

Significant Contribution of Ancient Bhartiya Mathematician towards Vasudhaiva Kutumbakam

Ankita Sharma¹ and Anuj Kumar Sharma²

ABSTRACT

Ancient Indian mathematicians made significant contributions in the development of mathematics by introducing fundamental concepts such as the decimal system, zero, arithmetic operations, algebra, geometry, trigonometry, and astronomy. They pioneered the use of place-value numeration and the concept of zero, which laid the foundation for modern mathematics. Additionally, they developed advanced mathematical techniques like the Pythagorean theorem, methods for squaring the circle, and circling the square, as well as simple combinatorics and speculation on infinity. Indian mathematicians also excelled in mathematical astronomy, computing planetary positions and eclipses. Their contributions to mathematics, science, and technology have had a lasting impact on the field, influencing mathematicians and scientists over the worldwide and it proves that the concept of Vasudhaiva Kutumbakam is deeply imbibed among the Indian mathematicians.

Keywords: Arithmetic, Algebra, Trigonometry, Geometry and Astronomy

INTRODUCTION

Ancient Indian mathematicians made significant contributions in the development of mathematics by introducing fundamental concepts such as zero, place-value numeration, Vedic mathematics, arithmetic operations, algebra, trigonometry, and astronomical calculations. They systematized arithmetic, algebra, geometry, and trigonometry etc., which laying the foundation for modern mathematical principles that are teaching today. Notable mathematicians like Jaina, Pi ñ gala, Brahmagupta, Bodhayana, Bhaskara II, and Āryabhaṭ a I played a crucial role in advancing mathematical knowledge during the early classical period in India. Their works were pivotal in shaping the evolution of arithmetic through the Hindu positional decimal number system, and Algebra through innovative methods for solving equations, and trigonometry through the development of infinite series for sine, cosine, and arctangent functions. In the last two or three decades some researches work on the that contribution and cited his work. Kumar and Dutt in 2002, focus on ancient Indian mathematics (Number Theory) and highlights achievements in solving Diophantine equations with integers (Kumar and Dutta. 2002). In 2009, R. K. and Bhattacharyya describe the Brahmagupta's works and focuses mathematical transmission processes to Arab countries (Bhattacharyya. 2009). Gurudeo et.al. in 2010, highlight the Vedic Indians first developed symbolic algebra and Philosophical ideas influenced decimal system,

¹ Department of Statistics, University of Delhi, Delhi

² Department of Mathematics, Shyam Lal College, University of Delhi, Delhi

arithmetic, and algebra (Tularam 2010). In 2011 Yadav, Mohan Girish and Nair, discussed about the Ancient Indian mathematicians' contributions to various mathematical fields and study on physical forces and differential calculus in ancient India (Yadav and Mohan 2011, Girish and Nair 2011). In 2012, Pranesachar shows the Brahmagupta's remarkable contributions in Geometry and Number Theory (Pranesachar 2012). Gurdev et. al. discussed the development of algebra in Vedic India: symbolic, philosophical, and religious influence (Gurudev and Tularam 2012). Dani highlighted the contributions from Vedic age to Kerala school (Dani 2012). Puttaswamy discussed chronologically mathematical achievements of Pre-Modern Indian Mathematicians (Puttaswamy 2012). Sarah and Glaz in 2013, represented the Ancient Indian poetry intertwine mathematical ideas and decimal number system from Vedic period influenced Europe (Sarah and Glaz 2013). Further, Kalpana and Modi describe the contributions of Indian mathematicians in various mathematical branches (Kalpana and Modi 2013). In 2014, David et. al. discussed about the Ancient Indian math achievements such as positional decimal system, square roots computation (David and Borwein 2014). Satya and Kumar in 2015, presented Indian mathematics rooted in Vedic literature, significant contributions over centuries such as introduced zero, numeral system, algebra techniques, square root, and cube root (Satya and Kumar 2015). In 2018, Toke and Knudsen Studies ancient Indian mathematics until 650 CE and includes decimal system, Pythagorean theorem, and mathematical astronomy (Knudsen 2018). Ramasubramanian in 2019, explore the Indian mathematicians' second-order interpolation schemes in ancient astronomical works (Ramasubramanian2019). In 2020, Francisco et. al. Discussed historical and mathematical elements of Brahmagupta Sphuta Siddhânta and focuses on his contributions to diophantine equations and current research (Francisco 2020). In 2021, Abul et. al. explores the significant contributions of Indian mathematicians to global mathematics (Abul *et al* 2021). Further, Steven et.al. studies the Indian mathematics tradition dates back 5000 years and Indian discoveries align with modern mathematical results (Steven *et al* 2021). Vijay et. al., Ham and Efren describe the Indian mathematical research with significant contributions in various subjects and notable discoveries include Zero, Decimal System, and Negative Quantities in 2023 (Pérez 2022, Ham 2022, Steven et al 2021) In 2023, Chandra et. al., Gabriela and Sharon studies the notable Hindu mathematicians made significant contributions to various mathematical fields and explains development of mathematics and its daily life applications (Chandra 2023, Gabriela 2023, Sharon *et al* 2023).

