

9. CONDEMN is coded as CNODMEN. Then TEACHER is coded as?

CONDEMN
~~C N O D M E N~~

TEACHER
~~T A E C E H R~~

14. RAIN is
? # 8@.

RA
⑧\$

Direct coding

10. COMPUTRONE is coded as PMOCTUENOR. Then ADVANTAGES is coded as?

COMPUTRONE
~~P M O C T U E N O R~~
inter change

ADVANTAGES
~~A V D A T N S E G A~~

15. CHAR
is coded
coded
CHA
\$ 54

11. COMPUTER is coded as RFUVQNPC. How is MEDICINE coded as?

COMPUTER
~~R F U V Q N P C~~
+ + + + + + + -

M E D I C P N E
~~M E D I C P N E~~
E O J D J E F M

16. E = 5

12. DISTANCE is written as IDTUBECN and DOCUMENT is written as ODDVN TNE. How is THURSDAY written?

DISTANCE
~~I D T U B E C N~~
+ +

DOCUMENT
~~O D D V N T N E~~
+ +

17. O = 1
↓
15 + 1

THURSDAY
~~H T V S T Y A D~~
+ +

13. RED is coded as 6720, then GREEN is coded as 1554. RED
as 1554
RED
6 7 2 0

4 5 18
D E R
+ 2 + 2 + 2
16 7 7 20

GREEN

14 5 5 18 7
N E E R G
+ 2 + 2 + 2 + 2
16 7 7 20 9

18. Num
Co
Cond
(i) first
(ii) fir
(iii) (a)

$\begin{array}{r} 37 \ 38 \ 39 \ 40 \\ -26 -26 -24 -26 \\ \hline 11 \ 12 \ 13 \ 14 \\ \text{E L M N Y} \end{array}$

only called elements
 letters / numbers / symbols

for the code for

INTER
 | +1 +1 |
 I O U E R

is written as
written in

LB and
will be

- 4) In a certain language, SIGHT is written as FVTUG. How is REVEAL written in same language.

$\begin{array}{r} 17 \ 9 \ 7 \ 8 \ 20 \\ \text{SIGHT} \\ +13 +13 +13 +13 \\ \hline 32 \ 26 \ 20 \ 21 \ 7 \\ \text{F V T U G} \\ 32-26 \qquad 33=26 \end{array}$

$\begin{array}{r} 11 \ 5 \ 11 \ 5 \ 11 \ 12 \\ \text{R E V E A L} \\ +13 \\ \hline 31-26 \ 35-26 \\ 5 \ 18 \ 9 \end{array}$

- 5) MIRACLE is coded as NKUEHRL, then

GAMBLE codes as?

$\begin{array}{r} 13 \ 9 \ 18 \ 1 \ 3 \ 12 \ 5 \\ \text{MIRACLE} \\ +1 \ +2 \ +3 \ +4 \ +5 \ +6 \ +7 \\ \hline 14 \ 11 \ 21 \ 5 \ 8 \ 18 \ 12 \\ \text{N K U E H R L} \end{array}$

$\begin{array}{r} 9 \ 1 \ 13 \ 2 \ 12 \ 5 \\ \text{G A M B L E} \\ +1 +2 +3 +4 +5 +6 \\ \hline 8 \ 3 \ 16 \ 6 \ 11 \end{array}$

- 6) POND is coded as RSTL, then HEAR is

coded as?

$\begin{array}{r} 16 \ 15 \ 14 \ 4 \\ \text{P O N D} \\ +2 \ +4 \ +6 \ +8 \\ \hline 18 \ 19 \ 20 \ 12 \\ \text{R S T L} \end{array}$

$\begin{array}{r} 8 \ 5 \ 1 \ 18 \\ \text{H E A R} \\ +2 +4 +6 +1 \\ \hline 10 \ 9 \ 7 \ 26 \\ \text{J I G Z} \end{array}$

- 7) INACTIVE is coded as VITCANDE. Then COMPUTER is coded as?

IN A C T I V E
 |
 V I T C A N D E

COMPUTER
 |
 E T M P M O C R

- 8) CAT is coded as SATC and DEAR is coded as SEARD. Then SING is coded as

CAT
 | +10
 SATC
 adding S to every word

DEAR
 |
 SEARD

SING
 |
 SINGS
 extra letter

- 25) EIGHTY : GTEYTH :: OUTPUT : ?
REV ↗ EV ↗ TUOTUF ↗
- 26) ? : ΦEHMDF : WIDELG : HVCOKXK
+ FRIN6E ↗ + b6X ↗ +
23 9 4 5 12 25
- 27) MULTAN ↗ OUOTEN :: PURIFY : ?
OJOTEN ↗ UVUTY ↗
- 28) FRESEND : FPTBN 2 :: MENTOR : ?
FPTBN ↗ 1-2|3|-4 ↗
FPTBN ↗ MNGON ↗
FPTBN ↗ 3 ↗ N ↗ 14
- 29) PARK : QZSJ :: TANK : ?
PARK ↗ 16|15|14 ↗
+ QZSJ ↗ +|-+|- ↗
15 26 11 10
- = 35
35-26
P
- 30) CIRCLE : RJCELC :: SQUARE : ?
PER ↗ PER ↗ UGSER ↗
- 31) MAN : LNZBMO :: SBN : ?
- LNZBMO ↗ R ↗ T ↗ M ↗ O ↗
- LNZBMO ↗ +|-+|-+| ↗
- RJTVMO ↗ RJTVMO ↗
- 32) SET : QUCCRN :: HAT : ?
SET ↗ QUCCRN ↗ HAT ↗
SET ↗ -2|3+1622 ↗ K ↗ O ↗ C ↗ R ↗ V ↗
-2 + 2 - 2 + 16 - 2 + 2
- K O Y C R V ↗
- 33) BUCKET : ACTVBDJLDFSU :: BONUS : ?
BUCKET ↗ -1+1 ↗ ACNPMTVRT ↗

$$18) 42 : 56 :: ? : 9 \times 10 - (90)$$

$$19) 0.16 : 0.0016 :: 1.02 : ?$$

Point is moved towards left two places

$$0.0102 \sim$$

$$20) SL : PT :: LP : ? \sim TM$$

$$\begin{array}{r} 19 & 12 \\ S & L \\ -3 & P \\ \hline 16 & 9 \end{array}$$

$$\begin{array}{r} 12 & 16 \\ 2 & P_3 \\ -3 & H \\ \hline 9 & 13 \end{array}$$

$$21) TS : PP :: JT : ? \neq Q \sim$$

$$\begin{array}{r} -3 & +15 \\ 12 & 10 \\ \hline 15 \end{array} -3$$

$$22) LG : AV :: TM : ?$$

$$\begin{array}{r} 15+13 & 15+20 \\ 26-26 & 35-26 \\ \hline B & T \end{array}$$

$$\frac{27}{26} = 1$$

$$\begin{array}{r} 27 \\ +15 \\ \hline 34 \end{array} \frac{12}{16}$$

$$16 18 20 22$$

$$23) SWY : LPTX :: PRTV : ?$$

$$\begin{array}{r} 19 & 21 & 23 & 25 \\ 7 & 5 & 3 & -1 \\ \hline 16 & 20 & 24 \end{array}$$

$$\begin{array}{r} 14 & 13 & 17 & 21 \\ 12 & 16 & 18 & \end{array}$$

$$24) BCDE :: DFHI :: ? \neq JLNK$$

$$\begin{array}{r} 23 & 45 \\ 2 & 2 \\ \hline 46 & 810 \end{array}$$

$$\begin{array}{r} 6789 \\ +677+877 \\ \hline 8789 \end{array}$$

LNP \sim Original logic

$$25) \frac{EIGHTY}{M} \leftarrow ? :$$

$$26) ? : +1$$

$$27) \frac{MULT}{M} \leftarrow ? :$$

$$28) \frac{FIVE}{PFB} \leftarrow ? :$$

$$29) \frac{CIRCUIT}{PFB} \leftarrow ? :$$

$$30) \frac{ROW}{ROW} \leftarrow ? :$$

$$31) \frac{MAN}{LNU} \leftarrow ? :$$

$$32) \frac{SET}{SET} \leftarrow ? :$$

$$33) \frac{S}{S} \leftarrow ? :$$

$$\text{Ques: } \begin{array}{l} \text{BD}, \text{DGK}, \text{HMS}, \text{HTB}, \text{SBL}, \\ \text{DB}, \text{EGF}, \text{HKL}, \text{LPQ}, \text{ZK} \end{array}$$

$$\begin{array}{l} \text{Ans: } 25 : 37 \\ \text{BD} : \text{DGK} : \text{HMS} : \text{HTB} : \text{SBL} : \text{ZK} \\ 1 : 2 : 3 : 4 : 5 : 6 \end{array}$$

$$\begin{array}{l} \text{Ans: } 25 : 37 \\ \text{BD} : \text{DGK} : \text{HMS} : \text{HTB} : \text{SBL} : \text{ZK} \\ 1 : 2 : 3 : 4 : 5 : 6 \end{array}$$

$$2, 6, 11, 12, 24 \Rightarrow X$$

$$+4 +3 +5 +6 +7$$

Ans: KQVX

numbers
letters

(4) $\begin{array}{c} 2, X, J, W, K, V, L, ? \\ 9 \quad 24 \quad 10 \quad 23 \quad 11 \quad 22 \quad 12 \quad 21 \end{array}$ Ans: - $\cup +1$

(5) $\begin{array}{c} B, G, P, C, +, Q, D, \Sigma, R, E, T, S, ?, ? \\ +1 \quad +1 \end{array}$

(6) $\begin{array}{c} F, K \\ + \quad +1 \end{array}$ Ans: $\begin{array}{c} BO, CP, DO, ? \\ +1 \quad +1 \quad +1 \quad +1 \end{array}$ ER

(7) Ans: - $\begin{array}{c} ER \\ +4 \end{array}$ DF, GJ, KW, NO, RT, ?, UX

(8) Ans: - $\begin{array}{c} UX \\ +6 \end{array}$ BE, GK, MK, NK, RT, ?, BT

(9) $\begin{array}{c} 28 - 26 = 2 \\ 35 - 28 = 7 \\ +6 \quad +7 \end{array}$

(Bw)

Schrod
Score,

$$\begin{array}{l}
 \text{Ans: } B^T \\
 \text{⑥ } ACD, EGH, OLP, UOT \\
 \frac{1}{3} \frac{1}{4} \frac{1}{5} \frac{1}{6} \frac{1}{12} \frac{1}{16} \frac{1}{20} \\
 \text{A, E } \textcircled{1} \quad 0 \quad 0 \\
 3, 6, \frac{1}{7} \quad 12, 15 \\
 +3 \quad +3 \\
 \hline
 \end{array}$$

$$\begin{array}{l}
 \text{Ans: } B^T \\
 \text{⑦ } YEB^T, WFD, UKG, QOL \\
 \frac{1}{5} \frac{1}{5} \frac{1}{6} \frac{1}{8} \frac{1}{12} \frac{1}{16} \frac{1}{23} \\
 \text{+2} \quad +3 \quad +2 \quad +3 \\
 \text{+2} \quad +3 \quad +2 \quad +3 \\
 \hline
 \end{array}$$

Letter Series

Letters & Numbers

pairs of letters

A B C D E F G H I J K L M N O P Q R S T U
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
 W X Y Z
 23 24 25 26

Pairs of letters:-

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Z	X	Y	Z																		
26	25	24	23																		

A Z H S
 B Y I R
 C X J Q
 D W K P
 E V L O
 I U M N
 G T

pair

Jack Queen
 Pawan Palayam PK | Kevin Peterson Indian Railways
 Infared Rays

Middle letters (MN)

10 VE
 pair

Aus-B2

④ Q Y, J, X, I, P, U

⑤ Q Y, J, X, I, P, U

⑥ Q Y, J, X, I, P, U

⑦ Q Y, J, X, I, P, U

⑧ Q Y, J, X, I, P, U

⑨ Q Y, J, X, I, P, U

⑩ Q Y, J, X, I, P, U

⑪ Q Y, J, X, I, P, U

⑫ Q Y, J, X, I, P, U

⑬ Q Y, J, X, I, P, U

⑭ Q Y, J, X, I, P, U

⑮ Q Y, J, X, I, P, U

⑯ Q Y, J, X, I, P, U

⑰ Q Y, J, X, I, P, U

⑱ Q Y, J, X, I, P, U

⑲ Q Y, J, X, I, P, U

⑳ Q Y, J, X, I, P, U

㉑ Q Y, J, X, I, P, U

㉒ Q Y, J, X, I, P, U

㉓ Q Y, J, X, I, P, U

㉔ Q Y, J, X, I, P, U

㉕ Q Y, J, X, I, P, U

㉖ Q Y, J, X, I, P, U

㉗ Q Y, J, X, I, P, U

㉘ Q Y, J, X, I, P, U

㉙ Q Y, J, X, I, P, U

㉚ Q Y, J, X, I, P, U

㉛ Q Y, J, X, I, P, U

㉜ Q Y, J, X, I, P, U

㉝ Q Y, J, X, I, P, U

㉞ Q Y, J, X, I, P, U

㉟ Q

2 prime numbers
⑪ 213, 517, 1113, 1319, ?, 2329

- a) 2329 b) 1824 c) 1921 d) 2023

⑫ 90, 180, 12, 50, 400, 200, ?, 3 \times 50, 4 \times 25, 2 \times 10, 3 \times 30, 1 \times 150
a) 120 b) 130 c) 140 \rightarrow 150

⑬ $11 \frac{1}{9}, 12 \frac{1}{2}, 14 \frac{2}{7}, 16 \frac{2}{3}, ?$

- a) 25 b) 15 \rightarrow 20 d) 30

$$\frac{100}{9}, \frac{25 \times 4}{2 \times 4}, \frac{100}{2^2}, \frac{50}{3 \times 2}$$

$$\frac{100}{9}, \frac{100}{8}, \frac{100}{6}, \frac{100}{5} \Rightarrow 20$$

⑭ 49, 121, 69, 289, 361, ? (consecutive primes)
a) 484 b) 529 c) 441 d) 625

⑮ 6, 15, 35, 77, 143, 221, ?

- a) 289 b) 304 c) 323 d) 346

$$11^3, 11, 17^2, 12, 21^2, 13, ? 14^2$$

⑯ 2744, 14, 3125, 15

$$2^3 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8, 72, 360, ?$$

⑰ 3, 3, 6, 18, 72, 360, ?

- a) 1848 b) 720 c) 2160 d) 1080

$$\frac{3}{2} \times \frac{3}{3} \times \frac{6}{6} \times \frac{18}{18} \times \frac{72}{72} \times \frac{360}{360}$$

⑱ 1806, 420, 630, 714

⑲ 6, 15, 35, 77, 143, 221, ? 17×19
 $2 \times 3, 3 \times 5, 5 \times 7, 7 \times 11, 11 \times 13, 13 \times 17$
a) 289 b) 304 c) 323 d) 346

$$\frac{42}{2} \times \frac{1}{1} \times \frac{6}{3} \times \frac{14}{7} \times \frac{21}{11} \times \frac{19}{13} \times \frac{1}{17}$$

⑳ $3^2, 4^2, 5^2, [1, 5^2 + 1^2, 13], 2^2, 24, 25, 8^2 + 5^2, ?$
a) 18 b) 19 c) 16 d) 17

