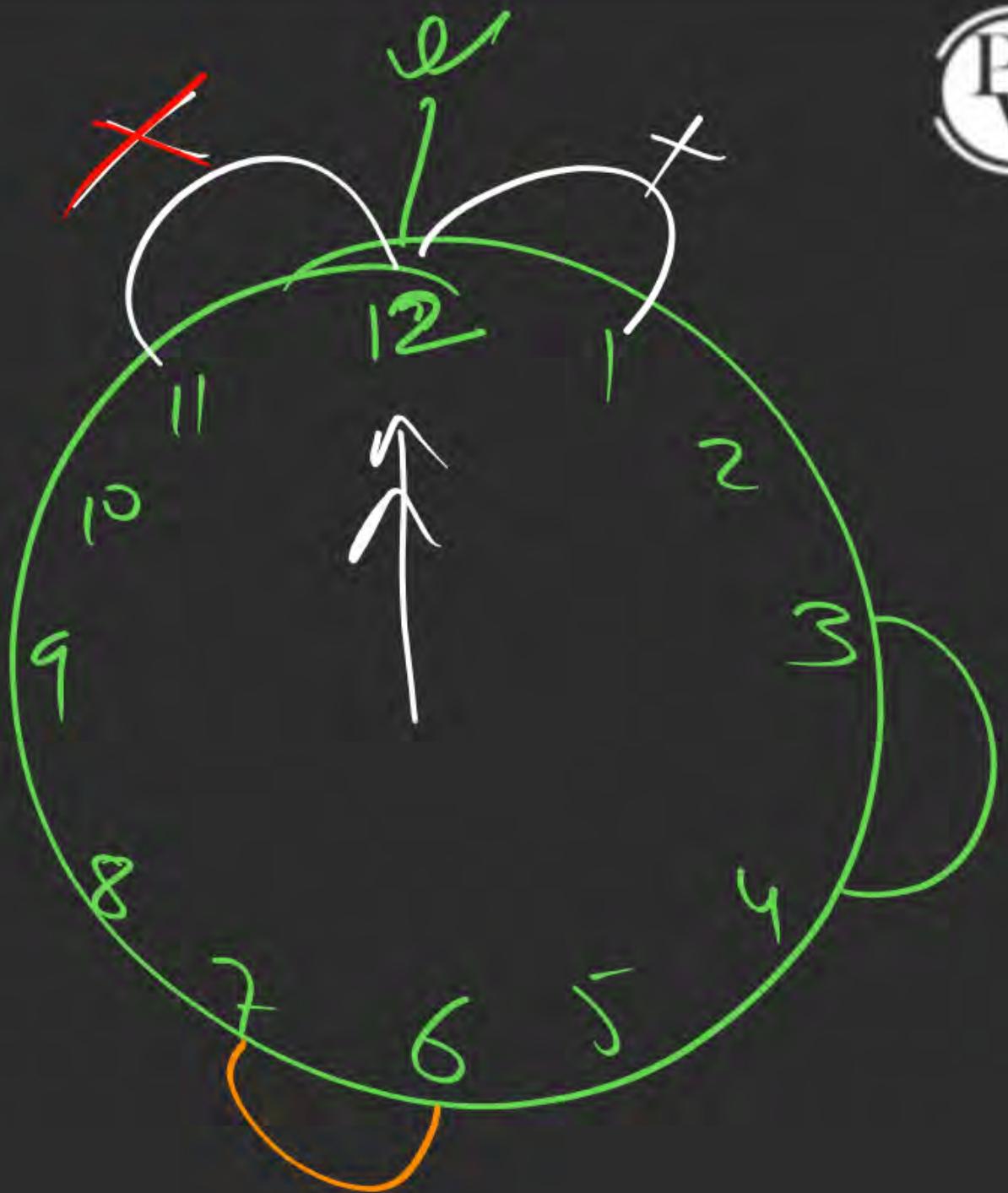




0° or Coincide

$$12 \text{ hrs} = 11 \text{ tms}$$

$$24 \text{ hrs} = 22 \text{ tms}$$



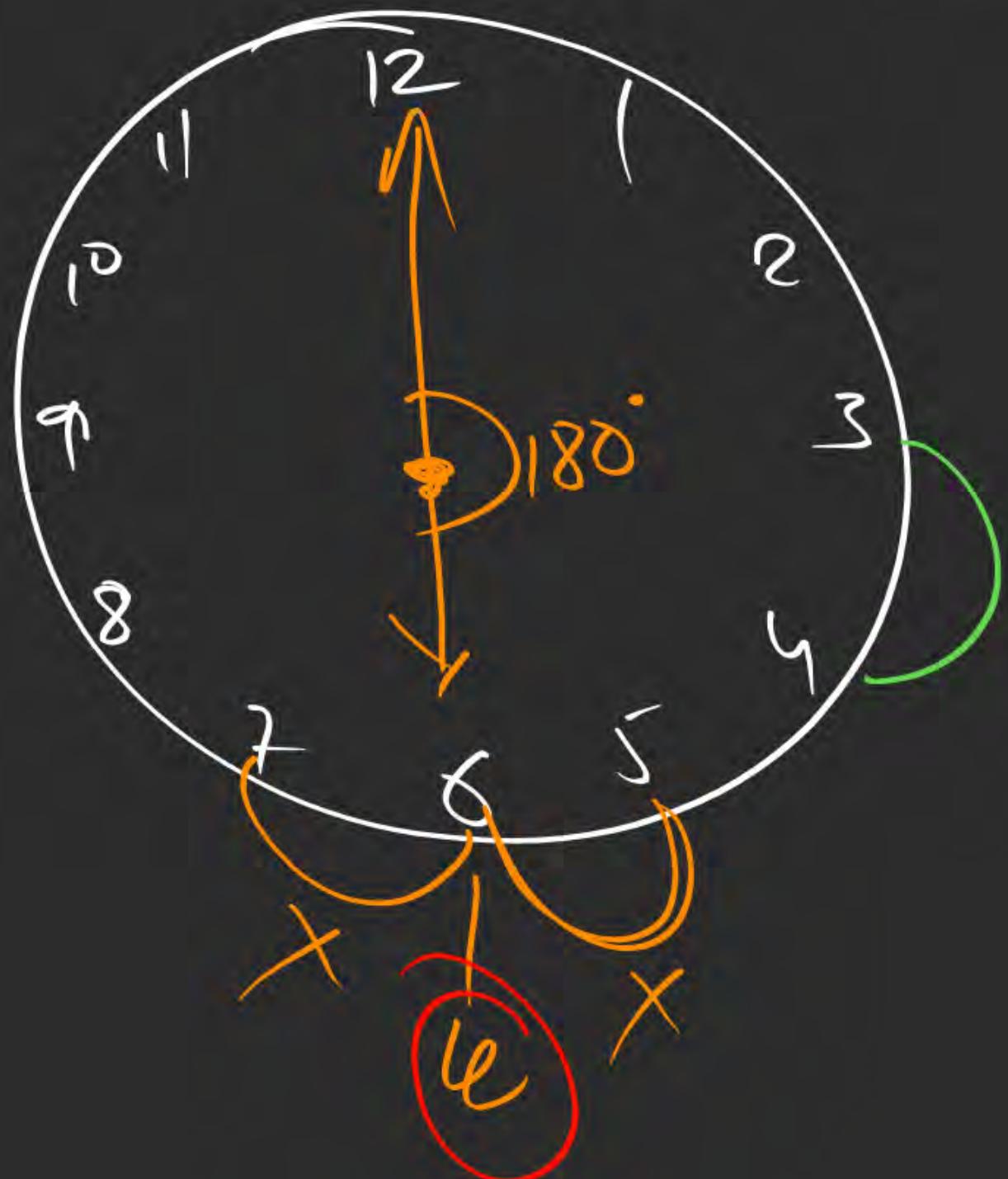


180° or Opposite

P  
W

12 hours = 11 times

24 hours = 22 times





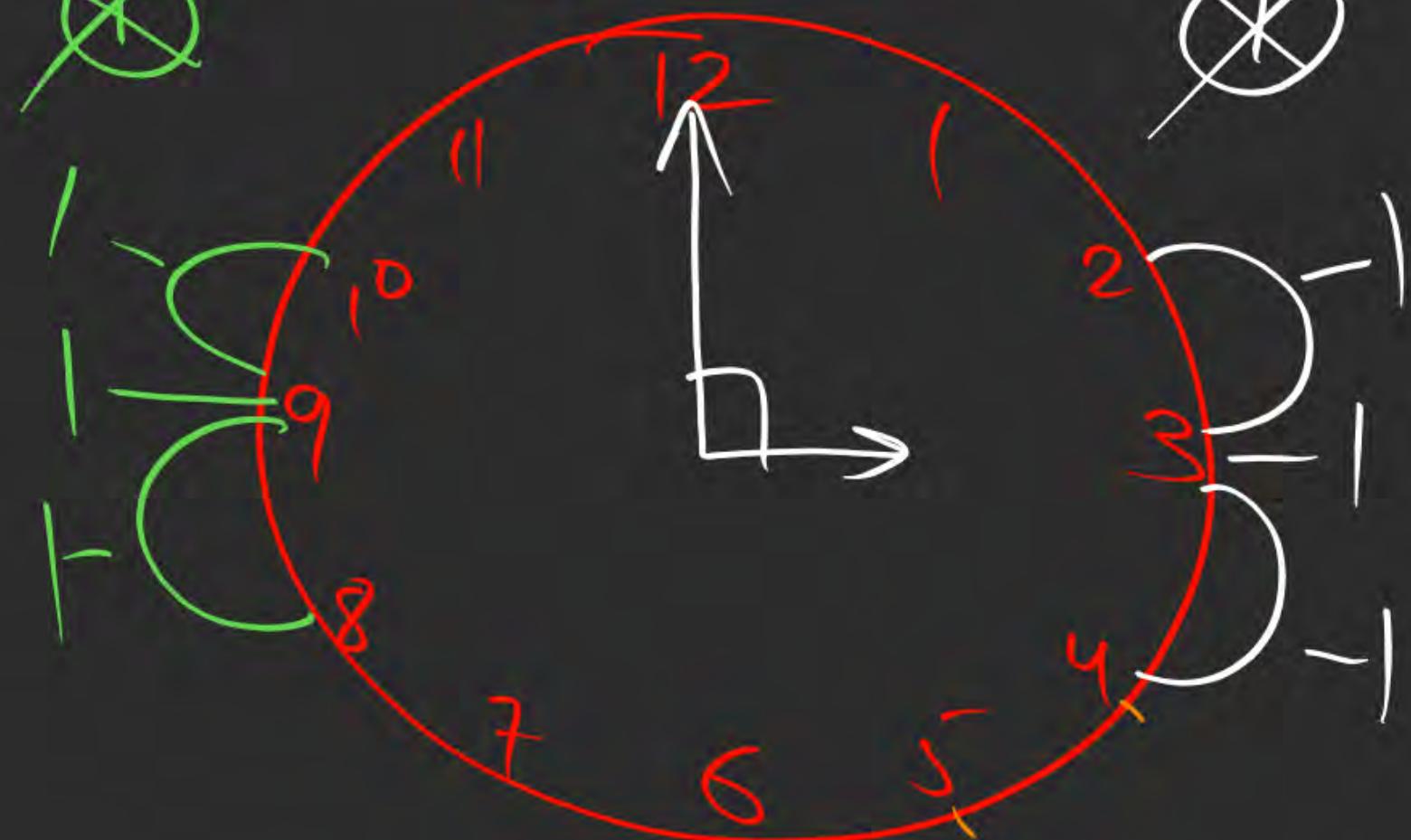
90° or Right Angle

Any degree except  
0° & 180°



12 hrs = 22 times

24 hrs = 44 times



THANK  
YOU!



Mission ISRO 2023  
(CS/EC/ME)

General Aptitude  
Logical Reasoning  
Lecture No. 04

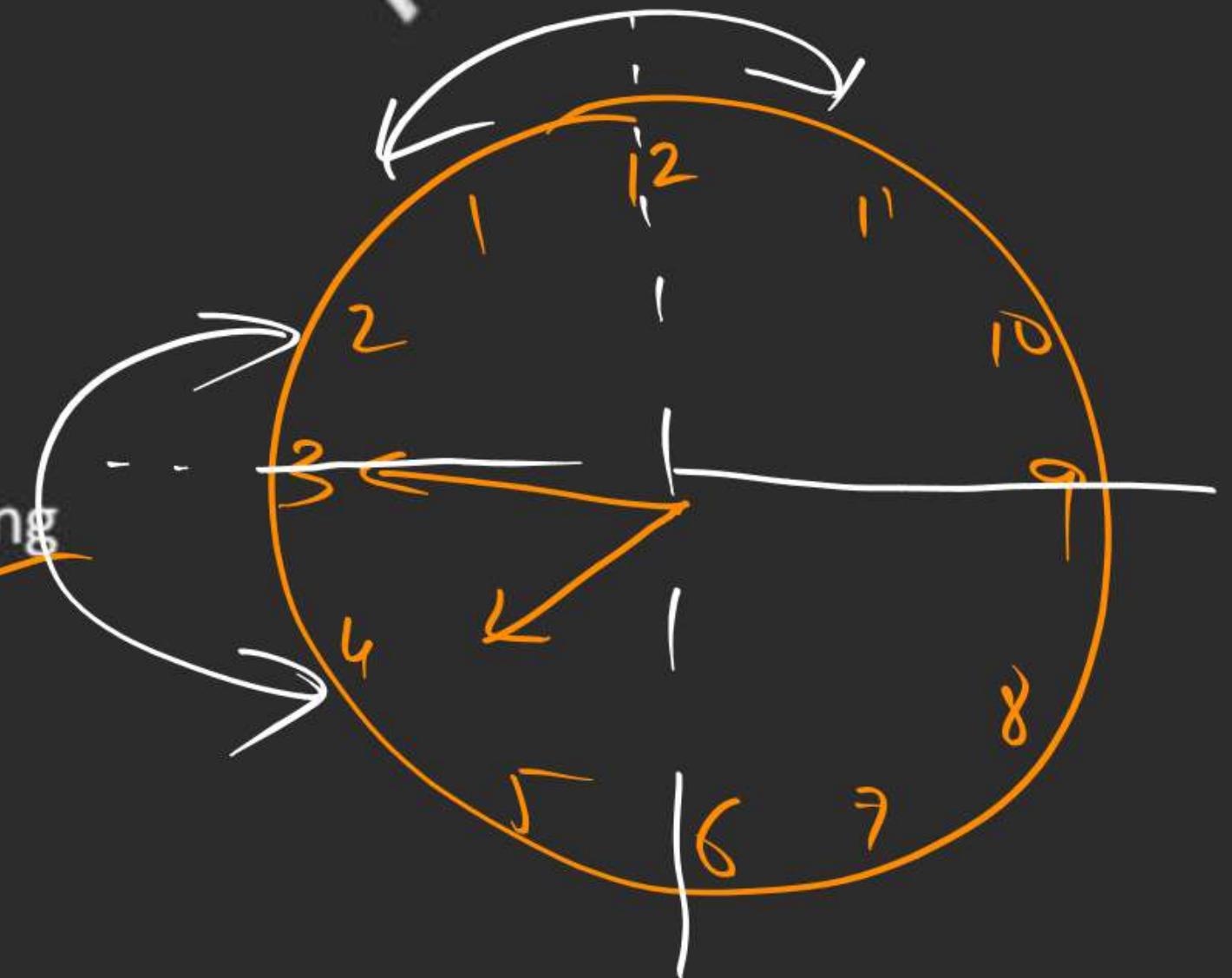


Amulya Ratan Sir

# Today's Targets



- 1 More Questions on Clocks
- 2 Understanding Concept of Coding Decoding
- 3 Questions on the Topic





0° or Coincide

One hour = One line

12 hrs = 11 times

24 hrs = 22 times





180° or Opposite

P  
W

One hour = One time

12 hrs = 11 times

24 hrs = 22 times



90° or Right Angle

P  
W

One hour = Two dings

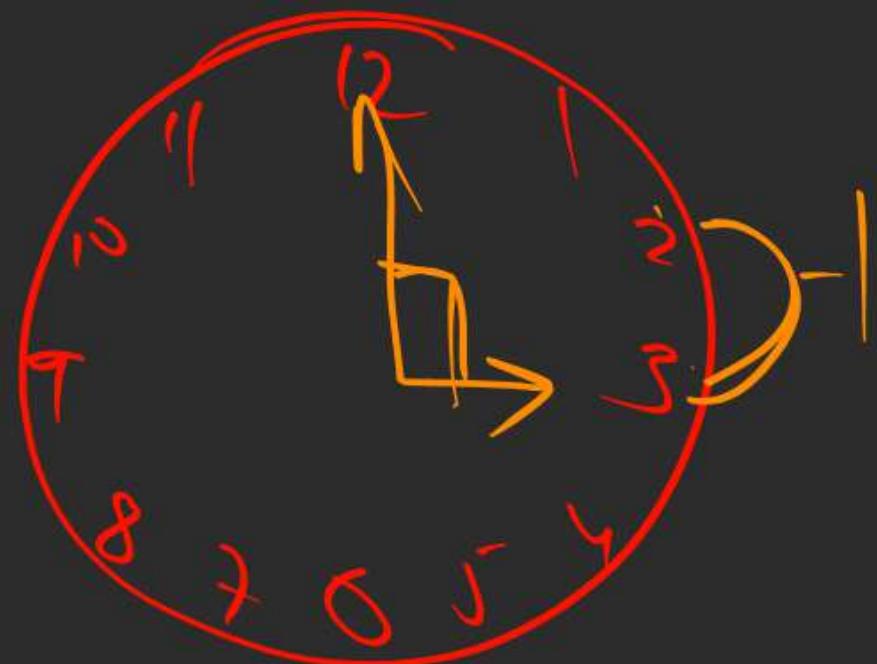
Any angle

except

0° & 180°

12 hrs = 22 dings

24 hrs = 44 dings



Q.