In this article, we discussed the significant contribution of ancient Indian Mathematicians such as Jaina, Pi ñ gala, Brahmagupta, Bodhayana, Bhaskara II, and Āryabhaṭ in various branches of Mathematics as Vedic mathematics, Arithmetic Operations, Algebra, Trigonometry, and Astronomical calculations etc. without any fame and greed they just contributed for the global well-being. Their contributions strength the thought of Indian: Vasudev Kutumbakam.in front of world the entire world.

NOTABLE CONTRIBUTION OF ANCIENT INDIAN MATHEMATICIANS

Ancient Indian mathematicians made significant contributions to the development of mathematics by introducing fundamental concepts such as zero, place-value numeration, Vedic

mathematics, arithmetic operations, algebra, trigonometry, and astronomical calculations. They systematized arithmetic, algebra, geometry, and trigonometry, laying the foundation for modern mathematical principles taught today. Notable mathematicians like Jaina, Pi ñ gala, Brahmagupta, Bodhayana, Bhaskara II, and Āryabhaṭ a I played crucial roles in advancing mathematical knowledge during the early classical period in India. Their works were pivotal in shaping the evolution of arithmetic through the Hindu positional decimal number system, algebra through innovative methods for solving equations, and trigonometry through the development of infinite series for sine, cosine, and arctangent functions.

Hindu Mathematics in early classical period (500 BC - 500 AD) - Notable mathematicians made significant contributions to various mathematical fields. One notable mathematician from this period was Aryabhata, who is credited for introducing the concept of zero and developing the decimal system. Aryabhata's ground-breaking work laid the foundation for future advancements in mathematics, particularly in the fields of algebra, trigonometry, and astronomy. His innovative mathematical theories also influenced the development of calculus and provided a basis for modern mathematical principles that continue to shape our understanding of the universe today. Aryabhata's mathematical treatise, *Aryabhatiya*, not only revolutionized the way numbers were understood and manipulated but also paved the way for sophisticated astronomical calculations and theories in ancient India. Aryabhata's contributions to mathematics were not only limited to theoretical advancements but also extended to practical applications in fields such as navigation, architecture, and timekeeping. One of Aryabhata's most significant practical applications was his development of a method for accurately predicting solar and lunar eclipses, showcasing the breadth of his mathematical prowess and its real-world impact. This method for predicting eclipses was based on his groundbreaking understanding of the Earth's rotation and revolution around the Sun, demonstrating Aryabhata's deep insights into celestial mechanics. Aryabhata's innovative approach to eclipse prediction involved intricate calculations based on the relative positions of the Earth, Moon, and Sun, setting a precedent for future astronomers and mathematicians to build upon. His methods not only revolutionized eclipse prediction but also laid the foundation for advancements in astronomy and mathematical modeling, influencing generations of scholars to come. His contributions to astronomy extended beyond eclipse prediction, as he also made significant strides in the study of planetary motion and the concept of zero, which would later become fundamental to the development of modern mathematics. Aryabhata's work on planetary motion led to the development of mathematical models that accurately described the movement of celestial bodies, further solidifying his legacy as a pioneer in the field of astronomy and mathematics. His interdisciplinary approach and innovative methodologies not only influenced his contemporaries but also paved the way for future generations of mathematicians and astronomers to build upon his legacy and further expand the boundaries of scientific knowledge.

