On Use and Importance of Vedic Mathematics in Daily Life

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Abstract

The present paper is an attempt to show that the Vedic Mathematics of ancient India is an influential and unique system of epistemology, especially reasoning and solving mathematical problems in daily life in an easy and faster way. Vedic Mathematics is an ancient Indian science easy to learn and use as it begins with understanding of the fundamental mathematical concepts and ideas. Vedic Mathematics incorporates an eclectic range of techniques that simplify not just simple arithmetic but also complex branches of mathematics such as algebraic operations and so on. There is no question of doubt that Vedic Mathematics helps us to simplify difficult and complex calculations and thereby offers alternative strategies to conventional methods that have been recognized worldwide. In this sense, Vedic Mathematics may be called a convenient tool or means through which one can improve speed, and accuracy as well as boost mental agility when dealing with numbers. Daily exercising Vedic Mathematics enhances the brain's functioning and helps to overcome mathematical problems quickly. This is where the relevance and importance of the present paper actually hinges on. Thus, in a nutshell it can be said that like in the past, Vedic Mathematics is an important tool, a living and evolving system in the 21st century world due to its unique problem-solving approaches.

Keywords

Importance, mathematics, system, tool, Vedic.

Introduction

It would not be an exaggeration if we claim that the history of mathematics is the history of human civilization in general and Indian culture in particular. In India, mathematics has its roots in Vedic works or literature. India has a long history of teaching and learning of mathematics dating back thousands of years, i.e., Ancient Vedic Mathematics is a system of mathematical principles rooted in the Vedic age (1500 B. C. to 500 B. C.). But before going to discuss the use and importance of Vedic Mathematics in daily life we need to know *what Vedic Mathematics is*. Simply speaking, Indian mathematics is an offshoot of a system of mathematical calculation known as Vedic Mathematics. It is a set or collection of methods, techniques and sutras (aphorisms) outlined in our ancient Indian scriptures or texts known as the Vedas to solve or resolve mathematical problems in a quick and easier way. The Sanskrit term "Veda" is derived from the root "Vid"[1] (to know) covers *Veda-Sakhas* to develop humanity entirely. As a result, like all other branches of knowledge, Vedic Mathematics comes from the Vedas and is hence grounded on the Vedas. If we look back, recently it was Jagadguru Shri Bharathi Krishna Tirthaji (1884 – 1960), an Indian eminent scholar of Sanskrit (a spiritual leader), History, Philosophy, and Mathematics, who after a careful inquiry and examination of the Vedas revealed Vedic Mathematics in between 1911 and 1918. His revolutionary work *Vedic Mathematics* (1965) is considered as an initial or opening point of all work on Vedic Mathematics. It is important to note here that of four primary ancient Indian religious texts or Vedas, *Atharva Veda* (the fourth Veda) is the primary source of Vedic Mathematics. *Atharva Veda* is also known as Vedic Mathematics comes down verbally or orally from generation to generation. In this sense, Vedic Mathematics has originated from Atharva Veda[2] in that it offers disciplines like engineering, medicine and many more sciences. Since Vedic mathematics is the outcome of the Vedas and so we can define it as a "system of reasoning and mathematical working based on ancient Indian teachings called Veda."[3]

Objectives

The prime objectives of the present paper are as under:

i. To explain Vedic mathematics is a testament to human civilization and intellectual history.

ii. To focus on the benefits of unique methods and techniques of Vedic mathematics.

iii. To show how and why Vedic mathematics is an indispensable and relevant for the 21st-century mathematical world.

