

VEDIC MATHEMATICS

The Cosmic Software For The Cosmic Computer

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Introduction

Vedic Mathematics offers a new holistic approach to mathematics and to mathematics education. Its range extends from the most concrete values of numerical computation to the most abstract aspects of the dynamics of intelligence.

The computational methods of Vedic Mathematics have been found to be easier to learn, faster, and more enjoyable than conventional methods. The intrinsic flexibility of the Vedic system of calculation develops the students' creativity and clarity of mind.

The system of Vedic Mathematics is derived from the Vedic tradition or knowledge, recently revitalized and reinterpreted by Maharishi Mahesh Yogi in the form of a modern systematic science, known as Maharishi's Vedic Science. According to Maharishi, at its deepest level, Vedic Mathematics is the exploration and exposition of the self-interacting structure of pure consciousness, which is the orderly basis of all phenomena in nature. By connecting mathematics to its source in the field of pure consciousness, Vedic Mathematics has the potential to bring fulfillment to all areas of mathematics and to solve the current crisis in mathematics education.

The Sutras of Vedic Mathematics

All the computational methods of Vedic Mathematics are based on sixteen sutras (aphorisms) that are directly derived from the Atharv Ved, one of the primary texts of the ancient Vedic literature of India. This mental computational system was brought to light in recent times by the Shankaracharya of Puri, Swami Bharati Krishna Tirtha.

On one level, each sutra aphoristically describes the actual computational method to be used for the various types of mathematical problems. On a deeper level, however, each sutra may be seen as a refined formula for producing a high degree of coherence and order in brain functioning, facilitating the rapid and precise solution to the mathematical problem.

The coherently functioning brain, with its billions of neurons and interconnections is, in Maharishi's words, a "cosmic computer." Through proper programming it can accomplish anything. The sutras of Vedic Mathematics are the "cosmic software" that create the ability to compute most rapidly and precisely.

Applications to Mathematics Education

Vedic Mathematics offers a new approach to resolving the current crisis in mathematics education. It is not simply a collection of new computational techniques; rather it provides an entirely different approach to mathematical computation, based on pattern recognition.

The conventional methods of mathematical computation consist of rigid, sometimes monotonous procedures that are uniformly applied to all problems of a given type. The result is often boredom, strain, and a lack of enjoyment for both student and teacher.

By contrast, the techniques of Vedic Mathematics allow for constant expression of the student's creativity. First, for any type of problem, there are always several different approaches: at least one general technique, applicable to all cases, and also a number of special techniques, applicable to cases having a particular pattern. The general technique is always faster and easier than the conventional technique, while the techniques for special cases extraordinarily fast, yielding solutions to complex problems, often at the speed of just writing down the successive digits of the answer. Second, at each stage of a particular technique, there are usually options with regard to the next step. This flexibility in the method keeps the mind lively and alert and cultures the ability to quickly discover the path of least action on the way to the solution.

In addition, the techniques of Vedic Mathematics have been found to be easier to learn than conventional methods. Computational complexities are significantly reduced by using digits and their complements. And finally, unique, independent cross-checking methods make the system less prone to error.

In summary, then, the techniques of Vedic Mathematics not only provide a quick and accurate solution to the problem at hand, but also develop clarity of mind and intuition. In this way, Vedic Mathematics succeeds in fulfilling the two major goals of mathematics education: to teach students procedures for solving specific mathematics problems and to develop clear and logical thinking.

In teaching Vedic Mathematics, Dr. Puri has found that students derive great enjoyment from it, even if they previously disliked mathematics. The problem of “math anxiety,” which confronts mathematics educators around the world, simply does not arise. The Vedic mathematics research group in London has successfully applied Vedic Mathematics at both primary and secondary school levels. The Indian Ministry of Human Resource Development recently held a workshop on Vedic Mathematics at Rajasthan University, which was attended by mathematicians, educators, and government representatives. The workshop recommended that the government immediately introduce Vedic Mathematics into the educational curriculum of the nation.

Glimpses of Vedic Mathematics

The following elementary examples provide a glimpse of the speed and simplicity of the computations provided by Vedic Mathematics.

- $99976 \times 99998 = 99974|00048$
The answer is directly obtained in just one line using the *nikhilam* sutra.
- $374 - 253 + 254 - 433 + 327 = 374 + \overline{253} + 254 + \overline{433} + 327 = 269$
The answer is directly obtained by treating the numbers to be subtracted as consisting of negative digits, using the *vinculum* method.
- $252 \times 254 = \frac{1}{4} \times 256|008 = 64008$
The answer is directly obtained using the *anurupyena* upasutra.
- $9993^2 = 9986|0049$
The square is obtained directly by using the *yavadunam* sutra.
- $195^2 = 19 \times 20|25 = 38025$
The square is obtained using the *ekadhiken purvena* sutra.