㉑ 4, 5, 3
a) 265

$$4n+1 = 5 \\ 5n-2 = 8 \\ 8n+3 = 23 \\ 23n-4 = 65$$

㉒ 5, 12, 21
a) 34
 $2+3 = 5+7$

㉓ 11, 31

a) 11 regular
b) 31

㉔ 35, 43

a) diff
b) 529
c) 12

$$\begin{array}{r} 1^2 \\ 2^2 \\ 2^2 \times 3^2 \\ 2^2 \times 5^2 \\ 2^2 \times 7^2 \\ 2^2 \times 11^2 \\ 2^2 \times 13^2 \\ 2^2 \times 17^2 \\ 2^2 \times 19^2 \\ 2^2 \times 23^2 \\ 2^2 \times 29^2 \\ 2^2 \times 31^2 \\ 2^2 \times 37^2 \\ 2^2 \times 41^2 \\ 2^2 \times 43^2 \\ 2^2 \times 47^2 \\ 2^2 \times 53^2 \\ 2^2 \times 59^2 \\ 2^2 \times 61^2 \\ 2^2 \times 67^2 \\ 2^2 \times 71^2 \\ 2^2 \times 73^2 \\ 2^2 \times 79^2 \\ 2^2 \times 83^2 \\ 2^2 \times 89^2 \\ 2^2 \times 97^2 \\ 2^2 \times 101^2 \\ 2^2 \times 103^2 \\ 2^2 \times 107^2 \\ 2^2 \times 109^2 \\ 2^2 \times 113^2 \\ 2^2 \times 117^2 \\ 2^2 \times 121^2 \\ 2^2 \times 125^2 \\ 2^2 \times 129^2 \\ 2^2 \times 133^2 \\ 2^2 \times 137^2 \\ 2^2 \times 141^2 \\ 2^2 \times 145^2 \\ 2^2 \times 149^2 \\ 2^2 \times 153^2 \\ 2^2 \times 157^2 \\ 2^2 \times 161^2 \\ 2^2 \times 165^2 \\ 2^2 \times 169^2 \\ 2^2 \times 173^2 \\ 2^2 \times 177^2 \\ 2^2 \times 181^2 \\ 2^2 \times 185^2 \\ 2^2 \times 189^2 \\ 2^2 \times 193^2 \\ 2^2 \times 197^2 \\ 2^2 \times 201^2 \\ 2^2 \times 205^2 \\ 2^2 \times 209^2 \\ 2^2 \times 213^2 \\ 2^2 \times 217^2 \\ 2^2 \times 221^2 \\ 2^2 \times 225^2 \\ 2^2 \times 229^2 \\ 2^2 \times 233^2 \\ 2^2 \times 237^2 \\ 2^2 \times 241^2 \\ 2^2 \times 245^2 \\ 2^2 \times 249^2 \\ 2^2 \times 253^2 \\ 2^2 \times 257^2 \\ 2^2 \times 261^2 \\ 2^2 \times 265^2 \\ 2^2 \times 269^2 \\ 2^2 \times 273^2 \\ 2^2 \times 277^2 \\ 2^2 \times 281^2 \\ 2^2 \times 285^2 \\ 2^2 \times 289^2 \\ 2^2 \times 293^2 \\ 2^2 \times 297^2 \\ 2^2 \times 301^2 \\ 2^2 \times 305^2 \\ 2^2 \times 309^2 \\ 2^2 \times 313^2 \\ 2^2 \times 317^2 \\ 2^2 \times 321^2 \\ 2^2 \times 325^2 \\ 2^2 \times 329^2 \\ 2^2 \times 333^2 \\ 2^2 \times 337^2 \\ 2^2 \times 341^2 \\ 2^2 \times 345^2 \\ 2^2 \times 349^2 \\ 2^2 \times 353^2 \\ 2^2 \times 357^2 \\ 2^2 \times 361^2 \\ 2^2 \times 365^2 \\ 2^2 \times 369^2 \\ 2^2 \times 373^2 \\ 2^2 \times 377^2 \\ 2^2 \times 381^2 \\ 2^2 \times 385^2 \\ 2^2 \times 389^2 \\ 2^2 \times 393^2 \\ 2^2 \times 397^2 \\ 2^2 \times 401^2 \\ 2^2 \times 405^2 \\ 2^2 \times 409^2 \\ 2^2 \times 413^2 \\ 2^2 \times 417^2 \\ 2^2 \times 421^2 \\ 2^2 \times 425^2 \\ 2^2 \times 429^2 \\ 2^2 \times 433^2 \\ 2^2 \times 437^2 \\ 2^2 \times 441^2 \\ 2^2 \times 445^2 \\ 2^2 \times 449^2 \\ 2^2 \times 453^2 \\ 2^2 \times 457^2 \\ 2^2 \times 461^2 \\ 2^2 \times 465^2 \\ 2^2 \times 469^2 \\ 2^2 \times 473^2 \\ 2^2 \times 477^2 \\ 2^2 \times 481^2 \\ 2^2 \times 485^2 \\ 2^2 \times 489^2 \\ 2^2 \times 493^2 \\ 2^2 \times 497^2 \\ 2^2 \times 501^2 \\ 2^2 \times 505^2 \\ 2^2 \times 509^2 \\ 2^2 \times 513^2 \\ 2^2 \times 517^2 \\ 2^2 \times 521^2 \\ 2^2 \times 525^2 \\ 2^2 \times 529^2 \\ 2^2 \times 533^2 \\ 2^2 \times 537^2 \\ 2^2 \times 541^2 \\ 2^2 \times 545^2 \\ 2^2 \times 549^2 \\ 2^2 \times 553^2 \\ 2^2 \times 557^2 \\ 2^2 \times 561^2 \\ 2^2 \times 565^2 \\ 2^2 \times 569^2 \\ 2^2 \times 573^2 \\ 2^2 \times 577^2 \\ 2^2 \times 581^2 \\ 2^2 \times 585^2 \\ 2^2 \times 589^2 \\ 2^2 \times 593^2 \\ 2^2 \times 597^2 \\ 2^2 \times 601^2 \\ 2^2 \times 605^2 \\ 2^2 \times 609^2 \\ 2^2 \times 613^2 \\ 2^2 \times 617^2 \\ 2^2 \times 621^2 \\ 2^2 \times 625^2 \\ 2^2 \times 629^2 \\ 2^2 \times 633^2 \\ 2^2 \times 637^2 \\ 2^2 \times 641^2 \\ 2^2 \times 645^2 \\ 2^2 \times 649^2 \\ 2^2 \times 653^2 \\ 2^2 \times 657^2 \\ 2^2 \times 661^2 \\ 2^2 \times 665^2 \\ 2^2 \times 669^2 \\ 2^2 \times 673^2 \\ 2^2 \times 677^2 \\ 2^2 \times 681^2 \\ 2^2 \times 685^2 \\ 2^2 \times 689^2 \\ 2^2 \times 693^2 \\ 2^2 \times 697^2 \\ 2^2 \times 701^2 \\ 2^2 \times 705^2 \\ 2^2 \times 709^2 \\ 2^2 \times 713^2 \\ 2^2 \times 717^2 \\ 2^2 \times 721^2 \\ 2^2 \times 725^2 \\ 2^2 \times 729^2 \\ 2^2 \times 733^2 \\ 2^2 \times 737^2 \\ 2^2 \times 741^2 \\ 2^2 \times 745^2 \\ 2^2 \times 749^2 \\ 2^2 \times 753^2 \\ 2^2 \times 757^2 \\ 2^2 \times 761^2 \\ 2^2 \times 765^2 \\ 2^2 \times 769^2 \\ 2^2 \times 773^2 \\ 2^2 \times 777^2 \\ 2^2 \times 781^2 \\ 2^2 \times 785^2 \\ 2^2 \times 789^2 \\ 2^2 \times 793^2 \\ 2^2 \times 797^2 \\ 2^2 \times 801^2 \\ 2^2 \times 805^2 \\ 2^2 \times 809^2 \\ 2^2 \times 813^2 \\ 2^2 \times 817^2 \\ 2^2 \times 821^2 \\ 2^2 \times 825^2 \\ 2^2 \times 829^2 \\ 2^2 \times 833^2 \\ 2^2 \times 837^2 \\ 2^2 \times 841^2 \\ 2^2 \times 845^2 \\ 2^2 \times 849^2 \\ 2^2 \times 853^2 \\ 2^2 \times 857^2 \\ 2^2 \times 861^2 \\ 2^2 \times 865^2 \\ 2^2 \times 869^2 \\ 2^2 \times 873^2 \\ 2^2 \times 877^2 \\ 2^2 \times 881^2 \\ 2^2 \times 885^2 \\ 2^2 \times 889^2 \\ 2^2 \times 893^2 \\ 2^2 \times 897^2 \\ 2^2 \times 901^2 \\ 2^2 \times 905^2 \\ 2^2 \times 909^2 \\ 2^2 \times 913^2 \\ 2^2 \times 917^2 \\ 2^2 \times 921^2 \\ 2^2 \times 925^2 \\ 2^2 \times 929^2 \\ 2^2 \times 933^2 \\ 2^2 \times 937^2 \\ 2^2 \times 941^2 \\ 2^2 \times 945^2 \\ 2^2 \times 949^2 \\ 2^2 \times 953^2 \\ 2^2 \times 957^2 \\ 2^2 \times 961^2 \\ 2^2 \times 965^2 \\ 2^2 \times 969^2 \\ 2^2 \times 973^2 \\ 2^2 \times 977^2 \\ 2^2 \times 981^2 \\ 2^2 \times 985^2 \\ 2^2 \times 989^2 \\ 2^2 \times 993^2 \\ 2^2 \times 997^2 \\ 2^2 \times 1001^2 \\ 2^2 \times 1005^2 \\ 2^2 \times 1009^2 \\ 2^2 \times 1013^2 \\ 2^2 \times 1017^2 \\ 2^2 \times 1021^2 \\ 2^2 \times 1025^2 \\ 2^2 \times 1029^2 \\ 2^2 \times 1033^2 \\ 2^2 \times 1037^2 \\ 2^2 \times 1041^2 \\ 2^2 \times 1045^2 \\ 2^2 \times 1049^2 \\ 2^2 \times 1053^2 \\ 2^2 \times 1057^2 \\ 2^2 \times 1061^2 \\ 2^2 \times 1065^2 \\ 2^2 \times 1069^2 \\ 2^2 \times 1073^2 \\ 2^2 \times 1077^2 \\ 2^2 \times 1081^2 \\ 2^2 \times 1085^2 \\ 2^2 \times 1089^2 \\ 2^2 \times 1093^2 \\ 2^2 \times 1097^2 \\ 2^2 \times 1101^2 \\ 2^2 \times 1105^2 \\ 2^2 \times 1109^2 \\ 2^2 \times 1113^2 \\ 2^2 \times 1117^2 \\ 2^2 \times 1121^2 \\ 2^2 \times 1125^2 \\ 2^2 \times 1129^2 \\ 2^2 \times 1133^2 \\ 2^2 \times 1137^2 \\ 2^2 \times 1141^2 \\ 2^2 \times 1145^2 \\ 2^2 \times 1149^2 \\ 2^2 \times 1153^2 \\ 2^2 \times 1157^2 \\ 2^2 \times 1161^2 \\ 2^2 \times 1165^2 \\ 2^2 \times 1169^2 \\ 2^2 \times 1173^2 \\ 2^2 \times 1177^2 \\ 2^2 \times 1181^2 \\ 2^2 \times 1185^2 \\ 2^2 \times 1189^2 \\ 2^2 \times 1193^2 \\ 2^2 \times 1197^2 \\ 2^2 \times 1201^2 \\ 2^2 \times 1205^2 \\ 2^2 \times 1209^2 \\ 2^2 \times 1213^2 \\ 2^2 \times 1217^2 \\ 2^2 \times 1221^2 \\ 2^2 \times 1225^2 \\ 2^2 \times 1229^2 \\ 2^2 \times 1233^2 \\ 2^2 \times 1237^2 \\ 2^2 \times 1241^2 \\ 2^2 \times 1245^2 \\ 2^2 \times 1249^2 \\ 2^2 \times 1253^2 \\ 2^2 \times 1257^2 \\ 2^2 \times 1261^2 \\ 2^2 \times 1265^2 \\ 2^2 \times 1269^2 \\ 2^2 \times 1273^2 \\ 2^2 \times 1277^2 \\ 2^2 \times 1281^2 \\ 2^2 \times 1285^2 \\ 2^2 \times 1289^2 \\ 2^2 \times 1293^2 \\ 2^2 \times 1297^2 \\ 2^2 \times 1301^2 \\ 2^2 \times 1305^2 \\ 2^2 \times 1309^2 \\ 2^2 \times 1313^2 \\ 2^2 \times 1317^2 \\ 2^2 \times 1321^2 \\ 2^2 \times 1325^2 \\ 2^2 \times 1329^2 \\ 2^2 \times 1333^2 \\ 2^2 \times 1337^2 \\ 2^2 \times 1341^2 \\ 2^2 \times 1345^2 \\ 2^2 \times 1349^2 \\ 2^2 \times 1353^2 \\ 2^2 \times 1357^2 \\ 2^2 \times 1361^2 \\ 2^2 \times 1365^2 \\ 2^2 \times 1369^2 \\ 2^2 \times 1373^2 \\ 2^2 \times 1377^2 \\ 2^2 \times 1381^2 \\ 2^2 \times 1385^2 \\ 2^2 \times 1389^2 \\ 2^2 \times 1393^2 \\ 2^2 \times 1397^2 \\ 2^2 \times 1401^2 \\ 2^2 \times 1405^2 \\ 2^2 \times 1409^2 \\ 2^2 \times 1413^2 \\ 2^2 \times 1417^2 \\ 2^2 \times 1421^2 \\ 2^2 \times 1425^2 \\ 2^2 \times 1429^2 \\ 2^2 \times 1433^2 \\ 2^2 \times 1437^2 \\ 2^2 \times 1441^2 \\ 2^2 \times 1445^2 \\ 2^2 \times 1449^2 \\ 2^2 \times 1453^2 \\ 2^2 \times 1457^2 \\ 2^2 \times 1461^2 \\ 2^2 \times 1465^2 \\ 2^2 \times 1469^2 \\ 2^2 \times 1473^2 \\ 2^2 \times 1477^2 \\ 2^2 \times 1481^2 \\ 2^2 \times 1485^2 \\ 2^2 \times 1489^2 \\ 2^2 \times 1493^2 \\ 2^2 \times 1497^2 \\ 2^2 \times 1501^2 \\ 2^2 \times 1505^2 \\ 2^2 \times 1509^2 \\ 2^2 \times 1513^2 \\ 2^2 \times 1517^2 \\ 2^2 \times 1521^2 \\ 2^2 \times 1525^2 \\ 2^2 \times 1529^2 \\ 2^2 \times 1533^2 \\ 2^2 \times 1537^2 \\ 2^2 \times 1541^2 \\ 2^2 \times 1545^2 \\ 2^2 \times 1549^2 \\ 2^2 \times 1553^2 \\ 2^2 \times 1557^2 \\ 2^2 \times 1561^2 \\ 2^2 \times 1565^2 \\ 2^2 \times 1569^2 \\ 2^2 \times 1573^2 \\ 2^2 \times 1577^2 \\ 2^2 \times 1581^2 \\ 2^2 \times 1585^2 \\ 2^2 \times 1589^2 \\ 2^2 \times 1593^2 \\ 2^2 \times 1597^2 \\ 2^2 \times 1601^2 \\ 2^2 \times 1605^2 \\ 2^2 \times 1609^2 \\ 2^2 \times 1613^2 \\ 2^2 \times 1617^2 \\ 2^2 \times 1621^2 \\ 2^2 \times 1625^2 \\ 2^2 \times 1629^2 \\ 2^2 \times 1633^2 \\ 2^2 \times 1637^2 \\ 2^2 \times 1641^2 \\ 2^2 \times 1645^2 \\ 2^2 \times 1649^2 \\ 2^2 \times 1653^2 \\ 2^2 \times 1657^2 \\ 2^2 \times 1661^2 \\ 2^2 \times 1665^2 \\ 2^2 \times 1669^2 \\ 2^2 \times 1673^2 \\ 2^2 \times 1677^2 \\ 2^2 \times 1681^2 \\ 2^2 \times 1685^2 \\ 2^2 \times 1689^2 \\ 2^2 \times 1693^2 \\ 2^2 \times 1697^2 \\$$

$$(22) \quad 4, 5, 8, 27, 104, 525, ?$$

- a) 2650 b) 3144 c) 2845 d) 3286

$$4N+1 = 5$$

$$5 \times 2 - 2 = 8$$

$$8 \times 3 + 3 = 27$$

$$27 \times 4 - 4 = 104$$

$$104 \times 5 + 5 = 525$$

$$525 \times 6 - 6 =$$

$$(23) \quad 5, 12, 24, 36, 52, 68, ?$$

- a) 74 b) 80 c) 84 d) 76
 $2+3, 5+7, 11+13, 17+19, 23+29, 31+37$

$$(24) \quad 11, 31, 71, 91, 32, 92, 13, ? \quad 73 \quad 137$$

- a) 73 b) 93 c) 14 d) 47

11 reverse prime numbers

$$8, 5, 11, 31, 71, 91, 32, 92, 13, ?$$

$$35, 43, 50, 55, 65, 76, ?$$

- a) 92 b) 95 c) 89 d) 85

difference

$$529, 144, 385, 441, 169, 272, 324, 225, ?$$

- a) 129 b) 109 c) 119 d) 99

let \sqrt{a} is rational

$$\frac{1}{2}$$

$$\frac{2306}{183} \quad \frac{77}{231}$$

$$6^{100}$$

let $\sqrt{a} = \frac{a}{b}$ [a,bare co-primes]

$$\frac{2}{5}$$

$$\frac{1001}{777}$$

no because

squaring on both sides.

$$\frac{3}{7}$$

$$\frac{1001}{777}$$

$b \neq 0$

$b^2 \neq 0$

$$\frac{5}{15}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

it always ends with 5.

$b^2 \neq 0$

$$\frac{3}{13}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

not 0.

$b^2 \neq 0$

$$\frac{7}{13}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{13}{35}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{17}{35}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{35}{42}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{18}{24}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{2}{2}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{3}{9}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{5}{25}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{1}{1}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{125}{2560}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{17}{1139}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{187}{187}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{1309}{1309}$$

$$\frac{125}{375} \quad \frac{125}{375}$$

so it does not end

$b^2 \neq 0$

$$\frac{1309}{1309}$$

CRT classes

① 6, 12, 21, 33, ? → means missing no ? mark
then oddman out

Ans-48

② 4, 9, 25, ?, 121, 169, 289, 361

- a) 64 b) 81 c) 49 d) 100

③ 240, ?, 120, 40, 10, 2

- a) 220 b) 232 c) 256 d) 240

④ 0, 2, 8, 14, ?, 34

- a) 20 b) 18 c) 24 d) 32

⑤ 1, 1, 4, 8, 9, 27, 16, ?, ?

- a) 48 b) 64 c) 100 d) 36

⑥ 1, 2, 3, 6, 9, 18, ?, 54

- a) 24 b) 36 c) 27 d) 45

⑦ 1, 3, 4, 8, 15, 27, ?

- a) 50 b) 45 c) 64 d) 48

⑧ 2, 15, 4, 12, 6, 7, 1, ?, ? priority to prime
a) 12, 4 b) 10, 2 c) 10, 0 d) 8, 0

⑨ 165, 195, 255, 285, 345, ?, ? first priority to prime
a) 375 b) 390 c) 435 d) 420

15x11 15x13 15x17 15x19 15x23 15x29
7-1 7-1 7-1 7-1 7-1 7-1
23 3-1 4-1 7-1 8-1
7, 26, 63, 124, 215, 342, ?
a) 999 b) 728 c) 511 d) 1330

⑩ 6x2+1, 13x2+1, 25x2+1, 51x2+1, 101x2+1, 19x2+1
a) 185 b) 303 c) 213 d) 195

Find the avg of 35, 43, 45, 48, 56, 67, 70

$$\text{Avg} = \frac{35+43+45+48+56+67+70}{7} = 52$$

Find the avg of all prime numbers b/w 30 and 50

$$31, 37, 41, 43, 47.$$

$$\text{Avg} = \frac{199}{5} = 39.8$$

Find avg of 1st 81 natural numbers.

$$1, 2, 3, 4, \dots, 81$$

$$\text{Avg} = \frac{81 \times 82}{2} = 41$$

sum of 'n' natural no's
 $= n(n+1)$

$$\text{First no last no} = 81(81+1)$$

$$= \frac{81 \times 82}{2}$$

$$\text{Avg} = \frac{1+81}{2} = \frac{82}{2}$$

$$= 41$$

Find avg of squares of natural numbers (1 to 41)

$$\text{Avg} = \frac{41(41^2)(83)}{6} = 881$$

$$n^2 + (n+1)^2 + \dots + (2n)^2 = \frac{n(n+1)(2n+1)}{6}$$

Find the avg of cubes of natural numbers from 1 to 27.

$$\text{Avg} = \frac{(27^2)(28)^2}{4} \Rightarrow \frac{27 \times 28}{4} = 5292$$

$$\frac{n^2(n+1)^2}{4}$$

Find avg of odd numbers from 1 to 40?

avg of odd no's from 1 to n.

$$\text{Avg} = \frac{\text{last odd no} + 1}{2} \Rightarrow \frac{39+1}{2} = 20$$

What is the avg of even no's from 1 to 81

$$\text{Avg} = \frac{80+2}{2} = 41$$

$$\text{Avg} = \frac{\text{last even no} + 2}{2}$$

$$\frac{x+y+2}{2(x+y+2)} = 7k$$

$$\frac{1}{2} = 7k \Rightarrow \boxed{k = \frac{1}{14}},$$

Averages

$$\text{Avg} = \frac{\text{sum of observations}}{\text{No. of observations}} \Rightarrow A = \frac{S}{N}$$

Sum of observations = Avg. * No. of observations

$$\text{No. of observations} = \frac{\text{Sum of observations}}{\text{Avg.}}$$

$$\rightarrow \text{Sum of } n \text{ natural numbers} = \frac{n(n+1)}{2}$$

$$\rightarrow \text{Sum of squares of } n \text{ natural numbers} = \frac{n(n+1)(2n+1)}{6}$$

$$\rightarrow \text{Sum of cubes of } n \text{ natural numbers} = \left[\frac{n(n+1)}{2} \right]^2 = \frac{n^2(n+1)^2}{4}$$

\rightarrow The avg of 'n' numbers is 'A'. If each number is multiplied by 'k'. Then, new average = $A \times k$

Same for addition & subtraction

$$+k \quad A+k, \quad A-k$$

$$-k$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

Avg speed.

D's are equal.

$$\begin{array}{c} D \\ | \qquad | \\ S_1 \quad S_2 \\ | \qquad | \\ T_1 \quad T_2 \end{array}$$

$$\text{Avg speed} = \frac{\text{Total dist}}{\text{Tot time}}$$

$$\text{Avg speed} = \frac{D+D}{T_1+T_2} = \frac{2D}{T_1+T_2}$$

$$\begin{aligned} T_1 &= \frac{D}{S_1} \\ T_2 &= \frac{D}{S_2} \end{aligned} \Rightarrow \frac{2D}{\frac{D}{S_1} + \frac{D}{S_2}} = \frac{2D}{\frac{1}{S_1} + \frac{1}{S_2}} = \frac{2S_1 S_2}{S_1 + S_2} \parallel$$

If three distances
 $\frac{3D}{T_1+T_2+T_3} = \frac{3S_1 S_2 S_3}{S_1 + S_2 + S_3}$

Find the avg
Avg =

Find the avg
31, 37

Avg =

Find avg of

Avg

Find avg of

Avg =

Find the avg

Avg =

Find avg

avg

What is

2 rupee coin.
5. The
of 50

The sum of monthly earnings of P, Q and R is Rs. 6300 for every rupee that P earns, Q earns 80 paise and for every rupee that Q earns, R earns 90 paise. Find the monthly earnings of R.

$$\begin{array}{ccc}
 P & Q & R \\
 100 & 80 & x \\
 5x) & 4 & 4 \\
 10 & 100 & 90 \\
 \hline
 & 10 : 9 &
 \end{array}$$

$63P = 6300$
 $1P = 100/-$
 $R = 18 \times 100 = 1800/-$

$$\begin{array}{l}
 50 : 40 : 36 \\
 R \Rightarrow \boxed{25 : 20 : 18}
 \end{array}$$

The ratio of incomes of A and B is $4:5$, the ratio of expenditure is $6:7$. Find the ratio of savings, if A saves $\frac{1}{6}$ th of his income.

$$\begin{array}{c}
 \text{In } 4 : 5 = 400 \quad 500 \leftarrow \\
 \text{exp } 6 : 7 = 300 \quad 350 \\
 \hline
 \text{savings} = 100 : 150 \\
 \Rightarrow 2 : 3
 \end{array}$$

The incomes of A & B are in ratio 3:2 and their expenditure is 5:3. If each saves Rs. 2000, then find their incomes.

Their incomes.

A	B	$S_A = S_B$	$\text{Saving} = \text{Income}$ Expenditure.
$3x - 3y$	$2x - 5y$	$3x - 5y = 2x - 3y$	
$exp - 5y$	$3y$	$x = 2y$	$3x - 5y = 2000$

$$3x - 5y = 2000$$

$$3x - 5y = 2000$$

$$2y = 2000$$

$$y = 1000$$

$$x = 2 \times 1000$$

$$x = 2000$$

If $\frac{x}{y+z} = \frac{y}{x+z} = \frac{z}{y+k} = 7k$, then find value of k.

$$\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \dots \quad \frac{a+c+e+\dots}{b+d+f+\dots}$$

- 8 In a bag there are 50 paise, 1 rupee and 2 rupees only. The ratio of the number of coins is 2 : 3 : 5. The total amount in the bag is Rs. 70. Find no. of 50 paise coins.

Coin Denominations 0.50R 1R 2R

$$\begin{array}{l} \text{Coins} \quad 2 : 3 : 5 \\ \text{Coin per 50 paise} \quad 1R \quad 2R \\ \text{No. of coins} \quad 2 : 3 : 5 \\ \text{Total amount} \quad 1 : 3 : 10 \end{array}$$

$$\boxed{\text{Total Amount} = \text{Deno} \times \text{no. of coins}}$$

$$\begin{aligned} 14P &= 70 & 1 \times 5 &= 5 \text{ RS} \\ P &= 5 \end{aligned}$$

No. of coins = $\frac{\text{Total Am}}{\text{Deno}} = \frac{5}{0.5} = 10$

50P	10
1P	15
2P	25

In a bag for every 2 notes of 100₹, there are 5 notes of Rs. 50. For every 3 notes of Rs. 50, there are 4 notes of Rs. 10. If the value of Rs. 50 notes is 2250, find the total value of money in the bag.

$$\begin{array}{c} \text{Deno} \rightarrow 100 \quad | \quad 50 \quad | \quad 10 \\ \times \left(\begin{array}{c} 2 \\ 3 \\ 3 \end{array} \right) \quad \left(\begin{array}{c} 5 \\ 5 \\ 3 \end{array} \right) \quad \left(\begin{array}{c} 10 \\ 5 \\ 4 \end{array} \right) \\ \text{Notes Ratio} \Rightarrow 6 : 15 : 20 \end{array}$$

$JA = D \cdot N \times \text{Notes}$

$$\text{Total Amount} = 600 : 750 : 200$$

$$750P = 2250$$

$$1P = 3$$

$$\begin{array}{rcl} 600 \times 3 & 750 \times 3 & 200 \times 3 \\ 1800 & + 2250 & \text{Total Amount} \\ & + 600 & \Rightarrow 4650 \end{array}$$

The sum of mon
every rupee that
every rupee that
monthly earning

$$P:Q:R \Rightarrow$$

The ratio of
expenditure is
 $\frac{1}{4}$ of his inc

In 4 :
exp 6 :
savings

The incomes
expenditure is
their incomes

$$(\text{Income}) A \Rightarrow 3 \times 4$$

$$I f \frac{x}{y+z}$$

5 is
becomes
red in que

→ 1528
= 91
= 5 × 91
b = 955

660 m
1/k.

and c
between

x48

88

336as

3rd son
third son.

