

A Functional Study of the Role of Vedic Mathematics in Improve the Speed of Essential Numerical Calculation

Gurusharan kaur*, Namrata Tripathi**, Yudhveer Kumar Verma***

*Department of Mathematics, Career College, Bhopal(M.P),India

Email: kgurusharan@gmail.com

** Department of Mathematics, Govt.PG Collège Rajgarh(Biaora) ,Bhopal(M.P),India

Email: tripathin661@gmail.com

***Department of Mechanical, Dronacharya College of Engineering Gurugram (Haryana) 123506, India

Email :yudhveer.verma@gmail.com

Abstract:

In this paper, we included the ideas of Vedic Science. Fundamentally, Vedic Arithmetic is an old Indian arrangement of numerical computations or tasks procedures created in 1957 with a 16 word recipe and a few sub-equations. In rivalries, understudies experience issues addressing inclination questions viably with exceptionally short or brief spans. Regardless of whether understudies can comprehend the inquiries, they can't accelerate the estimation cycle. In this article, essential mathematical computations, augmentation, square root, cubic root, and blended decimal deduction are given to a gathering of 25 understudies, who are understudies of cutthroat tests and need to settle them. inquiries without and with the Vedic strategy method. The time needed to finish the computations was required in minutes when embracing the Vedic Strategy method and examined utilizing a matched t test. This article may track down that the Vedic Strategy significantly improves estimation speed when playing out some fundamental numerical activities. I trust this article can assume a functioning and steady part in the real examination of Vedic math and methods to speed up computation, particularly when composing rivalries.

Keywords —Vedic Mathematics and Basic Mathematical Operation

I. INTRODUCTION

It is normal Vedic math is the name given to the antiquated Indian numerical framework, or a bunch of exact principles for effectively addressing

number-crunching, polynomial math, calculation, or geometrical issues. This framework depends on the 16 Vedic sutras, which are a bunch of word recipes that depict the means or rationale engaged with taking care of different numerical issues, which are

viewed as troublesome or unrealistic in customary techniques. Vedic science was initially rediscovered from Indian sacred writings somewhere in the range of 1911 and 1918 and completely created in 1957 by Jagadguru Sri Bharathi Krishna Thirthaji Maharaja, an expert in Sanskrit, math and theory [1-2].

Understudies confronting rivalries, for example, Bank Preliminary Official Test, IBPS Test, FDA, SDA, Bank Recorder Assessment in India think that its hard to determine capability issues or reasons. Vedic math mostly has 16 recipes that can address some fundamental numerical activities like 5 digit duplication, augmentation of numbers near base, square, square root, cubic, cubic root, schedule issues, deduction and division. This strategy can be viewed as an abridged technique and one that will incredibly decrease the issue weight of the serious test thinking and understudies can likewise take care of more issues in a brief timeframe.

In this article, an exact examination was directed to see if Vedic numerical methods speed up essential numerical tasks. A bunch of numerical statements disseminated in an opposition focused on understudies when the reception of Vedic numerical procedures. Essential number related activities incorporate square root, cubic root, increase by 4 digits, duplicate close to the base, take away utilizing the last nine and ten guidelines. The time it took understudies when embracing the Vedic strategy was recorded in minutes. At first, speculations were developed and assessed as huge or not utilizing a matched t test. This article tracks down that the Vedic Strategy significantly speeds up computations when playing out some fundamental numerical tasks.

2 RELATED RESEARCH:

There are a few related investigations on the job of Vedic science in speeding up tasks or fundamental numerical estimations accessible in the writing. The Vedic arrangement of math has gotten well known even external India. In 1981, English mathematicians, for

example, Kenneth Williams, Andrew Nicholas and Jeremy Pickles showed interest and gave addresses regarding this matter in different spots in London by extending the early on book of Bharathi Krishna Thirthaji [3]. Vedic numerical strategies help in speedy or quick computations in specific circumstances. It builds fixation and coherent reasoning which are fundamental prerequisites in math preparing understudies for paper challenges [4-5]. The Vedic numerical method is the current strategy, when gaining abilities in fast number-crunching and in fitness or thinking. Trachtenberg speed math, Lester Meyers number-crunching is another strategy or techniques which additionally assists with improving or improve familiarity with quick number-crunching [6-7].

