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VEDIC MATHS –EKADHIKENA PURVENA

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ABSTRACT: As proponents of Vedic Math our ultimate objective and dharma is to expose the beauty of this ancient mathematical system to the world. Every student should have the chance to study this simple, fast, and easy form of math. In this paper, I be going to to go beyond the noticeable and attempt to determine if there are really any limitations to Vedic Math that are preventing it from reaching its rightful place in the day to day life.

***INDEXTERMS* –** Vedic maths, squares, multiplications.

INTRODUCTION

Vedic Mathematics is an olden system of mathematics exists in India. In this well-known loom, methods of basic sums are simple, influential and logical. Another benefit is its regularity. Because of these recompense, Vedic Mathematics has develop into an important topic for study. The method use in Vedic Mathematics is mainly base on sixteen Sutras.Vedic mathematics was reconstruct from the very old Indian scriptures (Vedas) by Swami Bharati Krishna Tirthaji Maharaja (1884-1960) after his eight years of study on Vedas[1]. Vedic mathematics is mostly based on sixteen principles or word-formulae which are termed as
sutras [4].

These are the 16-basic sutra of Vedic mathematic:
1)Ekadhikina Purvena-By one more than the previous One.
2)Ekanyunena Purvena -By one less than the previous one.
3)(Anurupye) Shunyamanyat -If one is in ratio, the other is zero.

4)ChalanaKalanabyham-Differences and similarities.

5)Sankalana-vyavakalanabhyam -By addition and by subtraction.

6)Shesanyankena Charamena-The remainders by the last digit.

7)Puranapuranabyham -By the completion noncompletion.

8)Urdhva-tiryakbhyam -Vertically and crosswise.

9)Nikhilam Navatashcaramam Dashatah -All from 9 and last from 10.

10)Paraavarty a Yojayet-Transpose and adjust.

11)Shunyam Saamyasamuccaye -When the sum is same then sum is zero.

12)Yaavadunam-Whatever the extent of its deficiency.

13)Vyashtisamanstih -Part and Whole

14)Gunitasamuchyah-The product of sum is equal to sum of the product.

15)Sopaantyadvayamantyam -The ultimate and twice the penultimate.

16)Gunakasamuchyah-Factors of the sum is equal to the sum of factors.

METHODOLOGY:

1) EKADHIKENA PURVENA-By one more than the previous One.

It means one more than previous one we relate this sutra to multiplication of numbers suppose p with digit [p_1,p_0] and q with digit [q_1,q_0] whose last digit addition (q_0+p_0) comes out to be 10 and previous digit both numbers (p_1=q_1) is same, this sutra, gives the procedure as follows:

1. Last digit $p_0 x q_0 = y_1 y_0$
2. Previous digit (p_1=q_1) =p_1x (p_1+1) =$z_2 z_1 z_0$.
3. Concatenate result of equations mentioned in point no2 and 1 gives $z_2 z_1 z_0$ $y_1 y_0$ which is equal to the numeric value of pxq.

Here we relate the sutra to the 'squaring of numbers ending with 5'the number 35, the last digit is 5 and previous digit is 3. Hence, 'one more than the previous one', means 3+1=4 gives the procedure 'to multiply the previous digit 3 by one more than itself that is by 4'. It becomes the left hand part of the result here 3x4= 12 and the right hand part is $(5)^2$ =25. Thus $(35)^2$= 3x4| 25 =1225

In this way

$(45)^2$= 4x5|25 =2025

$(55)^2$= 5x6|25 =3025

$(105)^2$= 10x11|25 =11025

$(115)^2$= 11x12|25 =13225

Nos.	Value $(x)^2$	Answer	Nos.	Value $(x)^2$	Answer	Nos.	Value $(x)^2$	Answer
1	05	25	11	105	11025	21	205	42025
2	15	225	12	115	13225	22	255	65025
3	25	625	13	125	15625	23	305	93025
4	35	1225	14	135	18225	24	315	99225
5	45	2025	15	145	21025	25	405	164025
6	55	3025	16	155	24025	26	455	207025
7	65	4225	17	165	27225	27	555	308025
8	75	5625	18	175	30625	28	645	416025
9	85	7225	19	185	34525	29	755	570025
10	95	9025	20	195	38025	30	875	765625