The ratio of three numbers is 1:3:5. If the difference between the squares of 1st and 2nd is 200, then find the 3rd number.

$$S = 3 \times 5 = 15 \\ \text{Second no} = 15$$

$$\begin{array}{r} F S T \\ 1 : 3 : 5 \\ \hline \text{square} 1 : 9 : 25 \end{array}$$

$$\text{diff } \Rightarrow 8p = 200 \\ 8p = 25 \Rightarrow p = \sqrt{25} \\ 1p = 5$$

There are 3 positive numbers in the ratio 3:4:5. If the sum of their squares is 1800, find the greatest among them.

$$\begin{array}{r} F S T \\ 3 : 4 : 5 \\ \hline \text{square} 9 : 16 : 25 \end{array}$$

$$\text{greatest number} = 5 \times 6 \\ = 30$$

$$80 \text{ sq p} \rightarrow \frac{1800}{36} \\ 16p = 36 \Rightarrow \sqrt{36} \\ p = 6$$

A, B and C play cricket. The ratio of A's runs to B's runs and B's runs to C's runs is 3:2 each. Altogether they score 342 runs. How many runs does B score?

$$\begin{array}{r} A : B : C \\ 3 : 2 : 2 \\ \hline 9 : 6 : 4 \end{array}$$

$$19p = 342 \\ p = 18 \Rightarrow B = 6 \times 18 = 108 \text{ runs}$$

The no. of students in 3 sections A, B and C are in ratio 7:8:5. If 5 students are shifted from B to A, the ratio of students in their two section is interchanged. Then the no. of students in section A initially?

$$\frac{A}{B} = \frac{7x+5}{8x-5} \times \frac{8}{7}$$

$$49x + 35 = 64x - 40 \\ 15x = 75 \\ x = 5 \\ A = 7x = 7 \times 5 = 35$$

Two numbers are in the ratio of 5:6. If 5 is subtracted from each number, the ratio becomes 4:5. Then find numbers

$$\begin{aligned} 5x5 &= 25 \leftarrow \frac{5x-5}{6x-5} = \frac{4}{5} \\ 6x5 &= 30 \leftarrow 25x - 25 = 24x - 20 \\ &\quad x = 5 \end{aligned}$$

Linked in que
 15 : 20
 0 : 5
 5 : 3
 8 parts $\rightarrow 15x$
 1P = 191
 0 = 5 \times 191
 0 = 955

The ratio of between the 2nd numbers

Gopi, Abhi and Krishna share an amount of 660 in the ratio of 3:4:5. What are shares of G,A,K.

$$\begin{array}{l} \text{G A K} \quad 12 \text{ parts} - 660 \\ 3:4:5 \\ 3 \times 55 \quad | \quad 4 \times 55 \quad 5 \times 55 \\ 165 \quad 220 \quad 275 \end{array}$$

There are the sum of them.

An amount of 1200 is distributed among A,B and C in the ratio of 5:7:13. What is difference between shares of B & C.

$$\begin{array}{l} \text{A B C} \quad 25P \rightarrow 1200 \\ 5:7:13 \quad P = 48 \end{array}$$

$$\begin{aligned} \text{Diff betw B & C} &= 13 - 7 = 6 \times 48 \\ &= 288 \end{aligned}$$

A father divides his property of 1,20,000 among 3 sons so that 1st son gets twice the second and 3rd son gets thrice the second, then find shares of third son.

$$\begin{array}{l} \text{F S T} \quad 6P = 120000 \\ 2:1:3 \quad P = 20000 \\ 3 \times 20,000 = 60,000 \end{array}$$

The no. 7:8:5 ratio of Then

If $A:B = \frac{1}{2} : \frac{3}{8}$, $B:C = \frac{1}{3} : \frac{5}{9}$, $C:D = \frac{5}{6} : \frac{12}{4}$ then find
 $A:B:C:D$.

$$\begin{array}{c|c|c|c} A & B & C & D \\ \hline 4 & 3 & 3 & 3 \\ \hline 3 & 3 & 5 & 5 \\ \hline 10 & 10 & 10 & 9 \\ \hline 4 \times 8 \times 6 & 3 \times 5 & 3 \times 8 \times 9 & \\ \hline & 15 & 15 & \\ \hline & 4 & 4 & \end{array}$$

$$8:6:10:9$$

$$A:B:C:D$$

If $A:B = 8:15$, $B:C = 5:8$, $C:D = 4:5$

then find $A:D$

$$\begin{array}{c|c|c|c} A & B & C & D \\ \hline 8 & 15 & 15 & 15 \\ \hline 5 & 5 & 8 & 8 \\ \hline 4 & 4 & 4 & 5 \\ \hline 8 \times 5 \times 4 & & 15 \times 8 \times 5 & \\ \hline & 4 & 15 & \\ \hline & 2 & 3 & \\ \hline & 10 & & \end{array}$$

$$A:D$$

shortcut
 $A:D$
product of 1st terms product of last terms
 $8 \times 5 \times 4 : 15 \times 8 \times 5$
 $4:15$

If $\frac{A}{3} = \frac{B}{4} = \frac{C}{5}$ then $A:B:C$

$$\frac{A}{3} = \frac{B}{4} = \frac{C}{5} = k$$

$$A=3k \quad B=4k \quad C=5k$$

$$3k:4k:5k$$

$$3:4:5$$

$$\rightarrow A:B:C$$

If $2A = 3B = 4C$, then find $A:B:C$

$$2A = 3B = 4C$$

$$A:B \rightarrow 3:2$$

$$B:C = 4:3$$

shortcut

$$\begin{array}{c|c|c} A & B & C \\ \hline 3 & 2 & 2 \\ \hline 4 & 4 & 3 \\ \hline 12 & 8 & 6 \\ \hline B:4:3 & & \end{array}$$

$$\frac{k}{2} : \frac{k}{3} : \frac{k}{4}$$

$$12 \times \frac{1}{2} : \frac{12}{3} : \frac{12}{4} = 6:4:3$$

If $2A = 3B = 4C$

$$B = 2k$$

$$4k$$

$$\frac{A}{C}$$

$$A$$

If $x:y = 7:8$

power $x =$

y

Degrees of N.Y

Degree of D.Y

If they directly

check powers first

If $a:b$

If $2A = 3B$ & $4B = 5C$ find $A:C$

$$B = \frac{2A}{3}$$

$$4 \times \frac{2A}{3} = 5C$$

$$\frac{A}{C} = \frac{15}{8}$$

$$A:C = 15:8$$

$$A:B = 3:2$$

$$B:C = 5:4$$

A	B	C
3	2	2
5	5	4
5×3	2×4	
15	8	

prod of cst
term : prod
of last
terms

$$\Rightarrow 15:8$$

If $x:y = 7:8$, find $(4x+5y):(8x-5y)$

$$\begin{aligned} x &= 7k \quad \text{common factors} \\ y &= 8k \\ \text{Degrees of NR} &= \frac{4x+5y}{8x-5y} = \frac{1}{1} \quad \frac{(4x7k+5x8k)}{(8x7k)-(5x8k)} = \frac{28k+40k}{56k-40k} = \frac{17}{12} \\ \text{Degree of DR} &= \frac{4x+5y}{8x-5y} = 17:12 \end{aligned}$$

If they are equal

directly substitute x & y values
in expression.

check
powers
first

$$\frac{4x7+5x8}{8x7-5x8} = 17/12$$

If $a:b = 3:2$, then find i) $(a^{\tilde{}}+b^{\tilde{}}):(a^{\tilde{}}-b^{\tilde{}})$
ii) $(a^{\tilde{}}+b^{\tilde{}}):(a+b)$

$$\frac{a^{\tilde{}}+b^{\tilde{}}}{a^{\tilde{}}-b^{\tilde{}}} = \frac{2}{2}$$

$$\frac{a^{\tilde{}}+b^{\tilde{}}}{a+b} = \frac{2}{12} \neq$$

$$\frac{3^{\tilde{}}+2^{\tilde{}}}{3^{\tilde{}}-2^{\tilde{}}} = \frac{9+4}{9-4} = \frac{13}{5}$$

can't be determined

$$\frac{(3k)^{\tilde{}}+(2k)^{\tilde{}}}{3k+2k} = \frac{13k^{\tilde{}}}{5k} = \frac{13k}{5}$$

$$13k:5$$

until 'k' value
is known
so it is not
determined

Two numbers are in the ratio 2:3. If 4 is added to both the numbers, their ratio changes to 5:7. Then find the greater number.

$$\begin{array}{l} \text{smallest} = 2x \\ \text{largest} = 3x \\ \frac{2x+4}{3x+4} = \frac{5}{7} \end{array}$$

$$14x + 28 = 15x + 20$$

$$x = 28 - 20$$

$$x = 8$$

largest number = 24

Two numbers are in ratio 5:6. If 5 is subtracted from each number, the ratios become 4:5. Then find numbers.

$$\begin{array}{r} 5x-5 \\ 6x-5 \\ \hline 1 \\ 5x \end{array} \times \frac{4}{5}$$

$$25x - 25 = 24x - 20$$

$$x = 5$$

$$\begin{array}{l} 5x \Rightarrow 5 \times 5 = 25 \\ 6x \Rightarrow 6 \times 5 = 30 \end{array}$$

1st number
2nd number

Unit in ques:
Sum of 1528
Diya Shreya
5 : 3
Total 8 parts = 1528
1P = 191
Amount received by Diya =
 $D = 5 \times 191$
 $= 955/-$

If $A:B = 2:3$ and $B:C = 4:5$ then find $A:B:C$

$$\begin{array}{c|c|c} A & B & C \\ \hline 2 & 3 & 3 \\ \hline 4 & 4 & 5 \\ \hline 8 & 12 & 15 \end{array}$$

If $A:B = 2:3$, $B:C = 4:5$, $C:D = 6:7$ then $A:B:C:D$

$$\begin{array}{c|c|c|c} A & B & C & D \\ \hline 2 & 3 & 3 & 3 \\ \hline 4 & 4 & 5 & 5 \\ \hline 6 & 6 & 6 & 7 \\ \hline 2 \times 4 \times 3 & 3 \times 4 \times 5 & 3 \times 5 \times 6 & 3 \times 5 \times 7 \\ \hline 16 & 24 & 30 & 35 \end{array}$$

$$16:24:30:35$$

Find third proportion to $\frac{4}{a}$ and $\frac{42}{b}$

$$c = \frac{b^2}{a} \Rightarrow \frac{42 \times 42}{4} = \frac{(42)^2}{4}$$

$$c = 441$$

Find 3rd proportion to 0.8 , 0.2

$$c = \frac{b^2}{a} \Rightarrow \frac{0.2 \times 0.2}{0.8 \times 0.2} = 0.05$$

Find mean proportion between 64 and 81

$$\text{Mean prop} \Rightarrow b = \sqrt{ac} = \sqrt{64 \times 81} \\ = 8 \times 9 \\ = 72$$

Find the mean proportional between 0.25 and 0.04

$$b = \sqrt{ac} = \sqrt{0.25 \times 0.04}$$

$$b = 0.5 \times 0.2 = 0.10$$

Two numbers are in the ratio $4:7$. The sum of those two numbers is 550 . Find two numbers.

$$F = 4 \times 50 \\ = 200$$

$$S = 7 \times 50 \\ = 350$$

$$4:7 \\ 4k \quad 7k$$

$$4k + 7k = 550 \\ 11k = 550$$

$$\boxed{k = 50}$$

Shortcut
11 parts $\rightarrow 550$
 $1p = 50$

$$F = 4 \times 50 = 200 \quad S = 7 \times 50 = 350$$

Two numbers in the ratio $7:4$. If the larger number is 81 more than the smaller number, then find 2 numbers.

$$L = S + 81$$

$$L - S = 81$$

Difference = 3 parts $\Rightarrow 7-4$

$$\Downarrow \\ 81/27$$

$$1p = 27$$

$$F = 7 \times 27 = 189$$

$$S = 4 \times 27 = 108$$

If A:B

Two numbers to both the
Then find
 $2 \times 8 = 16$ ←
smallest =
 8
 $3 \times 8 = 24$ ←
largest =

Two numbers subtracted from
then find num

$$5x \rightarrow 5 \times 5 = \\ 6x \rightarrow 6 \times 5 =$$

If A:B

proportion:-

Equality of 2 ratios (\therefore)

$a:b :: c:d \rightarrow 4^{\text{th}} \text{ pro}$
1st pro $\rightarrow 2^{\text{nd}}$ pro $\rightarrow 3^{\text{rd}}$ pro
product of extremes = product of Means

4th pro
3rd pro
2nd mean pro

$$2^{\text{nd}} \text{ pro } ad = bc$$

$$1) 4^{\text{th}} \text{ prop. } d = \frac{bc}{a} \quad a:b = b:c$$

$$\frac{ac}{a} = b^2$$

$$2) 3^{\text{rd}} \text{ pro. } c = \frac{b^2}{a}$$

$$3) 2^{\text{nd}} \text{ mean pro. } b = \sqrt{ac}$$

Variations:-

1) Direct

$$x \propto y \quad x \uparrow y \uparrow / x \downarrow y \downarrow$$

$$x \propto \frac{y}{z}$$

3) Joint variation

2) Inverse

$$x \propto \frac{1}{z}$$

$$x \uparrow z \downarrow / x \downarrow z \uparrow$$

$$x = \frac{ky}{z}$$

$$x = \frac{k}{z}$$

$$x = \frac{b}{z}$$

Then

TER
CHR
ENOR.

14. RAIN is written as \$ 1.6 and MORE is written as # 8@. How is REMAIN written in that code?

RAIN | MORE
\$ 1.6 | # 8@
Direct coding
REMAIN
↓ ↓ ↓ ↓ ↓ ↓
8 @ \$ 1.6 ✓

15. CHARCOAL is coded as 45164913 and MORALE is coded as 296137, how word ALLOCHRE is coded.

CHARCOAL MORALE ALLOCHRE
↓↓↓↓↓↓ ↓↓↓↓↓ ↓↓↓↓↓↓
45164913 296137 13394567

DIRECT CODING

16. E = 5 and HOTEL = 12, how will you code LAMB?

HOTEL LAMB Sum of digits
↓↓↓↓↓ ↓↓↓↓↓ Total No. of letters
1520512 12132 +
↓↓↓↓↓ + + +
60 → 12 28 4 = 7 ✓

17. O = 16, FOR = 42, FRONT equal to
↓↓↓↓↓ ↓↓↓↓↓
15+1=16 61518 11171
↓↓↓↓↓ ↓↓↓↓↓
39 + 3 39 6151420
↓↓↓↓↓ ↓↓↓↓↓
42 73 + 5 = 78 ✓

18. Numerals 3 5 7 4 2 6 8 10 9
Codes * B E A @ F K /. RM

Conditions

- (i) first digit and last digit is odd, both are coded as 'x'.
(ii) first digit and last digit is even, both are coded as '\$'.
(iii) last digit is 0, it is coded as '#'

a) 546839

* A F K * X ✓

Condition 1

5 18 7
E RG
2 2 2 2 2
7 7 20 9 ✓

- b) 713540 3rd condition
 E 7. * BA# ✓
- c) 765082 No condition apply
 E F B R K E
- d) 487692 2nd condition
 \$ K E F M \$
- e) 364819 1st condition
 X F A F % X

Ratio & proportion:-

Unit - I

Number System
Number Series

- II

LCM & HCF
Letter Series

- III

Ratio & Propor.
Number Analogies
(Letter Analogy)

IV

Averages
Odd man out, logical sequence
of order

Soft skills

Ratio: Comparison of 2 or more than 2 variables by division (\therefore) \rightarrow is to

$$\frac{F}{a} : \frac{S}{b} \rightarrow \text{consequent}$$

Antecedent

$$F = \frac{a}{a+b}$$

$$S = \frac{b}{a+b}$$

$$\frac{F}{a} : \frac{S}{b} : \frac{T}{c} \quad \text{common factor } F = ak$$

$$S = bk$$

$$T = ck$$

$$F : S : T$$

$$a : b : c$$

$$F = \frac{a}{a+b+c}$$

$$S = \frac{b}{a+b+c}$$

$$T = \frac{c}{a+b+c}$$

Types of Ratios:-

- 1) Duplicate Ratio: $a^n : b^n : c^n$
- 2) Sub-Duplicate $\sqrt{a} : \sqrt{b} : \sqrt{c}$
- 3) Triplicate $a^3 : b^3 : c^3$
- 4) Sub-Triplicate $\sqrt[3]{a} : \sqrt[3]{b} : \sqrt[3]{c}$
- 5) Inverse $\frac{1}{a} : \frac{1}{b} : \frac{1}{c} \rightarrow bc : ac : ab$
- 6) Compound

$a:b, c:d, e:f$

$\frac{a}{b} \times \frac{c}{d} \times \frac{e}{f}$ product of given ratios

proportion:-

Equality

$a:b :: c:d$

1st pro $\frac{a}{b}$ 2nd pro $\frac{c}{d}$

Product of extremes

2nd pro $\frac{a}{b}$

1) 4th pr

$\frac{a}{c}$

2) 3rd

3) 2nd

Variations:-

- 1) Direct

$x \propto y$

- 2) Inverse

$x \propto \frac{1}{y}$

$x = \frac{k}{y}$

1) I

$0.2 \times F = 2$

1 class not attended

Find the
original set to
reduce by

Find 4th

Five bells toll at regular intervals of 10, 15, 12 and 30 seconds respectively. If they toll together at 8:00 AM then, at what time will they all toll together for the first time after 8:00 AM?

$$8 \text{ AM} + \text{LCM}(10, 15, 12, 30) =$$

$$8 \text{ AM} + \frac{300 \text{ sec}}{100} = 8:05 \text{ AM}$$

The product of 2 numbers is 2028 and their HCF is 13. Find the number of such pairs which satisfy the above condition?

$$13x \times 12y = 2028$$

$$\text{HCF} = 1 \sqrt{1 \times 12 (1, 12)} \\ \sqrt{2 \times 6 (2, 6)} \\ \sqrt{3 \times 4 (3, 4)}$$

$\Rightarrow 2 \text{ pairs}$

or 2 pairs which chose $\rightarrow \text{HCF} = 1$

The sum of 2 numbers is 528 and their HCF is 33. Find the number of such pairs which satisfy the possible pairs

$$33x + 33y = 528$$

$$33(x+y) = 528$$

$$x+y = 16 \text{ coprime}$$

$\Rightarrow 4 \text{ pairs}$

A milkman has 75 L milk in one can and 45 L in another. Find the maximum capacity of the container which can measure milk of both containers (without leaving any milk in either case) exactly?

$$\left[\begin{array}{l} \boxed{75} \\ \boxed{45} \end{array} \right] \text{ HCF} = 15$$

$$75 \rightarrow 37+12 \text{ times } 3 \times 15 = 45$$

Maximum capacity: 15L

Q. 5 Find the greatest number which will divide 272 and 2798 so as to leave the remainder 5 in each case.

Ans Find the remainders mentioned

i) remainders mentioned
HCF $\{x_1 - R\}, \{y_1 - R\}, \{z_1 - R\}\}$

$$\text{Req. No} = \text{HCF} \{272 - 5, 2798 - 5\}$$

$$= \text{HCF} \{267, 2793\}$$

$$\begin{array}{r} 2793(3) \\ - 2301 \\ \hline 492 \\ - 472 \\ \hline 20 \end{array}$$

$$\text{HCF is } 59.$$

HCF is 59.

59 is the greatest number //

$$\begin{array}{r} 2798(1) \\ - 272 \\ \hline 576 \\ - 560 \\ \hline 16 \\ - 15 \\ \hline 1 \end{array}$$

Model question.

Q. 6 Model question on dividing 62, 132, 182.

Find the greatest number which on dividing 62, 132, 182 leaves the same remainder.

Req. No $= \text{HCF} \{x_1 - y\}, \{y_1 - z\}, \{z_1 - x\}\}$

$$\text{Req. No} = \text{HCF} \{132 - 62, 182 - 132, 62 - 132\}$$

$$= \text{HCF} \{70, 105, 175\} : \text{HCF} = 35$$

$70)105(1$
 $\underline{70})30(2$
 $\underline{30})0(0$

$$35)175(5$$

$35)175(5$
 $\underline{175})0(0$

which on dividing 152, 274, 49, leaves the same remainder.

Find the greatest number which on dividing 152, 274, 49 leaves the same remainder?

$$152)274(1$$

$$152)49(0$$

$$152)152(1$$

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$$152)152$$

$$C.D = x - R_1 \mid y - R_2 \mid z - R_3$$

$$\text{Reg No} = \text{lcm}(36, 48, 64) - 11$$

$$36 = 2^2 \times 3^2$$

$$48 = 2^4 \times 3$$

$$64 = 2^6$$

$$36 = 2^2 \times 3^2$$

$$48 = 2^4 \times 3$$

$$64 = 2^6$$

$$\text{Find the least number which when divided by } 20, 25, 35, 40 \text{ leaves remainder } 14, 19, 29, 34 \text{ respectively}$$

$$\text{Reg No} = \text{lcm}(20, 25, 35, 40) - C.D$$

$$100 \rightarrow 40 = 1400 - 6$$

$$100 \rightarrow 50 = 1394 \mid$$

$$100 \rightarrow 35 = 1394 \mid$$

$$100 \rightarrow 20 = 1394 \mid$$

$$100 \rightarrow 40 = 1394 \mid$$

Model find the least number of 4 digits which is divisible by 4, 6, 8 and 10.