Furthermore, Aryabhata's innovative approach to calculating the circumference of the Earth demonstrated his profound understanding of Geometry and Trigonometry, showcasing his

multidisciplinary expertise and leaving a lasting impact on the scientific community. His groundbreaking calculations estimated the Earth's circumference with remarkable accuracy, laying the foundation for future advancements in geodesy and navigation. Aryabhata's contributions extended beyond astronomy and mathematics, as his treatises also delved into the fields of algebra, quadratic equations, and the concept of sine, influencing generations of mathematicians and scientists to come. His work not only revolutionized the scientific understanding of his time but also paved the way for future discoveries and innovations in various branches of mathematics and science. His innovative methods and theories were not only ahead of his time but also served as a catalyst for the development of new mathematical and scientific principles that continue to shape our understanding of the world today. One of Aryabhata's most significant contributions was his approximation of the value of π , which he calculated to an impressive accuracy of five decimal places, laying the foundation for further advancements in mathematical calculations and trigonometry. This groundbreaking achievement in the calculation of π by Aryabhata sparked a renewed interest in the study of mathematics and trigonometry, inspiring generations of scholars to delve deeper into the mysteries of numbers and shapes. Aryabhata's work not only revolutionized the field of mathematics but also had a profound impact on the scientific community, influencing future discoveries and innovations in various branches of science. One of the key aspects of Aryabhata's work that garnered widespread acclaim was his development of the concept of zero as a placeholder in mathematical calculations, a revolutionary idea that transformed the way numbers were understood and manipulated. Aryabhata's introduction of zero laid the foundation for the decimal system, which would later become a fundamental component of modern mathematics and revolutionize the way numerical values were represented and computed. One of Aryabhata's most notable achievements was his proposal of the heliocentric model of the solar system, centuries before it was reintroduced in the West by Copernicus. Aryabhata's heliocentric model challenged the prevailing geocentric view of the universe and laid the foundation for a more accurate understanding of the cosmos, revolutionizing the way we perceive our place in the universe. This groundbreaking shift in perspective sparked a wave of curiosity and exploration among scholars, igniting a scientific revolution that would shape the course of human understanding for centuries to come. Aryabhata's contributions not only influenced the field of astronomy but also had a profound impact on mathematics, with his development of trigonometry and algebraic concepts still being studied and applied today.

Furthermore, the mathematical treatises produced by Indian scholars, such as Aryabhata's "Aryabhatiya" and Brahmagupta's "Brahmasphutasiddhanta," not only influenced mathematical thought in India but also spread to neighboring regions like Persia and Arabia, shaping the development of mathematics in those areas as well. These mathematical works served as foundational texts for future scholars and were instrumental in the transmission of mathematical knowledge across different cultures and civilizations. The exchange of mathematical ideas between India and other regions also facilitated the development of new mathematical concepts and techniques that continue to influence modern mathematics. One notable example of this

cross-cultural exchange is the introduction of Indian numerals, including the concept of zero, to the Arab world, which revolutionized arithmetic and laid the groundwork for the development of algebra. The adoption of Indian numerals in the Arab world not only revolutionized arithmetic but also paved the way for advancements in fields such as astronomy, engineering, and commerce due to their efficiency and ease of use. The widespread adoption of Indian numerals in the Arab world led to a significant increase in mathematical literacy and paved the way for the flourishing of scientific and intellectual pursuits during the Islamic Golden Age. The translation of Indian mathematical texts into Arabic further facilitated the dissemination and understanding of advanced mathematical concepts, contributing to the rapid progress of scientific knowledge in the region. This exchange of mathematical knowledge between different cultures also fostered cross-cultural collaborations and laid the foundation for future breakthroughs in various scientific disciplines. Let us discuss the individual significant contribution of notable Indian Mathematicians.

PINGALA CONTRIBUTION (3rd CENTURY BCE)

Pingala, an ancient Indian mathematician, made significant contributions in the development of mathematics, particularly in the areas of Sanskrit prosody and binary arithmetic. His work on binary arithmetic laid the foundation for modern computer science and information technology, as it introduced the concept of using 0s and 1s to represent numbers, a fundamental principle in digital systems. Pingala's advancements in mathematics, along with other ancient Indian mathematicians, such as Brahmagupta and the Kerala mathematicians, played a crucial role in shaping the field of mathematics. Their discoveries, including the invention of zero, the decimal system, and negative quantities, have had a lasting impact on mathematical theory and practice. Overall, Pingala's contributions have significantly influenced the historical trajectory of mathematics, paving the way for future developments in the field.

