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## Application of mathematical analysis in Vaidik Maths

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### Abstract

Vedic mathematics is an old technique that consists of sixteen sutras and thirteen sub sutras. It simplifies the fundamental arithmetic operations. It also solves algebraic concepts like simultaneous equation, quadratic equations, factorization of cubic equations etc. more effectively than the traditional approach. Vedic Mathematics can speed up mathematical calculations such as Arithmetic, Algebra, Trigonometry and Geometry. It reduces the time to solve a mathematical problem and boosts the student confidence. Vedic Mathematics works faster in areas of Trigonometry, Co-ordinate Geometry and Calculus, in the same effective manner. It helps students in minimizing careless mistakes. It is simple and one-line approach. Moreover, it has an inbuilt system of a series of checks. Medical research has proved that our brain weight may increase by five percent if we do not have mental exercise and brain weight once increased, cannot be reduced.

**Keywords:** Vedic math's, calculation, equation, shlokas

### Introduction

The current scenario of interest in the mathematics in students were very strange and anxiety creating as the students tends towards more marks gaining subject than mathematics. modern teaching of one way calculations are rigid and boring. Vedic Mathematics has general methods and also many methods that apply for special cases. These calculations can often be carried out independent of direction & orientation. Because of this flexibility, students can use their own approach which promotes creativity and intuition. In this rapidly changing world, flexibility and adaptability are indispensable for success. By using Vedic Sutras, complicated and lengthy computations can be solved with greater accuracy and lesser time as compared to calculations based on conventional mathematics. Vedic Mathematics also improves memory and creates greater mental alertness. The most significant quality of Vedic Mathematics is its consistency. Because of this quality, it creates stress-free and enjoyable environment. It inspires innovations. The beautiful coherence between arithmetic and algebra is clearly visible in the Vedic system.

Mathematical analysis, in general, is the study of the limiting process of algebraic structures. This branch forms the hardcore of modern mathematics. Mathematical analysis is an outgrowth of algebra and geometry and has its origin in the number system, zero and the concept of infinity. Since the history of evolution of natural numbers cannot be precisely ascertained, it is presumed that the natural number system is a gift of God to mankind. But the history of rational, irrational and complex numbers systems can be properly traced out to a reliable degree of precision. Aim of is to highlight two numbers namely- zero and infinity. In Vedanta philosophy zero and infinity appears in purely mathematical sense.

### Zero and infinity in Vedanta Philosophy

Concepts of Zero and infinity have be extensively used in vedanta Philosophy Following concept of Kathopanishad, for instance, zero hand infinity both appear in purely mathematical sense. (cf.[1]:II,6,14)

यदा सर्वे प्रमुच्यन्ते कामा येऽस्य हृदि श्रिताः।  
अथ मर्त्योऽमृतो भवत्यत्र ब्रह्म समश्नुते ॥

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That is when all the desires in the heart (of a person becomes zero, then that mortal becomes immortal and equivalent to God) In other words concept states that  
 Lim P/D $\infty$ G (God or Bramha)  
 D $\rightarrow$ 0  
 Where P = Possession  
 D= Desire

In case D $\rightarrow$ 0 (tending to zero), the mortal becomes equivalent to God. If D=0 then according to the Bramhagupta (620 AD) [Cf 2, ganita dhyaya]

P/0 is called "Tatchedada" तच्चेद The concept of zero and infinity as described in Kathopanishad, has lead to the formulation basic tenets of Vedanta Philosophy as propounded in shvetashvatara Upanishad.

अणोरणीयान्महतो महीयानात्मा गुहायां निहितोऽस्य  
 जन्तोः।

तमक्रतुः पश्यति वीतशोको धातुः प्रसादान्महिमानमीशम्॥

That is smaller than the atom and greater than the greatest the soul resides in the heart thing, living beings. It is well known that the main kernels of Vedanta Philosophy involve the immortality of soul, rebirth and theory of "Karma" Which depends on the concept of infinity and zero. According to shretashvatar Upanishad, the soul has been imagined in the form: (cf.[V]:9)

बालाग्र शतभागस्य शतधा काम्पितस्य च।

भागो जीवः स विज्ञेयः सचानन्त्याय कल्पते॥ ९॥

That is, a hundredth part of the hair-point is divided again into hundred parts. (That is a hair point is divided into 10,000 parts)The soul is known to reside there and assumed to be infinite.

### Scientific approach to Infinity

Our Earth is a part of the solar system. There are many solar systems. Galaxy is the set of solar systems. The Milky Way is where our Galaxy resides. (Milky Way i.e. the Aakash Ganga- आकाशगंगा)

Shape of the milky way is serpentine. It has many arms, like a cyclone, when we take images through satellite it gives the glimpses of clouds moving in circular motion.



Time taken to travel from one end to another is two lakhs Light years. Earlier this time calculation was 1 Lakh light year But due to presence of black spots, time observed to complete one arm is changed and now it is two lakh light years. We know the speed of light is  $3 \times 10^8$  m/s and this is the time to cover only our galaxy. There are millions and

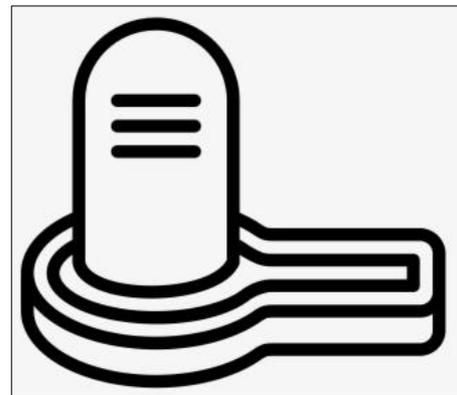
billions of galaxies, each galaxy has its own stars, planets, and satellites. Nearly 100 to 400 billions of stars are present in the galaxy only.

We have one Sun, eight planets and each planet has its own satellites. Thus the expansion of the universe is infinite. There is no end to this expansion therefore we cannot measure its size, because light takes two lakhs years to cover one milky way. And the survival of human life in maximum 100 years or 125 years. So it is highly impossible to know that infinity.

Moreover in this universe, there are millions and billions of galaxies. It is very interesting to know that now that the concept of universe has itself changed the recent theory predicts that multi-verse exists (Uni-verse means unit-one). Concept of the multiverse is amazing for human beings. So the supreme of the supreme parmatma परमात्मा who made this universe/multiverse cannot be defined by words but be realized. This Supreme is known as Formless-niraka निराकार (bundle of energy) and that is infinity.

Therefore the focal aim of aim of this paper is to use the concept of zero '0' and infinity ' $\infty$ ' in the MANTRA, which is taken from chapter 5 of Brihadaranyaka Upanishad, this mantra is used for shanti paath and known shanti mantra in IshaVasya Upanishad.

ॐ पूर्णमदः पूर्णमिदं पूर्णात्, पूर्णं मुदच्यते,  
 पूर्णस्य पूर्णमादाय, पूर्णं मेवा वशिष्यते।  
 ॐ शांतिः शांतिः शांतिः ॥



### Epilogue

1. The concept of infinity, zero and number systems lie at the root of mathematical analysis, which is growing like a banyan tree in various directions. This implies that the above basis of mathematical concepts, which originated in India during the Vedic period, provided a solid foundation for the development of mathematical analysis and its application.
2. Indeterminate ( $0/0$   $\infty/\infty$ , etc) does not mean, it is meaningless. Value of indeterminate form can be evaluated by using contain transformation. So of course Supreme of Supreme (परमात्मा) is formless but can be realized and expressed too.

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