Based on digits

$$\text{Reg No} = \text{least n digit number} + \text{lcm}(x, y, z) - \text{Remainder}$$

$$\begin{aligned} &= 1000 + \text{lcm}(4, 6, 8, 10) - 40 \\ &\quad (\text{least 4 digit no}) \quad = 1000 + 120 - 40 \\ &\quad (\text{P}) \quad = 1000 + 80 = 1080, \rightarrow \text{least 4 digit no.} \\ &\text{Model } \frac{\text{III} + R}{\text{model}} \rightarrow \text{same remainders} \\ &\text{Model } \frac{\text{III} + R}{\text{model}} \rightarrow \text{C.D} \end{aligned}$$

Find the least number of 5 digits which is exactly divisible by 16, 24, 36, 54?

$$\text{Reg No} = \text{least n digit no} + \text{lcm} - \text{Rem}$$

$$\begin{aligned} &= 10000 + \text{lcm}(16, 24, 36, 54) - \text{Rem} \\ &= 10000 + 432 - 64 \\ &= 10,368 \mid \end{aligned}$$

$$\begin{aligned} &16 = 2^4 \\ &24 = 2^3 \times 3 \\ &36 = 2^2 \times 3^2 \\ &54 = 2 \times 3^3 \end{aligned}$$

$$\frac{190080}{864} \rightarrow 23$$

$$\frac{1368}{432} \rightarrow 32$$

$$\text{Find the smallest 4 digit number which when divided by } 12, 18, 21 \text{ and 28 long which the remainder 3 in each case}$$

$$\begin{aligned} \text{Reg No} &= 1000 + \text{lcm}(12, 18, 21, 28) - \text{Rem} + 3 \\ &= 1000 + 252 - 244 + 3 \\ &= 1000 + 252 - 244 \mid \\ &= 1000 + 252 - 244 \mid \end{aligned}$$

$\frac{1000}{252} = 3 \frac{13}{21}$

$\frac{252}{244} = 1 \frac{3}{21}$

$\frac{244}{21} = 11 \frac{3}{21}$

$\frac{21}{13} = 1 \frac{8}{21}$

$\frac{13}{21} = 1 \frac{2}{21}$

$\frac{2}{21} = 1 \frac{1}{21}$

$\frac{1}{21} = 1 \frac{1}{21}$

First introduce the waiter to the surroundings, rest kitchen, necessary arrangements of the test kitchen family items and preparation instructions.

Communicate staff and customers.

Interact in a friend

how to greet him

him the

1300 = x_1

The LCM of two numbers is 495. Their HCF is 5. If the sum of the numbers is 100. Find their difference.

Ans)

$$5x + 5y = 495$$

$$xy = 99 \text{ product}$$

$$5(x+y) = 100$$

$$(x+y) = 20 \text{ sum}$$

$$5x = 55 - 1^{\text{st}} \text{ number}$$

$$5y = 45 - 2^{\text{nd}} \text{ number}$$

$$\Rightarrow \text{difference} \neq$$

$$55 - 45 = 10/\text{HCF}$$

$$\text{LCM} = 45 \times 10/\text{HCF}$$

$$= 90 \text{ LCM}$$

$$5x = 55 - 1^{\text{st}} \text{ number}$$

$$5y = 45 - 2^{\text{nd}} \text{ number}$$

$$\Rightarrow \text{difference} \neq$$

$$55 - 45 = 10/\text{HCF}$$

$$= 90 \text{ LCM}$$

Find HCF of (6.16 and 13?) X100

616 and 1300 HCF of 616 and 1300 = 11

$$616 \mid 1300 \quad (2)$$

$$\underline{1232}$$

HCF of (6.16, 13)

$$68) \begin{array}{r} 616(9 \\ 612 \\ \hline 4) \end{array} \begin{array}{r} 68(17 \\ 68 \\ \hline 0) \end{array}$$

Find the LCM of $\frac{2}{5}, \frac{3}{10}$ and $\frac{6}{25}$?

$$\frac{\text{LCM } (2, 3, 6)}{\text{HCF } (5, 10, 25)} = \frac{6}{5}$$

Find the LCM of $\frac{2}{3}, \frac{8}{9}, 1\frac{16}{81}$ and $\frac{10}{27}$?

$$\frac{\text{LCM of } (2, 8, 16, 10)}{\text{HCF of } (3, 9, 81, 27)} = \frac{80}{3} \neq$$

Find HCF of $\frac{4}{9}, 1\frac{10}{21}$ and $\frac{20}{63}$

$$\frac{\text{HCF } (4, 10, 20)}{\text{LCM } (9, 21, 63)} = \frac{2}{63} \neq$$

HCF of two numbers is 11 and their LCM is 693. If one of the numbers is 77, then find the other number.

$$axb = \text{LCM} \times \text{HCF}$$

$$77 \times b = 693 \times 11$$

$$\boxed{b=99}$$

\nearrow must be multiples
of HCF then
only we get answer

The numbers are in the ratio 3:4. Their LCM is 84. Then the greatest number?

$$\text{LCM } (3x, 4x) = 84$$

$$12x = 84$$

$$3x = 3 \times 7 = 21$$

$$4x = 4 \times 7 = 28$$

∴ greatest number = 28

The LCM of two numbers is the sum of the HCF

5

$$5 \times 11 =$$

$$5 \times 9 =$$

$$5 \times 11 + 5 \times 9 =$$

The HCF and LCM of one of the

two numbers is the same remain-

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A cricketer has a certain avg of runs for his 8 innnings. In the 9th innning he scores 100 runs, thereby increases his avg by 9 runs. Find his new avg of runs.

$$\text{Sum} = 8x \\ x+9 = \frac{8x+100}{9} \Rightarrow 9x+81 = 8x+100 \\ 9x+81 = 8x+100 \\ 9x - 8x = 100 - 81 \\ x = 19$$

$$\text{New avg} = x+9 \\ = 19+9 = 28$$

The avg weight of 20 students in a class is increased by 0.75 kg, when one of the students weighing 30 kg is replaced by a new student. Find weight of new student.

$$\text{Sum} = 20x \Rightarrow 20x - 30 + A = x + 0.75$$

$$20x - 30 + A = x + 0.75 \\ A = 45.75 \rightarrow \text{weight of new student}$$

The avg of 8 men is increased by 2 years when 2 of them whose ages are 21 & 23 years are replaced by two new men. Find avg age of two new men.

$$\text{Sum} = 8x \\ \frac{8x - 21 - 23 + A+B}{8} = x+2 \Rightarrow 8x+16 \\ -44+A+B=16 \\ A+B=60 \quad \begin{matrix} A+B=60 \\ \hline A+B=30 \end{matrix} \rightarrow \text{avg of two men}$$

The avg age of A & B is 30 yrs, that of B & C is 32 yrs and the avg age of C & A is 34 yrs. Find the age of C.

$$A+B = 30 \times 2 = 60$$

$$B+C = 32 \times 2 = 64$$

$$C+A = 34 \times 2 = 68$$

$$2(A+B+C) = 192$$

$$A+B+C = 96$$

$$C = (A+B+C) - (A+B)$$

$$C = 96 - 60$$

$$C = 36 \text{ yrs}$$

$$\left| \begin{array}{l} \text{if } A = (A+B+C) - (B+C) \\ \text{then } = 96 - 64 \\ = 32 \text{ yrs} \end{array} \right.$$

LCM & HCF

Least Common
Highest Common
Greatest Com

Factorisation

$$\begin{matrix} 12 \\ 16 \\ 18 \end{matrix} \rightarrow 12 = 2^2 \times 3 \\ 16 = 2^4 \\ 18 = 3^2 \times 2$$

$$\text{LCM} = 2^4 \times 3^2 \\ = 16 \times 9 =$$

$$\text{HCF} = 2$$

LCM of fraction

HCF of fraction

product of 2

ax

① Same remain

② Different rem

① Find the
1491 exactly
long division

$$852) \overline{10} \\ 85 \\ \hline 2$$

② Find LCM
then 600
if it's not div
then

LCM & HCF

Least Common Factor Multiple
Highest Common factor (GCD)
Greatest Common divisor

Factorisation method

$$12 = 2^2 \times 3^1$$

$$16 = 2^4 \times 1^2 \text{ (or) } 2^4$$

$$18 = 3^2 \times 2^1$$

$$\text{LCM} = 2^4 \times 3^2 \text{ highest power}$$

$$= 16 \times 9 = 144$$

$$\text{HCF} = 2$$

LCM of fractions =

$\frac{\text{LCM of Ns}}{\text{HCF of Ds}}$

HCF of Fractions = $\frac{\text{HCF of Ns}}{\text{LCM of Ds}}$

Product of 2 nos = $\text{LCM} \times \text{HCF}$

$$a \times b = \text{LCM} \times \text{HCF}$$

Long division method

$$\begin{array}{r} \text{LCM: - } \\ 2 \overline{) 12, 16, 18} \\ 2 \overline{) 6, 8, 9} \\ 3 \overline{) 3, 4, 9} \\ 1, 4, 3 \end{array}$$

$$2 \times 2 \times 3 \times 4 \times 3 = 144,$$

$$\text{HCF: - } 12, 16$$

$$12 \quad | \quad 16 \quad (1)$$

$$\begin{array}{r} 12 \\ 4) 12 \quad (2 \\ - 12 \\ 0 \end{array}$$

$$\text{HCF of } 12 \text{ & } 16 = 4$$

$$4) 18 \quad (4 \\ 16$$

$$2) 4 \quad (2 \\ 2$$

$$2) 12, 16, 18 \quad (2 \\ 0$$

$$\text{HCF of } 12, 16, 18 = 2$$

① Same remainder \rightarrow Based on no. of digits

② Different remainder \rightarrow $\frac{\text{LCM} - 3}{\text{HCF} - 3}$

① Find the greatest number which divides 852, 1065 and 1491 exactly.

long division:-

$$\begin{array}{r} 852) 1065 \quad (1 \\ 852 \\ \hline 213) 852 \quad (4 \\ 852 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 1491 \quad (7 \\ 1491 \\ \hline 0 \end{array}$$

HCF of 852, 1065, 1491 is - 213,

② Find LCM of (1, 2, 0.24 and 3), $\times 100$ \rightarrow 120, 24, 600
then 600 is LCM if it is not divisible by multiple of 600
pick highest number 600
check 600 \div req. nos

$$\begin{array}{r} \text{LCM} = 600 \\ \hline 100 \end{array}$$

$$\text{LCM} = 600$$

the 13thinning
after 12th
mornings $\frac{13}{12}$
 $m = \text{Avg } KN$

is 38kg.
persons
ght of the

$$B = 312 - 190$$

$$t = 122,$$

If the
s by 1year.

$$10 \\ 39 \times 15 \\ 75 \\ \text{yes}$$

A number x is equal to 80% of the avg of 5, 7, 14 and a number y , if the avg of 'x' and 'y' is 26, then find value of 'y'.

$$x = \frac{80}{100} \left[\frac{5+7+14+y}{4} \right] \Rightarrow \begin{cases} 5x = 26+y \\ y = 5x - 26 \end{cases}$$

$$\frac{x+y}{2} = 26$$

$$x+y = 52$$

$$x+5x-26 = 52 \Rightarrow x = 13$$

$$6x = 78$$

$$y = 52 - 13$$

$$\boxed{y = 39}$$

A man goes to a certain place at a speed of 30km/hr and returns to the original place at a speed of 20km/hr, find the avg speed during the up & down journey.

$$S_1 = 30 \quad S_2 = 20 \quad \text{Avg sp} = \frac{2S_1S_2}{S_1+S_2} \quad \text{ds are equal} \quad \frac{30+20}{2}$$

$$\frac{2 \times 30 \times 20}{30+20} = 24 \text{ km/hr}$$

An aeroplane travels distance 2500km, 1200km and 500km at the rate of 500 km/hr, 400 km/hr and 250 km/hr respectively. Find the avg speed. S_1, S_2 distances not equal

$$\text{avg sp} = \frac{\text{Total dist}}{\text{Total time}}$$

$$= \frac{2500 + 1200 + 500}{5+3+2}$$

$$T_1 = \frac{D}{S} = \frac{2500}{500}$$

$$T_2 = \frac{1200}{400}$$

$$T_3 = \frac{500}{250}$$

$$\text{avg sp} = \frac{4200}{10} = 420 \text{ km/hr}$$

The avg of 25 observations is 13. It was found later that an observation 73 was wrongly entered as 48. Find the new avg? +ve for correct value -ve for wrong value

$$\text{New avg} = \text{Initial avg} + \frac{(73-48)}{25}$$

$$\text{New avg} = 13 + 1 = 14$$

The avg of 25 results is 18. The avg of 1st twelve of them is 14 and that of last twelve is 17. Find the 13th result.

$$\dots \quad \boxed{13} \quad 14 \quad \dots \quad 17$$

$$13^{\text{th}} \text{res} = \frac{\text{sum of 25 res}}{\text{sum of 1st 12 res} + \text{sum of last 12 results}}$$

$$13^{\text{th}} \text{res} = \frac{100 \times 18 - 12 \times 14 - 12 \times 17}{= 450 - 168 - 204 \\ = 7450 - 372}$$

$$13^{\text{th}} \text{res} = 78\frac{1}{11}$$

The avg of 11 results is 60. If the avg of first six results is 58 and that of last six is 63. Then find the sixth result.

$$\begin{array}{c} 1 & 2 & 3 & 4 & 5 & \boxed{6} & 7 & 8 & 9 & 10 & 11 \\ \hline \text{1st 6 res} & & \text{last 6 res} \end{array}$$

$$6^{\text{th}} \text{res} = \frac{\text{sum of 1st 6 results} + \text{sum of last 6 results}}{\text{sum of 11 res}}$$

$$6^{\text{th}} \text{res} = \frac{6^{\text{th}} = (1-6) + (6-1) - (1-11)}{(1-11)}$$

$$6^{\text{th}} \text{res} = 58 \times 6 + 63 \times 6 - 60 \times 11$$

$$6^{\text{th}} \text{res} = 6(58+63) - 660$$

$$= 6 \times 121 - 660 = 66\frac{1}{11}$$

If the avg of 8 consecutive odd numbers is 48, what is the difference between the smallest and the largest number?

$$\textcircled{11} \quad 43 \ 45 \ 47 \ \cancel{48} - 49 \ 51 \ 53 \ \textcircled{55}$$

$$\text{Diff} = 55 - 41 \\ = 14$$

Nine persons went to hotel for taking their breakfast. Eight of them spent Rs. 12 on their breakfast and the 9th one spent Rs. 8 more than the avg expenditure of all the nine. What is the total money spent by them?

$$\text{Total money} = \frac{12 \times 8 + (x+8)}{9} = x \quad \text{Total Money} = 12 \times 8 + (13+8)$$

$$\text{Avg} = \frac{\text{sum}}{N} = \frac{96 + x + 8}{9} = x \quad 96 + 13 + 8 \\ 96 + x + 8 = 9x \\ x = 13 \quad = 117$$

Find avg of first 31 consecutive even numbers
 $\frac{(n+1)}{2}$

$$\text{Avg} = \frac{n+1}{2} \\ \Rightarrow 31+1 \Rightarrow 32$$

$$2, 4, 6 - 4 \\ 2, 4, 6, 8 - 5 \\ 2, 4, 6, 8, 10 - 6$$

The avg of 25 of them is 14 and the 13th result

$$\dots \dots \text{or } 113$$

Find avg of first 50 consecutive odd numbers
 $\frac{n}{2}$

$$\text{Avg} = \frac{50}{2}$$

$$\text{Avg} = n = 50 //$$

$$1, 3, 5 - 3 \\ 1, 3, 5, 7, 9 - 5$$

If the avg of 4 consecutive even numbers is 27. Then find the largest of these numbers.

shortcut: $\frac{24+26+28+30}{4} = 27 \times 4$

$$24, 26, 28, 30 \\ \frac{4x+12}{4} = \frac{108}{4} \Rightarrow x = 24$$

6th res

Avg 27
 Avg of 10 numbers is 7. What will be the new avg.
 If each of the numbers is multiplied by 8?

$$\text{new Avg} = \text{Avg} \times k \\ \text{initial Avg} \\ \Rightarrow 7 \times 8 \\ \Rightarrow 56 //$$

Find avg of first 12 multiples of 7?

$$\text{Avg} = \frac{F+L}{2} = \frac{7+84}{2} = \frac{91}{2}$$

$$\text{Avg} = 45.5 //$$

If the avg what is the the largest

$$43$$

In section A, the avg height of the students is 100cm and in section B the avg height of the students is 160cm. Total no. of students in sec A is 60 & in sec B is 40. Find the avg height of entire class.

$$\text{avg height} = \frac{150 \times 60 + 160 \times 40}{60+40} = \frac{15400}{100} = 154$$

Out of 3 numbers, second is twice the 1st and is also thrice the 3rd. If the avg of 3 numbers is 44, find the largest number.

$$\begin{array}{lll} F & S & T \\ F & 2F & 2F/3 \end{array}$$

Largest number $\frac{72}{3} = 24$

$$F + 2F + \frac{2F}{3} = 44 \times 3$$

$$\frac{11F}{3} = 132 \Rightarrow F = 36 //$$

$$\frac{2F}{3} = \frac{72}{3} = 24$$

Nine persons fast. Eight the 9th one all the nine.

$$\text{OR} \\ \text{Total money} = 132$$

A batsman makes a score of 87 runs in the 12th inning and thus increases his avg by 3. Find avg after 12th innings.

$$\text{Avg} \Rightarrow \frac{\text{Sum of 17}}{N} = \frac{16x + 87}{17} = x + 3$$

$$16x + 87 = 17x + 51$$

$$\text{Avg upto } x = 36$$

$$\begin{aligned} \text{16 innings After 17th inning} &= x + 3 \\ &= 36 + 3 = 39 \end{aligned}$$

$$\begin{aligned} \text{16 innings} &\approx 39 \\ \text{Sum} = \text{Avg} \times N \end{aligned}$$

A number x is equal to y if the avg of x is y .

$$x = \frac{y}{2}$$

The avg weight of 5 persons sitting in a boat is 38kg. If the avg weight of the boat and the persons sitting in the boat is 52kg. What is the weight of the boat?

$$\text{Sum of 5 mem} = 5 \times 38 = 190 \text{ kg}$$

$$\frac{\text{Total} + B}{6} = 52$$

$$\frac{190 + B}{6} = 52 \Rightarrow 190 + B = 312 \Rightarrow B = 312 - 190 \text{ weight of boat} = 122,$$

The avg age of class of 39 students is 15 years. If the age of teacher included, then the avg increases by 1 year. Find the age of the teacher.

$$\begin{aligned} \frac{39 \times 15 + T}{40} - 16 &\Rightarrow 39 \times 15 + T = 640 \\ T &= 640 - 39 \times 15 \\ \text{Teacher} &= 55 \text{ yrs} \end{aligned}$$

$$\begin{array}{r} 12 \quad - 39 \\ 15 \quad 15 \quad - 15 \\ 16 \quad 16 \quad - 16 \\ \hline 39 \times 1 + 16 = 55 \text{ yrs} \end{array} \quad \textcircled{1}$$

The avg age of 5 members is 21 years. If the age of the youngest member is 5 years, find the avg age of family at birth of the youngest member.

$$\text{Sum of family} = 21 \times 5 = 105 \text{ yrs}$$

$$\text{5 yrs ago avg age} = \frac{\text{Sum of family 5 yrs ago} - 105}{\text{No. of persons 5 yrs ago}} = \frac{105 - 5 \times 5}{4} = 25$$

A man goes to returns to the the avg speed.

$$\begin{aligned} S_1 &= 30 \\ S_2 &= 20 \end{aligned}$$

$$\text{Avg sp}$$

$$\frac{S_1 \times S_2}{S_1 + S_2}$$

An aeroplane at the rate of 200 kmph. Find the avg

$$\text{avg}$$

The avg of later that as 48. Find

$$\text{New}$$

number is ending
of 4
ice = 4
x 4

$$= \frac{97}{1} \Rightarrow 97$$

$$100! = 2^{97} //$$

$$50+25+12+6+3+1$$

2	100
2	50
2	25
2	12
2	6
2	3
2	1

quotient
values

Ex:- Highest power of 3 in 100!

$$= \frac{\text{sum of Q's}}{\text{power of P-N}} = \frac{33+11+3+1}{1}$$

$$= \frac{48}{1} \Rightarrow 48$$

3	100
3	33
3	11
3	3
3	1

3	100
3	33
3	11
3	3
3	1

Highest power of 9 in 100!
Convert it into prime number 3^2 ↴ not a prime

$$= \frac{48}{2} // \Rightarrow 24 //$$

Three-fourth of one-fourth of a number is 60. Find the number.

$$\frac{3}{4} \times \frac{1}{4} \times N = 60 //$$

$$N = 20 \times 16$$

$$N = 320 //$$

$(\frac{1}{5})^{\text{th}}$ of a number when subtracted from $(\frac{1}{3})^{\text{rd}}$ of it gives 12. find number.

$$\frac{x}{3} - \frac{x}{5} = 12$$

$$\frac{5x - 3x}{15} = 12 \Rightarrow 2x = 15 \times 12$$

$$x = 90 //$$

Find value of x' in $\frac{x}{21} \times \frac{x}{189} = 1$

$$x^2 = 21 \times 189$$

$$x = \sqrt{21 \times 189}$$

$$x = \sqrt{21 \times 9 \times 21}$$

$$x = 21 \times 3$$

$$x = 63 //$$

2) 4, 9

$$\begin{array}{rcl} 4^1 & = & 4 \\ 4^2 & = & 16 \\ 4^3 & = & 64 \\ 4^4 & = & \underline{256} \\ & = & 4 \\ & = & 6 \end{array}$$

$$\begin{array}{r} 9 \\ \times 9 \\ \hline 81 \end{array}$$

$$94 = \underline{\quad}$$

8) If any number is ending

with 4:

with 4 :
1) for odd powers of 4
units place = 4

units place = 4

2) for even power of 4
units place = 6

1) If any number is ending with 9?

