CALENDAR

- Every century is not leap year.
  - Ex:- 100 years → 5 odd day
  - 200 → 3 odd day
  - 300 → 1 odd day
- Every 4^{th} century is leap year
  - Ex:- 400, 800, 1200, 1600, 2000 ... ⇒ 0 odd day.
- Up to 1900 ⇒ 1 odd day
- 1 normal year ⇒ 1 odd day
- 1 leap year ⇒ 2 odd d.

month	odd day
Jan	→ 3
Feb	→ 0 normal, 1 LY
Mar	→ 3
Apr	→ 2
May	→ 3
June	→ 2
July	→ 3
Aug	→ 3
Sep	→ 2
Oct	→ 3
Nov	→ 2
Dec	→ 3

Weak	odd day
Sun	→ 0
Mon	→ 1
Tues	→ 2
Wed	→ 3
Thur	→ 4
fri	→ 5
Sat	→ 6

(Q.) 2 oct 1869. days-?

⇒

	odd days
1600 →	0
200 →	3
for 68 years { LY →	$17\times2=34$
Nor. year →	51
month up to Sep. →	21
days →	2

7) 111 (15
105
6 → Sat.

CLOCK

- Hrs hand in 1 hr → 30° Angle
  - 1 min → ½ Angle
- Min hand in 5 min → 30° Angle
  - 1 min → 6° Angle
- coincide = $5x\times\frac{12}{11}$
- Right angle $=(5x\pm15)\times\frac{12}{11}$
  - +ve → 1^{st} ans
  - −ve → 2^{nd} ans
- Opposite $=(5x\pm30)\times\frac{12}{11}$
  - If $x\geq6$ → Take −ve sign
  - $x<6$ → ,, +ve ,,
- Mirror image = 12 − given

* General formula

$$\left[5x\pm\left(\frac{D^{\circ}}{6}\right)\right]\times\frac{12}{11}$$

Put, D → 0° (coinside)
D → 90° (Right ∠s)
D → 180° (opposite)

(Q.) coincide, right ∠s, opposite b/n 4'o clock & 5'o clock.

⇒ Put X = 4 then solve.

for Right angle

$(5\times4+15)\times\frac{12}{11}=\frac{420}{11}=38\frac{2}{11}\Rightarrow 4:38\frac{2}{11}$ Ans

$(5\times4-15)\times\frac{12}{11}=\frac{60}{11}=$ 11)60(5 = $5\frac{5}{11}\Rightarrow 4:5\frac{5}{11}$ Ans
55
5

BLOOD RELATION

- A^{+} → for male
- A^{-} → for female

Don't Judge gender by name

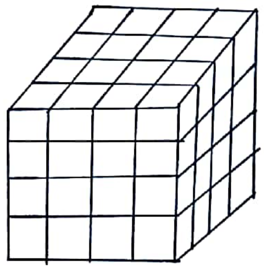
Bhanja, Bhateja ⇒ Nephew

Bhanji, Bhatiji ⇒ Niece

Relation from mother side ⇒ Maternal

Relation from father side ⇒ Paternal

CUBE



64 equal parts

$\sqrt[3]{64}=4$ ⇒ It means one side has 4 cube.

- Total Blocks = $l\times b\times h$
- 3 side painted = 8
- 2 side painted $=4[(l-2)+(b-2)+(h-2)]$
- 1 side ,, $=2[(l-2)(b-2)+(b-2)(h-2)+(h-2)(l-2)]$
- 0 side painted $=(l-2)(b-2)(h-2)$

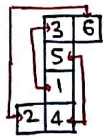
DICE

- When one no. is common on both the dices.

⇒ 6 (4) (2)
6 (5) (3)
opp. opp.

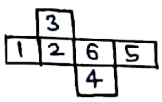
Open dice

(i) General dice



3 ↔ 1 (opp)
5 ↔ 4
6 ↔ 2

(ii) Standard dice :- opposite surface sum should be 7.



