



Content based Comparative Study of Mathematics and Asian Tamil Texts

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Abstract

This article investigates the technical aspects of mathematics explored in the ancient Tamil text “Kanakathikaram”, “Kanitha Theebigai”, “Kanitha Thivagaram”. We analyze the book's methods for calculating measurements, including those related to astronomy, engineering, and daily life. We then bridge the gap between these methods and their applications in contemporary engineering mathematics and nanotechnology. The rich tapestry of Tamil literature extends beyond poetry and prose to encompass a remarkable legacy in mathematics. “Kanakathikaram”, a 15th-century mathematical treatise by Korakkaiyur Kari Nayanar, stands as a testament to this brilliance. This article probes the technical details of mathematical approaches presented in the book, highlighting their relevance to modern engineering mathematics and nanotechnology.

Keywords: Kanakkathikaram, Kanitha Theebigai, Kanitha Thivagaram, Tamil Mathematics, Ancient Measurements.

Introduction

The history of mathematics has traditionally included a significant contribution from Tamil. The mathematical brilliance of the poets who wrote in ancient Tamil is the basis for the language's literature. Kaniyan, Kanithar and Kanakaayar are only two examples of the many names that may be found in Tamil literature that relate to mathematically talented people. You can learn about mathematics as an art form by reading the book "Kanakkadikaram." In the 15th century, a learned individual by the name of Korokaiyur Kari Nayanar penned a mathematical text that was published as the book Kanakkathikaram. This article's goal is to draw attention to the mathematical approaches discussed in this book, as well as the cutting-edge technology of the nano industry and the applications of engineering mathematics that may be found in Tamil literature.

Present Mathematics Practice

The Ramanujan Math Park, a 172-acre facility located near Kuppam, Andhra Pradesh, is a pioneering initiative dedicated to transforming mathematics education. Established in 2017 by Agastya Foundation, the park employs innovative approaches to make complex mathematical concepts accessible and engaging for students of all backgrounds. The park's primary goal is to stimulate greater engagement with mathematics through immersive, experiential learning. By integrating mathematics with disciplines such as architecture,



physics, engineering, technology, music, and art, the park provides a holistic learning environment. The impacts of the Ramanujan Math Park include: Innovative Pedagogy: The park utilizes visual representations, models, and hands-on activities to demystify mathematical concepts., Teacher Development: Comprehensive teacher training programs equip educators with the tools and strategies necessary to create engaging mathematics classrooms., Student Achievement: With an annual visitation of 7,000 to 9,000 students, the park has demonstrated a significant impact on student learning, fostering a new generation of mathematically proficient individuals., Interdisciplinary Learning: The integration of mathematics with other subjects cultivates well-rounded students with a strong foundation in problem-solving and critical thinking., Social Impact: The park serves as a platform for bridging the educational gap between rural and urban students, promoting inclusivity and equal opportunities.

The Ramanujan Math Park has established a strong foundation for mathematics education. Future endeavors will focus on expanding its reach, developing advanced programs, and conducting rigorous research to measure its long-term impact. By continuing to innovate and adapt, the park aims to become a global model for effective mathematics education.

Mathematical Practice in elderly age

Allen S.C. Ross, He discovered it in the study of the Indus Valley script In the case of “Pathin kuutru keezh vaai ilakka murai” in Mohanjataro. So, the Tamils have been in control for ages one for the small letter called “Keezhvaaiyilakkam” which came the whole number is three hundred and twenty. Divide into equal shares Make a part of it by the name of Munthiri provided.

Kanakkathikaram and Kanitha Deepikai

The author of the Mathematical treatise known as *Kanakkathikaram* is the person known by that name, Korakkaiyur Kari Nayanar. It is interesting to notice that the mathematical approaches contained in these are deeply rooted in the material existence of the people and attempt, in an accounting fashion, to model the dimensions of daily labor. A scientific approach is taken throughout the presentation of mathematical knowledge in this work. Throughout the accounting, there are a total of 60 Venbha (poem) and 45 calculations using puzzles. The length of time it takes for the earth to complete one revolution around the sun, the moon to complete one revolution around the sun, the earth to complete one revolution around the moon, and so on. This book demonstrates Karinayanar's mathematical expertise as well as his poetic and imaginative abilities. Note that the solutions to all of the mathematical puzzles and formulas, as well as the page numbers, are presented in Tamil numerals throughout the entirety of the book.

Kanitha Deepikai is a Tamil Arithmetic book. It was written by Bandulu Ramasamy Nayak and published in 1825. He was one of the first to use the decimal notation in Tamil numerals. That means earlier ௩0 used to represent 10 in Tamil numerals, he changed it to ௩0

Accounting Methods and Procedures

Measurements of Ancient Elongation, Face, and Stops were done by Venbha (poem); names of Tamil integers, names of Tamil fractional numbers, techniques of alloying, fashion



details, measures of oceans, ways of measuring fields, circumference of circles, areas, etc. Agriculture, harvesting, payment of wages, methods of measuring fields, etc. The method of calculating, from smallest to largest size, the amount of time it takes for the Earth to make one revolution around the sun, the amount of time it takes for the moon to make one revolution around the sun, and the amount of time it takes for the earth to make one revolution around the moon; a way for determining the number of pits contained inside a jackfruit without having to cut it open; a method for determining the number of seeds contained within a pumpkin without having to cut it open; the number of grains of rice contained within a single step of rice, from the Calculations involving magic squares, which provide the same result regardless of the order in which the numbers are added, as well as calculations involving quizzes and answers, are covered in this book. These individuals, without a doubt, were the forefathers of the technology that we use today. In addition, the author has done a good job of simplifying the many different minor aspects that can be calculated using a calculator.