1) For odd powers of 9
units place =

2) for even power of 9
units place = 1

$$\textcircled{1} (3 \underline{49}) = \underline{9}$$

$$\textcircled{2} (724)^{5972} \rightarrow \begin{matrix} 6 \\ \text{units place} \end{matrix}$$

3) 2, 3, 7, 8

If a number is ending with 2, then units place

$$\begin{array}{r} \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \\ \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \quad \cancel{\text{11}} \end{array} = 2^{\text{rem}} \\ = 3^{\text{rem}} \quad \text{PBM}$$

✓ n. inf. [u] u- u u "7, 1, 2 rem

$$(3242)^{137} = 2^{\text{Rem}} \equiv 2^L = 2 \rightarrow 0.\text{place}$$

$$\Rightarrow (3742)^{137} = 2^{\text{Rem}} = 2^l = 2 \rightarrow \text{0-place 1}$$

$$\rightarrow (648)^{760} = 8^{\text{Rem}} = 8^4 = \frac{6}{\text{units place}}$$

Highest power of prime number in $N!$:-

1) Highest power of 2 in $100!$

$$\text{Highest power} = \frac{\text{sum of all Quotients}}{\text{power of prime number}}$$

either 0 (or) multiple of 11.

$$\text{Ex:- } \begin{array}{r} 1331 \\ \underline{1234} \\ 1+3+1 \\ 4-4=0 \end{array} \quad \checkmark$$

$$\begin{aligned} &\div 16 \rightarrow \text{last 4 digits } \div 16 \\ &\sqrt{38926480} \quad \div 16 \\ &\div 19 \rightarrow \text{sum of no. of tens of 4 Twice the units place } \div 17 \end{aligned}$$

$$\text{Ex:- } 361 \quad 36 + 1 \times 2 = 38 \div 19$$

\Rightarrow \rightarrow Difference b/w no. of tens of 4 Twice the units place $\div 17$

$$\text{Ex:- } \begin{array}{r} 343 \\ 34-2 \times 3 \\ 34-6=28 \end{array} \div 17$$

$$\div 19 \quad 6726 = 672 + 12 = 684$$

$$684 \quad \quad \quad = 68 + 8 = 76 \div 19$$

$$\frac{\div 13}{\text{Sum of no. of tens of 4 }} \quad 219+28 = 247 \quad 24+28 = 52 \div 13$$

\therefore Difference of no. of tens of 4 5 times of units place $\div 17$

$$\begin{aligned} \text{Ex:- } &289-45-28 = 132 \div 17 \\ &= 60 - 40 = 56 \quad \boxed{56-5=51} \div 17 \\ &= 60 \quad \quad \quad 18 \end{aligned}$$

Units place digit

Units place digit

0, 1, 2, 3, 4, 5, 6, 7, 8, 9
any number is ending with either 0, 1, 5 (or)

1) 0, 1, 5, 6 : If any number is ending with its units place 6 it is same digit

2) 4, 9.

3) 2, 3, 7, 8

$$(325)^{2567} = 5 \quad \checkmark$$

$$(126897)^{464} = 6$$

$$(131)^{464} = 1$$

number is ending
er, of &
ce = x
x =

$$= \frac{97}{1} \Rightarrow 97 \\ 100! = 2^{97} //$$

$$50+25+12+6+3+1$$

2	100
2	50
2	25
2	12
2	6
2	3
2	1

Quotient
values

Ex:- Highest power of 3 in 100!

$$= \frac{\text{sum of Q's}}{\text{power of P.N}} = \frac{33+11+3+1}{1} \\ = \frac{48}{1} \Rightarrow 48$$

3	100
3	33
3	11
3	3
3	1

Highest power of 9 in 100!
Convert it into prime number 3^2 ↴ not a prime
 $= \frac{48}{2} // \Rightarrow 24 //$

3	100
3	33
3	11
3	3
3	1

Three-fourth of one-fourth of a number is 60. Find the number.

$$\frac{3}{4} \times \frac{1}{4} \times N = 60 \\ 20 \times 16$$

$$N = 320 //$$

$(\frac{1}{5})^{\text{th}}$ of a number when subtracted from $(\frac{1}{3})^{\text{rd}}$ of it gives 12. Find number.

$$\frac{x}{3} - \frac{x}{5} = 12$$

$$\frac{5x - 3x}{15} = 12 \Rightarrow 2x = 15 \times 12 \\ x = 90 //$$

Find value of x in $\frac{x}{21} \times \frac{x}{189} = 1$

$$x^2 = 21 \times 189$$

$$x = \sqrt{21 \times 189}$$

$$x = \sqrt{21 \times 9 \times 21}$$

$$x = 21 \times 3$$

$$x = 63 //$$

Number System

Divisibility rules:

$\therefore 2 \rightarrow$ ends with 0, 2, 4, 6, 8 (even numbers)

$\therefore 3 \rightarrow$ sum of digits is $\div 3$

$$\text{Ex:- } \underline{34}16 = 3+3+4+1+6 = 21 \div 3 \quad \checkmark \quad \begin{matrix} 7 \\ 34 \\ \text{is divisible by 3} \end{matrix}$$

$\therefore 4 \rightarrow$ ends with last 2 digits of the number is $\div 4$

$$39 \rightarrow 2\overline{36} \quad 36 \div 4 \quad \therefore 39 \rightarrow 236 \text{ is divisible by 4.}$$

$\therefore 5 \rightarrow$ ends with 0 or 5

$$3150, 213615$$

$$2364 \div 5 \checkmark$$

it must be divisible by

$\therefore 6 \rightarrow$ Both 2 & 3

$\therefore 10 \rightarrow$ numbers ending with 0 $10 = 2 \times 5$

$$\therefore 12 \rightarrow$$
 Both 3 & 4 $12 = 3 \times 4$

$$\therefore 14 \rightarrow$$
 Both 2 & 7 $14 = 2 \times 7$

$$\therefore 15 \rightarrow$$
 Both 3×5

$$\therefore 18 \rightarrow$$
 Both 2×9

$$\therefore 20 \rightarrow$$
 Both 4×5

$$\therefore 21 \rightarrow$$
 Both 3×7

$$\therefore 22 \rightarrow$$
 Both 2×11

$$\therefore 24 \rightarrow$$
 Both 3×8

$$\therefore 36 \rightarrow$$
 Both 4×9

$$\therefore 48 \rightarrow$$
 Both 6×3

$$\therefore 35 \rightarrow$$
 Both 5×7

$$\therefore 8 \rightarrow$$
 last 3 digits $\div 8$

$$358 \underline{408} \quad 408 \div 8 \quad \checkmark \quad \begin{matrix} 4+5+3+6+2+7=27 \\ 27 \div 9 \end{matrix}$$

$\therefore 9 \rightarrow$ sum of digits $\div 9$

$$\text{Ex:- } \underline{453627} \quad \checkmark$$

$\therefore 11 \rightarrow$ difference b/w sum of even place digits & sum of odd place digits is

How many numbers up to 100 are divisible by 7?

$$7) 100 \quad 14 \text{ nds} \div 7 \\ \begin{array}{r} 7 \\ \overline{)30} \\ 28 \\ \hline 2 \end{array}$$

up to 100

How many numbers up to 200 are divisible by both 2 & 3?

$$6) 200 \quad 33 \text{ nds} \quad \text{LCM}(2,3) \\ \begin{array}{r} 18 \\ \overline{)20} \\ 18 \\ \hline 2 \\ \begin{array}{r} 18 \\ \hline 2 \end{array} \end{array} \quad \begin{array}{r} 1 \\ \downarrow \\ 6 \end{array}$$

$33 \text{ nds} \div \text{both } 2 \& 3$

upto 200

The difference b/w the squares of two consecutive numbers is 35. Find the numbers.

$$(x+1)^2 - x^2 = 35$$

$$x^2 + 2x + 1 - x^2 = 35$$

$$2x = 34$$

$$x = 17$$

$$324 - 289$$

$$35 \checkmark$$

$$x+1 = 18$$

Divide 50 into two parts, so that the sum of their reciprocals is $\frac{1}{12}$. Find the two parts.

$$\frac{1}{x} + \frac{1}{50-x} = \frac{1}{12}$$

$$\begin{array}{c} 50 \\ \diagup \quad \diagdown \\ x \quad 50-x \end{array}$$

$$\frac{1}{10} + \frac{1}{40} = \frac{4+1}{40} = \frac{81}{40} \times \frac{1}{12}$$

$$1) 10, 40$$

$$\frac{1}{20} + \frac{1}{30} = \frac{3+2}{60} = \frac{81}{60} = \frac{1}{12} \checkmark$$

$$2) 20, 30$$

$$\frac{1}{25} + \frac{1}{25} = \frac{2}{25} \neq \frac{1}{12}$$

$$3) 25, 25$$

$$4) 15, 35$$

$$x = 20 \Rightarrow 50-x = 30 \checkmark$$

no one divisible
both

Ex. A number when divided by 315 leaves the remainder as $\frac{46}{Q}$ and the value of quotient is $\frac{7}{Q}$. Find number.

$$\text{Dividend} = \text{divisor } \times Q + R$$

$$N = 315 \times 7 + 46$$

$$N = 2205 + 46$$

$$N = 2251$$

The quotient arising from a division of a number by 62 is $\frac{463}{Q}$ and the remainder is 60. What is num? Rem

$$\text{dividend} = \text{divisor } \times Q + R$$

$$N = 62 \times \frac{463+60}{2870628}$$

$$N = 28766$$

What is the least value of k so that the number 6735k7 is divisible by 9?

$$\div 9 \rightarrow \text{sum of digits } \div 9$$

$$6+7+3+5+k+1$$

$$22+k \div 9$$

$$k=5$$

What is the least value of k so that the number 5k3457 is divisible by 11?

$$(5+3+5) - (k+4+7) = 0$$

$$-13 = k+11$$

$$k=2$$

A number is decreased by 4 & divided by 6, the result is 9. What would be the result, if 3 is

The product of 2 numbers is 120. The sum of their squares is 289. Find the sum of numbers.

$$x+y=? \quad xy=120 \quad x^2+y^2=289$$

$$(x+y)^2 = x^2+y^2+2xy$$

$$x+y = \sqrt{x^2+y^2+2xy}$$

$$= \sqrt{289+2(120)} = \sqrt{289+240} = \sqrt{529}$$

$$\boxed{x+y = 23}$$

The sum of 3 consecutive even numbers is 15 less than three-fourth of 60. What is the middle number?

$$x-2+x+x+2 = \frac{3}{4} \times 60 - 15$$

$$3x = 45 - 15 = 30$$

$$3x = 30$$

$$x = 10$$

$$8, 10, 12$$

The denominator of a rational number is 3 more than its numerator. If the numerator is increased by 7 and the denominator is decreased by 2, we obtain 2. Find the rational number.

$$\frac{N+7}{N+3-2} = \frac{(2)(P) + 50 + 8q - 8(a)}{(a)(P) - 6(b)}$$

$$\frac{N+7}{N+1} = 2 \Rightarrow N+7 = 2N+2$$

$$\boxed{N=5} \Rightarrow \frac{5}{5+3} = \frac{5}{8}$$

$$\frac{N}{D} = \frac{5}{8}$$

A fraction becomes 4 when 1 is added to both the numerator and denominator; and it becomes 7 when 1 is subtracted from both the numerator and denominator. Find the numerator of the given number.

time more
after 8 yrs he
times of
I know many
age?

The sum of the present ages of a father and his son is 60 yrs. Six yrs ago, father's age was 5 times the age of the son. After 6 yrs, son's age will be:

$$\begin{aligned} F + S &= 60 \\ F - 6 &= 5(S - 6) \\ F - 6 &= 5S - 30 \\ F &= 5S - 24 \end{aligned}$$

After 6 yrs, son's age

$$\begin{aligned} 5S - 24 + S &= 60 \\ 6S &= 84 \\ S &= 14 \end{aligned}$$

14 yrs

At present the ratio of the ages of Arun and Deepak is 4:3. After 6 yrs, Arun's age will be 26 yrs. What is the age of Deepak at present?

$$\begin{aligned} A &: D \\ \text{pre} \rightarrow 4 : 3 & \\ D &= 3 \times 5 = 15 \text{ yrs} \end{aligned}$$

$A + 6 = 26 \Rightarrow A = 20$

$$D = 20 \times \frac{3}{4} = 15 \text{ yrs}$$

The present ages of 3 persons in proportions 4:7:9. 8 yrs ago, the sum of their ages was 56. Find their present ages (in yrs).

$$\begin{aligned} \text{pre} \rightarrow 4 : 7 : 9 & \\ 8 \downarrow & \\ x-8 &+ y-8 + z-8 = 56 \\ x+y+z-24 &= 56 \\ x+y+z &= 80 \end{aligned}$$

$x = 4 \times 4 = 16 \text{ yrs}$
 $y = 7 \times 4 = 28 \text{ yrs}$
 $z = 9 \times 4 = 36 \text{ yrs}$

Father is aged three times more than his son Ronit. After 8 yrs he would be two and a half times of Ronit's age. After further 8 yrs, how many times would he be of Ronit's age?

$$\begin{aligned}
 & F = S \\
 & F + 8 = 3(S + 8) \\
 & F + 16 = 2.5(S + 16) \\
 & F + 24 = 2(S + 24) \\
 & F = 32
 \end{aligned}$$

Father will be 2 times that of son's age after further '8' yrs.

→ The sum of ages of 5 children born at the intervals of 3 yrs each is 50 yrs. What is the age of youngest child?

$$\begin{aligned}
 & 4 + 7 + 10 + 13 + 16 = 50 \\
 & 5x = 50 \\
 & x = 10
 \end{aligned}$$

age of youngest child $\frac{1}{5} \times 6 = 1.2$ yrs.

→ The father said to his son, "I was as old as you are at the present at time of your birth". If the father's age is 38 yrs now, the son's age five yrs back was:

$$\begin{array}{c|c}
 F & S \\
 \hline
 \text{pre-F} & \downarrow \\
 \text{past-F-S} & 0
 \end{array}$$

$$\begin{aligned}
 & F = 2S \\
 & 38 = 5 \text{ years ago} \\
 & FS = 19 \\
 & S - 5 = 19 - 5 \\
 & S = 14 \text{ yrs old}
 \end{aligned}$$

The sum of the present ages of a father and his son is 64 yrs. Six times son's age was 5 times father's age 8 yrs ago. What will be the age of the son in 6 yrs?

$$\begin{aligned}
 & F + S = 64 \\
 & 6S = 5(F + 8) \\
 & 6S = 5(64 - S + 8) \\
 & 6S = 5(72) \\
 & 6S = 360 \\
 & S = 60
 \end{aligned}$$

At present
the son
be 26

⑥ 10 years ago, the age of a father was three times the age of his son. After 8 years, age of father will be twice the age of his son. What is the ratio of their present ages?

$$F : S$$

$$\text{10 years past } F = 3S$$

$$\text{Future } F = 2S$$

$$F : S$$

$$3 : 1$$

$$9 : 2 \text{ IP}$$

$$1P = 15 \text{ yrs}$$

$$10 \text{ years past } F = 3 \times 15 = 45$$

$$10 \text{ years past } S = 1 \times 15 = 15$$

$$\text{Present } F = 45 + 10 = 55 \text{ yrs}$$

$$\text{Present } S = 15 + 10 = 25 \text{ yrs}$$

$$F : S \rightarrow 11 : 5 \rightarrow 22 : 10$$

$$\text{Pre } 55 : 25$$

$$11 : 5 \rightarrow 9 : 5$$

⑦ In a family, the avg age of father and the mother is 35 yrs. The avg age of father, the mother and the only son is 27 yrs. What is the age of son?

$$F + M = 35 \times 2 = 70 \text{ yrs}$$

$$F + M + S = 27 \times 3 = 81 \text{ yrs}$$

$$70 + S = 81$$

$$S = 11 \text{ yrs}$$

$$28 \text{ yrs} \rightarrow 9 \text{ yrs}$$

$$28 \text{ yrs} = 21$$

$$28 \text{ yrs} = 15 \times 2 \rightarrow 7$$

$$28 \text{ yrs} = 15 \times 1 \rightarrow 2$$

At Present, April is 8 years hence, the ratio is 1.5 times.
April and son's age, what is ratio? April is 1.5 times their respective ratios.

Cancel Pre & Post
Or take Pre & Future

the age of a father was
of his son, after 8 years
twice the age of his
present age.

At present, Anil is 1.5 times of Purov's age.
8 years hence, the respective ratio between
Anil and Purov's ages, then will be 25:18.

What is Purov's present age?

$$\begin{aligned} & \text{cancel pre } A:P \\ & 0.5 \text{ table pre } (3:2) \times 7 \\ & \text{future 8} \rightarrow (25:18) \times 1 \\ & (2:1) \times = 8+7 \\ & 05+22.5 = 8+21.5 \\ & \text{pre } 21:14 \downarrow 4P \rightarrow 8 \text{ yrs} \\ & \uparrow 4P \downarrow 1P = 24 \text{ yrs} \\ & P = 14 \times 2 = 28 \text{ yrs.} \end{aligned}$$

The ages of Harish and Sunil are 40 yrs
and 60 yrs respectively. How many years before,
the ratio of their ages was 3:5?

$$\begin{aligned} & \text{ratio 8 yrs } \frac{40-x}{60-x} = \frac{40-x \times 3}{60-x \times 5} \\ & 200-5x = 180-3x \\ & -10 \downarrow \quad 2x = 20 \\ & 40-10 = 30 \quad x = 10 \\ & 60-10 = 50 \quad 10 \text{ yrs to mid age} \\ & 3:5 // \quad 10 \text{ yrs to 8 yrs ago} \end{aligned}$$

The age of father 10 yrs ago was twice the
age of his son. Ten years hence, father's age
will be twice that of his son. The ratio of
their present ages is:

$$\begin{aligned} & 10 \downarrow \rightarrow (3:1) \times 1 \quad \downarrow 3:1 \downarrow 10 \text{ yrs} \\ & \text{now } 10 \rightarrow (2:1) \times 2 \quad \downarrow 4:2 \\ & \text{at 10 yrs } 20:30 \quad \downarrow \text{sub in past 10 yrs} \\ & F = 3 \times 20 = 60 \\ & \text{pre } F = 60, +10 = 70 \text{ yrs} \\ & S = 1 \times 20 = 20 \\ & \text{pre } S = 20 + 10 = 30 \text{ yrs} \\ & F:S = 7:3 // \end{aligned}$$

ation of
Avg Ratios
Reasons
Time
Rate
Scales

What is Meena's present age?

$$\begin{array}{l} M : D \\ \text{pre} \rightarrow 8 : 12p \\ \text{future} 81 \rightarrow 10 : 3 \\ \text{difference} \quad 9 : p \\ M = 8 \times 4 \\ = 32 \text{ yrs} \\ D = 1 \times 4 = 4 \text{ yrs} \end{array}$$

- ④ The ratio between the present ages of A and B is 4:5 if the ratio between their ages four years hence becomes 14:17. What is B's age at present?

$$\begin{array}{l} A : B \\ \text{pre } (4 : 5) \times 3 = 12 : 15 \\ \text{future } (14 : 17) \times 1 = 14 : 17 \\ 3p \quad 2p \rightarrow 44 \text{ yrs} \\ 1p = 2 \text{ yrs} \end{array}$$

- ⑤ A father is twice as old as his son. 20 years back, he was 12 times as old as his son. What are their present ages?

$$\begin{array}{l} F : M \\ \text{pre} \rightarrow (2p : 1) \times 11 = 22 : 11M + 3 \\ \text{past } 20 \downarrow (12 : 1) \times 11 = 12 : 11 \\ 11p \quad 11p \rightarrow 20 \text{ yrs} \\ 10p \rightarrow 20 \text{ yrs} \\ 1p = 2 \text{ yrs} \end{array}$$

$$\begin{array}{l} F = 22 \times 2 = 44 \text{ yrs} \\ S = 11 \times 2 = 22 \text{ yrs} \end{array}$$

All perfect squares
are exactly odd no. &
102, 112, 122, 132, 142
152, 162, 172, 182, 192
202, 212, 222

use of softskills

Increase productivity	Problem solving	Decision making
	Creative	Negotiations
	conflict resolution	listening
	Time management	Empathy
	Team work	

Lavish serendipity

Rambunctious - difficult to control - noisy

Scrumptious - delicious food

Introduction
content
conclude

Cognitive games

3BM - Shortcut, Numbubble, Tallyup, Gridlock,
Resembles - angle (or) Recreate

Affable - very friendly

Clump - fall (sink heavily)

Repose - rest / sleep

2.8 x 8 = 91

2.8 x 9 = 9

2.8 x 10 = 9

2.8 x 11 = 9

2.8 x 12 = 9

2.8 x 13 = 9

Goldmedal and merit do not always bring the most
joy all the other gift, like music, sports etc. give
more joy than the goldmedal and merit.

→ Problems On Ages & application of Avg Ratios.

- ① The age diff b/w any 2 persons at any point of time must be same.
- ② Father, son, mother, daughter, sister
F: Ramesh, Ram, Suresh, Priya's

A	B	diff	starting letter as present ages
pre 20 yrs	25 yrs	5 yrs	R
pos 15 yrs	20 yrs	5 yrs	M
Future 25 yrs	30 yrs	5 yrs	E

- ① The ratio of present ages of Nutan and Vibha is 9:11. After 12 years, age of Vibha will be 34 years. What was the age of Nutan before 8 years

$$\text{Pre } \frac{N}{V} = \frac{9}{11}$$

$$N = 9 \times 2 = 18 \text{ yrs}$$

$$V = 11 \times 2 = 22 \text{ yrs}$$

$$N - 8 = 18 - 8 = 10 \text{ yrs}$$

- ② Sachin is younger than Rahul by 2 years. If their ages are in the respective ratio 7:9, how old is Sachin?

$$(S : R) \quad 1P = 3.5 \text{ yrs}$$

in terms of ratio
2 parts

$$S = 7 \times 3.5 = 24.5 \text{ yrs}$$

$$R = 9 \times 3.5 = 31.5 \text{ yrs}$$

- ③ At present Meena is 8 times her daughter's age. Eight years from now, the ratio of the ages of Meena and her daughter will be 10:3, respectively.

What is Meena's Present age?
Pre → M
future 8 yrs → 10 yrs
M + 8 → 10

④ The
is 4
years

use of soft skills Problem solving
Creative conflict resolution
Time management
Team work
Increasing Productivity

Lavish serendipity
Rambunctious scrumptions
Introductory context

Ex: $4 = 1, 2, 4 \rightarrow$ All perfect squares have exactly odd no. of factors.

$16 = 1, 2, 4, 8 \rightarrow 5$ have exactly 5 factors.

$8 = 1, 2, 4, 8 \rightarrow 4$ factors.

