Unit-1

High Speed Addition and Substraction:-

- History of Vedic Maths and its Features
- Vedic Maths formulae; Sutras and Upsutras
- Addition in Vedic Maths - without Carrying,
- Dot Method
- Substraction in Vedic Maths - Nikhilam Navatashcaramam Dashatah

Vedic Maths

- Simplicity : This is the unique features of vedic maths. It saves your time and Increases your productivity

- Creativity :- Many methods Apply on a single question. Its inspire you to encourage your mind to find your unique approach to solve the problem.

- Fast learning : In Modern Mathematics System Student learn whole mathematical Operation in almost 10 to 12 years besides of vedic mathematic tricks can be gained by the Same student in 6 or 9 months with utmost accuracy and fast result.

- Algebric Connection : One advantage of the vedic Mathematics is if you become good in the arithmetic calculation and master on it, the whole technique is also applicable to the Algebraic problem.

- Innovation : It gave chance to add creativity and innovation in modern mathematics.

- Fast and Accurate Result: Most of the problem solved in mind with a single step which saves time and less number of phase also increases the accuracy.

History of Vedic Maths

Vedic Math comes from the Vedas, more specifically the Atharva Veda. It was revived by Indian mathematician Jagadguru Shri Bharati Krishna Tirthaji between 1884 and 1960. He then published this work in a book called Vedic Mathematics in 1965. It comprises 16 Sutras (formulae) and 13 Sub sutras.

Meaning of Vedic Mathematics :-

- The word Vedic Mathematics means Vedic + Mathematics. where Vedic means knowledge and wisdom and Mathematics means the Abstract science of numbers Thus it represents the knowledge of mathematics. It was used by Indian Saints and Sages. (Rishis)

- It is an ancient technique, which simplifies multiplications, divisibility, complex number, squaring, cubing, square root and cube roots etc.

- The original copy of Vedic Mathematics was kept in a library of Nagpur. Many of the works were either destroyed or stolen by British Rulers.

Features of Vedic Maths :-

- Integrity: Learning becomes easy because of the integrity of the Vedic mathematics subject. Every Sutra and sub-Sutra is correlated and uniform. One rule may be applied in different operation

⇒ What is Vedic Mathematics?

- Vedic Mathematics is a collection of Techniques/Sutras to solve mathematical arithmetics in easy and faster way. (quickly & faster)

→ Vedic Mathematics is a System of Mathematics which was discovered by Indian Mathematician JagadGuru Sri Bharati Krishna Tirthaji in the period between A.D. 1911 and 1918 and published his findings in a Vedic Mathematics Books by Tirthaji Maharaj.

⇒ Advantages of Vedic Mathematics:

→ Vedic Mathematics can definitely solve mathematical numerical calculations in faster way. Some Vedic Maths scholars mentioned that Using Vedic Maths tricks, You can do calculations 10-15 times faster than our usual methods. I agree this to some extent because some methods in Vedic Mathematics are really very fast. But Some of these methods are dependent on the specific numbers which are to be calculated. They are called specific methods.

Example:

Division shortcut in Vedic Mathematics:

→ 1/19 is a rational number which forms a recurring decimal number and which recurs in the sequence after every 18 digits.

→ How much time will you take to divide 1/19?

→ Using Ekadhikena Purvena Sutra of vedic Mathematics.

=: Sutras and Sub-Sutras :-

16-Sutras:

(1) एकाधिकेन पूर्वेण - By one more than the one Previous. Before
(combination of एक अधिक पूर्वेण)

(2) निखिलं नवतश्चरमं दशतः - All from 9 and last from 10.
use for Subtraction

(3) ऊर्ध्व-तिर्यग्भ्याम् - Vertically and crosscoise
use for Multiplication

(4) परावर्त्य योजयेत् - Transpose and adjust
use for Multiplication

(5) शून्य साम्ये समुच्चये - when Sum is same, that sum to zero.
use for Solving of simultaneous linear eqns.

(6) अनुरूप्ये शून्य अन्यत् - If one is in ratio, the other is zero

(7) संकलन व्यवकलनाभ्याम् - By addition and by Subtraction
use for Solving of simultaneous linear eqns.