In between 2'o Clock and 3'o Clock at what time the hands of a clock make  $90^\circ$ ?

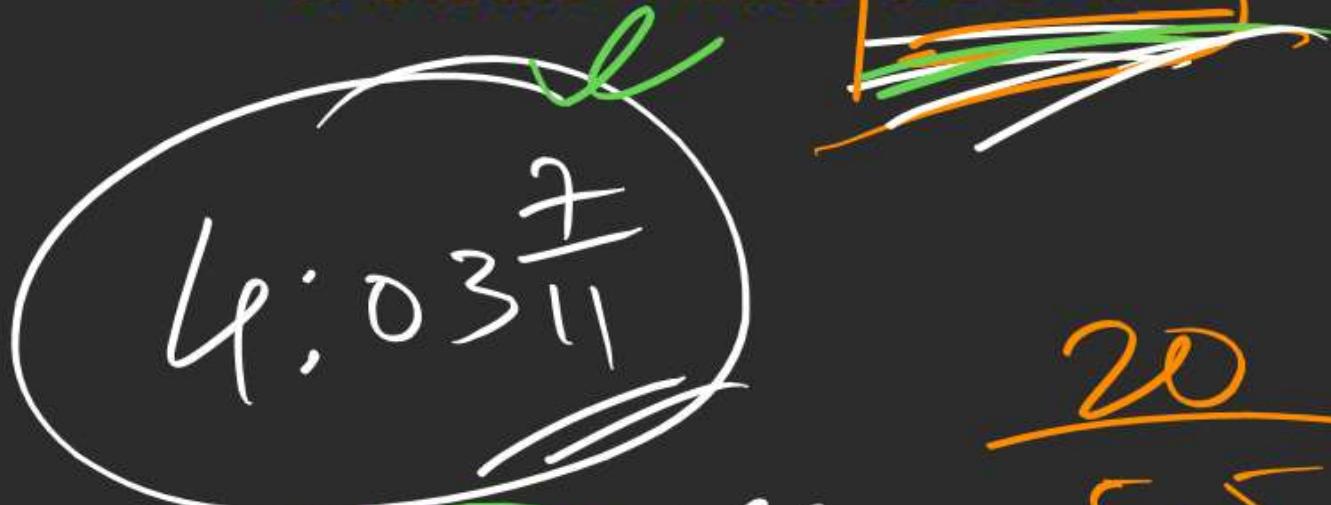
$2:27\frac{3}{11}$

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

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



Q. In between 4'o Clock and 5'o Clock at what time the hands of a clock make  $100^\circ$ ?

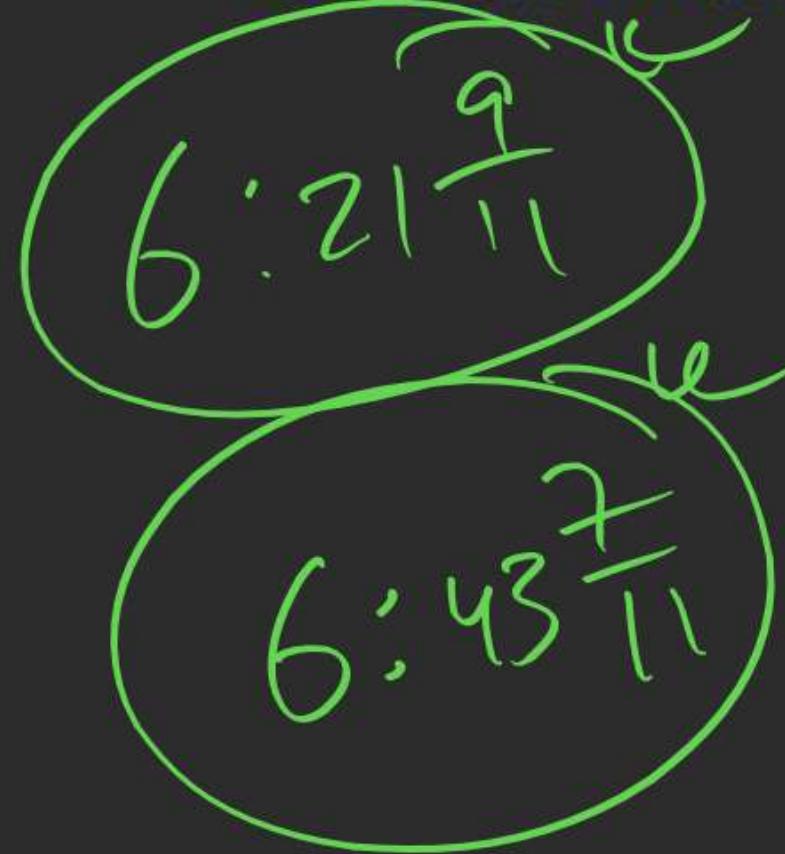


$$\frac{20}{5.5} = \frac{40}{11} = 3\frac{7}{11} \text{ min}$$

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

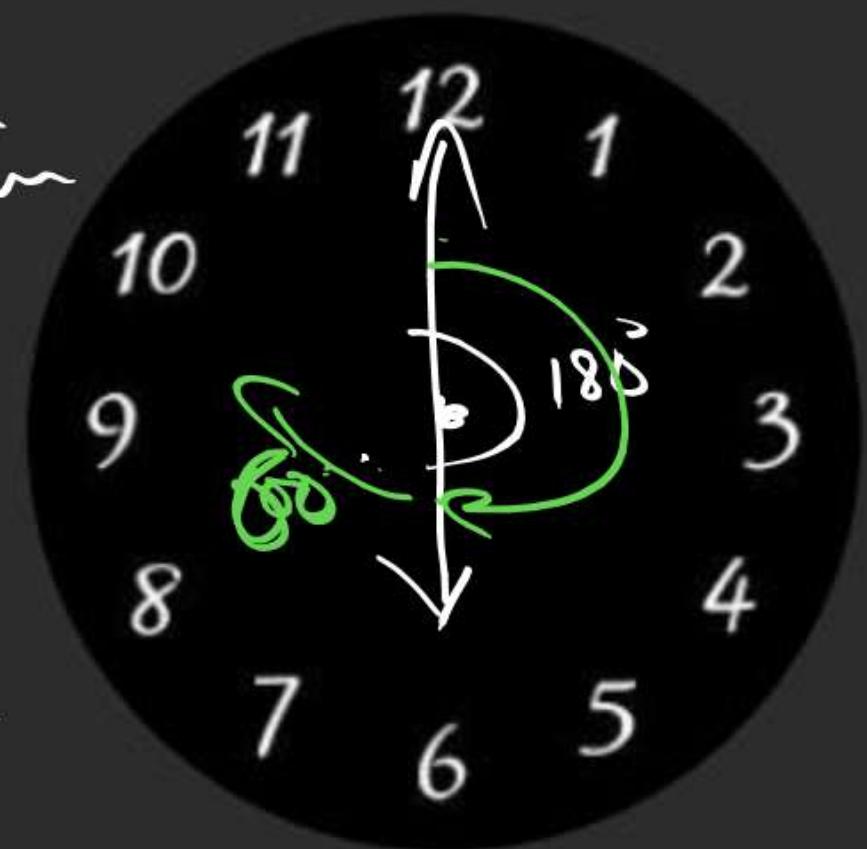


Q. In between 6'o Clock and 7'o Clock at what time the hands of a clock make  $60^\circ$ ?

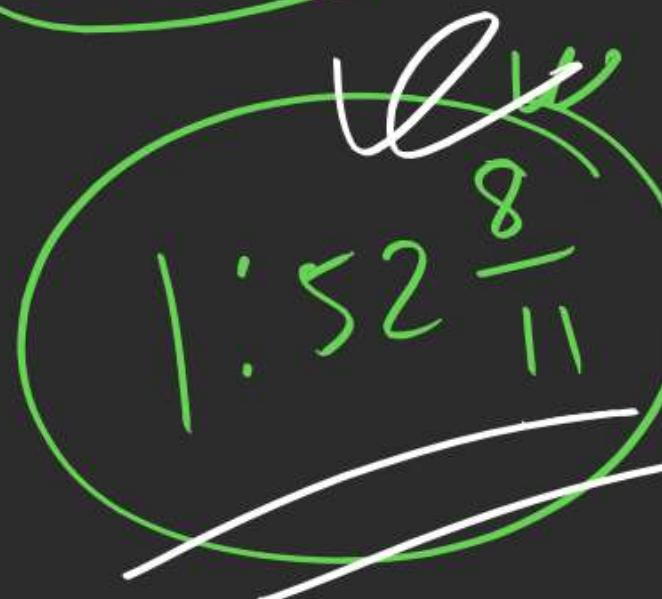
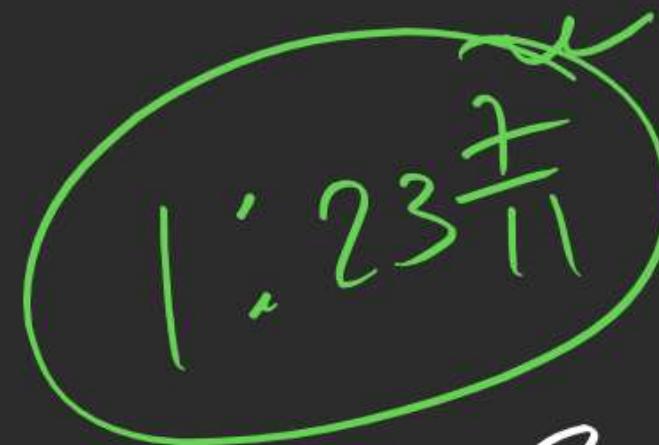


$$\frac{120}{5.5} = \frac{240}{11} = 21\frac{9}{11} \text{ min}$$

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



Q. In between 1'o Clock and 2'o Clock at what time the hands of a clock make  $100^\circ$ ?



$$\frac{130}{5.5} = \frac{260}{\pi} \Rightarrow 23 \frac{7}{11} \text{ min}$$

$$\frac{290}{5.5} = \frac{580}{\pi} \Rightarrow 52 \frac{8}{11} \text{ min}$$



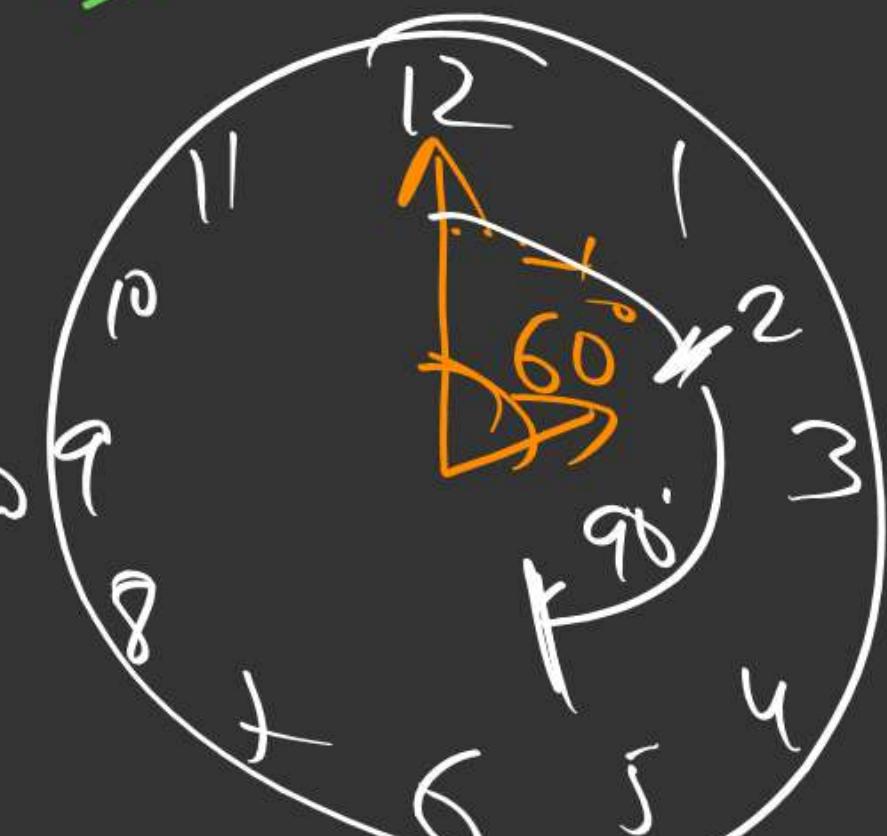
Q.  $2 - 3$  @ 



$270^\circ$



$$\frac{150}{5.5} = \frac{300}{11} = 27 \frac{3}{11} \text{ min}$$



$$\frac{\underline{60+270} \# 330^\circ}{5.5} = \frac{660^\circ}{11} = \cancel{6}$$



Q.

In between 1'o Clock and 2'o Clock at what time the hands of a clock make  $100^\circ$ ?

P  
W



$$\frac{40}{5.5} = \frac{80}{11} = 7\frac{5}{11} \text{ min}$$



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



GAIN or LOSE



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?

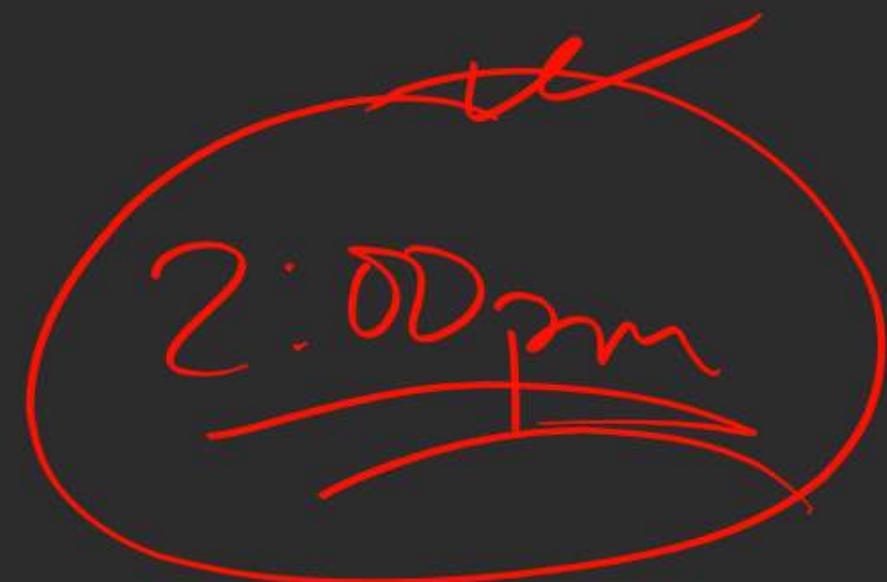
P  
W

1:40

Q.

A clock which loses 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?

P  
W





## CODING & DECODING

A B C D E F G H I J  
26 25 24 23 22

27

- 5

22

27

- 1

26

①

A

26

B

E

22

F

26

2

0

1

13

14

N

14

13





## CODING & DECODING

- ALPHABETICAL / LETTER
- NUMBER
- SUBSTITUTION
- MIXED



Q.

In a certain code GIGANTIC is written as GIGTANCI. How is MIRACLES written in that code?

PW

- A** RIMLASCE

**B** RIMLACSE

**C** RMLIASCE

**D** RIMLSCAE

The diagram illustrates the mapping between **Word** and **Code** for four words. Orange arrows point from the **Word** side to the **Code** side, indicating the transformation process.

- GIGANTIC**: The word is underlined in orange. The letters **G**, **I**, and **A** are circled in orange. An orange arrow points from **G** to the first **I**. Another orange arrow points from **I** to the **A**.
- MIRACLES**: The word is underlined in orange. The letters **M**, **I**, and **R** are circled in orange. An orange arrow points from **M** to the **I**. Another orange arrow points from **I** to the **R**.
- RIMLACSE**: The word is written in orange.
- TURBULENCE**: The word is written in orange.

Q.

In a certain code MAN is written as SANM and WORD is written as SORDW. How would SALE be written in that code?

- A SEALS
- B LEASS
- C LESAS
- D SALES



Q.

If CURE is written as BTQD. How will MAIL be written in that code?