Vedic Mathematics Techniques used in this study:

This study considers some Vedic mathematics techniques, which includes:

Vedic Method : Calculate any square of the number ending with 5

$$(85)^2 = \text{LHS and RHS}$$

LHS=(First Number) \times (Next Consecutive Number)

$$=8 \times 9 = 72$$

$$\text{RHS} = 5^2 = 5 \times 5 = 25$$

$$\text{Answer} = 7225$$

Multiplication with 11's

Vedic method

$$32 \times 11$$

32 split in two parts 3 and 2

$$\text{Sum of two parts } 3+2=5$$

Final we got the answer 352

The principle behind it

$$(10a+b)(10+1)=100a+10(a+b)+b$$

Base method

That number which is closes to 10,
 100,100,....

LHS	RHS
99	- 01
97	- 03
96	03

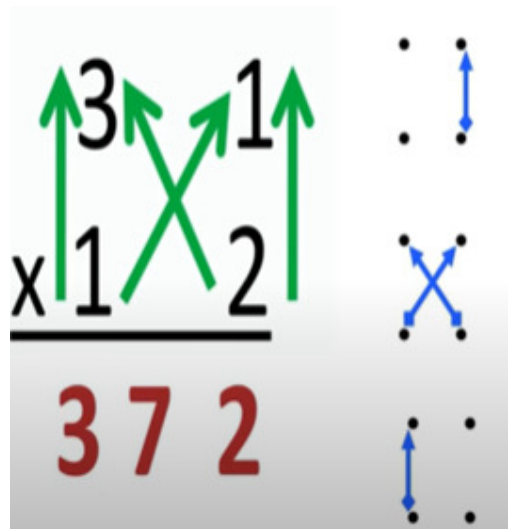
Answer $99 \times 97 = 9603$

The principle behind the concept

$$(x+a)(x+b)=x(x+a+b)+ab$$

X=base 10,100.....

Vertically and Crosswise pattern of two
 digits



Multiplication with 9's

Type-1 When no. of 9s in multiplier are
 equal to the no. of digits in multiplicand

Ex-1 $\frac{43 \times 99}{42/57}$

LHS=43-1=42

RHS=99-42=57

Answer=4257

Ex-2 $\frac{376 \times 999}{375/624}$ LHS=376-

1=375

RHS=999-

375=624

Type-2: When no. of 9s in multiplier are
 more than the no. of digits in multiplicand.

487×9999

Rewrite as

$\frac{0487 \times 9999}{0486/9513}$ LHS=0487-

1=0486

RHS=9999-

0486=9513

Ans 4869513

Multiplication with 1s:

$\frac{42 \times 11}{4 \setminus 6 \setminus 2}$ I=2

II=2+4=6

III=4

Ans=462

$$\frac{3405 \times 11}{3 \setminus 7 \setminus 4 \setminus 5 \setminus 5}$$

$$I=5$$

We write down 2 in the unit place as it is 2 -----2

$$II=5+0=5$$

Add (2+3) = 5 -----5

$$III=0+4=4$$

Add (2+3+4)= 9 -----9

$$IV=4+3=7$$

Add (2+3+4+1)=10 1 carry -----0

$$V=3$$

Add (3+4+1+2) + 1carry =11 1 carry -----1

Add (4+1+2) + 1 carry = 8 -----8

Add (1+2) = 3 -----3

Write down 2 as it is = 2 -----2

Ans 37455

Final Answer is = 23810952

Method: First step is to copy extreme right hand side(RHS) digit. In second step two digits from RHS are added. In third step three digit from RHS are added. Now we keep on adding three digits until possible as described above. In second last step again we add two digits and finally we copy the last digit.

$$\frac{3234 \times 111}{3 \setminus 5 \setminus 8 \setminus 9 \setminus 7 \setminus 4}$$

$$I=4$$

$$II = 4 + 3 = 7$$

$$III=4+3+2=9$$

$$IV=3+2+3=8$$

$$V=3+2=5$$

$$VI=3$$

Multiplication of numbers with series of 1's in the multiplier: Multiply 21432 by 1111

OBJECTIVE AND METHODOLOGY OF THE STUDY:

Its main aim is to find out whether Vedic mathematical techniques increase the speed of basic mathematical operations.