$50 = 1, 2, 5, 10, 25, 50$

$64 = 1, 2, 4, 8, 16, 32, 64$

$8^m = 2^{3m}$

$8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22$

$8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22$

Ques: How many natural numbers less than 1000 have exactly 3 factors?

Sol: $4 = 1, 2, 3, 4$
 $9 = 1, 3, 9$
 $25 = 1, 5, 25$
 $49 = 1, 7, 49$
 $81 = 1, 9, 81$

Find the number of prime factors in the expression $6^{10} \times 7^{19} \times 11^{27}$.

$$(2 \times 3)^{10} \times 7^{19} \times 11^{27} \rightarrow 2^{10} \times 3^{10} \times 7^{19} \times 11^{27} \rightarrow 10 + 10 + 19 + 27 = 66$$

Total prime factors = 66
Distinct prime factors = $\sqrt{3}, \sqrt{7}, \sqrt{11} = 4$

Ans

and the total number of factors which is

$$\begin{array}{r}
 27 = x+y = 2 \\
 36 = x+y = 11 \\
 45 = x+y = 20
 \end{array}
 \text{ when adding } \begin{array}{l} \text{large digits} \\ \text{then } x+y = 9+8+7+6
 \end{array}$$

$y=8 \Rightarrow$ then $x+y=21$ is not possible
 $\cancel{x+y=11} \Rightarrow \boxed{x=3}$

$$\begin{aligned}
 M_{\min} &= x-y \\
 &= 3-8 = -5
 \end{aligned}$$

Find the number of times the keys of a type writer must be pressed to type the first 1000 natural numbers.

$$\begin{array}{cccc}
 1-\text{digit} & 2-\text{digit} & 3-\text{digit} & 4-\text{digit} \\
 1-9 & 10-99 & 100-999 & 1000 \\
 9 \times 1 & + 90 \times 2 & + 900 \times 3 & + 1 \times 4
 \end{array}$$

$$9 + 180 + 2700 + 4 = 2893$$

The sum of digits of a 2 digit number is 9. If the digits are reversed, the number is increased by 54. Find the number.

$$\begin{array}{r}
 \text{REV}(xy) \\
 \begin{array}{r}
 91 \rightarrow 19 \\
 82 \rightarrow 28 \\
 53 \uparrow \\
 44 - \\
 35 \downarrow \\
 26 \downarrow \\
 17 \downarrow
 \end{array}
 \\ \hline
 \begin{array}{r}
 17 - 71 = 54 \\
 \hline
 174
 \end{array}
 \end{array}$$

How many natural numbers b/w 50 & 500 have odd number of factors.

A, B and C are partners in a business. During a particular year, A received one-third of the profit, B received one-fourth of the profit and C received the remaining Rs. 5000. How much amount of money did A receive?

$$\text{Rest} = P - \frac{P}{3} - \frac{P}{4} = \frac{12P - 4P - 3P}{12} = \frac{5P}{12}$$

$$A = \frac{1}{3} \times 12000 = \frac{12000}{3} = 4000$$

$$P = 12000$$

$$\boxed{A = 4000}$$

In a business partnership among A, B, C and D, the profit is shared as follows A's share = B's share = C's share = $\frac{1}{3}$ D's share. If the total profit is Rs. 400000, then find the share of C.

A	B	C	P
1	3	3	40P = 400000
1	3	3	1P = 10000
1	1	1	C = 9 \times 10000
11 : 3 : 9 : 27			$\boxed{C = 90000}$

Alphabet Test:-

How many such pairs of letters are there in the word clearing each of which has two letters below them in the word as also in the alphabet?

- 4) Three 5) None

- 1) One 2) Nil 3) Two

M N P Q R
 C X F R T N G
 P F G H I J
 D E F G H I J

(C E)

$$OB = 91$$

$$OF = 41$$

$$OF = 41$$

$$\begin{aligned}x+1 &= 4 \Rightarrow x+1 = 4y+4 \Rightarrow x = 4y+3 \\y+1 &= 7 \Rightarrow x+1 = 7y+7 \Rightarrow x = 7y+6 \\x-1 &= 7 \Rightarrow x-1 = 7y-7 \Rightarrow x = 7y-6 \\4y+3 &= 7y-6 \\3y &= 9 \\4y+3 &\quad \boxed{4y+3} \Rightarrow x = 4(3)+3 \\&\quad \Rightarrow x = 15\end{aligned}$$

$\therefore x \neq 15$

In a division sum, the divisor is 12 times the quotient and 5 times the remainder. If the remainder is $\frac{48}{R}$, then find the dividend.

$$\text{Divisor} = 12Q = 240 \Rightarrow Q = 20$$

$$\text{Divisor} = SR = 5 \times 48 = 240$$

$$\begin{aligned}\text{Dividend} &= \text{Divisor} \times Q + R \\&= 240 \times 20 + 48 \Rightarrow 4800 + 48 = 4848\end{aligned}$$

If $P+Q=6$ & $PQ=9$, then find the value of P^3+Q^3

$$(P+Q)^3 = P^3 + Q^3 + 3PQ(P+Q)$$

$$(6)^3 = P^3 + Q^3 + 3(9)(6)$$

$$P^3 + Q^3 = (6)^3 - 3(9)(6)$$

$$P^3 + Q^3 = (6)^3 - 162$$

$$P^3 + Q^3 = 216 - 162$$

$$P^3 + Q^3 = 54$$

If number $123 \times 56y$ is divisible by 36, then find the minimum value of $x-y$ & divisible by 9.

$$\begin{aligned}1 \text{ digit} &\div 4 \Rightarrow y = 0, 2, 4, 6, 8, 0 \Rightarrow \min(x-y) \text{ of } 123 \times 56y \\x \rightarrow 0 \rightarrow 9 &\div 9 \Rightarrow 1+2+3+1+5+6+y+8 = 25+x+y \\y \rightarrow 0 \rightarrow 9 &\end{aligned}$$

When adding
2 digits
 $x+y=2$
 $x+y=3$
 $x+y=4$
 $x+y=5$
 $x+y=6$
 $x+y=7$
 $x+y=8$
 $x+y=9$
Min " = 3-8
Max " = 9-9
Find the number
must be pressed
1-digits
1-9

A and B invest in a business in the ratio 3:2. If 5% of the total profit goes to charity and A's share is Rs. 855. Find the total profit.

$$A:B \text{ profit} = 3:2$$

$$\begin{array}{c} 100\% \\ \swarrow \quad \searrow \\ 95\% \text{ (A&B)} \quad 5\% \text{ charity} \end{array}$$

$$A = 3P \rightarrow 855$$

$$1P = 285$$

$$A+B = 5P = 5 \times 285$$

$$= 1425$$

$$95\% \rightarrow 1425$$

$$T:P = 100\% \rightarrow ? \boxed{1500}$$

In this business A received $\frac{1}{10}$ of part of profit as an active partner. Remaining profit is distributed between A and B in the ratio 4:5. If part of profit of A is Rs. 325, then find the part of profit of B.

$$\text{Rem} = P - \frac{P}{10} = \frac{9P}{10} \Rightarrow A : B = 4 : 5 \quad A=B=325$$

$$A = 4P \quad B = \frac{5P}{10}$$

$$A = \frac{P}{10} + \frac{4P}{10} = \frac{5P}{10}$$

$$B = \frac{5P}{10}$$

Ramesh, Jai and Raju rented a pasture for Rs. 980. Ramesh grazed 5 cows for 2 months, Jai grazed 7 cows for 4 months and Raju grazed 10 cows for 6 months. Find the rent paid by Jai.

R J R

$$5 \times \frac{1}{2} \quad 7 \times \frac{1}{4} \quad 10 \times \frac{1}{3}$$

$$49P \rightarrow 980$$

$$1P = 20$$

$$5 : 14 : 30$$

$$J = 14 \times 20 = 280$$

A began business with Rs. 3750 and B joined afterwards with Rs. 5000. When did B join if the profits at the end of the year were divided equally?

$$P = IT$$

$$3750 \times 12 = 5000 \times T_B$$

$$\frac{1}{3} = \frac{1}{4} + \frac{T_B}{12}$$

$$T_B = 9 \text{ months}$$

When did

$$12 - 9 = 3 \text{ months}$$

after 3 months

A, B, C and D enter into partnership. A invest $\frac{1}{3}$ rd of the capital, B invest $\frac{1}{4}$ th of the capital, C invest $\frac{1}{5}$ th of the capital and D invests the rest. What is the share of D out of a profit of Rs. 6000?

$$A: B: C: D = \frac{1}{3}: \frac{1}{4}: \frac{1}{5}: \text{Rest} = \frac{1}{3}: \frac{1}{4}: \frac{1}{5}: \frac{1}{3} - \frac{1}{3} - \frac{1}{4} - \frac{1}{5}$$

$$20: 15: 12: 13$$

$$D = \frac{13}{60} \times 6000$$

$$D = 1000$$

$$D = 13 \times 100 = 1300$$

A and B jointly invest Rs. 2100 and Rs. 3100 in a business respectively. A is an active partner and hence he gets 25% of the profit separately. If their business yields them total Rs. 1040 as profit, then what will be the profit of each of them?

$$A: B = 21: 31$$

$$82P \rightarrow 3100$$

$$1P = 15$$

$$A = 260 + 315 = 575$$

$$B = 465$$

$$\begin{array}{r} 1040 \\ - 260 \\ \hline 780 \end{array}$$

$$\begin{array}{r} 780 \\ \times 25 \\ \hline 1950 \end{array}$$

$$\begin{array}{r} 1950 \\ - 1260 \\ \hline 690 \end{array}$$

$$\begin{array}{r} 690 \\ \times 15 \\ \hline 1035 \end{array}$$

$$\begin{array}{r} 1035 \\ - 315 \\ \hline 720 \end{array}$$

$$\begin{array}{r} 31 \times 15 \\ \hline 465 \end{array}$$

and B invest in a business
If 5% of the
total profit goes to
charity and A's share
is 55% of the
total profit.
100%
95%
(A's)

Rs. 20,000 respectively for the years 3 p.
amount of profit each year was divided in proportion of profit each

$$\frac{P_A}{P_B} = \frac{I_A T_A}{I_B T_B} \Rightarrow \frac{2}{3} = \frac{3000 \times 16}{I_B \times 7}$$

$$I_B = 9000$$

Ane, Manu and Tanu invested capitals in the ratio 4:6:9. At the end of the business they received the profits in the ratio 2:3:5. Find the ratio of time for which they invested their capitals.

$$T_1 : T_2 : T_3 = \frac{P_1}{P} : \frac{P_2}{P} : \frac{P_3}{P} \quad P = PT$$

$$T_1 : T_2 : T_3 = \frac{4}{2} : \frac{6}{3} : \frac{9}{5} \quad T = \frac{P}{P}$$

$$T_1 : T_2 : T_3 = 2 : 2 : 9 \quad (4 \times \frac{1}{2} : 6 \times \frac{1}{3} : 9 \times \frac{1}{5})$$

A, B and C invested capitals in the ratio 3:5:9, the timing of their investments being in the ratio 2:3:1. In what ratio would their profits be distributed.

$$P_A : P_B : P_C = I_1 T_1 : I_2 T_2 : I_3 T_3$$

$$= 3 \times 2 : 5 \times 3 : 9 \times 1$$

Abhi and Gopi enter into a business with capitals in the ratio 5:6. At the end of 8 months, Abhi withdraws his capital. If they receive the profits in the ratio of 5:9, how long Gopi's capital was used?

$$\therefore \frac{5}{9} = \frac{5 \times 8}{6 \times T_G}$$

$$T_G = 12 \text{ months}$$

A, B and C invested Rs. 20,000, Rs. 50,000 and Rs. 40,000 respectively in a business. The net profit for the year is Rs. 12100. Which was divided in proportion to investments. Find the amount of profit each partner earned.

$$P_1 : P_2 : P_3 = 2 : 5 : 4$$

$$T.P = 11P = 12100$$

$$A = 2 \times 1100 = 2200$$

$$B = 5 \times 1100 = 5500$$

$$C = 4 \times 1100 = 4400$$

A B C

$$2 : 5 : 4$$

$$11P = 12100$$

$$P = 1100$$

There are 3 partners A, B and C in a business. A invest Rs. 2000 for 5 months, B invest Rs. 1200 for 6 months and C invest Rs. 2500 for 3 months. Find the ratio of their shares in the profit.

$$\text{Ratio} = A : B : C$$

$$100 \times 6 = 20 \times 5 : 12 \times 6 : 25 \times 3$$

$$\text{Profit Ratio} = 100 : 72 : 75$$

A, B and C entered into a business. A invested Rs. 16000 for 9 months, B invested Rs. 12000 for 6 months and C invested Rs. 8000 for 12 months. At the end of the year, there was a profit of Rs. 26000. Find the share of B.

$$\text{Profit} = \frac{16 \times 9}{12 \times 6} : \frac{12 \times 6}{12 \times 6} : \frac{8 \times 12}{12 \times 6} = 6 : 3 : 4$$

$$\text{Total Profit} = 13P \rightarrow 13P = 26000$$

$$\text{Share of B} = 3 \times 2000 = 6000$$

A starts a business with Rs. 3500 and 5 months after B joins A as his partner. After a year the profits are divided in the ratio 2 : 3. How much did B contribute?

Q32

Partnerships → Business field

$$P_1 : P_2 : P_3 = I_1 T_1 : I_2 T_2 : I_3 T_3$$

$$I_1 : I_2 : I_3 = \frac{P_1}{T_1} : \frac{P_2}{T_2} : \frac{P_3}{T_3}$$

$$T_1 : T_2 : T_3 = \frac{P_1}{I_1} : \frac{P_2}{I_2} : \frac{P_3}{I_3}$$

$$PRO = Inv \times Time$$

$$P = IT$$

$$I = \frac{P}{T}$$

$$T = \frac{P}{I}$$

Active partner Sleeping partner

Work + Inv

↓
employer (salary)

only Inv
money

→ Profit shared

Total profit

$$30000 - 6000 = 24000$$

Active sleeping
Salary 6000

A, B and C invested Rs. 5000, Rs. 10,000, and Rs. 15,000 respectively in a business for a period of 2 years. Then find the ratio of their profits at end of 2 years.

$$I_1 T_1 : I_2 T_2 : I_3 T_3$$

$$P_A : P_B : P_C = 5000 \times 2 : 10,000 \times 2 : 15,000 \times 2$$

$$5 : 10 : 15$$

$$1 : 2 : 3$$

$$\begin{array}{r}
 140 \\
 85.2 \\
 + 10.2 \times 40 \\
 \hline
 18 \quad 160 \\
 \hline
 1840
 \end{array}$$

$$\textcircled{40} \quad \text{sum} = 40 \times 15 = 600$$

$$600 + \frac{\text{sum of } 10}{50} = 15.2$$

$$600 + \frac{\text{sum of } 10}{50} = 760$$

$$\text{sum of } 10 = 760 - 600$$

$$\text{avg} = \frac{160}{10} = 16 \text{ yrs}$$

The avg age of 11 players of a cricket team is increased by 2 months when two of them aged 18 yrs and 20 yrs are replaced by two new players. Find the avg age of new players.

$$\text{sum of } 11 = 11x$$

$$\frac{11x - 18 - 20 + A + B}{11} = x + \frac{2}{12}$$

$$11x - 38 + A + B = 11x + \frac{2}{12} \quad \text{Cir + 10 months}$$

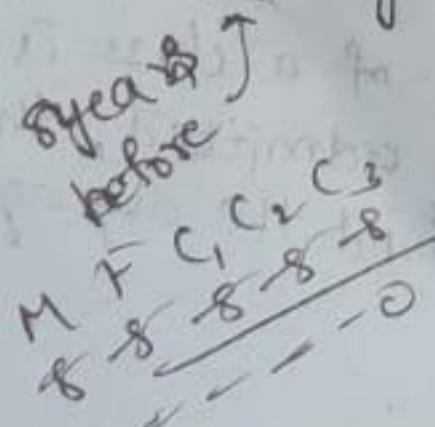
$$\frac{A + B}{2} = \frac{38}{11} + \frac{2}{12}$$

2 players 11 months

The avg age of a family of five members is 24. If the present age of the youngest member is 8 yrs, what was the avg age of family at the time of the birth of the youngest member?

$$\text{sum of family at pre} = 24 \times 5 = 120$$

$$\text{Avg age of family} = \frac{\text{sum of family at pre} - 8}{\text{No. of Persons}}$$



$$= \frac{120 - 8 \times 5}{4}$$

$$= \frac{120 - 40}{4} = \frac{80}{4} = 20 \text{ yrs}$$

$$\begin{aligned}
 & \text{Partnerships} \rightarrow \text{Business Field} \\
 & P_1 : P_2 : P_3 = T_1 : T_2 : T_3 \\
 & T_1 : T_2 : T_3 = P_1 : P_2 : P_3 \\
 & P_{TO} = P \cdot T \\
 & P = \frac{T}{T_1 + T_2 + T_3} \\
 & T = T_1 + T_2 + T_3
 \end{aligned}$$

If the total ages of Iqbal and Shikhar is 12 yrs more than the total age of Shikhar and Chauhan. Chauhan is how many years younger than Iqbal?

$$I + S = S + C + 12$$

$$I - C = 12$$

The sum of ages of a daughter and mother is 56 yrs; after four years the age of the mother will be three times that of the daughter. What is the age of the daughter and the mother, respectively?

$$\begin{aligned} D + M &= 56 \text{ yrs} \\ D + 3(D+4) &= M+4 \\ 4D + 12 &= M+4 \\ M &= 3D + 8 \end{aligned}$$

$$D + 3D + 8 = 56$$

$$4D = 48$$

$$D = 12 \text{ yrs}$$

$$M = 3 \times 12 + 8$$

$$M = 44 \text{ yrs}$$

The avg age of class of 40 students is 16.95 yrs. Due to new admission, the avg age increased to 17 yrs. Find the age of new student.

$$16.95 - 17 \text{ New}$$

$$16.95 - 16.95$$

$$17 - 17 = 19 \text{ yrs}$$

$$40 \times 0.05 = 2 \text{ yrs}$$

The avg age of 40 students of a class is 15 yrs. When 10 new students are admitted, the avg age is increased by 0.2 yrs. Find the avg age of new students.

Ayesha's father was 36 yrs of age when she was born while her mother was 36 yrs old when her brother four yrs younger to her was born. What is the diff b/w the ages of her parents.

Ayesha		Ayesha's Bro	
28 yrs	36	36	22
+4	0	-22	0
42	4	36	22

$02 = 24$

$$F - M = 42 - 36$$

$$48 - 24$$

$$48 - 24$$

$$\text{Diff} = 6 \text{ yrs}$$

A person's present age is two-fifth of the age of his mother. After 8 yrs, he will be one-half of the age of his mother. How old is the mother at present?

$$\frac{S}{M} = \frac{2}{5}$$

$$\text{pre} \rightarrow \left(\frac{2}{5}\right) \times 1 = \frac{2}{5} \times 2 = \frac{4}{5}$$

$$8 \uparrow \rightarrow \left(\frac{1}{2}\right) \times 3 = \frac{3}{2}$$

$$M = 5 \times 8 = 40 \text{ yrs}$$

Q is as much younger than R as he is older than T. If the sum of the ages of R & T is 50 yrs. what is the age of Q?

$$R + T = 50$$

$$2x = 50$$

$$R = 25 \text{ yrs}$$

$$\text{Age of Q} = 25 \text{ yrs}$$

$$R + T = 50$$

$$Q \rightarrow R$$

$$T \rightarrow R$$

$$T \rightarrow R$$

$$T \rightarrow R$$

letter
in the word
position as it does
some position
in the word
the word
the English alphabet?
1) C 2) T 3) R 4) S 5) None

If the 1st and 2nd letters of the word UNPRECEDENTED are interchanged with the last and the 2nd last letters and similarly the 3rd and 4th letters are interchanged with the 3rd and 4th letters from the last respectively, then what will be 7th letter to the right of the 3rd letter from left?

- 1) C 2) E 3) P 4) R 5) None

DE ~~T~~ N ~~E~~ E ~~D~~ G ~~R~~ P N U
EP CE
→ left

If in the word DISTURBANCE the 1st letter is interchanged with the last letter, the 2nd letter is interchanged with the 10th letter and so on, which letter would come after T in the newly formed word?

- 1) I 2) N 3) S 4) D 5) U
E C N A B R U F ~~S~~ I D

A meaningful word starting with A is made from the first, 2nd, 4th & 5th and 6th letters of the word CONTRACT. Which of the following is the middle letter of the word?

- 1) C 2) O 3) R 4) T 5) None

Ⓐ COTRA ACTOR

If with the 3rd, 4th, 5th, 7th & 10th letter of PERSONALITY, a meaningful word is formed.

then 1st letter of the word is the answer. If no word is possible, then X is the answer

- 1) O 2) T 3) R 4) S 5) X

1) O 2) T 3) R 4) S, O, A, T

ROASTED

Which letter in the word CYBERNETIC occupies the same position as it does in the English alphabet?

- 1) C 2) E 3) I 4) T 5) None
- 3 25 25 18 14 5 20 9 3 19
C 4 B E R N E T I c s
1 2 3 4 5 6 7 8 9 10 11

If the first and second letters in the word DEPRESSION were interchanged, also the 3rd and the 4th letters, the 5th and 6th letters and so on, which of the following would be the 7th letter from the right?

- 1) R 2) O 3) S 4) I 5) None

DEP R P S E I S N O
F 6 5 4 3 2 1

← right

The positions of the 1st and 8th letter in the word WORKINGS are interchanged. Similarly the positions of the 2nd and 7th letters are interchanged and the positions of the 3rd letter and 6th letter are interchanged and the positions of the remaining two letters are interchanged with each other, to which of the following will be the 3rd letter to the left of R after rearrangement.

- 1) 9 2) I 3) N 4) S 5) None

S G (N) E K R O W
3 2 1

W R O K E S G N I

business in a business
year, A received one
profit and C received
amount is
5000. How much
receive?