P  
W

-1 -1 -1  
CURE → BTQD

-1 -1 -1  
MAIL → LZHK

A LZGS

B LZKH

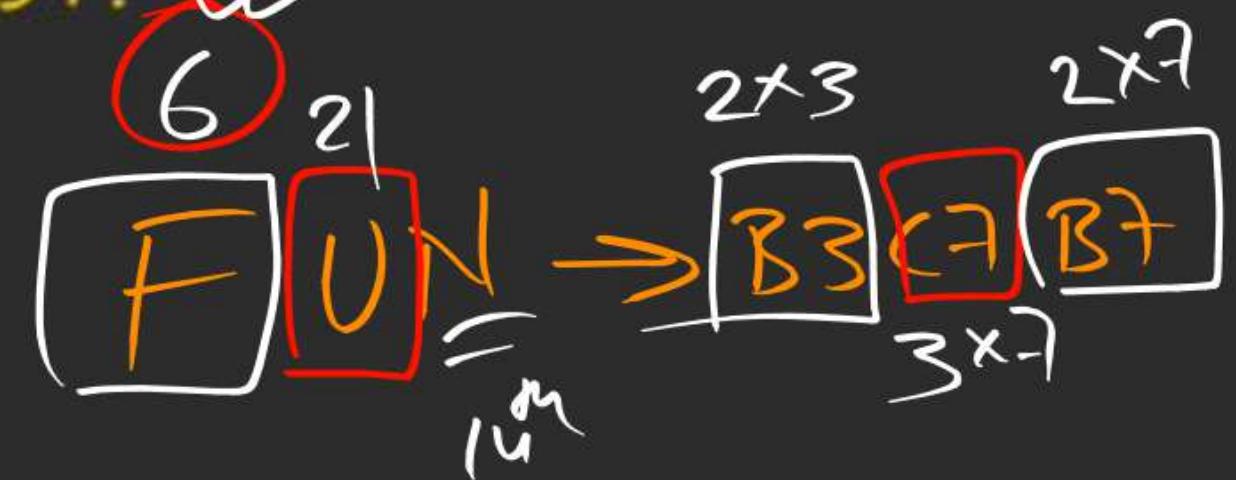
C LZHK

D LYHK

Q.

If FUN is written as B3C7B7 which word is written as B2C3B7?

P  
W

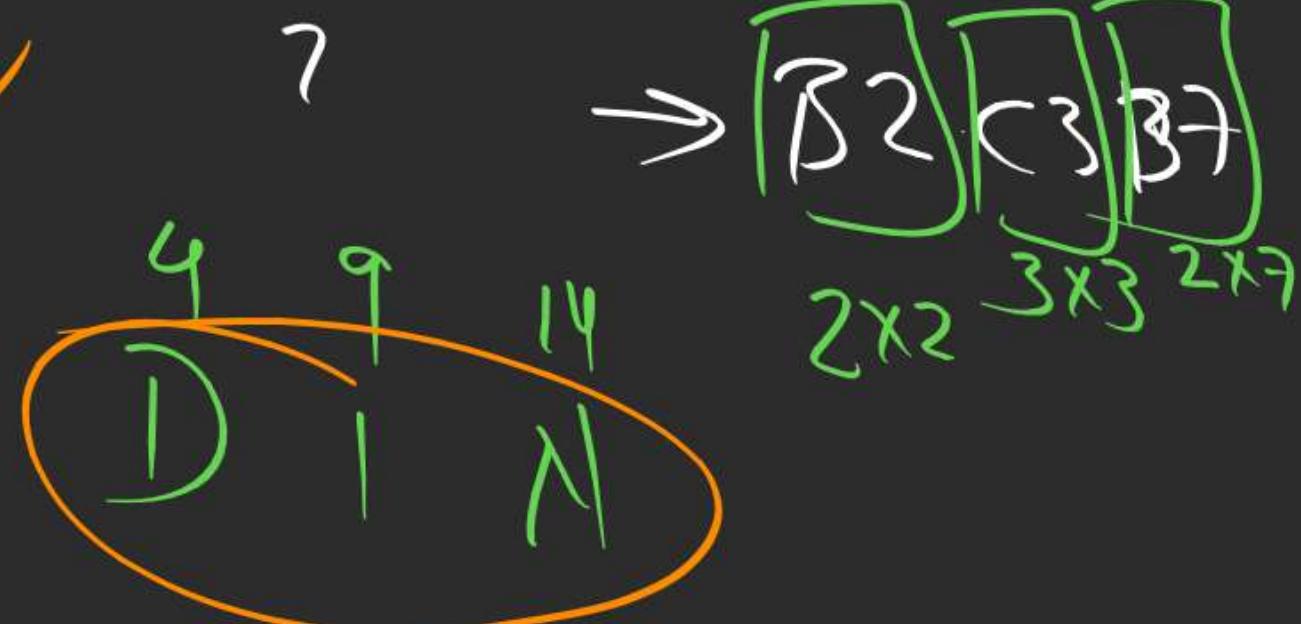


A PIN

B RUN

C DIN

D PUN



Q.

If in a certain code TWENTY is written as 863985 and ELEVEN is written as 323039, how is TWELVE written in that code?

A 863203

B 823230

C 823032

D 863903

TWENTY > 863985ELEVEN > 323039TWELVE > 863203

Q.

If in a certain language PRIVATE is coded as 1234567 and RISK is coded as 2398, how is RIVETS coded in that language?

PRIV~~I~~A TE  $\rightarrow$  123④5 67  
RIS~~K~~K  $\rightarrow$  23⑨8

A 687543

B 234769

C 496321

D 246598

RIVETS  $\rightarrow$  234769

Q.

If water is called food, food is called tree, tree is called sky,  
sky is called wall, on which of the following grows a fruit?

P  
W

A sky

B tree

C water

D food

Word

Tree is called Sky

Code

~~=~~

Code

Tree means

sky

Word

Q.

If sky is called sea, sea is called water, water is called air, air is called cloud and cloud is called river, then what do we drink when thirsty?

P  
W

A sky

B water

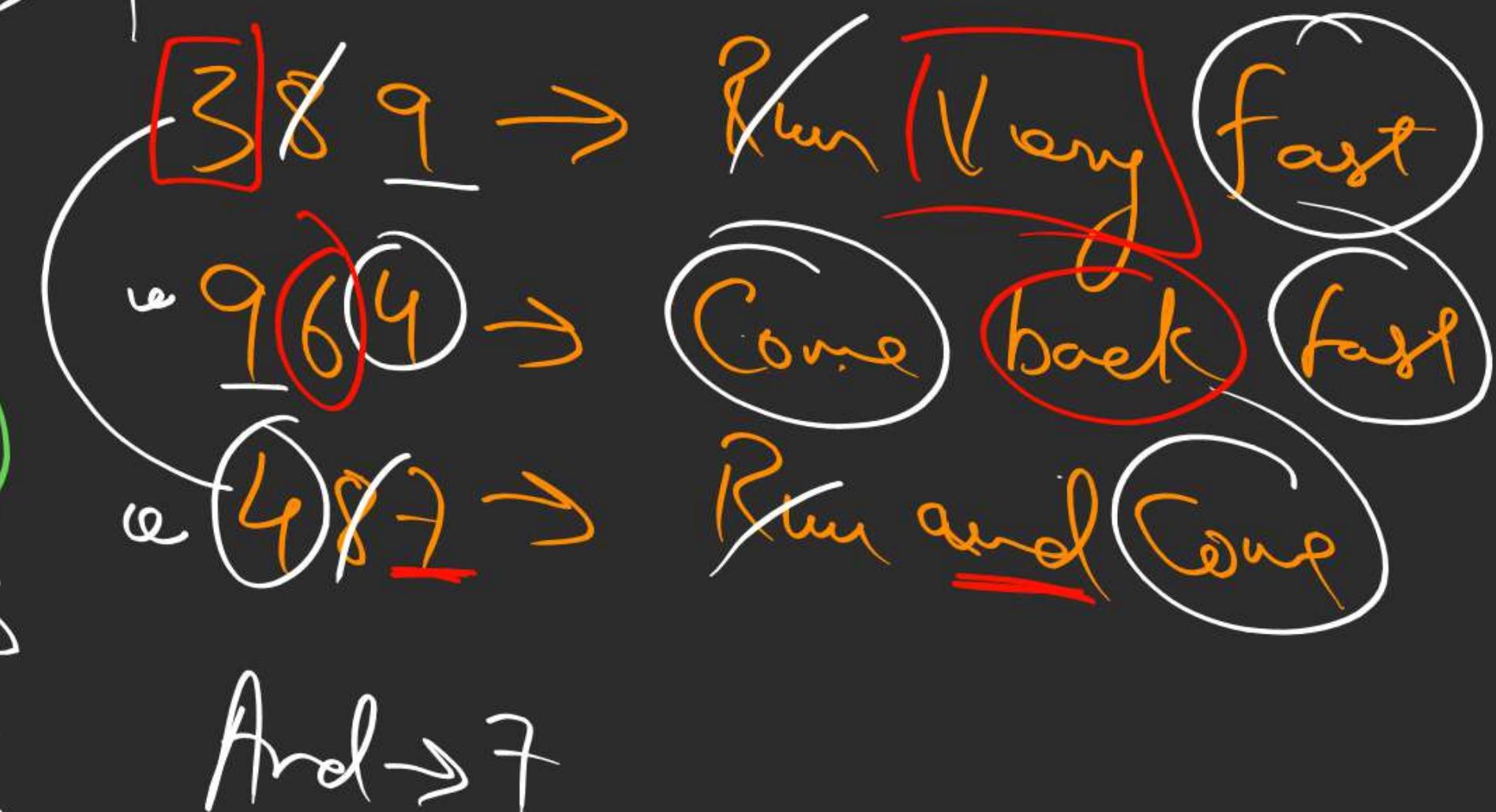
C air

D sea

Q.

In a certain code language '389' means 'run very fast' '964' means 'come back fast' and '487' means 'run and come'. Which digit in the language means 'come'?

- fast > 9
- Run > 8
- Come > 4
- Very > 3
- Back > 6
- And > 7
- A 9
  - B 4
  - C 7
  - D 8



Q.

In a certain code SOCIAL is written as TQFMFR, then how you will code DIMPLE?

$\begin{matrix} +1 & +2 & +3 \\ \text{S O C I A L} & \rightarrow & \text{T Q F M F R} \\ +4 & +5 & +6 \end{matrix}$

A EKPTQK

B EKPQPJ

C EKPSPJ

D EKPSOH

$\begin{matrix} +1 & +2 & +4 & +5 & +6 \\ \text{D I N P L E} & \rightarrow & \text{E K P T Q K} \\ +3 \end{matrix}$

Q.

In a certain code, '37' means 'which class' and '583' means 'caste and class'. What is the code for 'Caste'?

H.F.

- A 3
- B 7
- C 8
- D Either 5 or 8

Q.

In a certain code language, 'dom pul ta' means 'bring hot food'; 'pul fir sop' means 'food is good' and 'tak da sop' means 'good bright boy', which of the following does mean 'hot' in that language?

H.A.  
A

- A dom
- B pul
- C ta
- D Can't be determined

Q.

If pen is called pencil, pencil is called scale, scale is called bag and bag is called book, which is used to carry the books?



- A scale
- B pen
- C book
- D bag

THANK  
YOU!

Mission ISRO 2023  
(CS/EC/ME)



General Aptitude  
Logical Reasoning  
Lecture No. 05



Amulya Ratan Sir

# Today's Targets



- 1 Concept of Ranking
- 2 Understanding Arrangements of Data
- 3 Seating Arrangements
- 4 Brainstorming on the Topic



## RANKING

4<sup>th</sup>



Shreyas Rahul

②

Priyazari

③

Sweeta Arya

④

⑤



?



$$R.P = \text{No. of P} - L.P + 1$$

$$\text{No. of P} = L.P + R.P - 1$$

$$R.P = \text{No. of P} - L.P + 1$$

$$R.P = 5 - 3 + 1$$

$$R.P = 3^{\text{rd}}$$

$$= 5 + 2 - 1$$



Q.

In a row of trees, one tree is the 9th from either end of the row. How many trees are there in the row?

P  
W

$$\text{No. of Trees} = L \cdot P + R \cdot P - 1$$

- A 17
- B 19
- C 16
- D 18

$$= 9 + 9 - 1$$

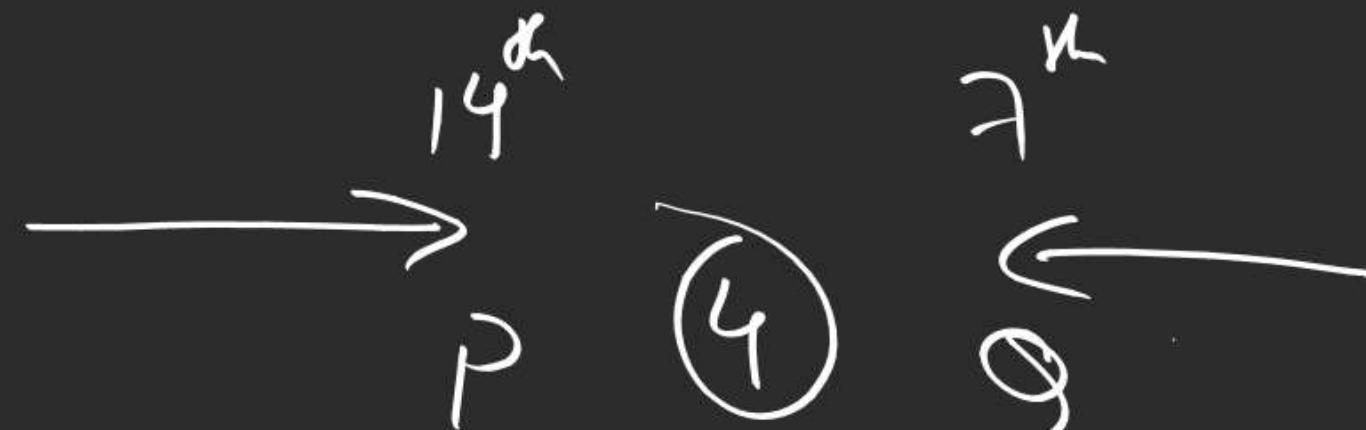
$$= 17$$

Q.

Some boys are sitting in a row, P is sitting 14th from the left and Q is seventh from the right. If there are four boys between P and Q, how many boys are there in the row?

P  
W

- A 19
- B 21
- C 25
- D 23



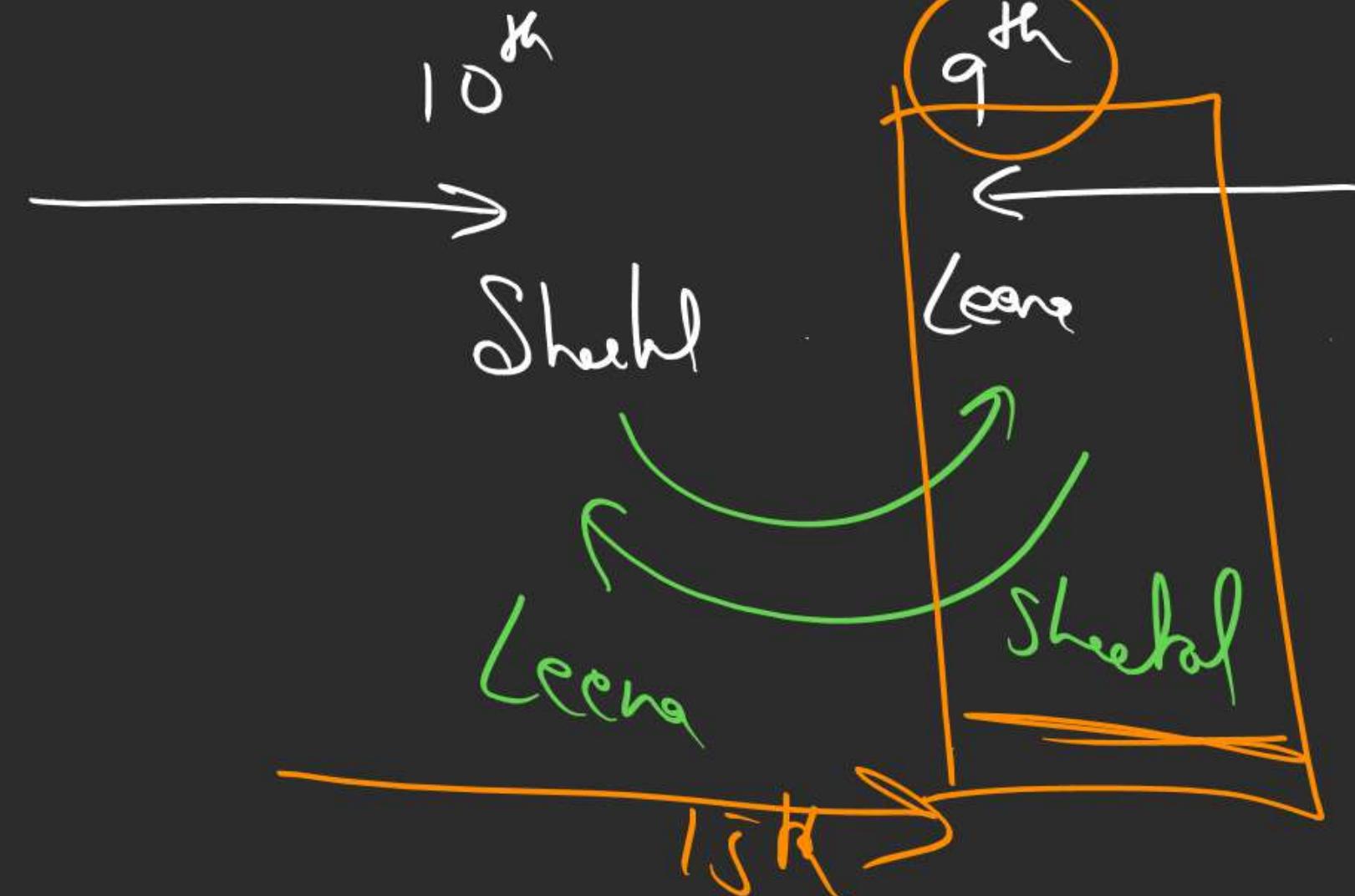
$$14 + 4 + 7$$

$$18 + 7 = 25$$

Q.