CHESS BOARD

n × n board

- No. of squares $=\Sigma n^2$
- No. of Rectangles $=\Sigma n^3$
- No. of types of rectangles $=\Sigma n$

"SUMIT KR"

NUMBER SYSTEM

* Number $= a^p b^q c^r$ — a,b,c → Prime No. ; p,q,r → Nat. No.
- Total factor $= (p+1)(q+1)(r+1)$

Ex:- N = 9000

$N = 2^3 \times 3^2 \times 5^3$

Total factor $= (3+1)(2+1)(3+1)$
$= 48$

odd factor $= (2+1)(3+1) = 12$

Even factor = TF − of = 36

2	9000
2	4500
2	2250
3	1125
3	375
5	125
5	25
5	5
	1

- Prime factor & composite factor :-

1 → neither prime nor composite.

prime factor → not consider higher power.

TF = cf + pf + 1

Ex:- $N = 9000 = 2^3 \times 3^2 \times 5^2$

⇒ TF = 48, pf = 3, cf = 48 − 3 − 1 = 44

HCF & LCM

- HCF of fraction = $\dfrac{\text{HCF of Numerator}}{\text{LCM of Denominator}}$
- LCM of fraction = $\dfrac{\text{LCM of Numerator}}{\text{HCF of denominator}}$

Ex:- $\frac{1}{2}, \frac{2}{3}, \frac{3}{7}$

⇒ HCF = $\dfrac{\text{HCF of }(1,2,3)}{\text{LCM of }(2,3,7)} = \dfrac{1}{42}$

LCM = $\dfrac{\text{LCM of }(1,2,3)}{\text{HCF of }(2,3,7)} = 6/1$

BASE SYSTEM

Ex:- 32 + 24 = 100 find Base.

$$\begin{array}{r} 32 \\ +24 \\ \hline 100 \end{array}$$

Base = 6

Ex:- 127 + 276 = 425 then, 731 + 672 = (?)

$$\begin{array}{r} 127 \\ +276 \\ \hline 425 \end{array}$$

Base = 8

$$\begin{array}{r} 731 \\ +672 \\ \hline 1623 \end{array}$$ Ans

CYCLICITY

2 →	2, 4, 8, 6
3 →	3, 9, 7, 1
7 →	7, 9, 3, 1
8 →	8, 4, 2, 6

4 →	4, 6
9 →	9, 1

0, 1, 5, 6 have no cyclicity.

Ex:-(i) 3^{323}

⇒ 4) 323 (8
32
× × (3)

unit digit $= 3^3$
⇒ 27 = 7 Ans

(ii) 14^{49}

⇒ 2) 49 (24
48
× (1)

unit digit $= 14^1$
⇒ $4^1 = 4$ Ans

FACTORIAL

Ex:- $\dfrac{100!}{3^n}$ find 'n'

⇒ 100! = [1×2×3× ---- 100]

$\frac{100}{3} = 33$

$\frac{33}{3} = 11$

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

$\frac{3}{3} = 1$

n = 33 + 11 + 3 + 1 = 48 Ans

Ex:- 1! + 2! + ---- 99! unit digit = ?

⇒ 1! = 1, 2! = 1×2 = 2, 3! = 1×2×3 = 6
4! = 1×2×3×4 = 24, 5! = 1×2×3×4×5 = 120

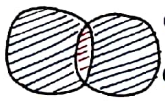
⇒ 1! + 2! + 3! + 4! = 1 + 2 + 6 + 24 = 33

Ex:- 100! end with how many zero.

⇒ 5×2 = 10 ⇒ $\dfrac{100!}{5^n}$ ⇒ n = 24
zero generate

i.e 24 zero

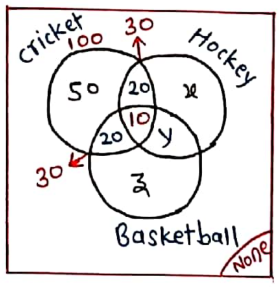
SET THEORY



- $n(A \cup B) = [n(A) + n(B)] - [n(A \cap B)]$
- $n(A \cup B \cup C) = [n(A) + n(B) + n(C)] - [n(A \cap B) + n(B \cap C) + n(A \cap C)] + [n(A \cap B \cap C)]$

A (or) B	A 'and' B
⇓	⇓
$A \cup B$	$A \cap B$

#



- Exactly 1 of games = 50 + x + z
- Exactly 2 " " = 20 + 20 + y
- Atleast 2 " " = 20 + 20 + y + 10
- Any of 3 games (or)
- $n(A \cup B \cup C)$ (or)
- Atleast one of the 3 games

= 100 + x + y + z

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