1) 5000 2) 10000
3) 15000 4) 20000

How many pairs of letters are there in the word REPURCUSSION which have as many letters between them in the word as in the alphabet and that too in the same order?
1) Nil 2) One 3) Two 4) Three 5) None

REPURCUSSION

Two letters in the word COUPLE have as many letters b/w them as in the alphabet. The letter which appears first in the alphabet is the answer. If there is no such pair of letters in the word, then mark your answer as X

C O U P L E (left-right)
L (right-left)

1) L 2) O 3) P 4) X 5) None

If the letters of the word TRANSFORM are rearranged as they appear in the English alphabets then the position of how many letters will remain unchanged after such rearrangement?

1) zero 2) one 3) Two 4) Three 5) None

Given → T R . A [N] S F O R M

Rearranged → A F M [N] P R R S T

If the order of letters of each of the following words is reversed, then which of the following will be the meaningful word? If more than one such word can be formed, mark 'S' as the answer and if no such word can be formed, mark 'X' as the answer.

1) PAUL, 2) RAIL, 3) MADAM 4) S 5) X

PAUL, RAIL, MADAM, TSER
LIAN, LIAP, LIAR, MADAM, TSER

If each letter is attached a value equal to its serial no. in the above arrangement, then what will be the sum of the numbers attached to all the vowels in the arrangement.

1) 50 2) 50 3) 50 4) 50

S + 10 + 4 + 20 + 23 \Rightarrow 72

1. M P O N R N B E Y C A A V L D G X H 9 J S 2 T
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

If SUMMER is coded as RUNNER, the code for WINTER will be ~~WINTER~~ ~~WINTER~~ ~~WINTER~~

W-2015-11-22
WINTER -1 +1+1

The certain code of propositions is written

ପ୍ରକାଶକ ପତ୍ର ୧୦

Orientation of subhalo

PEDOGENETIC

1911 MIND becomes KGLB and ARGUE

If in a code, HIN is there what will BTAGRAM be

that $\frac{1}{13} \cdot 9^{\frac{1}{14}} = 1$ $\frac{1}{13} \cdot 9^{\frac{1}{14}} - 1 = \frac{1}{13} \cdot 9^{\frac{1}{14}} - 1 + 1 = \frac{1}{13} \cdot 9^{\frac{1}{14}}$

BG Y EPYK

25 165 193
11 74 122

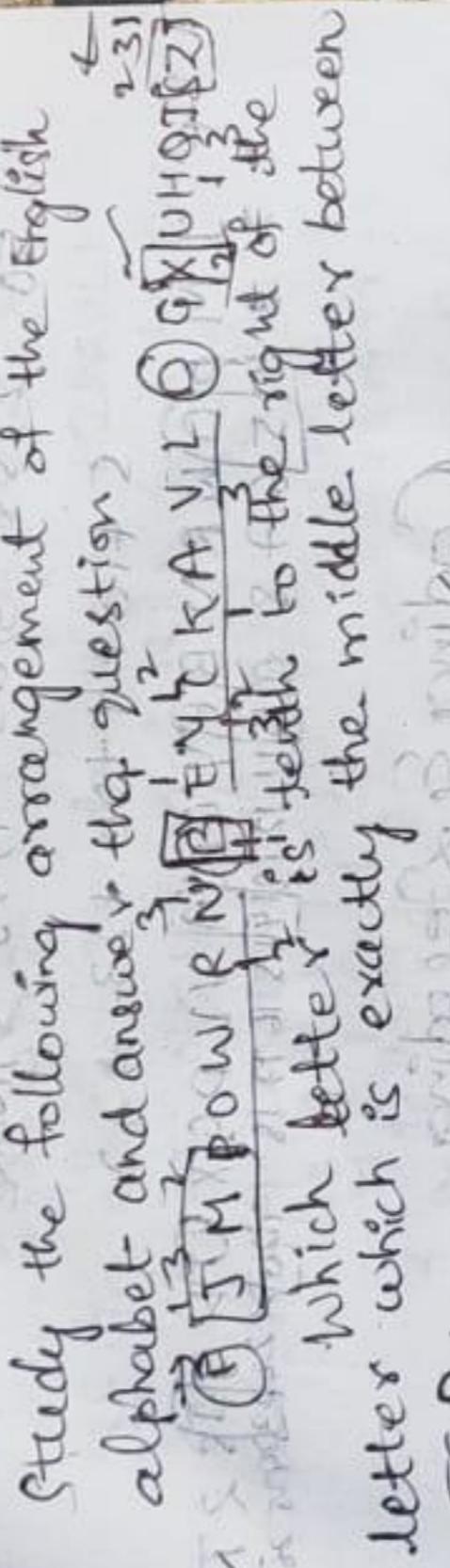
possible to make
INTERPRETATION, which letter of the
third letter of that word?
such words can be
answer 'x' and if no
such words can be

a meaningful word, what is the 1st letter
of that word?

A) B C D E F G H I J K L M N O P Q R S T V W X Y Z

2) E 3) No word can be formed

E, T, M, U, O, M, H, O, T, E ↗

Study the following arrangement of the English alphabet and answer that question

which letter is exactly the middle letter between
letter which is exactly the middle letter between

F, G, D, P, O, V, U, S, N, O, E, R, Y.

1) O 2) G 3) H 4) U 5) N, O, E

Same as above → Four of the following five are alike in a certain way based on their position in the above arrangement and hence form a group which one does not belong to that group?
1) DMR 2) HXL 3) KYN 4) DMN 5) KVN
21 3 21 3 21 3 21 3 21 3

INSTRUCTION: TS 2 in the same way as JNP?
same left right

ANSWER: 1) T, S, 2) 3) S, T, S, J, G
4) T, S, 2) 5) S, J, G
1) T, S, 2) 3) S, J, G
Which of the following pairs of letters has the above many letters between them in English
a) many letters between them are blue
b) many letters between them are black

ARRANGEMENT OF LETTERS
1) N, R, M, O, P, Q, S, T, U, V, W, X, Y, Z
2) F, L, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
3) A, T, H, A, X, F, J, M, P, O, W, R, N, B, E, Y, C, K, A, V, L, D, G, X, U, S, T, U, V, W, X, Y, Z
4) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
5) A, T, H, A, X, F, J, M, P, O, W, R, N, B, E, Y, C, K, A, V, L, D, G, X, U, S, T, U, V, W, X, Y, Z
6) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
7) A, T, H, A, X, F, J, M, P, O, W, R, N, B, E, Y, C, K, A, V, L, D, G, X, U, S, T, U, V, W, X, Y, Z
8) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
9) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
10) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
11) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
12) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
13) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
14) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
15) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
16) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
17) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
18) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
19) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
20) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
21) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
22) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
23) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
24) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
25) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
26) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
27) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
28) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
29) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
30) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
31) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
32) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
33) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
34) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
35) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
36) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
37) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
38) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
39) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
40) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
41) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
42) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
43) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
44) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
45) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
46) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
47) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
48) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
49) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
50) T, S, U, V, W, X, Y, Z, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z

If it is possible to make a meaningful word with 1st, 4th and 11th letter of the word INTERPRETATION, which of the following will be third letter of that word?

If more than one such words can be formed, give 'X' as the answer and if no such word can be made, give 'M'.

- 1) T
- 2) R
- 3) T

TIER

TIRE

If it is possible to make a meaningful word with the second, 4th and 6th and the 8th letters of the word ATMOSPHERE, what will be the 3rd letter of the word? If more than one such words can be formed give 'X' as the answer and if no such word can be formed give 'Y' as the answer.

- 1) E
- 2) O
- 3) T

TOPSY

TOPSY

If it is possible to make a meaningful word with the 3rd, 4th and 6th and the 12th letters of the word BREAKTHROUGHT which of the following is the 9th letter of that word? If no such word can be formed, give 'N' as the answer and if more than one such word can be formed give 'D' as the answer.

- 1) A
- 2) E
- 3) T

HAT

HAT

HAT

If you pickup from the following alphabet, the 6th and 14th letter from your right and then pick up the 5th and 20th letter from your left and form

How many odd numbers are there in the sequence which are immediately preceded and also immediately followed by even number?

even \swarrow Odd \searrow even

→ 4 "

The positions of the second and 8th digits of the number 39128564 are interchanged. Similarly, the positions of 4th and 5th digits are interchanged. The positions of the 1st and 6th digits are interchanged and the positions of the 3rd and the 7th digits are interchanged. What will be the third digit to the left of 3 after arrangement

$$\begin{array}{r} 3 \ 9 \ 1 \ 2 \ 8 \ 5 \ 6 \ 4 \\ - \\ 5 \ 4 \ 1 \ 6 \ 8 \ 2 \ 3 \ 1 \ 9 \end{array}$$

→ 64

Number & Ranking Test

which is the 3rd number to the left to the number which is exactly in the middle of the following sequence of numbers?

the following sequence of numbers:
1 2 3 4 5 6 7 8 9 2 4 6 8 9 7 5 3 1 9 8 7 5
13 13

5(4,3,2), (2), (3,1), (a,e), (c,d) <

13 Middle 13

13 Middle 13

→ 476-9 go to 3rd row which are preceded by
two many 4's, are there followed by 3's like
+ but not 5926979613287913832
593215926979613287913832
5674395820187963

$\Rightarrow 4/1 \Rightarrow$ four 4's, add them up. How many 8's are there in the list of numerals?

In the following list of numerals, each of which is followed by 1 but not

there each of which is preceded by a symbol which

$\frac{1}{2} \times 14 = 7$ $4 \times 4 = 16$ $16 + 7 = 23$

③ 12 414' 212 9190.000
X 4 2 1

$\Rightarrow \psi_1$ has four 2's in the following series

How many 7's are there in the following series which is not preceded

How many 7's are there which are preceded by 6 which is not preceded by 8?

which are preceded by 8?

1986-56 9761 6072688

8/76 8673 867
867

$\times 8 \quad 6 \quad | 7$
=) three 7's preceded by not 8

\Rightarrow three 7 by 6 not 8.

How many such pairs of digits are there ~~in~~
in the number 531268947 each of which ~~the~~
has as many digits between them in the number ~~as~~
as when they are arranged in descending order?

$\Rightarrow (5,2), (3,6), (1,2), (1,3), (2,7), (4,9)$
 \Rightarrow 6 pairs

If it is possible to form a number with the 2nd, 5th and 8th digits of number 31549786, which is the perfect square of a 2-digit even number, what will be the second digit of that even number?

number → 169 → 13rd odd
1, 9, 6 → 8 10 → 198 → 14th even ✓
961 → 31st odd

$\Rightarrow 4,$

Study the following number sequence and answer the questions given below:

How many numbers are there in the sequence?

How many odd numbers are there in the sequence
each of which is immediately followed by an odd number?

sixty odd odd ^{and} sixty sixty nine in the

size
How many even numbers are there in the sequence which are immediately preceded by an odd number but immediately followed by an even number?

odd Even even

-34-

✓

If 'room' is called 'bed', 'bed' is called window, 'window' is called flower and 'flower' is called cooler, on what would a man sleep?

generally bed → window → window
is called

If 'cushion' is called 'pillow', 'pillow' is called mat, 'mat' is called bedsheet and bedsheet is called cover, which will be spread on the floor?

generally mat → called as bedsheet

If 'blue' means 'green', 'green' means white, 'white' means yellow, 'yellow' means black, 'black' means red, and 'red' means brown, then what is color of milk?

which means white.

benati pab rawd snt! green is called

If 'paper' is wood, wood is called straw, straw is called grass, grass is called rubber and rubber is called cloth, what is the furniture made up of?

generally wood → straw → cloth

- According to certain code,
- A) min fin bingin means 'trains are always late'
 - B) tgin din cin hin means 'drivers were punished'
 - C) bin cin vin sin means 'drivers stopped all trains' and
 - D) din kin fin vin means 'all passengers were late'.

d) 987692

\$ KEFM# Cond 2 apply

e) 364819 Cond 1 apply

@ FAKtx

Numerals 3, 8 0 & 4 6 9 2 5)

Codes H \$ R A M % L K E @

(i) If a number begins and ends with a non-zero odd digits, then the first & the last digits are to be coded as Y and # respectively.

(ii) If a number begins and ends with an even digit (including zero), then the 1st & last digits are to be coded as P and X respectively. 8, 0, 2, 4, 6, 8

Cond 1 @ Y-J.

b) 173548 p no. cond 1 apply

@AHEM\$

a) 764981 → cond 1 Y-J. M-L \$ #

c) M-H-L-E-K@. → 439526

d) 278140 → P-A-S-O-M-X Cond 2

e) R-J-L-A-K@ → 069721

→ If 'bat' is 'racket', 'racket' is 'football', 'football' is 'shuttle', 'shuttle' is 'ludo' and 'ludo' is 'carrom', what is cricket played with?

Bat → Racket

left to right A is called B
A means B

which one means

Racket

is called answer,

25

In an exam a student fails by 15 marks and gets 40%. of marks. For the pass mark in that diff. is 52.5%.

The population of a town is decreased by 20% and 25% in two successive years. What percentage of population is decreased after 2 years?

$$\text{After } 2 \text{ yrs} = 100 \times \frac{80}{100} \times \frac{75}{100} = 60$$

∴ 40% decreased

The population of town increases by 12% during the 1st year & decreases by 10% during the 2nd year. If the present population is 50400 what was the population 2 years ago?

$$\text{Initial pop. } 2 \text{ yrs ago} \xrightarrow{\text{12% inc}} \boxed{x} \xrightarrow{\text{10% dec}} \frac{112}{100} \times \frac{90}{100} = \frac{50400}{5680}$$

$$x = \frac{50400 \times 5680}{50400 - 50000} \quad \checkmark \text{ 2 yrs ago}$$

The length & breadth of rectangle are increased by 30% & 20% respectively. Find the change in its area.

$$\text{Initial Area} \quad \text{New l} \quad \text{New b}$$

$$\text{New Area} = 100 \times \frac{130}{100} \times \frac{120}{100} = 156$$

$\underbrace{+ 56}_{\text{fit}}$

56% increases

The length and breadth of a cuboid are increased by 10% each height is decreased by 10%. Find the overall change in the volume.

$$\text{Initial V} \quad l \quad b \quad h$$

$$\text{New volume} = 100 \times \frac{110}{100} \times \frac{110}{100} \times \frac{90}{100} = 108.9$$

$\underbrace{+ 8.9\%}_{\text{fit}}$

If COMPUTRONE is written as PMOCUENOR then ADVANTAGES is written as

<u>COMPUTRONE</u>	<u>ADVANTAGES</u>
<u>PMOCUENOR</u>	<u>AVDATN SEGA</u>

In a certain language, COMPUTER is written as RFUVQNPC. How is MEDICINE written.

<u>COMPUTER</u>	<u>MEDICINE</u>
<u>RFUVQNPC</u>	<u>E OJD JEFM</u>

In a code language, DISTANCE is written as IDTUBECN and DOCUMENT is written as ODDVNNTNE. How is THURSDAY written

<u>DISTANCE</u>	<u>DOCUMENT</u>	<u>THURSDAY</u>
<u>IDTUBECN</u>	<u>ODDVNTNE</u>	<u>HTVSTYAD</u>

If RED is coded as 6720, then how would

GREEN be coded?

18 R E D	26 R E E N
6 11 9 20	+2

T16 # 7 209

If RAIN is written as 8 \$ 16 and MORE is written as 7 # 8 @ . How is REMAIN written

R A I N	MORE	REMAIN
8 \$ 16	7 # 8 @	8 @ 7 \$ 16

they are directly substituted

If CHARCOAL is coded as 45164913 and MORALE is coded as 296137, how the word ALLOCHIRE is coded

CHARCOAL	MORALE	ALLOCHIRE
45164913	296137	13394567

If $E=5$ and $\text{HOTEL} = 12$ how will code LAMB?

HOTEL

$$8 \ 15 \ 20 \ 5 \ 12 = \frac{60}{5} = 12 \text{ digit}$$

$$\text{LAMB} \quad 12+1+13+2 = \frac{28}{4} = 7, //$$

If $O=6$; $\text{FOR} = 42$, then what is FRONT equal to?

$$\text{FOR} = 6 + 15 + 18 + 3 = 42$$

$$\text{FRONT} = 6 + 18 + 15 + 14 + 20 + 5 = 78$$

Study the following information carefully and answer the questions.

Numerals 3 5 7 4 2 6 8 1 0 9
codes * B E A Q F K @ R M

→ conditions apply.

- If the first digit & last digit is odd, both are to be coded as 'X'.
- If the first digit & last digit are even, both are coded as '\$'.
- If the last digit is 0, it is to be coded as '#'. X A F K X

a) 5 4 6 8 3 9

Odd Odd

cond 2 Apply.

b) 7 1 3 5 4 0

E I * B A #

c) 7 6 5 0 8 2

No cond is Applied

E F B R K @

The weights of A & B are 20% and 30% more than C, then what percentage of A is C?

$$\frac{C}{A} \times 100 = \frac{120}{100}$$

$$\frac{100}{120} \times 100\% = \frac{250}{3}\% = 83\frac{1}{3}\%$$

If weight of A is 20% more than that of B, then by what percentage the weight of B is less than that of A?

$$\frac{A}{B} \times 100 = \frac{120}{100}$$

$$\% \text{ less than} = \frac{\text{Diff}}{\text{High value}} \times 100\%$$

$$= \frac{20}{120} \times 100 = 16\frac{2}{3}\%$$

There are 3 persons A, B & C. A's salary is 25% less than B's salary. C's salary is $4\frac{1}{6}$ % more than B's salary. By what percent A's salary is less than that of C's salary?

$$\frac{A}{B} \times 100 = \frac{75}{100}$$

$$\% \text{ less than} = \frac{\text{Diff}}{\text{High Val}} \times 100\%$$

$$= \frac{625 - 75}{6} \times 100\%$$

$$= \frac{550}{6} \times 100\% = 91\frac{2}{3}\%$$

$$\% \text{ less} = 28\frac{1}{3}\%$$

Two numbers are less than the 3rd number by 30% and 37% respectively. How much percent is the second number less than the first?

$$\begin{array}{ccc} F & S & T \\ 70 & 63 & 100 \end{array} \text{ Less than } = \frac{7}{70} \times 100\% = 10\%.$$

If weight of A is 25% less than that of B, then by what percentage, the weight of B is more than that of A?

$$\begin{array}{ccc} A & B \\ 75 & 100 \end{array} \text{ more than } = \frac{25}{75} \times 100\% = 33\frac{1}{3}\%.$$

The sales of a dealer decreased by 10% when he increased the price by 30%. Find the percentage change in the revenue?

$$\text{Rev} = \text{Sales} \times \text{price}$$

$$I. \text{ Rev} = 100 \times 100 = 10000$$

$$\text{New-Rev} = 90 \times 130 = 11700$$

$$\% \text{ change} = \frac{1700}{10000} \times 100\%$$

Rev + 17% increase

Shortcut

$$\begin{array}{ccc} I: \text{Rev} & S & P \\ 100 & 100 & 130 \\ \text{New-Rev} = \frac{100}{100} \times \frac{90}{100} \times \frac{130}{100} & & \\ & & = 117 \end{array}$$

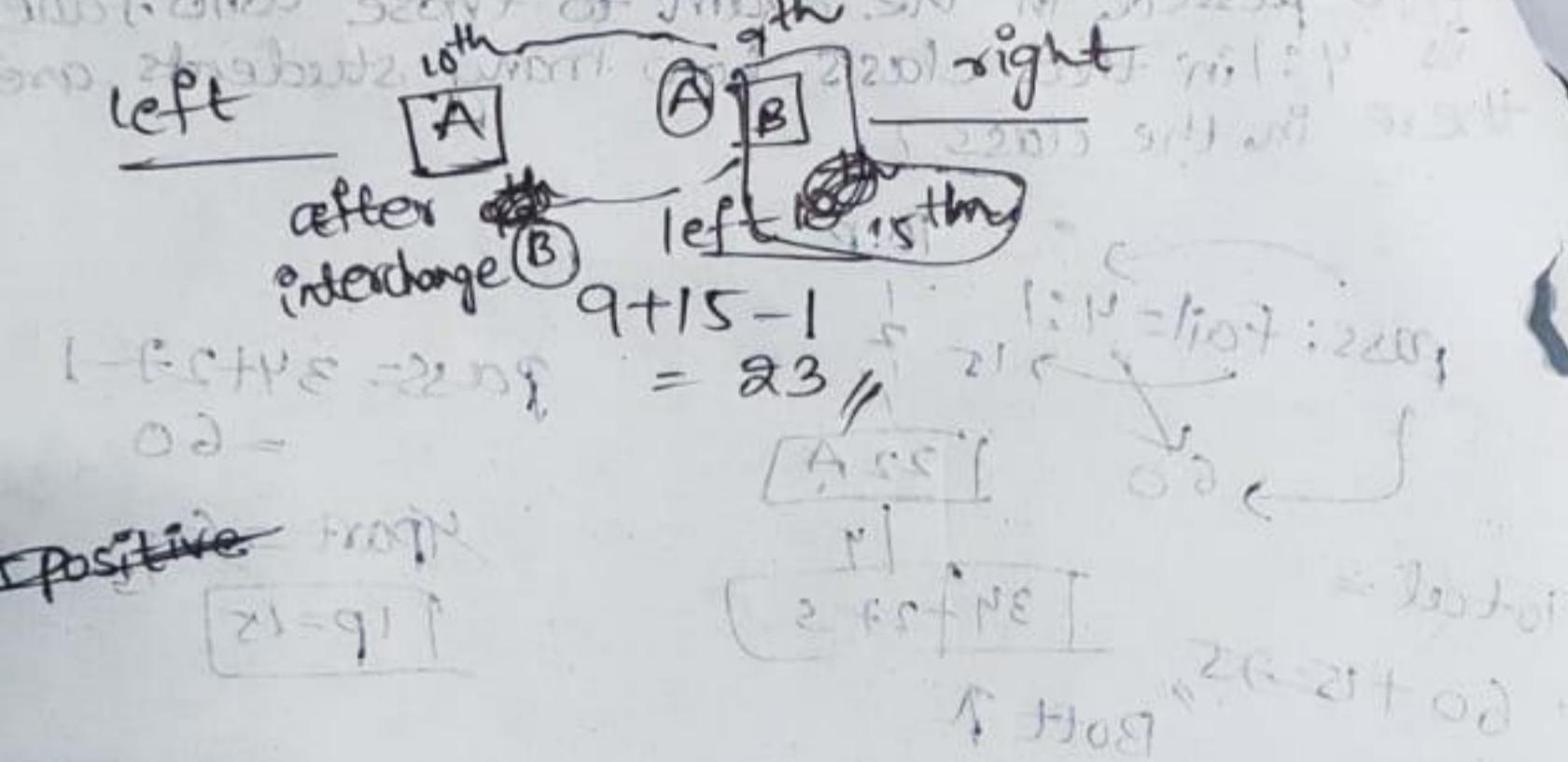
17% increase

A positive number first decreases by 20% and then increased by 20%. Find the overall change in it.

$$\begin{array}{rcl} 100 \times \frac{80}{100} \times \frac{120}{100} & = & 96 \\ \text{find} & & \end{array}$$

Decreased 4%.