(8) पूरणा पूरणाभ्याम् - By the completion or non-completion

(9) चलन कलनाभ्याम् - Differences and Similarities

(10) यावदूनम् - whatever the extent of its deficiency

(11) व्यष्टिसमष्टि - Part and whole
use for simultaneous linear eqns solving of

(12) शेषाण्यङ्क केन चरमेण - Remainders by last digit

(13) सोपान्त्य द्वयमन्त्यम् - The ultimate and twice the Penultimate

(14) एकन्यूनेन पूर्वेण - By one less than Previous one

(15) गुणित समुच्चय: - The Product of the Sum is equal to Sum of Product

(16) वर्गसमुच्चय: - The factors of the Sum is equal to Sum of factors.

13 - Subsutras

(1) आनुरूप्येण - Proportionality

(2) शिष्यते शेषसंज्ञ - Remainder Remains constant

(3) आद्यं माद्यनान्त्य मन्त्येन - first by first and last by last

(4) केवलै सप्तकं गुण्यात् - for 7 multiplicand is 143.

(5) वेष्टनम् - By OSCulation

(6) यावदूनं तावदूनं - lessen by Deficiency

(7) यावदूनं तावदूनीकृत्य वर्गं च योजयेत् - whatever the deficiency lessen by that amount and set up Sequare of deficiency

(8) अन्त्ययो दशकेऽपि - last totally 10

(9) अन्त्ययोरेव - only the last terms

(10) समुच्चयगुणित: - Sum of the Products

(11) लोपनस्थापनाभ्याम् - By alternate elimination and Rotation

(12) विलोकनं - By mere observation

(13) गुणित समुच्चय: - The Product of the sum is Sum of Product.

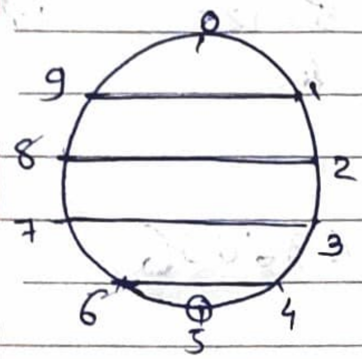
Vinculum

Sutra:

All from 9 and last from 10

(1) निखिलम् नवतश्चरमम् दशतः | (2) एकाधिकेन पूर्वेण

Friend number



(9,1)
(8,2)
(7,3)
(6,4)
(5,5)

Total = 10

⇒ greater than 4 no.

(1) $29 \rightarrow 3\bar{1}$

$$\begin{array}{cc} +1 & 10 \\ 2 & 9 \\ \hline 3 & \bar{1} \end{array}$$

(2) $178 \rightarrow 2\bar{2}\bar{2}$

$$\begin{array}{ccc} +1 & 9 & 10 \\ 1 & 7 & 8 \\ \hline 2 & \bar{2} & \bar{2} \end{array}$$

(3) $698 \rightarrow 1\bar{3}0\bar{2}$

$$\begin{array}{cccc} & +1 & -9 & -9 & -10 \\ & 6 & 9 & 8 \\ \hline 1 & \bar{3} & 0 & \bar{2} \end{array}$$

(4) $872 \rightarrow 1\bar{1}\bar{3}2$

$$\begin{array}{cccc} +1 & -9 & -10 & \\ & 8 & 7 & 2 \\ \hline 1 & \bar{1} & \bar{3} & 2 \end{array}$$

(5) $37892 \rightarrow 4\bar{2}\bar{1}\bar{1}2$

$$\begin{array}{ccccc} +1 & -9 & -9 & -10 & \\ 3 & 7 & 8 & 9 & 2 \\ \hline 4 & \bar{2} & \bar{1} & \bar{1} & 2 \end{array}$$

(6) $127298 \rightarrow 133\bar{3}0\bar{2}$

$$\begin{array}{cccccc} & +1 & 10 & +1 & -9 & -10 \\ 1 & 2 & 7 & 2 & 9 & 8 \\ \hline 1 & 3 & \bar{3} & 3 & 0 & \bar{2} \end{array}$$

⇒ Vinculum to Normal no.

Sutra: निखिलम् नवतश्चरमं दशतः (All from 9 and last from 10)

(Normal value to vinculum value) → (vinculum value to normal value)

① $3\bar{2} = 28$

$3\overset{10}{\bar{2}}$

-1

28

② $23\bar{4} = 166$

$2\overset{9}{3}\overset{10}{4}$

-1

166

③ $43\bar{02} = 3698$

$4\overset{9}{3}\overset{9}{0}\overset{10}{2}$

-1

3698

④ $43\bar{1}25 = 36885$

$4\overset{9}{3}\overset{9}{1}\overset{10}{2}5$

-1

36885

⑤ $4504\bar{9} = 3495$

$4\overset{9}{5}\overset{9}{0}\overset{9}{4}\overset{10}{9}$

-1

34951

Vinculum (Addition) :- (without carry)

① $986 + 889 \Rightarrow 1875$

889 → $1\bar{1}\bar{1}\bar{1}$ (+1 -9 -10)

986

$+\ 1\bar{1}\bar{1}\bar{1}$

$\Rightarrow 1875$

Basic Method

$\overset{1\ 1}{\ }$

986

889

1875

to avoid carry, we use vinculum no.