- **Enables faster computations.**
- **Reduces the time for solving mathematical problems.**
- **Avoids careless mistakes.**
- **Enhances holistic development of human brain through multidimensional thinking approach.**
- **Helps students to excel in competitive exams like SAT, CAT, MAT, GRE, Engineering and various entrance exam.**

The sub-objective is to find the reduction in jet lag in the minutes before and after adopting Vedic mathematical techniques while completing some basic mathematical operations.

Vedic Math is useful for:

- ❖ Students
- ❖ Teachers

- ❖ Professional indulged in computation requiring speed in accuracy.
- ❖ Vedic Mathematics enriches Knowledge and understanding of Mathematics.
- ❖ Vedic Mathematics methods comes as a boom for all competitive exams as mathematics problems can be solved with amazing accuracy and speed.

Table 1: Paired T-test table for before and After Adopting Vedic Mathematics Techniques

Sr. No.	Before adopting Vedic mathematics techniques (x)	After techniques (y)	Difference (d=x-y)	d ²
1	10	7	3	9
2	10	6	4	16
3	15	8	7	49
4	15	7	8	64
5	18	13	5	9
6	15	13	2	9
7	12	9	3	9
8	18	13	5	25

9	15	10	5	25	
10	17	10	7	9	
11	16	10	6	16	
12	19	13	6	16	
13	18	12	6	36	
14	19	12	7	4	
15	19	17	2	4	
16	13	9	4	16	
17	18	12	6	4	
18	15	9	6	36	
19	10	8	2	4	
20	14	12	2	4	
21	15	13	2	4	
22	18	17	1	1	
23	11	9	2	4	
24	15	12	3	9	
25	15	11	4	16	
				90	398

Null Hypothesis (H₀): $\mu_x = \mu_y$ Mean score before and after adopting Vedic mathematics techniques are same. In other words, there is no significant difference between before and after adopting Vedic mathematics techniques while solving some basic mathematical problems.

Alternative Hypothesis (H₁): $\mu_x \neq \mu_y$ (Two tailed)

H₁: There is a significant difference between before and after adopting Vedic mathematics techniques while solving some basic mathematical problems.

Test statistic. Under H₀, the test statistics is

$$t = \frac{d}{s/\sqrt{n}} \sim t_{n-1} = t_4$$

$$d = \frac{\sum d}{n} = \frac{90}{25} = 3.6$$

$$s^2 = \frac{1}{n-1} \sum d^2 - \frac{(\sum d)^2}{n} = \frac{1}{24} 398 - \frac{8100}{25} = 3.0833333$$

$$|t| = \frac{d}{s/\sqrt{n}} = \frac{3.6}{\sqrt{3.08333 \times 25}} = 10.25090635$$

The tabulated value of t for 24 degree of freedom (d.f.) and at 5% significance level is (t_{0.025})

=2.064. Since calculated value of t (10.25090635) is greater than tabulated t, it is significant at 5% level of significance. Hence null hypothesis is rejected and alternative hypothesis is accepted.

If we consider, one tailed t-test (right tailed), $\mu_x > \mu_y$, there is a significant decrease in time before and after adopting Vedic mathematics techniques while solving some basic mathematical problems. The tabulated value of t for 24 degree of freedom (d.f.) and at 5% significance level is (t_{0.05}) =2.064. Since calculated value

of t (10.25090635) is greater than tabulated t, it is significant at 5% level of significance.

From both the alternative hypothesis we can conclude that Vedic mathematics techniques improve the speed of calculations while solving some basic mathematical problems.

RQ: Whether Vedic mathematics improves speed of basic mathematical operations? About 98% respondents out of 25 members agree that Vedic mathematics improves the calculation speed. Where as only 2% replied no improvement in speed.

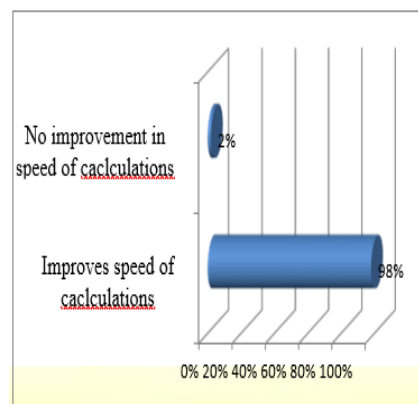


Figure 3: Graph showing the percentage of speed improvement and no improvement using Vedic mathematics techniques

RQ: Whether Vedic mathematics improves concentration?