In a row of boys, if A who is 10th from left and B who is 9th from right interchanging their positions, A becomes 15th from left. How many boys are there in the row?



1. ~~positive from~~
 $21 = 9 + 12$

$$\begin{array}{c} (8-2) \\ \uparrow \quad \text{c1} \\ 6-2 \\ \uparrow \quad \text{c2} \\ 4-2 \\ \uparrow \quad \text{c3} \\ 2-2 \\ \uparrow \quad \text{c4} \\ 0-2 \end{array}$$

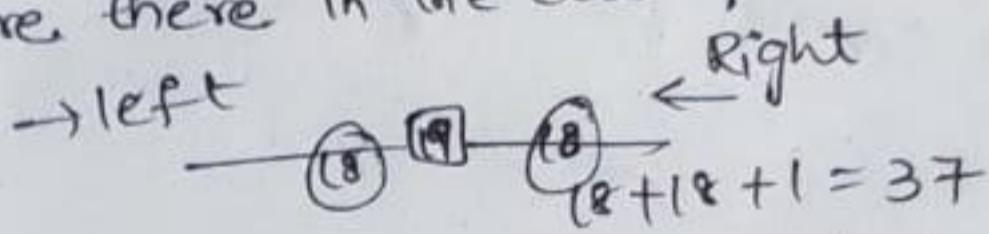
1. ~~positive from~~
 $21 = 9 + 12$

$$\begin{array}{c} 12-1-8+5 \\ \uparrow \quad \text{c1} \quad \text{c2} \quad \text{c3} \\ 4-1-8+5 \\ \uparrow \quad \text{c4} \quad \text{c5} \quad \text{c6} \\ 0-1-8+5 \\ \uparrow \quad \text{c7} \quad \text{c8} \quad \text{c9} \end{array}$$

Sam ranked 9th from top and 38th from bottom in a class. How many students are there in the class?

$$\begin{array}{r} \text{Top} \\ 9 \\ + 38 - 1 \\ \hline = 46 \end{array}$$

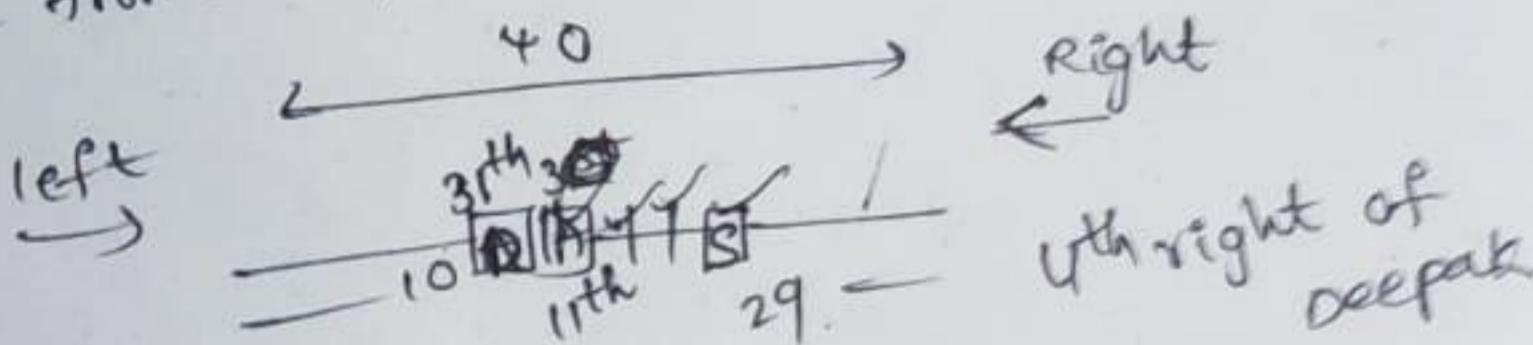
A class of boys stands in a single line. One boy is 19th in order from both the ends. How many boys are there in the class?



If Atul finds that he is 12th from right in a line of boys and fourth from the left, how many boys should be added to the line such that there are 28 boys in the line?

$$\begin{array}{l} \rightarrow 3^{\text{rd}} \text{ from left} \\ \boxed{13} \quad \boxed{A} \quad \boxed{11} \quad \leftarrow \text{right} \\ \text{12}^{\text{th}} \\ x = 28 - 15 \\ = 13 \\ 3+1+1 = \boxed{15} + x = 28 \end{array}$$

Fourty boys are standing in a row facing the North. Amit is 11th from left and Deepak is 31st from the right end of the row. How far will Shreya, who is 3rd to the right of Amit in row, be from Deepak?



Answer the following

a) Find $\frac{6}{4}\% \text{ of } 320$ b) Find $16\frac{2}{3}\% \text{ of } 216$

$$\frac{25}{4} \times \frac{1}{100} \times 320 = 20$$

$$\frac{50}{3} \times \frac{1}{100} \times 216 = 36$$

c) Find $8\frac{1}{3}\% \text{ of } 720$

$$\frac{1}{12} \times 720 = 60$$

What percentage of 180 is 54? (less than 1% more than 1%)

$$\frac{36}{180} \times 100\% = 20\%$$

What percentage of 40 is 360?

$$\frac{360}{40} \times 100\% = 900\%$$

A number, when increased by 30% becomes 78. Find the number?

$$100\% \rightarrow 78$$

$$\boxed{60} \times \frac{30}{100} = 18$$

$$100\% \rightarrow ?$$

$$\frac{100 \times 78}{130} = 60$$

There are 3 natural numbers. The first & the second numbers are less than third number by 40% and 50% respectively. What percent of 2nd number is the 1st number?

$$\begin{array}{c} F \\ (60) \end{array} \quad \begin{array}{c} S \\ 50 \end{array} \quad \begin{array}{c} T \\ 100 \end{array}$$

$$\frac{S}{T} \times 100\% = \frac{S}{100} \times 100\%$$

$$\frac{60}{50} \times 100\% = 120\%$$

Percentages:-

$$\frac{1}{2} = \frac{1}{2} \times 100\% = 50\%$$

$$50\% = \frac{50}{100} = \frac{1}{2}$$

Fraction

$$\frac{1}{2} \times 100\%$$

$$\frac{1}{3} \times 100\%$$

$$\frac{1}{4} \times 100\%$$

$$\frac{1}{5} \times 100\%$$

$$\frac{1}{6} \times 100\%$$

$$\frac{1}{7} \times 100\%$$

percentage

$$100\% = \frac{1}{8} \times 100\%$$

$$50\% = \frac{1}{9} \times 100\%$$

$$33\frac{1}{3}\% = \frac{1}{10} \times 100\%$$

$$25\% = \frac{1}{11} \times 100\%$$

$$20\% = \frac{1}{12} \times 100\%$$

$$16\frac{2}{3}\% = \frac{1}{13} \times 100\%$$

$$14\frac{2}{7}\% = \frac{1}{14} \times 100\%$$

$$14\frac{2}{3}\% = \frac{1}{15} \times 100\%$$

Fraction

$$12\frac{1}{2}\%$$

$$11\frac{1}{9}\%$$

$$10\%$$

$$9\frac{1}{11}\%$$

$$8\frac{1}{3}\%$$

$$7\frac{9}{13}\%$$

$$7\frac{1}{5}\%$$

$$6\frac{2}{3}\%$$

Model 1

what % of x is y
what % is y of x
y is what % of x?

$$\text{shortcut } (\frac{\text{is}}{\text{of}}) \times 100\% = \frac{y}{x} \times 100\%$$

Model 2

$$\begin{aligned} \text{- \% increment} \\ \text{- \% more than} \\ \text{- \% above} \end{aligned} = \frac{\text{Diff b/w 2 values}}{\text{less value}} \times 100\%$$

Model 3

$$\begin{aligned} \text{- \% decrement} \\ \text{- \% less than} \\ \text{- \% below} \\ \text{- \% reduction} \end{aligned} = \frac{\text{Diff}}{\text{High value}} \times 100\%$$

Answer the following
 Q) Find $6\frac{1}{4}\% \text{ of } 320$
 $\frac{35}{100} + \frac{1}{4} = 20$
 c) Find $\frac{1}{3} \times \frac{1}{4}$
 What per

In a election, there are two contestants A & B. It was found that 3640 votes were invalid. B polled 24% of valid votes and lost the election by 43680 votes. Find the total no. of votes polled in election.

valid (coot.)

$$\text{Total votes} = \text{valid} + \text{invalid}$$

$$\begin{array}{c} \text{A} \quad \text{B} \\ 76\% \quad 24\% \end{array} \text{diff } 52\% \rightarrow 43680$$

$$100\% \rightarrow ?$$

$$28 \rightarrow 10920$$

$$840 \rightarrow 43680 \times 100$$

$$535$$

$$\text{Valid} = 84000$$

$$\text{Total votes} = 84000 + 3640 = 87640$$

From the salary of an officer, 10% is deducted as house rent, 15% of the rest he spends on children education and 10% of the balance, he spends on clothes. After this expenditure, he was left with Rs. 1377. Find his salary.

$$I = ETS$$

$$\left\{ \begin{array}{l} 10\% \\ 15\% \\ 10\% \end{array} \right. \times \frac{90}{100} \times \frac{85}{100} \times \frac{90}{100} = 1377.00$$

$35\% \text{ EXP}$

$65\% \text{ SV}$

$$P_x = 2000$$

In an office 70% employees are males and 40% of employees which include a female, employees got promotion. If there are 35 male employees, what percent of male employees got promotion.

$$70\% \rightarrow 35$$

$$100\% \rightarrow 50$$

$$M \rightarrow 100\% \quad F \rightarrow 0\%$$

$$70\% \quad 30\%$$

$$35 \quad 15$$

40%

promotion (20)

40%

(14)

M

F

G

$$1. = \frac{14}{35} \times 100\% \\ 20 \\ 240\%$$

$$240\%$$

Sandeep gave 20% with him to Sudhe to Harish, 40% and 50% of remain the greatest and Sandeep @ 20%

$$163 \quad 80$$

34th from
bottom student
ranked 28th from
top and
in a single
class. How
many
in the class?
Bottom
3rd

In a class, among the passed students, Amisha is 22nd from top & Sajal, who is 5 rank below Amisha, is 34th from bottom. All the students from the class have appeared for the exam. If the ratio of the students who passed in the exam to those who failed is 4:1 in that class, how many students are there in the class?

there in the class?

TOP

pass: fail = 4:1

$\frac{1}{15} \cdot 22 = 1$

$\frac{1}{15} \cdot 22 = 1$

$1 - \frac{1}{15} = \frac{14}{15}$

$\frac{14}{15} \cdot 60 = 56$

$60 - 56 = 4$

$\frac{4}{15} \cdot 60 = 16$

$16 + 4 = 20$

$20 + 56 = 76$

Total = 76

Bott ↑

Pass = $34 + 27 = 61$

Fail = $15 + 4 = 19$

Part = $\frac{60}{15} = 4$

1P = 15

N rank 5th in a class. S is 8th from last. If T is 6th after N & just in the middle of N & S, then how many students are there in the class?

TOP 1

$5 \rightarrow N$

$13 \rightarrow T$

$13 \rightarrow S - 8$

$\Rightarrow 17 + 8 - 1 = 24$ // the left & peter is 12th from

$\Rightarrow 17 + 8 - 1 = 24$

George is 5th from the left & Peter is 12th from the right end in a row of children. If Peter shifts by 3 places towards George, he becomes 10th from the left end. How many children are there in the row?

of a town is decreased by
in two successive years. What
is decreased after

increased
by 12% during
the
ago?

Part → Pre
Pre → Future

In an exam a student got 30% of marks
and fails by 15 marks. Another student got
40% of marks and gets 25 marks more than
the pass mark. Find the maximum marks and
pass mark in that exam.

$$\text{Diff } S_1 \& S_2 = 10\% \rightarrow 40 \text{ marks}$$

$$\text{Max. marks} = 100\% \rightarrow 400 \text{ marks}$$

$$\begin{aligned} \text{pass marks} &= S_1 \\ &= 30\% + 15M \\ &= 120 + 15M \end{aligned}$$

$$\begin{aligned} \text{pass marks} &= S_2 \\ &= 40\% - 25M \\ &= 160 - 25M \end{aligned}$$

$$120 + 15M = 160 - 25M$$

$$35M = 40$$

$$M = 135$$

$$\begin{array}{c} S_2 \quad 40\% - \\ \hline 25M \quad PM \quad 40M \\ S_1 \quad 30\% - \\ \hline 15M \quad 0\% \end{array}$$

In an examination 30% & 35% students failed in
English and Maths respectively, while 27% students
failed in both the subjects. If the no. of students
passing the examination is 248. Find the total no. of
students who appeared in the exam.

$$\begin{array}{l} E \quad M \quad \text{Fail} \quad \text{Fail} / \text{Pass} \\ 30\% \quad 35\% \quad 37.2\% \quad 62\% \\ 100\% \quad 37.2\% \quad 62\% \end{array}$$

$$38\% \quad 62\%$$

$$62\% \rightarrow 248 \quad \text{Appeared} = 100\%$$

$$100\% = 400\%$$

Ashok secured 70% of votes in an election &
was elected by a majority of 1600 votes. All votes
polled were valid. Find the no. of votes polled, if
there are only two contestants.

$$\text{Total votes} = \text{Valid} + \text{Invalid}$$

valid (100%)

$$\begin{array}{c} A \quad B \\ 70\% \quad 30\% \\ \hline 100\% \end{array}$$

$$100\% \rightarrow 1600$$

$$1\% = 4000$$

$$\text{valid} = 100\% = 40000$$

$$\text{Total votes} = 40000$$

Anita purchased an item for Rs. 82.00 and sold it at the gain of 35%. From that amount she purchased another item and sold it at a loss of 20%. What is her overall gain/loss percentage?

$$\text{CP} = \frac{82}{1.35} = \frac{82}{\frac{135}{100}} = \frac{8200}{135} = \frac{1640}{3} \text{ No profit & No loss}$$

$$24000 \text{ one.} \\ \text{CP} = \frac{24000}{1.2} = \frac{24000}{\frac{12}{10}} = \frac{240000}{12} = 20000 \text{ loss}$$

$$\text{SP} = \text{CP} - \text{L}$$

On selling 44 articles, a shopkeeper got a profit equal to the selling price of 11 articles. What is the gain percentage?

$$1. \text{ SP} = \text{CP} + P$$

$$44 \text{ SP} = 44 \text{ CP} + 11 \text{ SP} \\ 33 \text{ SP} = 44 \text{ CP} \quad P\% = \frac{1}{3} \times 100\% = 33\frac{1}{3}\%$$

Find the single discount which is equivalent to three successive discounts of 10%, 20%, 30%.

$$\text{SP} = \text{MP} \times \frac{100-10\%}{100} \times \frac{100-20\%}{100} \times \frac{100-30\%}{100}$$

$$= 100 \times \frac{90}{100} \times \frac{80}{100} \times \frac{70}{100}$$

$$= 100 \times \frac{504}{1000} = 50.4\%$$

$$P = \text{MP} - \text{SP} = 100 - 50.4$$

$$D = 49.6\%$$

An article was marked 40% above the cost price. An 20% discount is allowed. Find the profit or loss percentage.

$$\text{MP} = \text{CP} + 40\% \text{ CP}$$

$$= 140 \text{ CP} + 20\% \text{ CP}$$

$$= 112 \text{ CP}$$

$$\text{Profit} = 12\%$$

A sold an article to B at 20% profit.
B sold it to C at 30% profit. B's profit
is Rs. 64 more than A's profit, then find
A's cost price.

	CP	SP	P
A	100%	120%	20%
B	100%	156%	36% = 20% + 64
C	156%	200%	44% → 89

CP

20

30

Respect — Formal/informal
Mail — correct/wrong
Dear sir:

that I have an issue regarding my major portal. It is not functioning properly. Since 2 days. I kindly, request you to rectify the

→ All nouns should be starting with capital letters

Sri. - Sotha, - Chandini are best-fnds.

Articles: - ① a, an & the
↳ usage of articles
Consonant vowel
make you a better
writer.

The selling price of two articles is the same on one article. There is 80% profit on the other there is 20% profit. Find the overall profit percentage.

$$SP = \frac{2ab}{a+b} = \frac{2 \times 180 \times 120}{300} = 144$$

CP₁
100

$$P = 44\%$$

Mahesh sold two bikes, each for Rs. 24000. If he makes 70% profit on the first and 15% loss on the second then find his gain or loss percentage in the whole transaction.

CP
100

$$\frac{2ab}{a+b} = \frac{2 \times 190 \times 120}{255} = \frac{3480}{255} = \frac{368}{3}$$

$$SP = 113\frac{1}{3}\%$$

100

100

A fruit seller buys 12 apples at the rate of Rs. 12 per dozen & sells them at the rate of 15 for Rs. 12, then find his profit (or) loss %.

$$CP = \frac{12}{12} = 1 \quad SP = \frac{12}{15} = \frac{4}{5} \quad CP > SP$$

$$\begin{aligned} \text{loss \%} &= \frac{CP - SP}{CP} \times 100 \\ &= \frac{1}{5} \times 100 \\ &= 20\% \end{aligned}$$

→ loss

$\frac{1}{5} \times 100$

When the selling price of an article is increased by 10%, then the loss of 15% is converted into a profit of 12%. Find the cost price of the article.

$$\begin{array}{c} SP_1 \rightarrow 112\% \\ | \\ 131 - \frac{100}{112} \cdot CP \\ | \\ SP_1 \rightarrow 85\% \end{array}$$

$$CP = 100\% = 300\%$$

Another P
sold it at
he purchased
for 300.
loss of
percent
loss

price the
the one
and
other

If 11 oranges are brought for Rs. 10^r sold at 10 for Rs. 11, what is the gain or loss?

$$P.L. = \frac{C.P. - S.P.}{C.P.} \times 100\% = \frac{\frac{10}{11} - \frac{10}{10}}{\frac{10}{11}} \times 100\%$$

The profit made on selling 8 meters of cloth is equal to the cost price of 3 meters of that cloth. Find the profit percentage.

$$P.L. = \frac{P}{C.P.} \times 100 = \frac{3C.P.}{8C.P.} \times 100\% = \frac{37.5}{8} \times 100\% = 37.5\%$$

The loss made on selling 6 meters of cloth is equal to the cost price of 1 meter of that cloth. find the loss percentage.

$$L.P. = \frac{1}{6} \times 100\% = 16\frac{2}{3}\%$$

The cost price of two articles is the same. On one article there is 20% profit, on the other 100% loss. Then find the overall profit or loss percentage.

$$P.L. = +20 - 10 = +\frac{10}{2} = 5\%$$

Rajesh sold two horses for Rs. 1000 each. If he makes 20% profit on one & 20% loss on the other, then find overall profit or loss.

$$C.P. = \frac{2ab}{a+b}$$
$$S.P. = \frac{2x120 \times 80}{(20+80)} = 190$$

$$S.P. = \frac{2x120 \times 80}{200} = 190$$

$$\text{Loss} = 100 - 190 = 10\%$$

By mistake a person calculated the profit percentage over selling price and it is found as 25% then find the actual profit percentage.

$SP > CP$

$$\text{Actual. P.} \% = \frac{P}{CP} \times 100\%.$$
$$= \frac{25}{75} \times 100\%.$$
$$= 33\frac{1}{3}\%.$$

By mistake a person calculated loss percentage over selling price and it is found as 20%. then find the actual loss percentage?

$$\text{Actual loss percentage} = \frac{L}{CP} \times 100\%.$$
$$= \frac{20}{120} \times 100\%.$$
$$= 16\frac{2}{3}\%.$$

$SP < CP$

$CP > SP$

Sandeep gave 20% of amount available with him to Sudhakar, 30% of remaining to Harish, 40% of remaining to Yogesh and 50% of remaining to Dhanush. Who got the greatest amount?

Sandeep @ Rem Bal

$$\begin{array}{r} 200 \\ \downarrow \\ 168 \quad 80 \\ -240 \\ \hline 560 \\ -224 \\ \hline 336 \\ -168 \\ \hline 168 \end{array}$$

$$Snd \rightarrow \frac{20}{100} \times 200 = 200$$

$$Harish \rightarrow \frac{30}{100} \times 80 = 240$$

$$Yog \rightarrow \frac{40}{100} \times 560 = 224$$

$$Dhanush \rightarrow \frac{1}{2} \times 336 = 168$$

The price of rice falls by 20%. How much rice can be bought now with the money that was sufficient to buy 20kg of rice previously?
 New price $\rightarrow 80\%$
 $100/\text{kg} \rightarrow 80\%$

20kg

$$T.A = 20 \times 100$$

2000

~~$\frac{80}{100} \times 2000$~~

$$80 \times 2000 = 1600$$

$$x = 25 \text{ kg} \checkmark$$

~~x~~

~~x~~

~~x~~

~~$3560 + 1200$~~