In a row of girls of sheetal who is 10th from the left and Lina who is 9th from the right <sup>exchange</sup> change their seats. Sheetal becomes 15th from the left. How many girls are there in a row?

- A 16
- B 23
- C 32
- D 25



$$15 + 9 - 1 = 23$$

Q.

Suresh is 7 ranks ahead of Ashok in the class of 39. If  
Ashok's rank is 17th from the last, what is Suresh's rank  
from the start?

P  
W

A 15

B 14

C 24

D 16

$$\begin{aligned} S &= x \\ A &= x + 7 \\ 23 - 7 &= x \end{aligned}$$

$$x + 7 = 23$$

$$x = 23 - 7$$

$$x = 16$$

$$39 - 17 + 1$$

$$= 23^{\text{rd}}$$

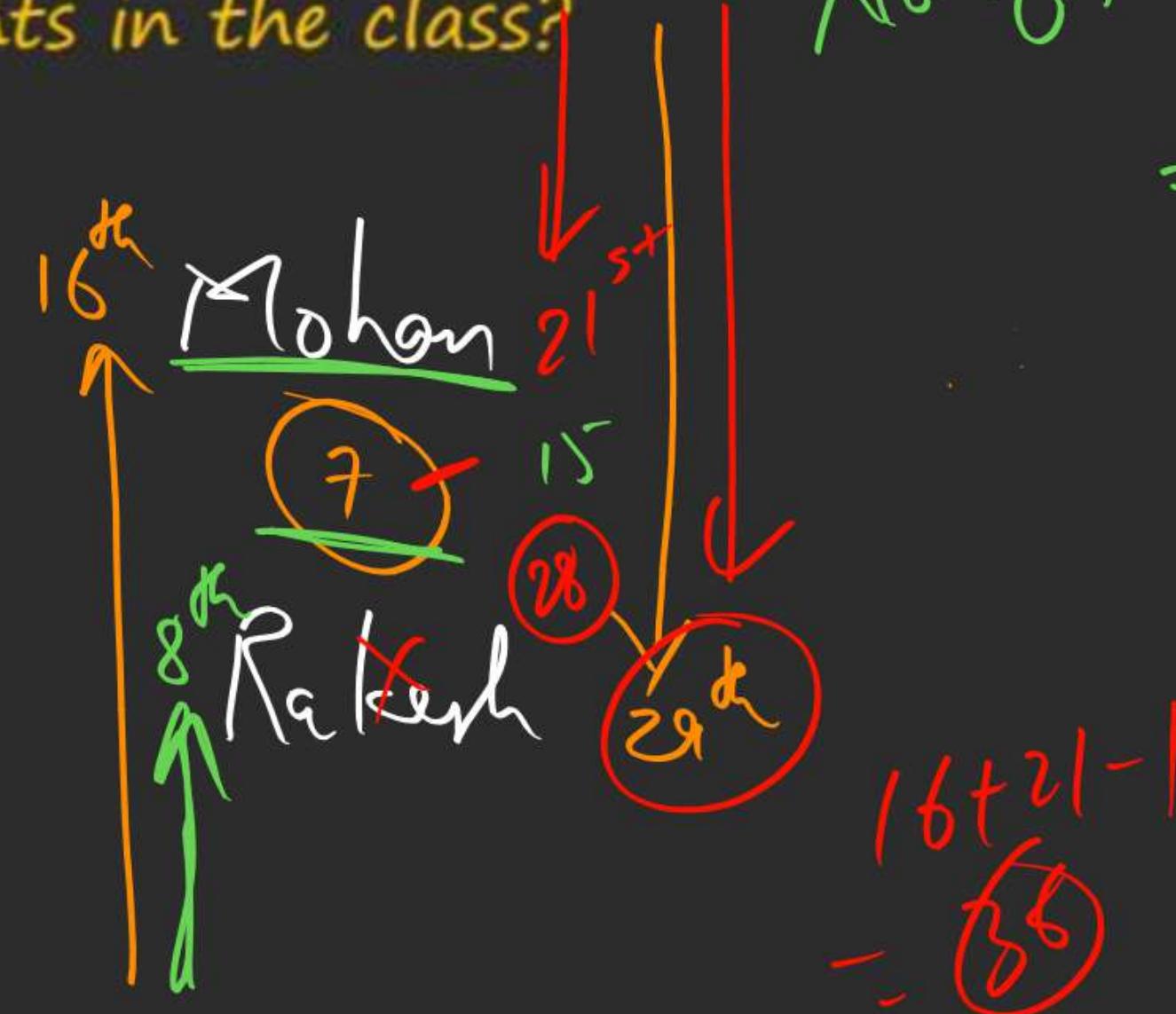
Q.

In a certain class, Rakesh is 29th from the top and mohan is 16th from the bottom in the alphabetical arrangements of names. If they have 7 boys between them what is the number of students in the class?

$$\text{No. of T} = 29 + 8 - 1$$

$$= \underline{\underline{36}}$$

- A 52
- B 45
- C 36
- D 35



$$16 + 21 - 1$$

- 7

P  
W

Q.

In a row of children Munni is ninth from the left and Tunni is thirteenth from the right. When they exchange places, Munni will be seventeenth from the left. Which of the following will be the new position of Tunni from the right?

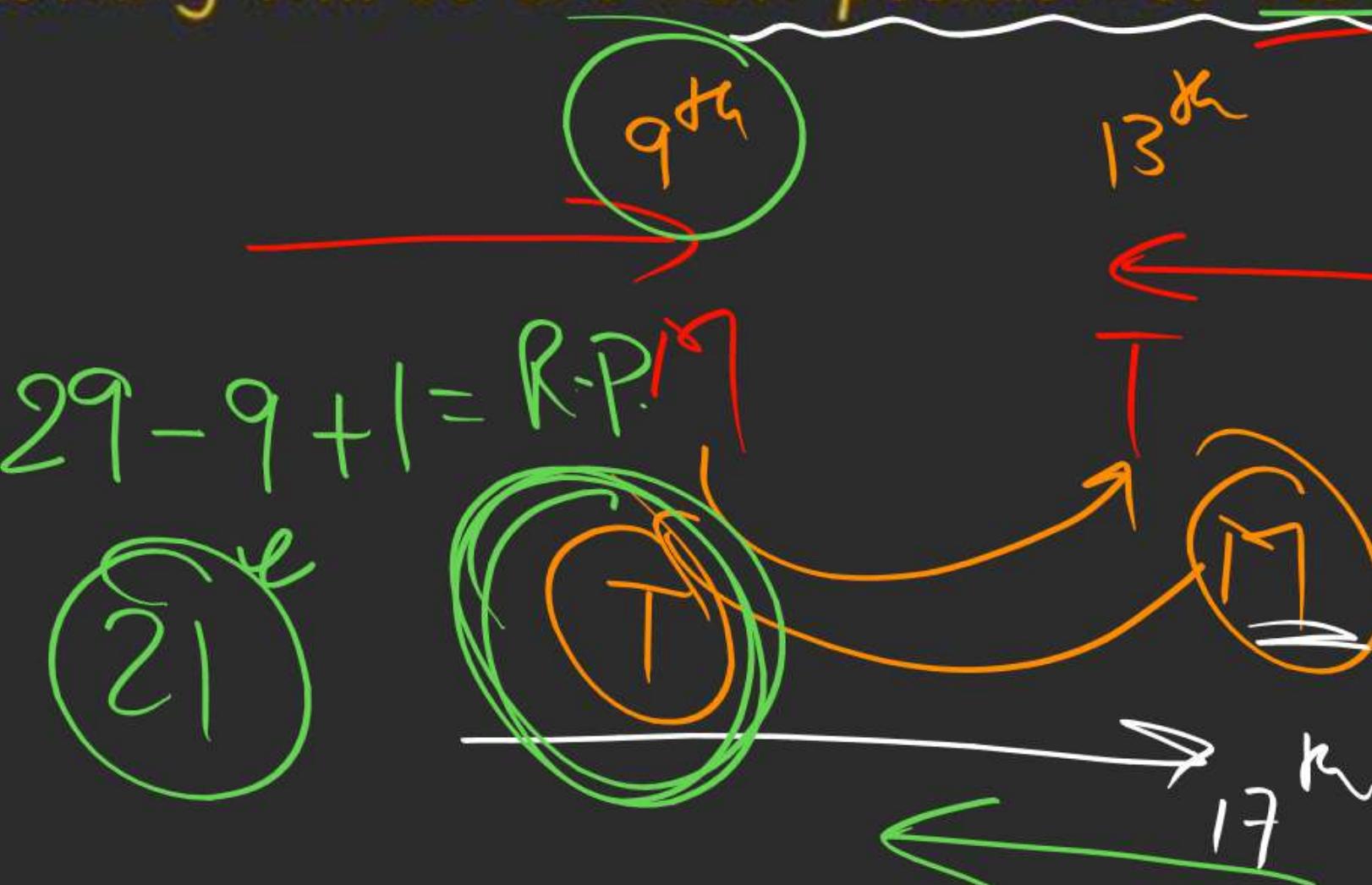
PW

- A 20<sup>th</sup>
  - B 7<sup>th</sup>
  - C 21<sup>st</sup>
  - D 9<sup>th</sup>

$$29 - 9 + 1 = R \cdot P$$

$$13^{\text{th}} \quad 17 + 13 - 1$$

29



Q.

Rakesh ranks seventh in a class of twenty. What is his rank from the last?

P  
W

A 15<sup>th</sup>

B 13<sup>th</sup>

C 14<sup>th</sup>

D 8<sup>th</sup>

7<sup>th</sup>  
R

$$20 - 7 + 1 = 14^{\text{th}}$$



## Data Arrangements



Problem Solving

Puzzles

Arrangements

Q.

Of the five villages: 1) Phulwade is smaller than Dhanwade  
2) Ambawade is bigger than ~~Khelwade~~ 3) Sonewade is  
bigger than Dhanwade but is not ~~as big~~ as Kelwade. Which is  
biggest village?

A Ambawade

B Phulwade

C Dhanwade

D Khelwade

Amb

Khel

Son

Dhan

Phul

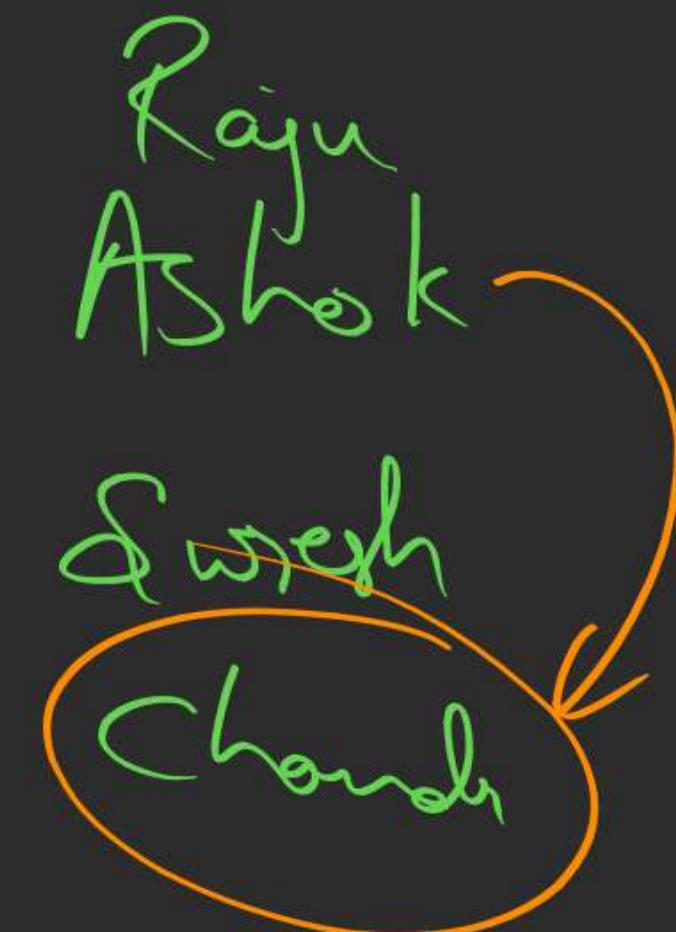
Amb

Khel

Q.

Ashok is taller than Suresh. Raju is taller than Ashok.

Chandu is shorter than Suresh, then chandu is \_\_\_\_\_



- A taller than Ashok X
- B as tall as Suresh X
- C taller than Suresh X
- D shorter than Ashok

Q.

Four girls are swimming in a stream.

- 1) Harjeet is further ahead of Manjula
- 2) Neena is behind Manjula
- 3) Ruchi is between Manjula and Neena.

Who is second from the last?

- A Neena
- B Manjula
- C Ruchi
- D Harjeet

→ End

Harjeet

Manjula

Neena

Ruchi



→ Start

P  
W

Q.

Five poles are standing in a row. M is on the left of N, O is on the right of P, which is on the right of N. If L is on the left of M, which pole is in center?

P  
W

- A L
- B M
- C N
- D O

L M N P O

Q.

Six families A, B, C, D, E and F are living in houses in a row. B has F and D as neighbours, E has A and C as neighbours. A does not live next to D. Who are F's next door neighbours?

- A B and E
- B B and D
- C B and C
- D Data Insufficient



Ě B Ď Č Ě Ā  
 Ď B Ě Č Ě Ā  
 Ď B F Ā Ě Č  
 Ď B F Ā Ě Č  
 Ā Ě Č Ď B F  
 Ā Ě Č Ď B F

Q.

Sudha is taller than Pushpa but shorter than Malati. Geeta is shorter than Vinu and Vinu is not as tall as Pushpa. Who should be in the middle if they stand in a row according to height?

A Pushpa

B Malati

C Sudha

D Geeta

Malati

Sudha

Pushpa

Vinu

Geeta



## Problem Solving



Five courses A, B, C, D and E each of one month duration are to be taught from January to May one after the other not necessarily in same order by lecturers, P, Q, R, S and T.  
P teaches course B but not in the month of April or May  
Q teaches course A in the month of March  
R teaches in the month of January but does not teach course C or D

Q.

Which course is taught by S?

P  
W

A

C

B

E

C

Either C or D

D

D

*either*  
*course / show*

Q.

Which lecture's course immediately follows after course B?

P  
W

- A Q
- B P
- C S
- D T

Q.

Which course is taught in the month of January?

P  
W

A

C

B

D

C

E

D

Data Inadequate



## Solution:



Five courses A, B, C, D and E each of one month duration are to be taught from January to May one after the other not necessarily in same order by lecturers, P, Q, R, S and T.

P teaches course B but not in the month of April or May

Q teaches course A in the month of March

R teaches in the month of January but does not teach course C or D

	JAN	FEB	MAR	APR	MAY
P	X	✓	X	X	X
Q	X	X	✓	X	X
R	✓	X	X	X	X
S	X	X	X	?	?
T	X	X	X	?	?



## Question:

- ✓ P, Q, R, S, T and U are six students pursuing their Bachelor degree in six different subjects i.e. English, History, Philosophy, Physics, Statistics and Mathematics. Two of them stay in Hostel, two in Paying guest and remaining two at their Home.
- {1} R does not stay as Paying guest and studies Philosophy.
- {2} The students studying Statistics and History do not stay as Paying Guest.
- {3} T studies Mathematics and S studies Physics.
- {4} U and S stay in Hostel.
- {5} T stays as Paying Guest and Q stays at Home.

Q.

Who studies English?

A R

B S

C T

D None

Slugs, Pronouns

Q.

Which of the following combinations of subject and place of stay is not correct?

A English - Hostel

English - Hostel

B Philosophy - Home

Philosophy - Home

C Mathematics - Paying Guest

D Physics - Hostel

Q.

Which subject does Q study?

A History

B

History or Statistics

C Statistics

D None

Q.

Which of the following pairs of students stay one each at Hostel and at Home?

A QR

B SR

C US

D None



## Question:

Ph → stat/~~hist~~

- {1} R does not stay as Paying guest and studies Philosophy.
- {2} The students studying Statistics and History do not stay as Paying Guest.
- {3} T studies Mathematics and S studies Physics.
- {4} U and S stay in Hostel.
- {5} T stays as Paying Guest and Q stays at Home.