About 84% respondents out of 25 members agree that Vedic mathematics improves the concentration. Where as only 16% replied that Vedic mathematics does not improves concentration power.

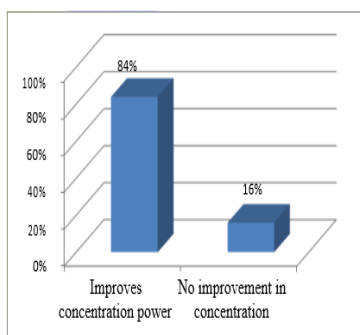


Figure 4: Graph showing the percentage of concentration improvement and no improvement due to Vedic mathematics techniques

RQ: Whether Vedic mathematics improves logical thinking?

About 80% respondents out of 25 members agree that Vedic mathematics improves the logical thinking. Where as only 20% replied no improvement in logical thinking.

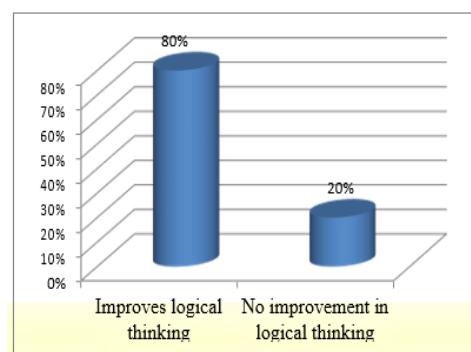


Figure 5: Graph showing the percentage of improvement in logical thinking and no improvement due to Vedic mathematics techniques

RQ: Practice is required for Vedic mathematics Techniques.

All the 100% respondents out of 25 members agree that continuous practice is required in order to familiarize and remember Vedic mathematics techniques.

5 LIMITATIONS AND FUTURE SCOPE OF RESEARCH:

This study is limited by the following factors:

- The population or sample size is very small and includes only 25 people. Future studies require more samples for higher precision.
- The study only considered a few mathematical operations. Future studies require more basic mathematical operations.

- The study looked at time in minutes. In order to obtain accurate results, future studies require a more advanced form of time maintenance in relation to the second pair.

1. conclusion

Vedic math is an antiquated Indian arrangement of arithmetic created based on 16 equations and sub-recipes initially called sutra in Sanskrit. To get capable in Vedic numerical methods, one requires consistent practice and an excellent interest. This article tracks down that Vedic numerical strategies altogether lessen the time it takes to play out some fundamental numerical estimations. Veda math methods can decrease the weight and overhead for understudies in contending critical thinking abilities and quantitative thinking. It is viewed as one of the abbreviated strategies for addressing essential numerical tasks.

In this article, we will talk about a progression of numerical activities, which incorporate square root, cubic root, augmentation of 4 digits, duplication of numbers near bases, deduction utilizing the all from nine principle and the remainder of ten. Measurable papers demonstrate that Vedic numerical procedures significantly decrease when taking care of some fundamental mathematical questions. All respondents tracked down that in the most pessimistic scenario, at any rate one moment could be saved in the event that we embraced Vedic numerical procedures to take care of

issues of fundamental numerical tasks. The invalid speculation is disproved and the elective theory is chosen dependent on the combined t test. I trust this article can assume a functioning and strong part in the real examination of Vedic science and methods to speed up computation, particularly when composing rivalries.

REFERENCES

- [1] Ann Arther and Rudolph McShane, "*The Trachtenberg Speed System of Basic Mathematics (English edition)*", Asia Publishing House, New Delhi, 1965
- [2] B.Dhaval, "*Vedic Mathematics Made Easy*", New Delhi: Jaico Publishing House, 2015.
- [3] Bill Handley, "*Speed Arithmetic*", Master Mind Books (Vasan Publications), 2000
- [4] Jagadguru Swami Sri Bharathi Krishna Tirthaji Maharaja, "*Vedic Mathematics: Sixteen Simple Mathematical Formulae from the Veda*". Delhi, 1965.
- [5] K.Williams, "*Discover Vedic Mathematics Skelmersdale*": Inspiration Books, 1984.
- [6] Lester Meyers, "*High-Speed Mathematics*", Van Nostrand, New York, 1947.
- [7] S.G. Dani, "*Myth and reality: on 'Vedic Mathematics'*", Frontline Vol 10, No. 21, October 22, 1993, pp. 90-92.