② $9378 + 2895$ (vinculum)

2895 (+1 -9 -9 -10) → $3\bar{1}05$

9378

$+\ 3\bar{1}05$

$\Rightarrow 12273$

→ Addition using Vedic Maths:-

① ⇒ Ten Point circle

② ⇒ Friend Number (FN)

③ ⇒ Sutra: Ekadhikena Purvena → 10, 100, 1000, 10000

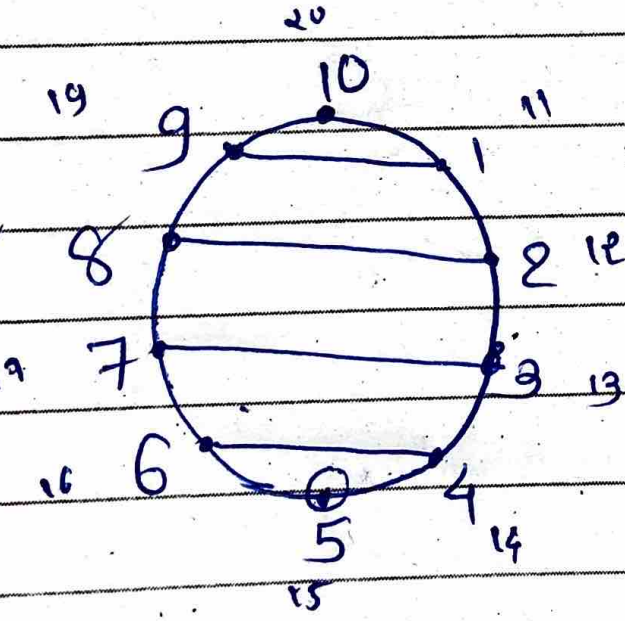
[By one more than one before]

④ → Addition Process:

- Vertical → use of F.N.
- Horizontal

Point

① Ten Point circle:



All nos are nearest to 10.

+6

(2) **Friend No.**

(1, 9)
(2, 8)
(3, 7)
(4, 6)
(5, 5)

These two particular digits whose sum is 10. → which are called Friend No.

||ly, **Triplet form**

(1, 4, 5)
(2, 4, 4)
(4, 3, 3)
(5, 2, 3)

whose sum is 10.

(3) **Sutra:-**

(4) **Horizontal Addition:-**

(1) (36 + 14) + 5

6 → F.N. (4)

50 + 5 = 55

36
14
5

55

(2) 12 + 34 + 85 + 36 + 15

12 → F.N. (8) is not there
34 → F.N. 6
85 → 5 F.N. (5)

12 + 34 + 36 + 85 + 15

34 + 36 = 70 (+1) addition

85 + 15 = 100 (+1) add

12 + 70 + 100 = 182

Vertical Addition :- (whenever the no exceeds beyond the 9 putting a dot)

eg.

① 25
72
36
+ 53
186

Traditional approach

25
72
36
53
76
11
186

vedic maths

when the no. is >9

Cross at output
X0, •
X1, •
X2, •

② 77
94
83
75
64
393

Traditional approach

16 77 x1
•6 9 4 •1
14 8 3 4
•4 7 5 9
x1 •1 6 4 • x3
73
32
393 → Ans

Vedic approach

Substraction (Vinculum) :-

Sutra: एकन्यूनेन पूर्वं (By one less than previous one)
निखिलम् नवतश्चरमम् दशतः (All from 9, last from 10)

① 345 - 196 = 149

345	345	9 10 251
− 196	−196	− 1
149	25T	⇒ 149

② 4567 - 989

4567	3 14 15 456·17	9 9 10 4422
− 989	− 0989	− 1
4422 → -ve Ans.	3578	⇒ 3578
9 9 10 4422	Basic (Conventional method approach)	
− 1		
⇒ 3578		

③ 1234 - 678

0 11 12 1234	1234	9 9 9 10 1444
− 678	− 678	− 1
0556	1444	⇒ 0556