2 P.G / 2 ~~Hostel~~ | 2 Home



Acco		ENG	HIST	PHIL	PHY	STA T	MAT H
P.G	P	✓	X	X	X	X	X
Home	Q	X	?	X	X	?	X
↓ down	R	X	X	✗	X	X	X
Host	S	X	X	X	✗	X	X
P.G	T	X	X	X	X	X	✓
Host	U	Y	?	X	X	?	X

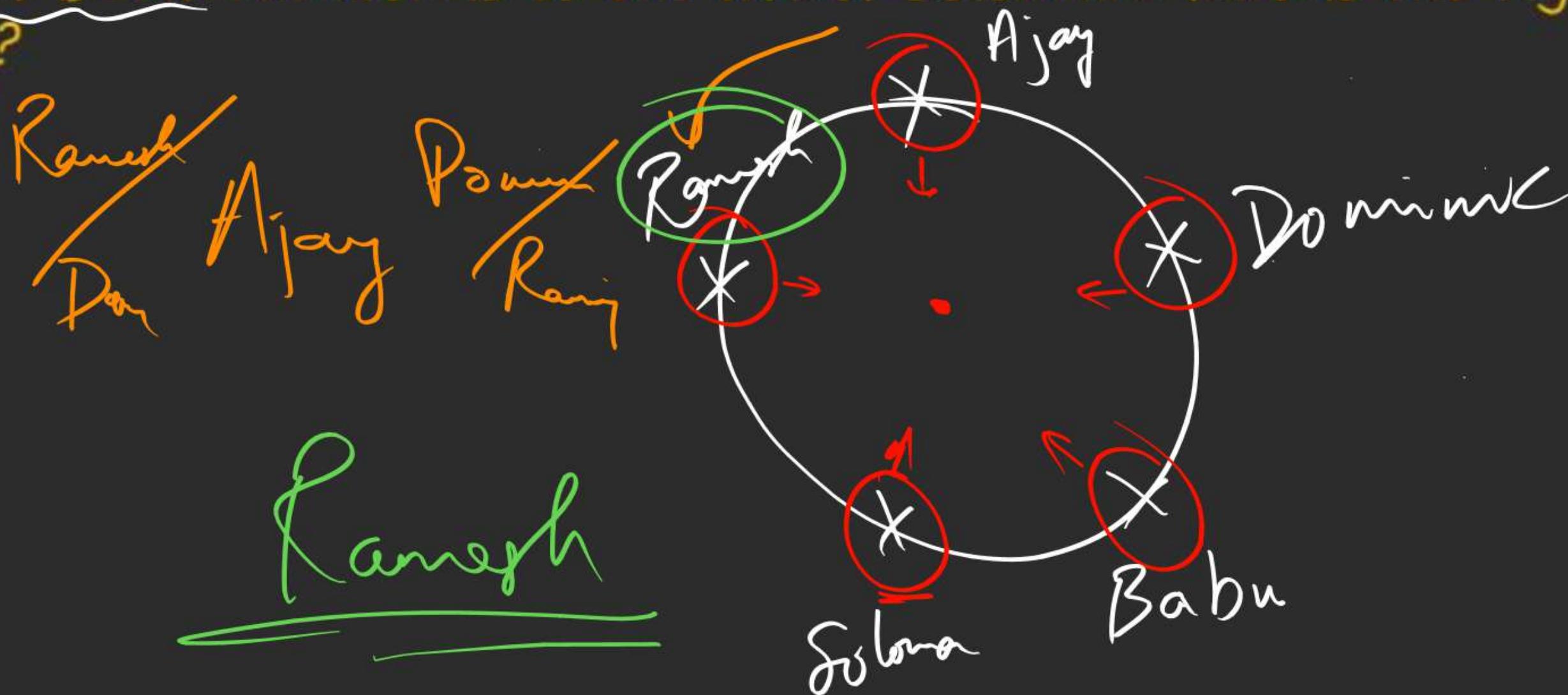


## Seating Arrangement



Left  $\rightarrow$  clockwise  
Right  $\rightarrow$  Anticlockwise

- ✓ Five boys are standing that they form a circle facing center. Ajay is between Ramesh and Dominic, Solomon is to the left of Babu. Ramesh is to the left of Solomon. Who is the right of Ajay?

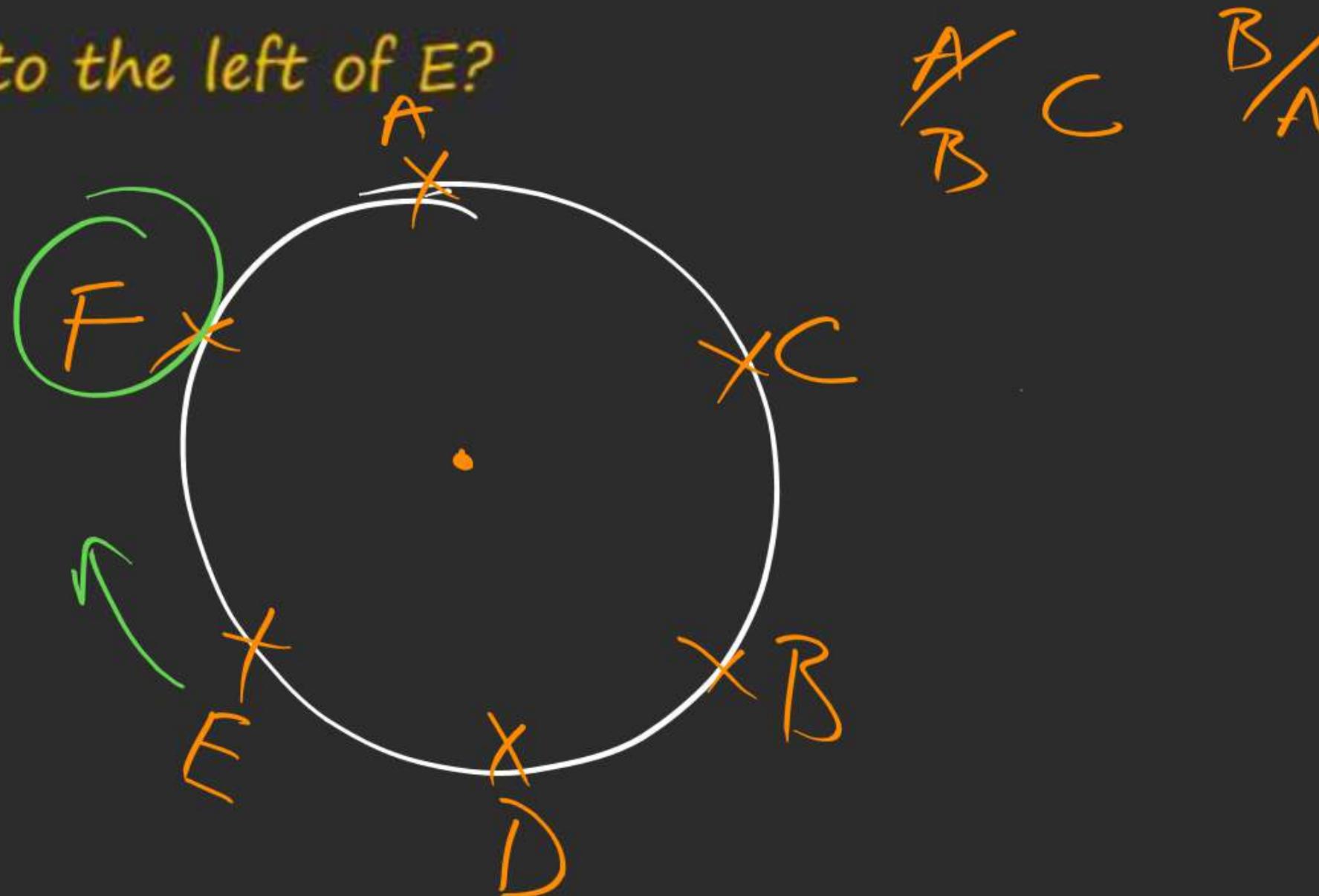


Q.

Six friends A, B, C, D, E and F are sitting in a closed circle facing the center. E is to the left of D; C is between A and B; F is between E and A.

- Who is to the left of E?

- |   |   |
|---|---|
| A | A |
| B | C |
| C | D |
| D | F |



THANK  
YOU!



Mission ISRO 2023  
(CS/EC/ME)

General Aptitude  
Logical Reasoning  
Lecture No. 06



Amulya Ratan Sir

# Today's Targets



- 1 More Questions of Clocks
- 2 Understanding the concept of Directions
- 3 Questionnaire on the Topic

Q. A clock which gains 10 minutes in every one hour was set correct at 6am. If that clock represents 1pm the same day, then find the correct time.

6am + 6 hrs


$$\frac{60 \times \cancel{6}}{\cancel{70} 18}$$

C.W

60 min

?

W.W

70 min

7 hrs



Q.

In a clock, the hour hand coincide with minute hand at an every interval of 65 minutes. Find how much does the clock gain or lose in a day.

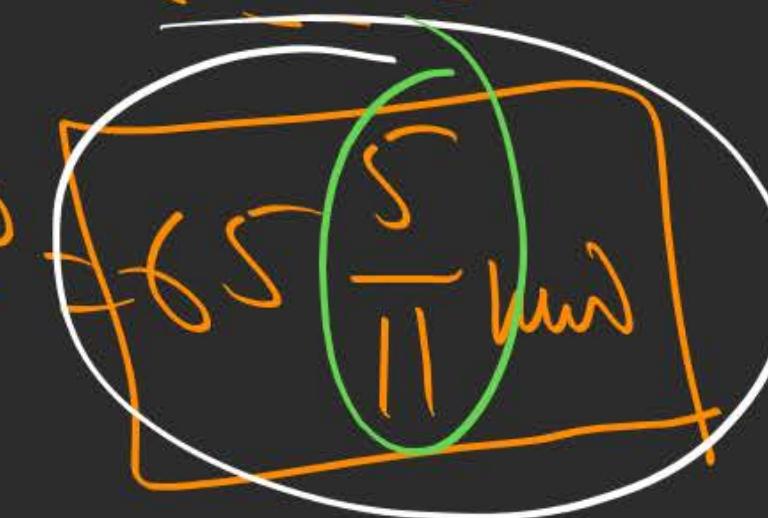
P  
W

$$\text{S-H} ?$$

$$6-x$$

$$\frac{360}{5.5}$$

$$= \frac{720}{11}$$

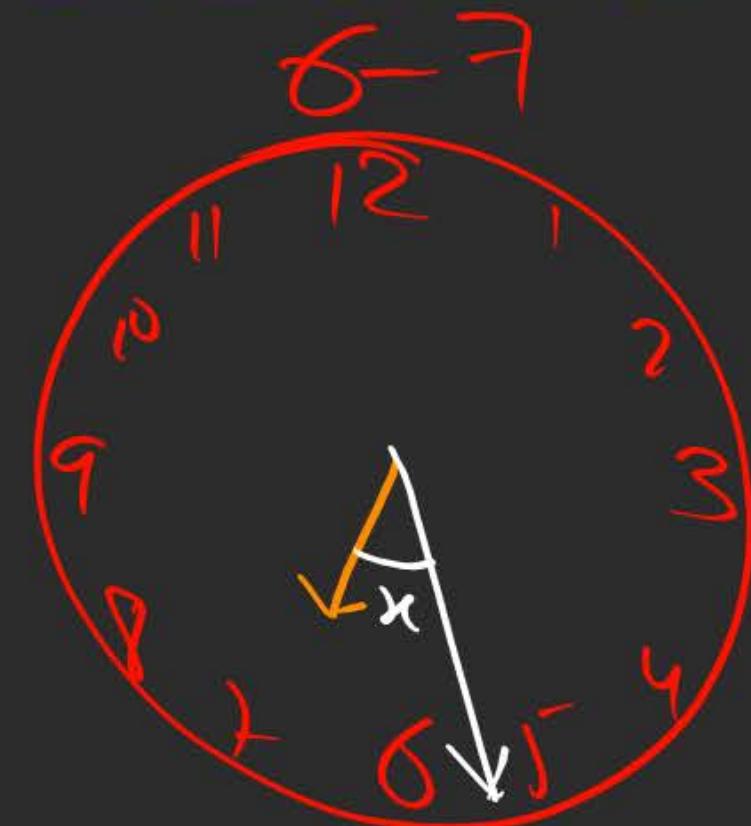


$$\frac{5}{11} \times 2\pi^2$$

= 0 min (gain)

Q.

A man went out for evening walk in between 5pm to 6pm and was back home in between 6pm to 7pm. After reaching home, he observed that minute hand and hour hand has interchanged their positions. At what time did the man went out for walk?

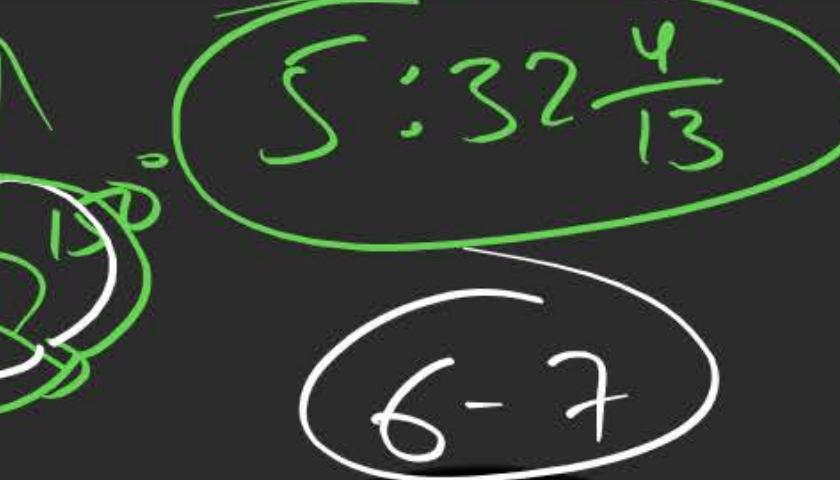




Solution:



$$150 + \frac{360}{13}$$



$$\begin{aligned} &= \frac{1950 + 360}{13} \times \frac{2}{11210} \\ &= \frac{2310}{13} \times \frac{2}{X} \end{aligned}$$