Algebraic proof: consider the identity $(px+q)^2$

$(px+q)^2 = p^2.x^2+2p.q.x+q^2$

For this identity let x=10 and q=5 it becomes

$(10p+5)^2 = p^2.10^2+2.10p.5+5^2$

$= p^2.10^2+p10^2 +5^2$

$= (p^2+p).10^2+5^2$

$\mathbf{(10p+5)^2 = p\ (p+1).10^2+25.}$

Clearly 10p+5 represent two digit numbers 15,25,35,45,55,-------95 and for the values p=1,2,3,4,5,-----9 respectively.

In such a case the number (10p+5)2 is of the form whose L.H. S. is **p(p+1)** and R.H. S. is **25** that is , **p(p+1)|25**

Any two digit number gives the result in the same manner. Let's see some examples.

$(35)^2=(30+5)^2$ if we convert in the form of (px+q)2 for p=3 and x=10 and q=5 then we get

Then we get the answer in **p(p+1)|25 i.e.3(3+1)|25**

=3X4|25

$(30+5)^2$ =1225

Ex.2. $(55)^2=(50+5)^2$ = Here p=5, x=10, q=5,

=p(p+1)|25

=5(5+1)|25

=5X6|25

$(50+5)^2$ =3025

Let's see the another identity, px^2+qx+r for x=10, $p\neq0$, p, q, r, Є W

Now $(px^2+qx+r)^2=p^2x^4+q^2x^2+r^2+2pqx^3+2qrx+2rpx^2$

$=p^2x^4+2pqx^3+(q^2+2pr)x^2+2qr.x+r^2$

For this identity let x=10, r=5 therefore $(p10^2+q10+5)^2$ becomes

$=p^2.x^4+2p.q.10^3+(q^2+2.5.p)10^2+2.q.5.10+5^2$

$=p^2.10^4+2.p.q.10^3+(q^2+10.p)10^2+q.10^2+5^2$

$=p^2.10^4+2.pq.10^3+q^2 10^2+p10^3+q10^2+5^2$

$=p^2.10^4+(2pq+p)10^3+(q^2+q)10^2+5^2$

$=(p^2.10^2+2p.q.10+p.10+q^2+q)10^2+5^2$

$=(10p+q)(10p+q+1).10^2+25$

$=\mathbf{P(P+1)10^2+25}$ where P=10p+q

Hence any three digit number whose last digit is 5 gives the same result as in (px+q) for P=10p+q, the 'previous' of 5.

For example let us solve $175^2=(1.10^2+7.10+5^2)^2$

It is of the sum form $(px^2+qx+r)^2$ for p=1 , q=7, r=5 and x=10. It gives the answer

P(P+1)|25, where P=10p+q= 10x1+7=17, the previous. The answer is 17(17+1)|25

17x18|25= 30625

CONCLUSION AND FUTURE SCOPE

Design with vedic maths and vedic sutras is seen to be efficient in alacrity and region of basic physics and basic mathematics with respect to simple equations.

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REFERENCES:

[1]Swami Bharati Krishna Tirthaji Maharaja, "Vedic Mathematics", Motilal Banarsi dass Publishers, 1965.

[2] Keneeth R. William, "Vedic Mathematics Teacher's Manual-Elementary Levels."Inspiration Books. 2002.

[3]AnantVyawahare,Shriram Chouthaiwale,Suresh. Borgoankar vedic Mathematics / Nachiket Prakashan,2014.

[4]Charan Lal, Michael Empeigne, Vitthal B. Jadhav "Quicker mathematics for all"first edition September 2016.

[5]Dr. Alok Kumar" Vedic Mathematics Sutra" Upkar Prakashan, ISBN-978-81-7482-244-4, 2008.

[6]Vedic Maths Sutras -Magic Formulae [Online]. Available: http://hinduism.about.com/library/weekly/extra/bl-vedicmathsutras.htm