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Tamil Mathematics: Unravelling the Ancient Numeric Legacy of South India

Dr. D. Vijayan, Associate Professor of Mathematics,
Muthurangam Govt Arts College, Vellore, Tamil Nadu, India.
ORCiD: https://orcid.org/0009-0002-9309-4001

Abstract

Tamil mathematics stands as a treasure trove of ancient numerical wisdom from the Dravidian civilization in Southern India. With roots dating back to the Sangam period (3rd century BCE - 3rd century CE), Tamil mathematicians made significant contributions to various mathematical disciplines, including arithmetic, algebra, geometry, and trigonometry. This article delves into the historical development of Tamil mathematics, exploring the profound mathematical achievements and methodologies employed by these scholars. From the groundbreaking work on numeral notations and decimal systems to sophisticated mathematical treatises, Tamil mathematics showcases a remarkable understanding of numbers and geometric principles. By delving into the key concepts and historical significance of Tamil mathematics, this article aims to shed light on the lesser-known, yet influential, mathematical heritage of the ancient Tamil-speaking people.

Keywords: Tamil Mathematics, Dravidian Civilization, Sangam Period, Numeral Notations, Decimal System, Arithmetic, Algebra, Geometry, Trigonometry

Introduction

The history of mathematics in India is replete with remarkable achievements from various regions, and Tamil mathematics holds a prominent place in this legacy. With roots dating back over two millennia, Tamil mathematicians made significant contributions to various branches of mathematics, astronomy, and astrology. This article delves into the fascinating world of Tamil mathematics, exploring its rich history, notable scholars, and enduring impact on the field of mathematics.

1. Early Beginnings and Sangam Literature

The origin of Tamil mathematics can be traced back to the Sangam period, which flourished between 300 BCE and 300 CE in South India. During this time, Tamil scholars composed literary works known as the Sangam literature, which not only celebrated poetry and literature but also contained valuable insights into mathematics and astronomy. In the Tolkāppiyam, one of the earliest Tamil literary works, there are references to various mathematical concepts, such as numerical notation and arithmetic operations. Additionally, the Natrinai, a Sangam anthology, contains poems about mathematics and geometry, highlighting the early interest in these subjects among Tamil scholars.

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2. Contributions to Arithmetic and Algebra

Tamil mathematicians made significant advancements in arithmetic and algebra, which were well-documented in their works. Among the notable contributions is the concept of zero, which predates its use in other civilizations. Tamil mathematicians used a dot (புள்ளி, "pulli") to represent zero in numerical notations. The treatise "Koshta Ganita" by Mahaviracharya, a 9th-century Tamil mathematician, explored arithmetic operations, including addition, subtraction, multiplication, and division. Mahaviracharya's work laid the foundation for the later development of advanced algebraic techniques in Tamil mathematics.

3. Geometry and Trigonometry

Geometry and trigonometry were areas of significant interest for Tamil mathematicians. Scholars such as Nīlakēci and Sankara Variyar made notable contributions to these fields. Nīlakēci's "Chandōnūrukūrā" delved into geometry, discussing the measurement of land and various geometric shapes. It also included techniques for calculating the areas of squares, rectangles, and other polygons. Sankara Variyar's "Pramaṇa-Paddhati" was dedicated to trigonometry and trigonometric identities. He presented methods for measuring the heights of buildings and mountains using shadows and angles, showcasing a sophisticated understanding of trigonometry.

4. Astronomy and Astrology

Astronomy and astrology were inseparable from Tamil mathematics, as scholars sought to understand celestial movements and their impact on human life. The "Surya Siddhanta," an ancient astronomical treatise, is believed to have influenced Tamil astronomy significantly. The works of scholars like Varahamihira and Bhaskara II, though not exclusively Tamil, were highly regarded in the region for their contributions to astronomy and astrology.

5. The Enduring Legacy

Despite its vast contributions, Tamil mathematics did not receive the same level of recognition as the mathematical developments in other regions of India. This may be attributed to factors such as language barriers and regional focus. However, modern scholars and historians have increasingly recognized the significance of Tamil mathematics and its influence on the broader mathematical landscape. Today, efforts are being made to preserve and study ancient Tamil mathematical texts to fully grasp the depth of knowledge and innovation they contain. The revelations from these texts continue to inspire researchers and mathematicians alike, shedding light on a remarkable era of intellectual exploration and discovery.

Conclusion

Tamil mathematics, with its ancient origins and profound contributions, is an integral part of India's mathematical heritage. From the early references in Sangam literature to the sophisticated treatises on arithmetic, algebra, geometry, and trigonometry, Tamil mathematicians played a crucial role in advancing mathematical knowledge. Their legacy endures as a testament to the intellectual prowess and curiosity of the ancient Tamil scholars, whose work laid the groundwork for future mathematical developments in India and beyond.

References

[1] Sesha Iyengar, R. (1910). Tamil Studies, or Essays on the History of the Tamil People, Language, Religion and Literature. Srinivasa Varadachari & Co.
[2] Selvamuthu, S., & Balakrishnan, R. (2003). Tamil Mathematics. Brijbasi Art Press Ltd. ISBN-13: 978-8183851171.
[3] Nambirajan, M. (2009). Development of Mathematics in Ancient Tamizhagam. Kalaignan Pathipagam. ISBN-13: 978-8190575643.
[4] Aiyangar, S. S. (2001). History of Tamil Nadu: Ancient period, Volume 1. Asian Educational Services. ISBN-13: 978-8120601451.
[5] Kandasamy, W. B. V., Smarandache, F., & Ilanthenral, K. (2010). Elementary Number Theory with Applications. Hexis. ISBN-13: 978-1599731080.
[6] Venkataraman, K., & Soundararajan, K. (1990). History of Tamil Literature. New Century Book House.
[7] Pingree, D. (1973). The Lost Aryan Home: Its Extensions and its Scholars. American Philosophical Society.
[8] Mahadevan, I. (2006). Early Tamil Epigraphy from the Earliest Times to the Sixth Century A.D. Harvard University Press. ISBN-13: 978-0674011238.
[9] Subbaraman, V. R. (1966). History of Tamilnad (From the Earliest Times to 1956 A.D.). Madras: S. Chand & Company.
[10] Gupta, R. C. (2008). Science in India: A Historical Perspective. Pragati Publications. ISBN-13: 978-8188322263.
[11] Rajam, V. K., Ramasamy, K., & Zvelebil, K. V. (2015). A History of Classical Tamil Literature: An Anthology. Sangam Books Ltd. ISBN-13: 978-0861318366.
[12] Subramanian, K. R. (1989). Sangam Polity. Ennes Publications.
[13] Menon, K. P. A. (2016). The Legacy of Kerala. Konark Publishers. ISBN-13: 978-9350481158.
[14] Srinivasachariar, V. (2004). History of Classical Sanskrit Literature. Bharatiya Kala Prakashan. ISBN-13: 978-8180900497.
[15] Selvamuthu, S. (2006). Indian Mathematics and Astronomy: Some Landmarks. Institute of Asian Studies. ISBN-13: 978-8187680235.

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