$$H \cdot H \frac{1}{2}^\circ \rightarrow M \cdot H \ 6^\circ$$

$$H \cdot H 1^\circ \rightarrow M \cdot H \cdot 12^\circ$$

$$H \cdot H x^\circ \rightarrow M \cdot H \cdot 12x^\circ$$

$$360 - x = 12x$$

$$\Rightarrow 360 = 13x$$

$$x = \frac{360}{13}$$

$$\begin{aligned} &\frac{420}{13} \\ &= 32 \frac{4}{13} \end{aligned}$$





## DIRECTIONS

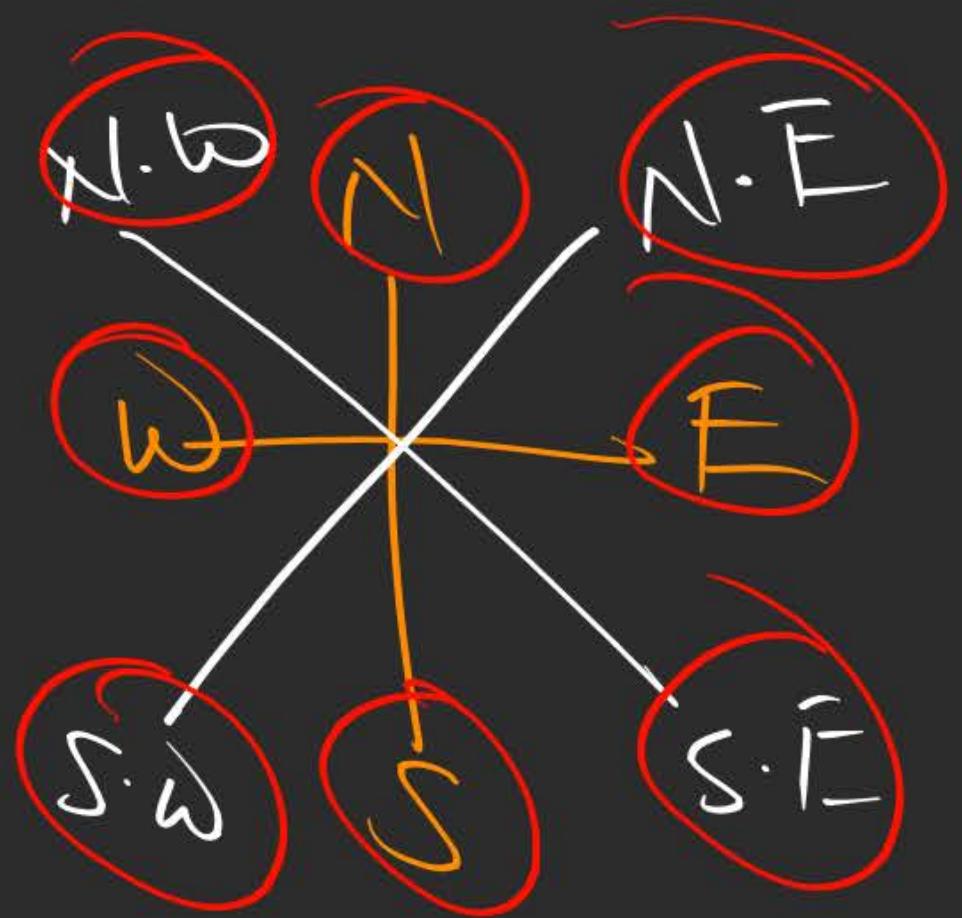


East

North

North pole

South pole





NEWS

Vertical Directions

North South

Horizontal Directions

East

West

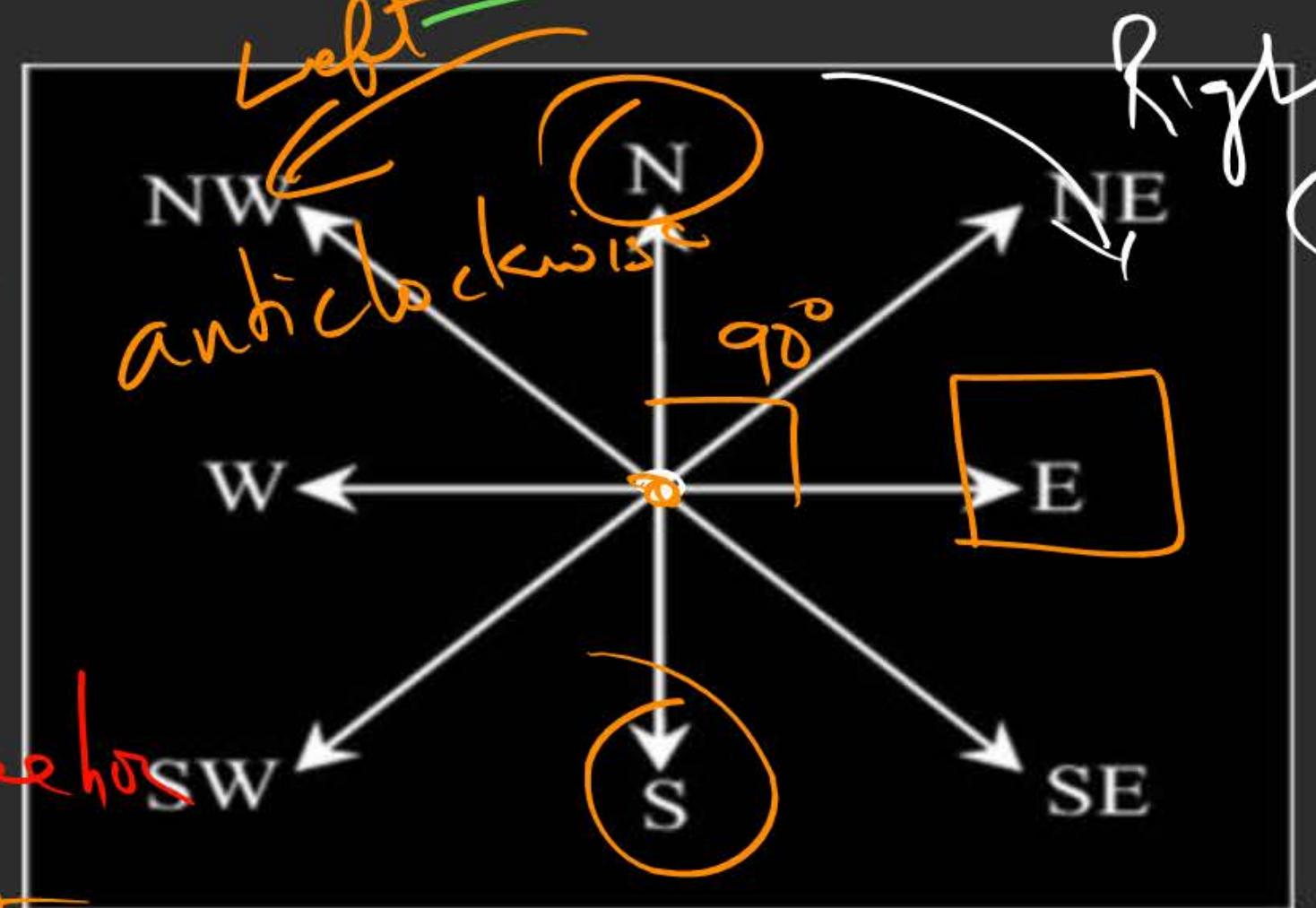
Displacement

Distance

left

Right

Clockwise



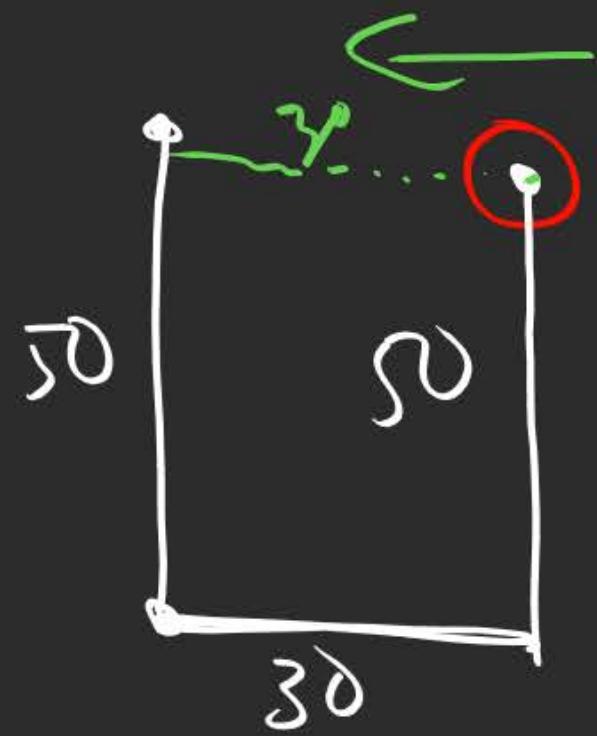
Q.

~~1. S 50  
2. W 30  
3. N 50~~

Facing towards south Ramesh walked 50 mts. He then turned to his right and walked 30 mts. He again turned right and walked 50 mts. How far was he from his original position and towards which direction?

P  
W

$$\sqrt{H^2 + V^2}$$

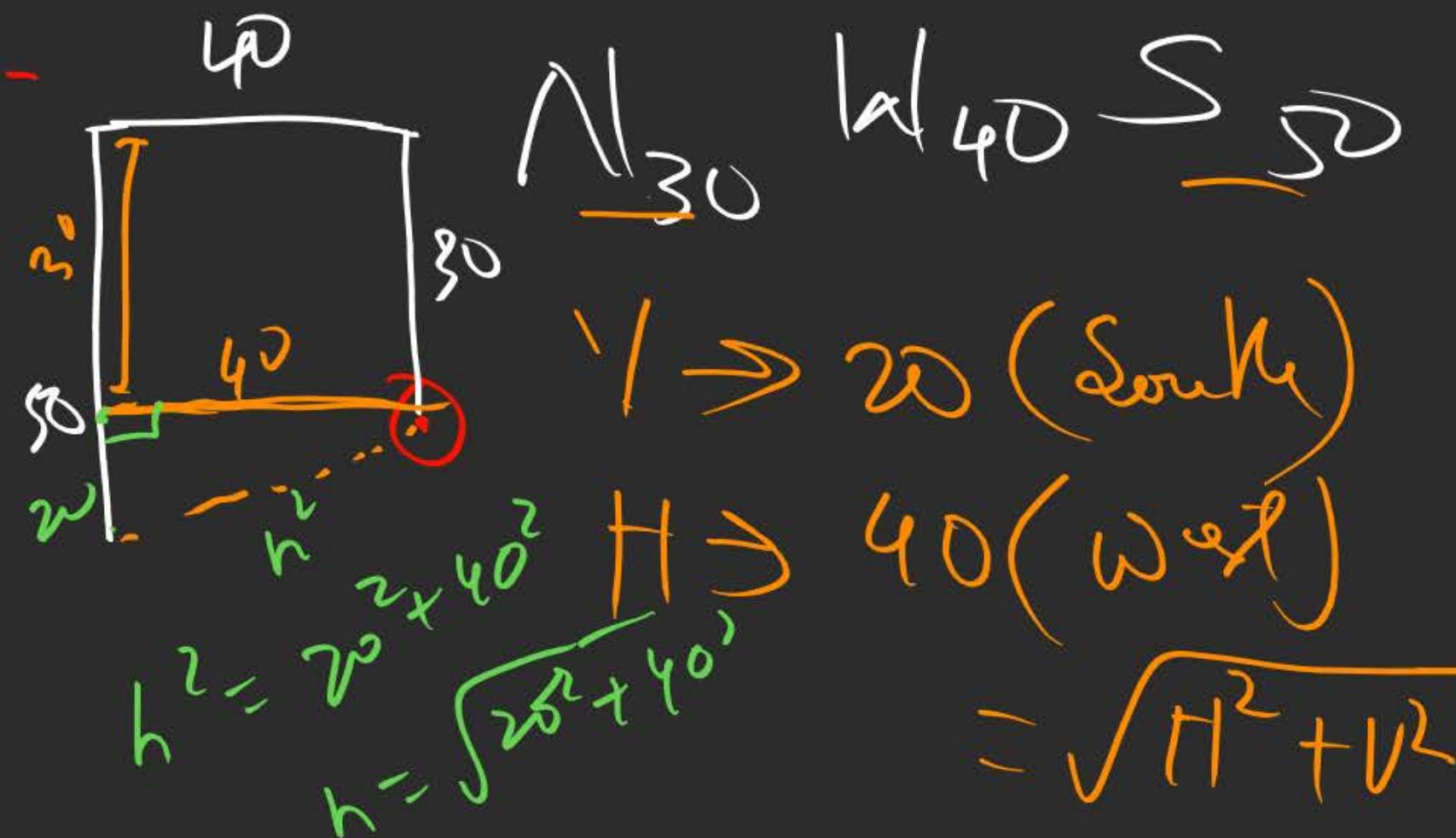


1. Vertical Distance 30 West
2. Horizontal Distance 30 West
3. In which direction faced at end North
4. In which direction as compared from origin West
5. How far from the origin



Q.

Alok started walking towards North. After walking 30 metres, he turned towards left and walked 40 metres. He then turned left and walked 50 metres. How far is he from his original position?

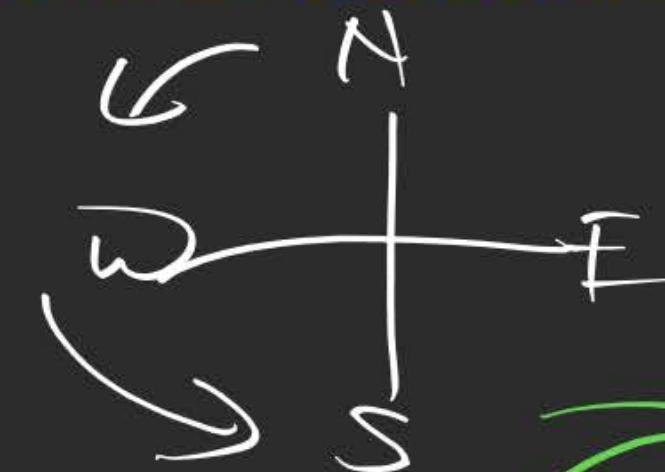


$$= \sqrt{1600 + 900}$$

$$= \sqrt{2500}$$

$$= \sqrt{4 \times 5 \times 100} = 2 \times 10\sqrt{5} = 20\sqrt{5}$$

$$= \sqrt{40^2 + 20^2} = 44.72$$



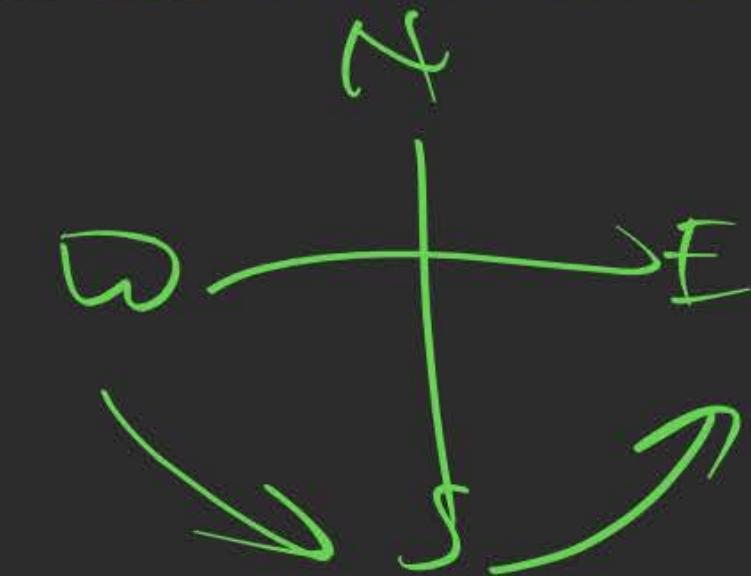
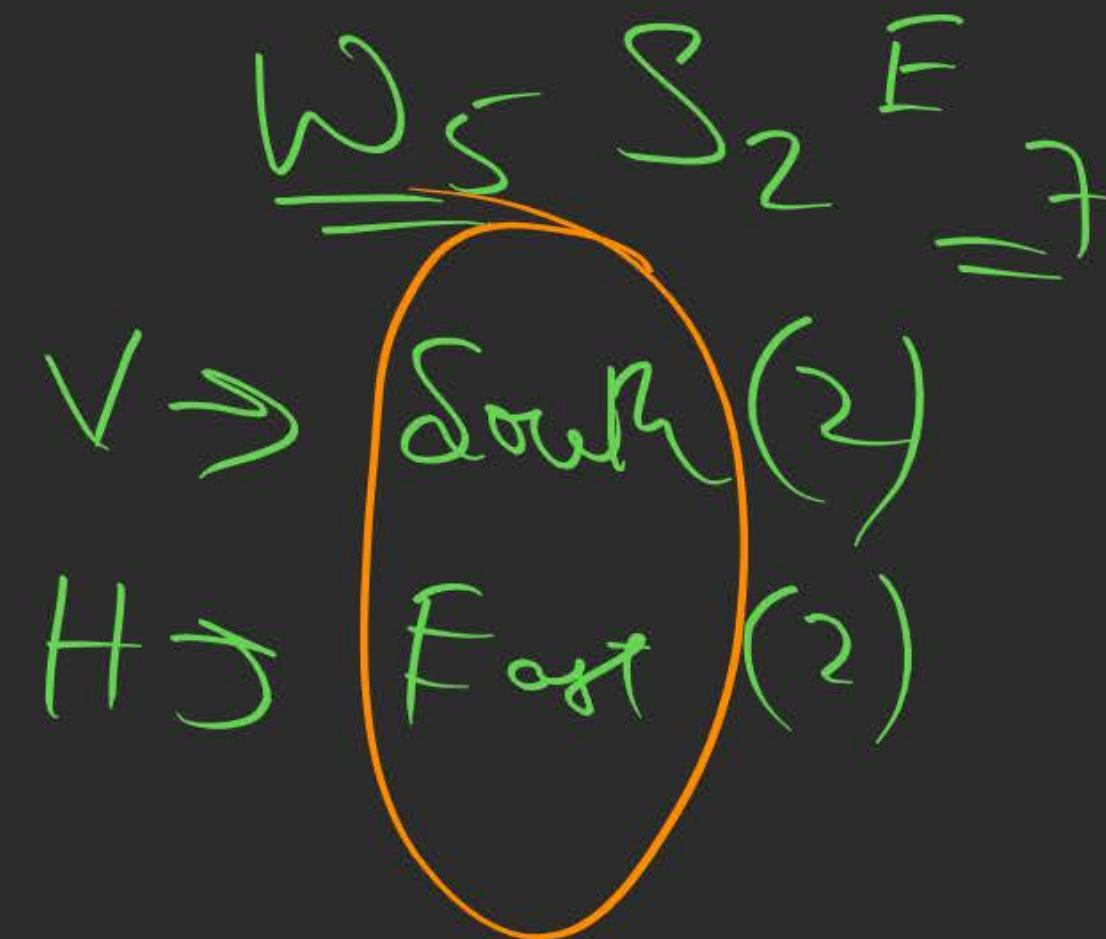
$$= 20\sqrt{5}$$



Q.

Mohit started from point X and walked straight 5 km West, then turned left and walked straight 2 km and again turned left and walked straight 7 km. In which direction is he from the point X?

South  
East



Q.

A is standing at P. He walks 10 meters towards the south; then he walks 20 meters towards the west; then he walks 10 meters towards the south; then he walks 20 meters towards the North and reaches Q. What is the straight distance between P and Q in meters?