BRIMIHI CONTRIBUTION (3rd CENTURY BCE)

Brimihi's contributions significantly impacted algebraic developments by introducing new classes of monomial ideals, such as \mathbb{A}^1 -fixed ideals, which extend previous concepts like \mathbb{A}^1 -Borel ideals. Additionally, Brimihi's work on Brill-Noether loci in Hilbert schemes of points on surfaces provided insights into the structure and dimensionality of these loci, proving their non-emptiness and irreducibility when expected dimensions are positive. Furthermore, the formal algebraic specification advocated by Brimihi facilitated the rigorous formalization of system design processes, particularly in manufacturing systems like CAD/CAPP systems, ensuring correctness in specifications and implementations for efficient software tool development. Moreover, Brimihi's research on Brill-Noether loci on projective varieties and surfaces offered valuable insights into the scheme structure, Zariski tangent space computation, and implications for numerical invariants of curves moving linearly on such varieties.

JAIN PHILOSOPHY CONTRIBUTION (6th CENTURY)

Jaina philosophy has seen significant contributions throughout history. Scholars like Bhaṭṭa Akalaṅka, Vidyānanda, Hemacandra, and others have played crucial roles in developing Jaina pramāṇa-śāstra, focusing on epistemology and logic. Additionally, Jainism's historical roots trace back to the pre-Vedic period, with contributions in art, architecture, and religious practices, reflecting cultural aspirations and providing centers for worship, education, and more. Furthermore, Jaina morality offers guidance in navigating modern challenges, emphasizing the importance of moral wisdom in today's society. Scholars in Jaina studies have also delved into various aspects, including philosophy, ethics, rituals, and the historical development of Jainism, shedding light on its relation to Buddhism and Ajivikism. Jainism's ethical principles, particularly non-violence, have been highlighted as guiding forces for sustainable economic development, showcasing the interdependency of virtues and economic progress.

BODHAYAN CONTRIBUTION (6th CENTURY BCE)

Bodhayana, an ancient Indian mathematician, made significant contributions to mathematics, particularly in the field of geometry. His work on right-angled triangles and the decimal system has had a lasting impact on mathematical development. Additionally, the emphasis on reason and science by Arabians in the Middle Ages, as discussed by Kong and Ma, helped promote the development of mathematics, with implications for the European Renaissance. Furthermore, the historical review by Nathanson highlights the importance of mathematical contributions in trigonometry, such as new relationships and tables, which were also significant aspects of Bodhayana's work. Bodhayana's mathematical achievements, alongside those of other ancient Indian mathematicians, have played a crucial role in shaping the foundations of mathematical knowledge and practice.

ARYABHATA CONTRIBUTION (5th CENTURY)

Aryabhata's groundbreaking work included the development of the concept of zero, the use of algebraic equations to solve astronomical problems, and the accurate calculation of the value of pi. Aryabhata's work also involved the creation of a mathematical system that laid the foundation for trigonometry and the calculation of planetary positions, which greatly influenced future advancements in these fields. Aryabhata also made significant contributions to astronomy and mathematics. In astronomy, he worked on time reckoning, spherical geometry, and trigonometry, with his legacy appreciated for introducing the concept of the sine and creating the first sine table. Aryabhata's mathematical work included pioneering the use of trigonometric identities and finite difference calculus, which are fundamental in modern calculus. Additionally, his text *Aryabhatiya* contained the principle of relativity of motion, crucial for his theory that the Earth rotates on its axis, marking a pivotal moment in the history of astronomy. Furthermore, Aryabhata's system of planetary constants was influenced by earlier Indic astronomical traditions, showcasing his integration of diverse ideas into his work. Aryabhata's contributions extended beyond mathematics and astronomy, as he also delved into the fields of algebra and arithmetic, laying the groundwork for future advancements in these areas. Moreover, Aryabhata's

astronomical observations and calculations were not only groundbreaking for his time but also paved the way for later astronomers to build upon his findings and refine our understanding of the universe. Aryabhata's innovative approach to science and mathematics continues to inspire scholars and researchers to this day, solidifying his legacy as a pioneer in the realms of astronomy and mathematics.

APASTAMBA CONTRIBUTION (AROUND 6th CENTURY)

Apastamba, an ancient Indian mathematician and scholar, played a significant role in influencing the development of Vedic mathematics. The Vedic Indians, including Apastamba, were pioneers in the evolution of symbolic algebra, deeply rooted in Vedic philosophy. Their mathematical advancements were driven by philosophical and religious ideas, leading to the creation of formulas that simplified calculations and aided in understanding the physical world. Additionally, the Vedic mathematicians excelled in geometry, trigonometry, and arithmetic, showcasing a high level of mathematical proficiency at an early stage in history. Apastamba's contributions, along with those of other Vedic scholars, laid the foundation for the rich tradition of Vedic mathematics, emphasizing creativity, abstraction, and symbolism in mathematical problem-solving.