Engineering Mathematics

One part of applied mathematics is engineering mathematics. Engineering mathematics focuses on the math methods and procedures that are commonly used in engineering and industry. The demands of engineers are what gave rise to the interdisciplinary field of engineering mathematics. These needs speak to the engineers' skill for a variety of practical, theoretical, and other issues, as well as their necessity to overcome challenges in order to be productive in their work. Historically, the majority of engineering mathematics focused on applied analysis, particularly differential equations, real and complex analysis (including vector and tensor analysis), approximation theory (broadly considered, which includes asymptotic, variation, and chaotic methods, representations, and numerical analysis), Fourier analysis, and probability theory. Engineering mathematics also included linear algebra and applied probability outside of the realm of analysis. These subfields of mathematics are inextricably linked to the growth of Newtonian physics as well as the mathematical physics that was prevalent during that time. Even though these fundamentals are currently evolving in a variety of ways, accounting still focuses on its core concepts.

The manipulation of matter on the atomic, molecular, and supra molecular levels is the focus of the field of nanotechnology, also known as micro technology. In its original, more familiar form, nanotechnology stuck to a set of technological goals that had already been set. According to this definition, micro technology refers to the technique of accurately manipulating materials at the atomic and molecular level in order to produce large-scale devices or products. Currently, we refer to this as molecular nanotechnology. After that, the United States National Nano electronics Technology Initiative provided an explanation that was broader in scope. Micro technology is defined as a technique that is able to handle microscopic matter ranging from 1 to 100 nano meters in at least one dimension. In other words, it is a technique that can handle nanotechnology. According to this description, nanoparticles have a very small bulk, the quantum state features of nano materials can vary substantially, and the quantum mechanical effects of nano materials have been observed to be very reactive. As a result, it is clear that the concept has evolved from referring to a particular



technological aim to becoming a category of research. As a result, it encompasses all of the research and technologies available today that characterize the unique qualities of matter with a density below a particular threshold. As a result of this, it is now referred to using the plural form, either micro-technologies or micro-technologies. This is how we can find the techniques of the nanotechnology industry in Kusutdhikaram. In this book, metals such as copper, brass, and lead are discussed along with their more subtle applications. Additionally, this book discusses issues related to nanotechnology, such as numbers that are smaller than one and very small materials.

Evolution of Nanotechnology and its Prospects

The spending of the world's superpowers is measured in billions of silver dollars. Via its National Nanotechnology Initiative, the United States has invested a total of US\$3.7 billion; the European Union has committed a total of US\$1.2 billion; and Japan has funded a total of US\$750 million. The term "nanotechnology" refers to extremely small particles and comprises a wide variety of scientific subfields. Some examples of these subfields are surface science, organic chemistry, molecular biology, semiconductor physics, microphysics, and molecular engineering. The potential repercussions of technologies including artificial intelligence have been the subject of discussion among scientists. It can come up with a lot of new materials and methods that can be used in a wide range of micro technological fields, such as medicine, electronics, bioenergy, and consumer goods. On the other hand, micro technology faces all of the problems that come with new technology. Instead of being negative about these problems, we should use all of the technology to do only good.

The governments of many countries, including but not limited to the United States and the European Union, have put a lot of money into research for the aquaculture industry. The United States of America is responsible for the conception of the nanotechnology sector as well as the development of the definition of nanotechnology. In addition to that, it disbursed money for the technologies. Because of fundamental programs for research and technological development in Europe, the continent has become a leader in the field of aquaculture technology. Around the middle of the 2000s, a substantial uptick in scientific attention could be seen. The planning of the micro technology highway, which focuses on precise control of material at the atomic level to find current and future resource opportunities, targets, and applications in the not too distant future, has led to a lot of new projects.

Conclusion

This article has tried to give a very short summary of the Tamils' ways of calculating and measuring numbers. It has also talked about how similar these old ways are to the technology that is used today in nanotechnology. *Kanakathikaram*, *Kanitha Theebigai*, *Kanitha Thivagaram* are the strong pieces of evidence demonstrating that ancient Tamils had a strong grasp of mathematics. In addition to expanding his mathematical understanding, he came up with a number of conundrums based on the happenings of everyday life. The author has computed the earth and oceans without any technical assistance, which is wonderful and much simpler than the current technology, which is fantastic for us. But we know many scientific specifics today because of today's sophisticated technology. And the effort of a



large number of people and an expensive cost of materials are required in order to build a technology in a way that is modern, yet it is to our pride that our ancient Tamil ancestors employed these technologies in times when there was no progress.

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Author Contribution Statement: NIL.

Author Acknowledgement: This research paper published with the fund support of RUSA 2.0 Project, Annamalai University, Annamalai Nagar. Office Memorandum No. G11/39493/DRD/RUSA 2.0 Dated: 06.09.2022. RUSA 2.0 EI & CH Post Doctoral Research Internship/scholarship Code 100-E-002.

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