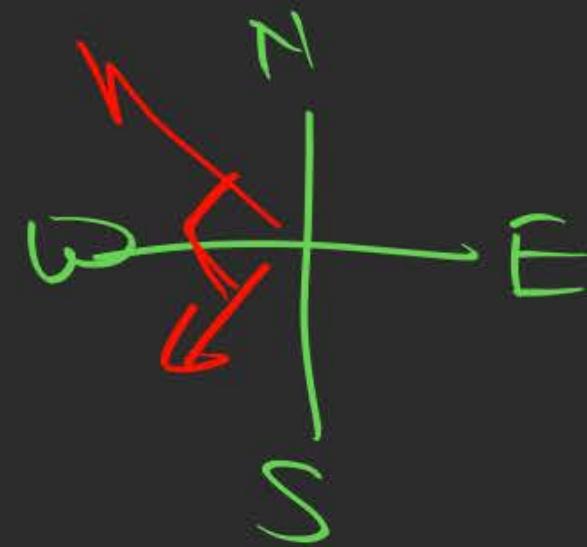
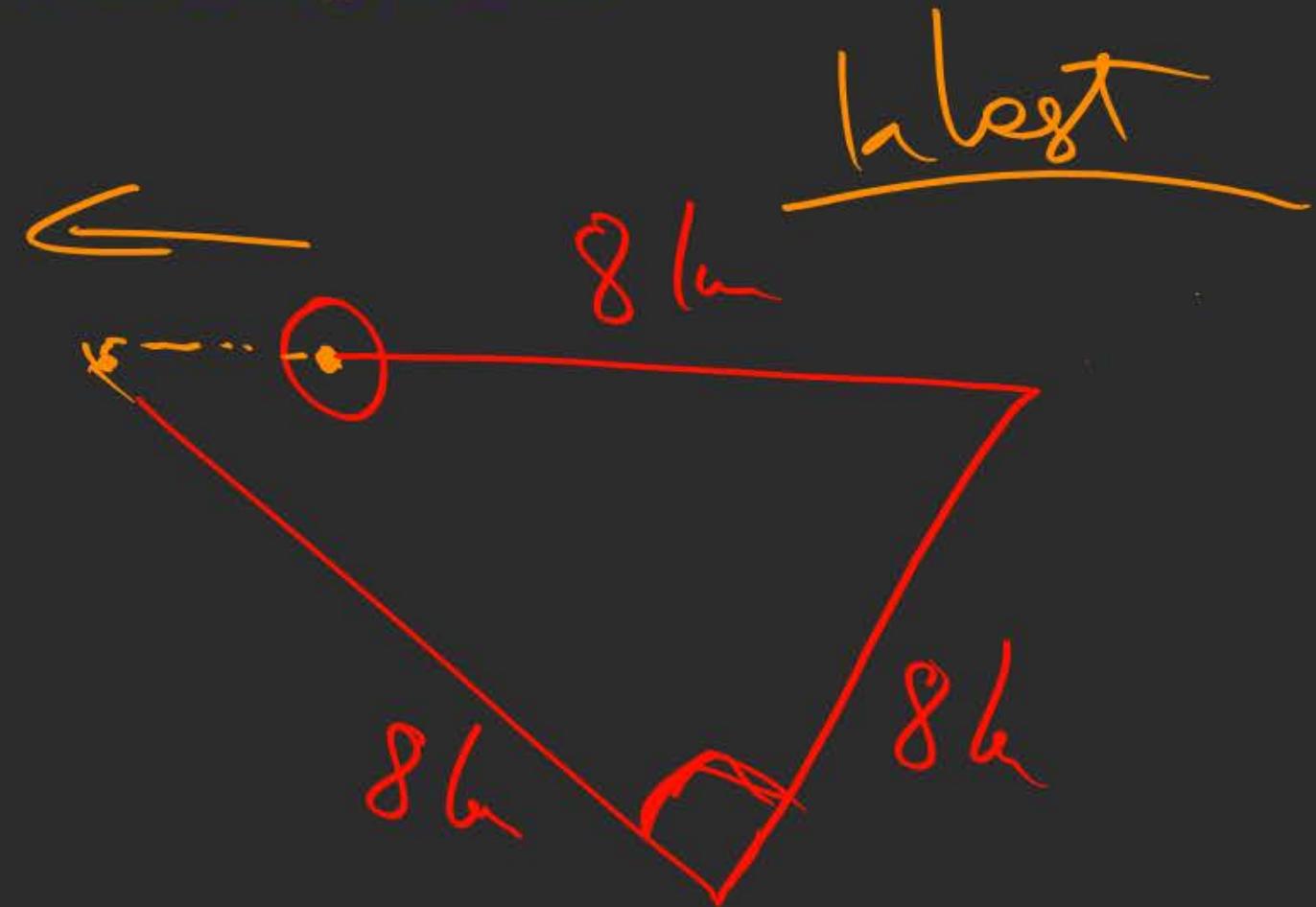
$$V > 0$$

$$H \rightarrow W$$



Q.

Sumit walks 8 km east, turns South-West and walks another 8km. He again takes a turn towards North-West and walks another 8km. In which direction from starting point is he standing now?



Q.

A walks 10 metres towards East and then 10 metres to his right, then every time turning to his left, he walks 5.15 and 15 metres respectively. How far is he now from his starting point?

- A 17.12 metre
- B 15.95 metre**
- C 16.8 metre
- D 18.75 metre



$$\begin{aligned} &\checkmark \rightarrow S(N) \\ &H \rightarrow 15.15(E) \end{aligned}$$

$$\sqrt{(15.15)^2 + 5^2} = \sqrt{229.52 + 25}$$

$$\begin{aligned} &= \sqrt{254.52} \\ &\Rightarrow 15.9 \end{aligned}$$

Q.

A man is facing North-West. He turns  $90^\circ$  in the clockwise direction, then  $135^\circ$  in the anticlockwise direction which direction is he facing now?

A West

B South west

C North east

D East



$45^\circ$  Anticlockwise

Q.

One day, Ravi left home and cycled 10 km Southwards, turned right and cycled 5 km and turned right and cycled 10 km and turned left and cycled 10 km. How many kilometers will he have to cycle to reach his home straight?

A 16 km

B 23 km

C 32 km

D 15 km



Y = 0  
H = 15 km west

**THANK  
YOU!**



Mission ISRO 2023  
(CS/EC/ME)

General Aptitude  
Logical Reasoning  
Lecture No. 07



Amulya Ratan Sir

# Today's Targets

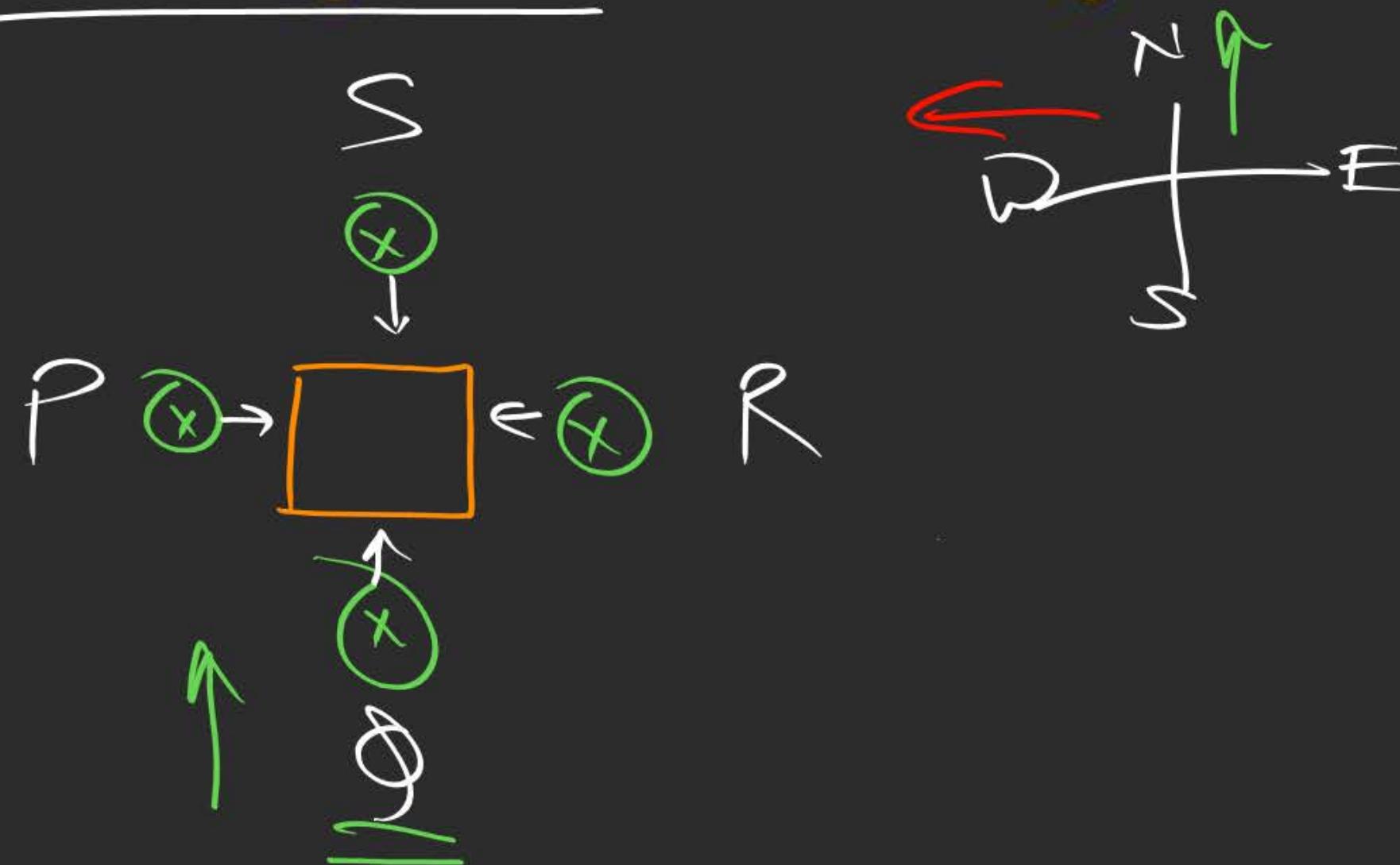


- 1 More Questions on Directions
- 2 Understanding Blood Relations
- 3 Questionnaire on the Topic

Q.

P, Q, R and S are playing a game of carom. P,R and S,Q are partners. S is to the right of R, who is facing West. Then, Q is facing?

- A North
- B South
- C East
- D None

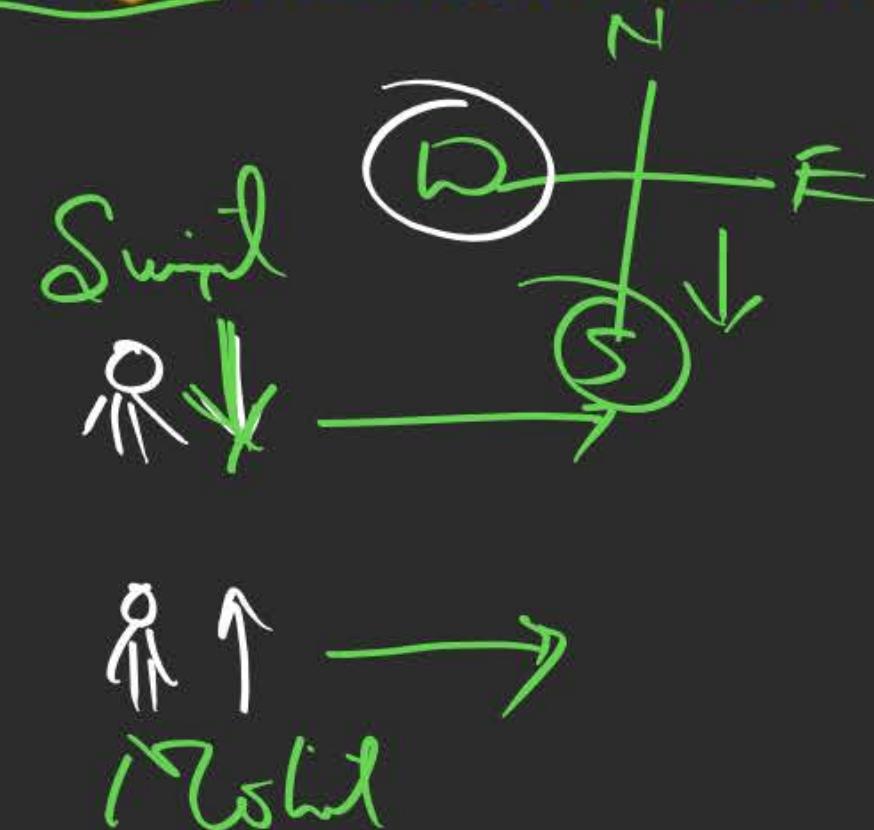


P  
W

Q.

One evening before sunset, two friends Sumit and Mohit were talking to each other face to face. If Mohit's shadow was exactly to his right side, which directions was Sumit facing?

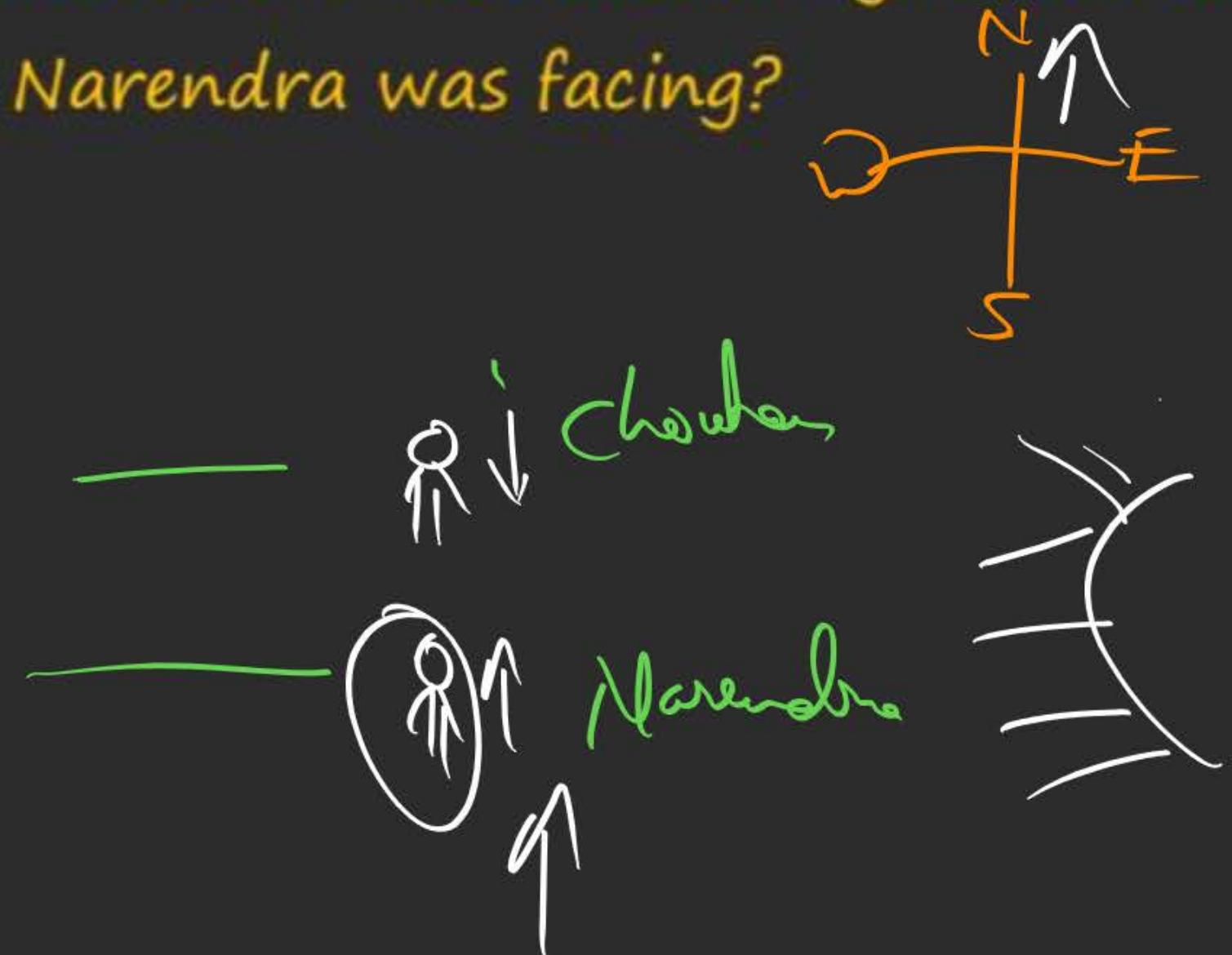
- A North
- B South
- C East
- D West



Q.

One morning after sunrise, Chouhan and Narendra were talking to each other face to face at Tilak square. If Narendra's shadow was to the right side of Chouhan, which direction Narendra was facing?

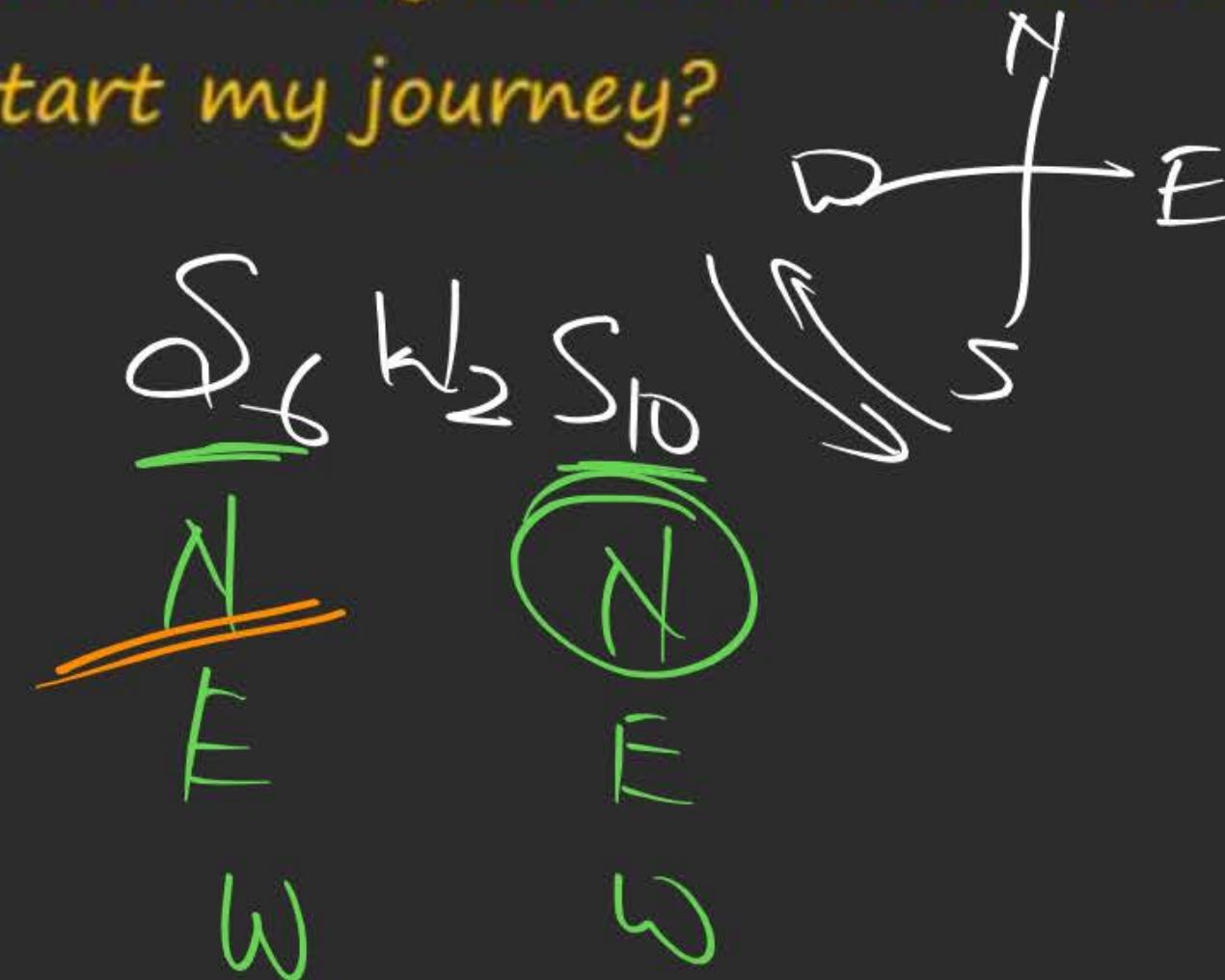
- A North
- B South
- C East
- D West



Q.