BRAHMAGUPTA CONTRIBUTION (7th CENTURY CE)

Brahmagupta's work in algebra holds significant importance due to his pioneering contributions that laid the foundation for mathematical concepts still relevant today. He was the first to define zero algebraically, influenced by Indian philosophical ideas and terminology. Additionally, Brahmagupta's formula for calculating the area of a quadrilateral by its sides, even when not inscribed in a circle, showcases his mathematical ingenuity and practical applications in land management expertise. Despite the underrepresentation of Indian mathematical achievements in Western discourse, Brahmagupta's innovative ideas in solving diophantine equations and his concept of zero attachment to mundane affairs continue to inspire modern mathematical research and generalizations. Furthermore, the characterization of Brahmagupta quadrilaterals through elliptic curves demonstrates the lasting impact of his work on diverse mathematical fields, leading to the construction of families of elliptic curves with specific properties and applications.

MAHAVIRACHARYA CONTRIBUTION (9th CENTURY CE)

Mahaviracharya, a significant mathematician, contributed to group theory, particularly in the context of solvable groups and Sylow subgroups. Additionally, Mahaviracharya's work is linked to practical geometry and mathematics in the Near East, showcasing a community of practical geometers with a rich history of methods and problems spanning millennia. Furthermore, the Vedic Sutras, which Mahaviracharya's work is associated with, have applications in computer arithmetic, specifically in the design of Vedic multipliers that enhance computational speed and accuracy through ancient mathematical principles. This multidimensional impact highlights

Mahaviracharya's enduring influence across various mathematical domains, from theoretical group theory to practical applications in arithmetic and geometry.

SHRIPATI CONTRIBUTION (11th CENTURY CE)

Shripati, a notable figure in Indian mathematics and astronomy, made significant contributions that enriched these fields. His work falls within the broader context of Ancient Indian Mathematics and Astronomy, where scholars like Aryabatha, Bhramagupta, and others have made substantial contributions that are often overlooked in Eurocentric education. Shripati's contributions likely align with the diverse areas of focus in Indian mathematics, including zero and place value notation, Vedic mathematics, algebra, trigonometry, and analysis. Additionally, Shripati's work may have been influenced by the rich tradition of Sanskrit mathematical astronomy, which integrated various knowledge systems and cosmological concepts, adapting them into familiar mathematical models. Overall, Shripati's contributions likely played a crucial role in advancing mathematical and astronomical knowledge in India, contributing to the broader tapestry of intellectual achievements in these fields.

BHASKARACHARYA CONTRIBUTION (12th CENTURY CE)

Bhaskaracharya, an influential mathematician in medieval India, introduced key algebraic concepts and techniques that have left a lasting impact on mathematics. His work encompassed operations involving positive and negative numbers, surds, and zero, as well as algebraic, simultaneous, and indeterminate equations, as highlighted in the treatise on algebra from his Sanskrit magnum opus Siddhānta Shiromani. Bhaskaracharya's algorithm for dealing with expressions involving multiples of zero, treated as infinitesimals, and zero-divisors has been considered significant, bearing similarity to the ideas of Newton and Leibniz in the development of Calculus. Furthermore, his law of impending operations involving zero, particularly division by zero, has been defended for its philosophical consistency and simplicity, challenging the methods of infinitesimals and limits. These contributions have solidified Bhaskaracharya's legacy in the realm of algebra and mathematics, shaping fundamental principles still studied and applied today.

NARAYAN PANDIT CONTRIBUTION (14th CENTURY)

Narayana Pandit, an Indian Mathematician from the 14th Century CE, made significant contributions to mathematics by introducing the Narayana's numbers and “Ganitakaumudi”, a sequence that produces a limiting constant akin to the Golden Ratio observed in the Fibonacci sequence. Furthermore, research has focused on Narayana-Mandelbrot polynomials, a novel concept that extends the Mandelbrot companion matrix, showcasing the ongoing relevance and impact of Narayana's work in modern mathematical explorations. Additionally, studies have delved into the finite nature of Narayana's numbers that can be expressed as a product of three repdigits in various numerical bases, shedding light on the intricate properties and limitations of

these unique sequences. These findings collectively highlight Narayana Pandit's enduring legacy in mathematics and his pioneering contributions to the field.