- $988 \times 996 \times 995 = 979|128|\overline{240} = 979127760$
The product is obtained in one line using the *nikhilam* sutra.
- $1/39 = 0.\dot{0}25641$
The answer is obtained in just six seconds using the *ekadhika* sutra.
- $4 \text{ yd. } 1 \text{ ft.} \times 8 \text{ yd. } 2 \text{ ft.} = 32|16|2 = 37 \text{ sq. yds. } 56 \text{ sq. ft.}$
The answer is obtained using the *urdhava* sutra.
- $20289^2 = 203\overline{11}^2 = 4|0|_12|\overline{4}|5|\overline{6}|\overline{5}|2|1 = 412\overline{4}5\overline{6}521 = 411643521$
The result can be directly obtained by working from either left to right or right to left in four alternative ways using *dwandwa yoga*.

These examples provide just a glimpse of the most elementary applications of Vedic Mathematics. More sophisticated applications include computational aspects of linear algebra, curve fitting, evaluation of transcendental functions, solution of cubic and higher order algebraic equations, and the solution of certain types of nonlinear problems in analysis.

The Foundations of Vedic Mathematics

Computational techniques are just one aspect of the complete approach of Vedic Mathematics. Maharishi's Vedic Science locates the deepest value of Vedic Mathematics in the mathematical structure of consciousness itself. The founders of the Vedic tradition discovered the capability of the human mind to settle into a state of deep silence while remaining awake, and therein to experience a completely unified, simple, and unbounded state of awareness, called pure consciousness. In this experience, Maharishi explains, the conscious mind becomes identified with an infinite, all-pervading unified field, an eternal continuum underlying all existence.

By gaining familiarity with the silence of pure consciousness, one develops the ability to cognize within that silence an eternal and unmanifest "fabric" or "blueprint" of all the laws of nature; this fine fabric of activity is the Ved. The Vedic seers gave expression to the self-sufficient, infinitely dynamic, self-interacting qualities of this unified state of awareness; and they articulated the dynamics by which it sequentially gives rise, through its own self-interacting dynamics, to the field of space-time geometry, and subsequently to all the diverse forms and phenomena that constitute the universe. These expressions and articulations constitute the Vedic Literature.

At its most profound level, Vedic Mathematics is the mathematics of the Ved, the structure of pure knowledge; it reveals the precise mechanics by which the infinite, absolute reality of pure intelligence knows itself and thereby creates, from within itself, all

quantified values and relationships. On this basis, Vedic Mathematics is able to portray the quantification of all levels of intelligence (pure mathematics) and also to describe the dynamics of intelligence found in all levels of nature's functioning (applied mathematics).

Maharishi describes the Ved, within the field of pure consciousness, as existing on the level of undivided unity. Within this unity two values, existence and intelligence, can be located. It is the intelligence value that knows itself and thereby conceptually creates three values within itself—the knower, the process of knowing, and the known. Thus, one becomes two, and two becomes three. Through the further interaction of these three values, the infinite diversity of the universe is created from the sequential quantification of unity. This unfoldment is portrayed with perfect precision by Vedic Mathematics.

According to Vedic Science, all values of relationship and transformation, both abstract and concrete, are simply expressions of the self-interacting structure and dynamics of an underlying, totally unified field of pure intelligence. The unlimited variety of relationships and transformations, ranging from the most abstract areas of modern mathematics to the most concrete phenomena of nature, can thereby be described in terms of the inner relationships of pure consciousness. Vedic Mathematics provides this description.

This general principle is familiar to modern mathematicians. The unified foundation of modern mathematics is provided by set theory, the mathematics of the infinite. At the foundations of set theory are mathematical principles that directly describe the nature of an abstract, infinitely dynamic field of intelligence. All of mathematics is described as sequentially unfolding from the internal dynamics of this field of pure intelligence. For example, all sets are sequentially created from the unmanifest point value of the null set. This self-referral nature of the field of intelligence at the basis of set theory is expressed at a deeper level by the reflection principle, which underlies the mathematical description of the different quantified values of infinity provided by the theory of large cardinals.

In Vedic Mathematics, all the fundamental principles are derived from direct experience of the unmanifest source of orderliness within the unified field or pure consciousness. Vedic Mathematics is, therefore, the mathematics of the most fundamental structures of natural law. This is its unique stature and contribution to the field of knowledge.

Invitation to All Mathematicians

The computational applications of Vedic Mathematics are only the first step in an ongoing research program. All areas of modern mathematics, both pure and applied, fall within the scope of Vedic Mathematics. We are just beginning to tap the enormous potential, of this more fundamental and complete approach to knowledge,

By connecting mathematics to its source in the field of pure consciousness, Vedic Mathematics has the potential to bring fulfillment to all areas of mathematics. All mathematicians and mathematics educators are invited to join this research program, to apply the sutras of Vedic Mathematics to all areas of mathematics, and to enjoy the full creative expression of mathematics for the benefit of mankind.

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