Discussion and Findings

Vedic Mathematics may be treated as an ancient Indian device of arithmetic. It is a set of hints and quick methods to answer mathematical hassle. Nobody can deny that its wonderful and practical applications in arithmetical computations, theory of numbers, compound and complex multiplications, algebraic operations, simple quadratic and higher order equations, partial fractions, calculus, squaring, cubing, square root, cube root, coordinate geometry and so on have gradually found acceptance the world over. In short, Vedic Mathematics applies to various scientific and technological disciplines to a great extent. In his *Fundamentals and Applications of Vedic Mathematics*, Anil Kumar Teotia says, "Recurring decimals and auxiliary fractions can be handled by Vedic Mathematics. It forms part of Jyotish Sastra."[4] It is worth noting here that the *Vedic Mathematics* of Swami Bharathi Krishna Tirtha builds the bridge between classical or ancient wisdom and contemporary scholarly practices. Even the work of Swami Tirthaji insists on the system's computational efficiency and adaptability. Truly speaking, Vedic Mathematical methods and principles have been studied and adapted for different applications. For example: the usefulness of its algorithms has been found in computational processes hinges Vedic Mathematics is applicable in the modern era or in the age of computers and big data. This makes the sense to say that Vedic Mathematics is a set of tools with substantial contemporary applications in that its algorithms can enhance computing efficiency. Its educational approaches, thus, can make mathematics globally accessible. It is globally recognized that Vedic Mathematics is effective in strengthening our understanding of mathematics. Besides, its historical roots serve valuable cultural asset. This is the reason why Vedic Mathematics is called a testament to human civilization and a requisite resource for this day and age.

Even though Vedic Mathematics is an ancient Indian system of mathematics, it offers new and effectual techniques to execute complex and difficult calculations with accuracy in a clean way via swift and effortless mental techniques. Vedic Mathematics is a system based on the concept of sutras. These sutras are not only concise, but also simply applicable principles or formulas. There are 16 phrase formulas (sutras) and 13 sub-sutras in Vedic Mathematics. These sutras cover a wide range of mathematical concepts and operations such as arithmetic, algebra, calculus, geometry etc. "The ancient Hindu scientists (Rishis) of Bharat in 16 Sutras (Phrases) and 120 words laid down simple steps for solving all mathematical problems in easy to follow 2 or 3 steps."[5] Most of the mathematical problems irrespective of their difficulty level can be solved infallibly by using sutras or Vedic mental or one- or two-line methods. Thus, each sutra can be used effectively for solving mathematical

problems within a second. Even each of these sutras helps in strengthening the ability to perform mental calculations. That is why Vedic mathematics is also known as **mental mathematics** in the world of mathematics. It contributes significantly to cognitive development as it develops memory power, enhances brain functioning as well and promotes logical thinking too. Practicing Vedic Mathematics provides an excellent workout of the brain and increases calculation capacity fast and thereby saving the time to overcome hard and tough problems. However, those who are dealing with Vedic Mathematics deviate from using of figures. "Vedic scholars did not use figures for big numbers in their numerical notation. Instead, they preferred to use the Sanskrit alphabet, with each alphabet constituting a number. Several mantras, in fact, denote numbers; that includes the famed Gayatri Mantra, which adds to 108 when decoded."[6]

In fact, Vedic Mathematics is wonderful in that with the help of sixteen phrase formulae and thirteen sub-sutras, most calculations to be carried out without the use of pen and paper. Since it is flexible, creative and the simple. One can able to mentally calculate complex mathematical problems immediately with the help of Vedic Mathematics. Interestingly, in the Scriptures, the words Sutra, formulae, aphorism etc. used synonymously.

The Sixteen (16) phrase formulas (Sutras) and 13 Sub-Sutras of Vedic Mathematics are given below:

A. Table of the Sixteen Sutras of Vedic Mathematics with meaning

Sl No.	Sutras Name	Meaning
1.	*Ekadhikena Purvena*	One more than the previous one
2.	*Nikhilam Navatascaramam Dasatah*	All from 9 and the last from 10
3.	*Urdhva-tiryagbhyam*	Criss-cross (Vertically and cross-wise)
4.	*Paravartya Yojayet*	Transpose and adjust
5.	*Sunyam Samyasamuccaye*	When the sum is the same that sum is zero
6.	*(Anurupye) Sunyamanyat*	If one is in ratio, the other is zero
7.	*Sankalana-vyavakalanabhyam*	By addition and subtraction
8.	*Puranapuranabhyam*	By the complete or non-completion
9.	*Chalana-Kalanabhyam*	Differences and Similarities
10.	*Yavadunam*	Whatever the extent of its deficiency
11.	*Vyastisamastih*	Part and whole

12.	*Sesanyankena Charamena*	The remainder by the last digit
13.	*Sopantyadvayamantyam*	The ultimate and twice the penultimate
14.	*Ekanyunena Purvena*	By one less than the previous one
15.	*Gunitasamuccdyah*	The product of the sum is equal to the sum of the product
16.	*Gunakasamuccayah*	The factors of the sum is equal to the sum of the factors