KAMALAKARA CONTRIBUTION

Kamalakara's works in Indian mathematics and astronomy significantly impacted the development of trigonometry and astronomical tables. The mathematical ingenuity of jyotiṣa authors, as discussed by Montelle and Plofker, evolved into a profuse variety of table-text types, emphasizing the importance of numerical tables in astronomical calculations. Additionally, the achievements of Indian mathematicians, particularly those from Kerala, in breaking barriers and exploring the infinite, as highlighted by Mallayya, contributed to advancements in mathematical techniques like series approximation and error analysis, which are fundamental in the development of accurate astronomical tables. Furthermore, Plofker's research indicates that while classical Indian mathematical astronomy heavily relied on plane trigonometry, techniques for exact solutions of spherical triangles were not independently developed, showcasing the influence of different mathematical traditions on astronomical computations.

SIGNIFICANT CONTRIBUTION BY TEXT TOWRD VISHAW GURU OR VASUDHAIVA KUTUMBAKAM

Sr. No.	Period	Details of Work	Mathematician	Salient feature
1	3000BCE or earlier	Vedic Text	-	The earliest recorded Mathematical knowledge, Number system, Bodhayan theorem, Decimal number system, concept of infinity,
2	800-600 BCE	Sulba-Sutras, Apasthamba,	Baudhayana, Apasthamba, Katyayana and Manva	Ancient text of geometry; approximate value of the square root of 2 and pi. Exact procedures for construction and transformations of square, rectangle, trapezia ect.
3	476-550 CE	Aryabhatiyam	Aryabhata	Concise versa; algorithm for square root, cube root, Place value system, Sine table, Geometry, quadratic equation, linear indeterminate equations,

				sum of squares and cubes of numbers, Planetary astronomy, plane and spherical trigonometry
4	482-565CE	Brhat Samhita, Braht-Jataka, Panca-siddhantika	Varaha Mihira	Summary of five ancient siddhantas, Sine table, trigonometric identities, combinatorics, magic squares.
5	600-800CE	Commentary on Aryabhataiya, Laghu-Bhaskariyam and Maha-bhaskariyam	Bhaskara I	Expand the Aryabhata's work on integer solution for indeterminate equation, approximation formula for Sine function, planetary astronomy.
6	598-668 CE	Brahmasphuta-siddhanta, Khandakhadyaka	Brahmagupta	Rules of arithmetic operations with zero and negative numbers, Algebra (Bijaganita); linear and quadratic equations, formula for finding the diagonals and area of a cycle quadrilateral.
7	800-870 CE	Ganita-sara-sangraha	Mahaviracharya	A text book covering arithmetic-geometry-algebra, continuing the ancient Jain mathematics tradition, permutations and combination, arithmetic and geometric series, the sum of squares and cubes of numbers in arithmetic progression.
8	1019-1066CE	Ganita-tilaka, Siddhanta-sekhara, Dhikotidakarana tct.	Shripati	Planetary Astronomy
9	1114-1185CE	Lilavati,	Bhaskaracharya	Addition formula for sine

		Bijaganita on algebra, Siddhant-siromani on astronomy, Vasanaabhasya on Siddhanta-siromani	-II	function, surds, permutations and combination, solution for indeterminate equation, ideas of calculus, including mean value theorem, planetary astronomy, construction of several instruments
10	1616-1700CE	Sidhanta-tattva-viveka	Kamalakara	Addition and subtraction theorems for the sine and the cosine, sines and cosines of double, triple, etc., angles

CONCLUSION

Ancient Indian mathematicians made significant contributions to the development of mathematics, laying the foundation for modern mathematical concepts. They introduced crucial ideas such as zero, the decimal system, and place-value numeration, value of Pi, . Additionally, they pioneered advancements in arithmetic, algebra, trigonometry, calculus, Astronomy and geometry, which played a vital role in the evolution of science and technology. The works of Indian mathematicians from the Vedic age to the Kerala school era showcased remarkable intellectual achievements that were ahead of their time, influencing mathematical thought globally. Hence, we conclude that the concept of Vasudhaiva Kutumbakam is deeply imbibed among the Indian mathematicians.

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