After walking 6 km, I turned right and covered a distance of 2 km, then turned left and covered a distance of 10 km. In the end, I was moving towards the North. From which direction did I start my journey?

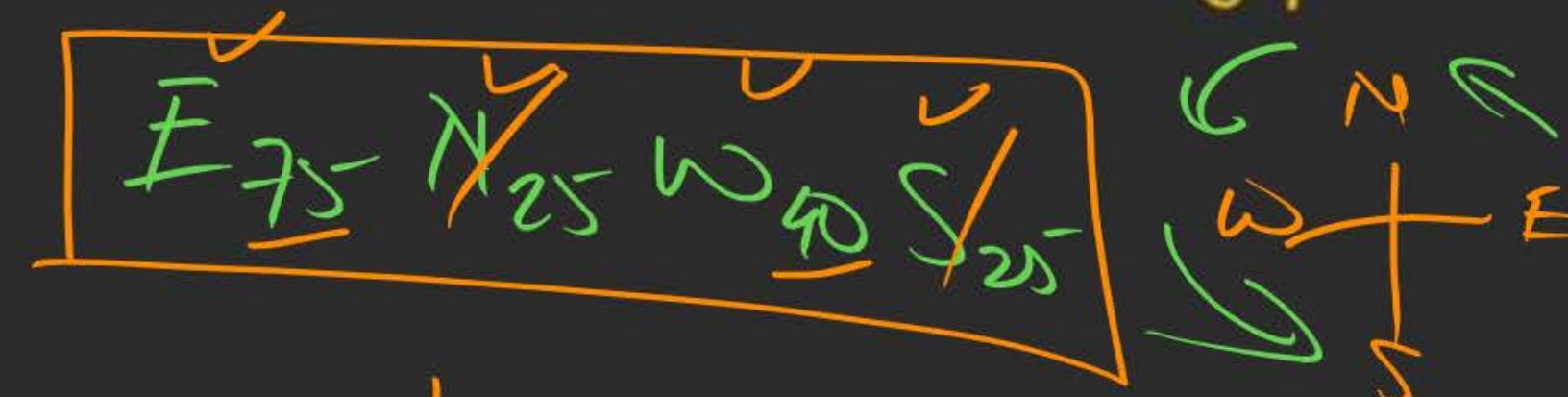
- A North
- B South
- C West
- D East



Q.

Vikas starts walking straight towards east. After walking 75 meters, he turns to the left and walks 25 meters straight. Again, he turns to left walks a distance of 40 meters straight, again he turns to left and walks a distance of 25 meters. How far is he from the starting point?

- A 25 metre
- B 40 metre
- C 115 metre
- D 22.8 metre



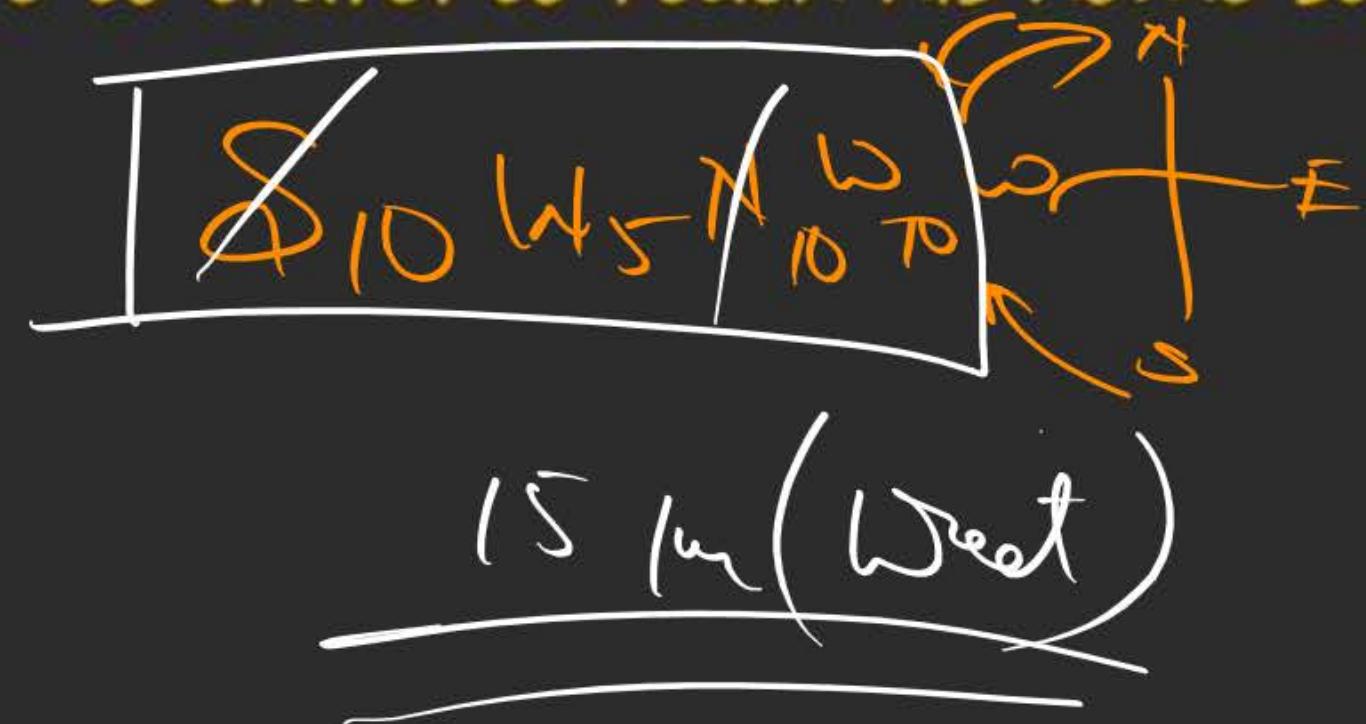
$$\begin{matrix} \checkmark \\ E \cancel{75} N \cancel{25} W \cancel{40} S \cancel{25} \end{matrix}$$

$\sqrt{> 0}$   
 $H \rightarrow 35 \text{ (East)}$

Q.

One day Jack left home and cycled 10 km southwards, turned right and cycled 5 km and turned right and cycled 10 km and turned left and cycled 10 km. How many kms will he have to travel to reach his home straight?

- A 12 km
- B 15 km
- C 18 km
- D 10 km





## BLOOD RELATIONS

forefather Maternal  
Nephew Uncle  
Paternal



G.F/G.M

Mother Father

Brother Sister

Grandson Granddaughter Son Daughter

Uncle Aunt

G.F G.M

Nephew Uncle

Cousins

Wife Husband





## Relations:

Paternal  
Maternal

P  
W

Mother : Father

Brother : Sister

Uncle : Aunt

Grand Father : Grand Mother

Grand son : Grand daughter

✓ Great Grand Father : Great Grand Mother

Forefather / Ancestors

(Parent)

(Sibling)

(Grand parent)

(Grand child)

(Child)

Son : Daughter

Cousins

Nephew : Niece

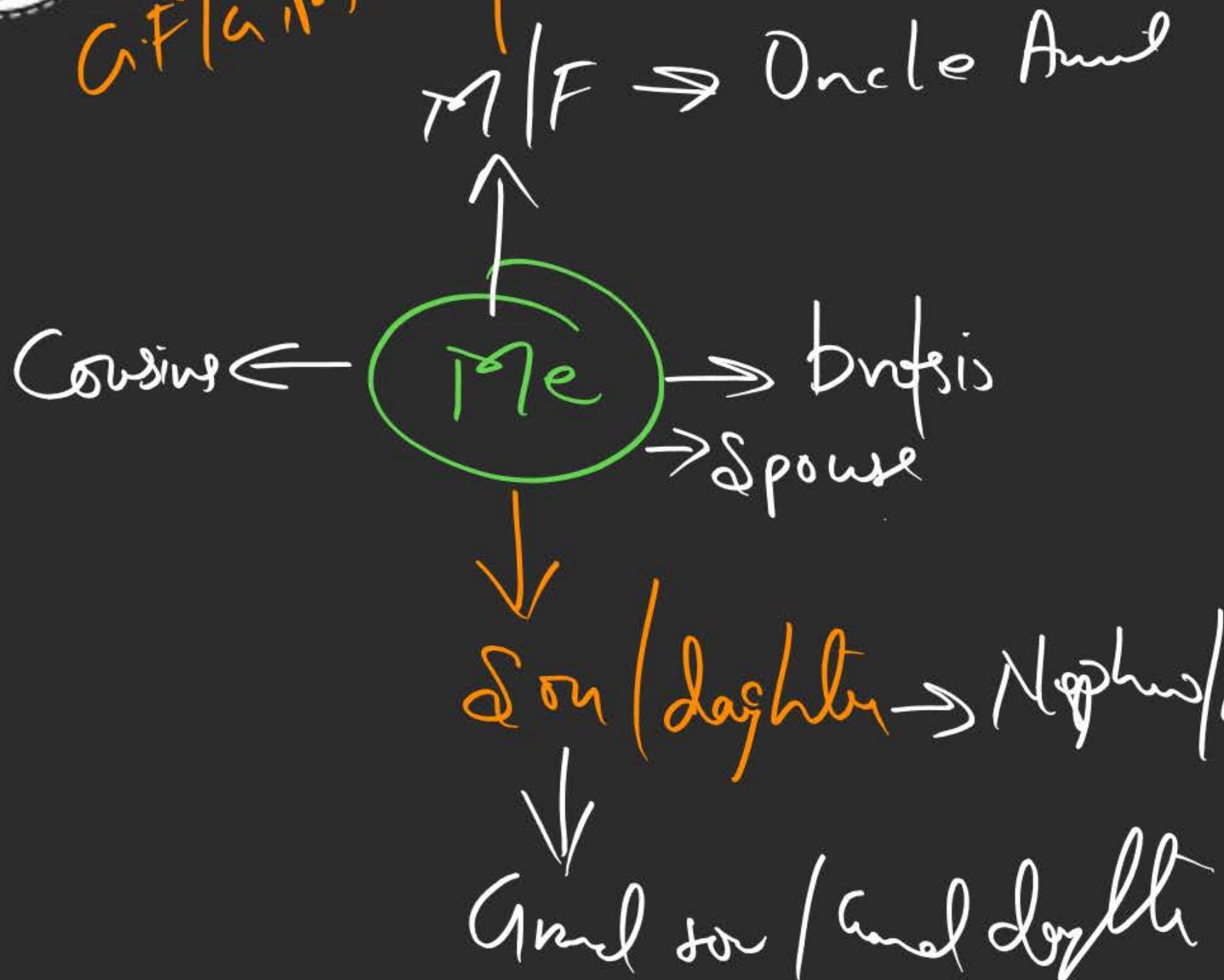
Husband : Wife

Spouse



## The term GENERATIONS:

C.F.I.G.A.M



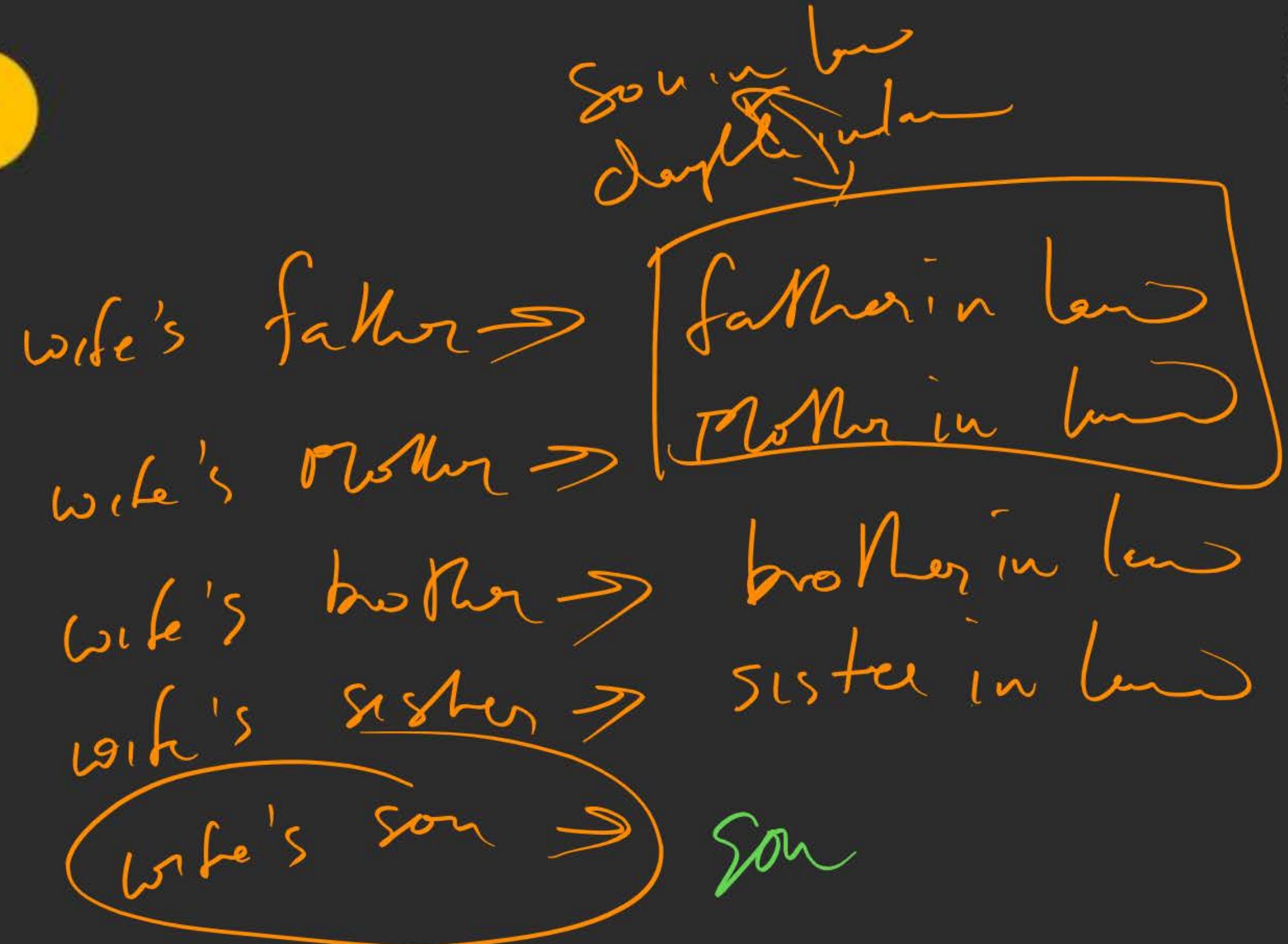
④

A

⑥  
B



## In Laws:





## In Laws:

Spouse Mother = Mother in law

Spouse Father = Father in law

Spouse Brother = Brother in Law

Spouse Sister = Sister in law

Son in Law  
Daughter in Law



Q.

Pointing to a boy in the photograph Manasa said, "His sister is the only daughter of my father". How is the boy related to Manasa's father?

me

A Father

B Brother

C Son

D Cousin

P  
W

Q.

Pointing to Neha, Mahesh said, "Her mother's only daughter is my daughter". How is Mahesh related to Neha? She

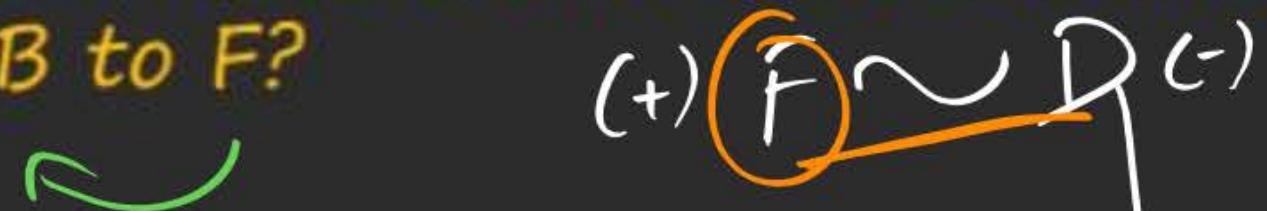
P  
W

- A Brother
- B Uncle
- C Son
- D Father

Q.

A is brother of B. B is wife of C. C is son of D. D is wife of F.  
Then what is B to F?

P  
W



- A Son in law
- B Daughter in law
- C Cousins
- D None of these

Q.

Pointing towards a person in a photograph, Raman said, "She is the only daughter of the mother of my brother's sister". How is that person related to Raman?

*my sis*  
*my mother*

- A Uncle
- B Mother
- C Sister
- D Father

**THANK  
YOU!**