B.   Table of the thirteen Sub-Sutras of Vedic Mathematics with meaning

Sl No.	Sub-Sutras Name	Meaning
1.	*Anurupyena*	proportionately
2.	*Situated Sesasanfitah*	Remainder remains constant
3.	*Adyamadyenantyainantyena*	First by first and last by last
4.	*Kevalalh Saptakan Gunyat*	For 7 the multiplicand is 143
5.	*Vestanam*	By Osculation
6.	*Yavadunam Tavadunam*	Lessen by the Deficiency
7.	*Yavadunam Taradunikrtya Varganca Yojayet*	Whatever the extent of its deficiency, lessen it still to that very extent; and also set up the square of that deficiency
8.	*Antyayordasake'pt*	Whose last digits together total 10 and whose previous part is exactly the same
9.	*Antyayoteva*	Only the last Terms
10.	*Samuccayaguaitah*	The sum of the coefficients in the product
11.	*Lopanasthapandbhyam*	By alternate elimination and Retention
12.	*Vilokanam*	By Mere Observation
13.	*Gunitasamuccayah Samuccayagunitah*	The product of the Sum is the Sum of the products

Repeatedly speaking, all sutras and sub-sutras, just stated above, contain each and every branch of mathematics as each of these Sutras encapsulates a specific mathematical principle or technique. Hence, these sutras are the basis of Vedic Mathematics and offer multipurpose or versatile approaches to answering several mathematical problems. In the same vein of magic, the application of the sutras is perfectly logical and rational. The application and use of the sutras save time and effort in solving the problems. For example: *Ekadhikena Purvena* helps in finding out the square of a number ending with 5; *Nikhilam sutra* is used for multiplication;

Urdhva-tiryagbhyam sutra is not only used for various mathematical operations like multiplication and division but also allows for rapid calculation and so on. In short, all sutras enable more efficient and quick calculations as Sutras provide a deeper understanding of numbers and mathematics. Even the knowledge of Vedic Mathematics enables the teachers to be more resourceful to reshape the students and improve their capacity, talent and creativity. Thus, nobody can evade the utility of the study of Vedic Mathematics for its ability to perform calculations swiftly.

Concluding Remarks

In view of the above, it can be said that Vedic Mathematics is a kind of gift given to this land of India in particular and the world in general by the Indian scholars of the past and the present such as Aryabhatta, Bhaskarcharya, Srinivasa Ramanujan etc. It is useful for reasons other than scholastic achievement. Its applications go beyond our workplace. It assists us with daily tasks like banking, budgeting and shopping via fast calculation ability. It is an effective and valuable tool not only in professions like banking, engineering etc., but also valuable in situations such as all competitive examinations in time-sensitive scenarios, mental math challenges and many more. Briefly speaking, Vedic Mathematics can be advantageous in examinations such as aptitude tests, SAT, ACT, GRE, GMAT and various entrance examinations for professional courses and so on. In comparison to conventional method, Vedic Mathematics is more useful because "Vedic Mathematics provides answer in one line whereas conventional method requires several steps."[1] What it reflects here is that traditional methods involve multiple steps and require the memorization of lengthy algorithms. By contrast, Vedic Mathematics offers concise, summarizing and easily applicable sutras, making calculations more accessible, entertaining and enjoyable. Briefly speaking, Vedic mathematics is essential in that it provides the quick solutions for many problems. This is where the benefits of the use of Vedic Mathematics.

The ancient Indian Vedic Mathematics is insightful and serves as a reminder that invention and originality in problem-solving have deep roots in our past. Its emphasis on mental mathematical techniques, unique algorithms and alternative approaches to calculation offers a new outlook on tackling and handling mathematical challenges. Beyond education, the Vedic Mathematical system finds its application in fields that demand fast and exact calculations, i.e., trading and finance etc. really hinges on the importance of exercising Vedic Mathematics in daily life. Thus, in a nutshell, it can be said that Vedic Mathematics can significantly benefit learners at all levels of education. We should not deviate from Vedic Mathematics as it is a handy or convenient tool for those who need to solve more complex math problems

or long sums faster by the day. Thus, nobody can evade the use and utility of Vedic Mathematics due to its numerous rules and techniques that help us perform various arithmetical calculations in time.

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