

# **Interdisciplinary Approaches to Science and Management for Innovative Development**



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## Chapter 9

# Unveiling Mathematical Concepts in Purananuru through Translation

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### Abstract

One of the oldest languages that continues to use today, Tamil is a language of logic and structure in addition to passion and philosophy. Mathematical accuracy and artistic beauty have been expertly integrated in Tamil Literature, particularly in classical poetry. Mathematics is implicitly present in Tamil poem, from the specified metric of Sangam Poetry to the rhythmic structures of Venpa and Yappilakkanam. Besides the rhythmic structure, a number of Tamil poets and academics have explained the environment, social structure, and the universe's principles through the lyrical use of mathematical concepts such as time computation, astronomy, proportion and geometry. This chapter describes how the Mathematical concepts used in Ancient Tamil Literature, particularly in Purananuru.

*Keywords: Number System, Tamil Literature Poem, Purananuru.*

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## **1. Introduction**

Although Mathematics is frequently considered as a contemporary scientific discipline, its roots are deeply embedded in Language, Art, Music, and Culture in addition to numerical operations. Mathematical concepts were expertly blended into poetry, grammar, architecture, and Astronomy in Ancient Tamil Literature, especially in works like Tholkappiyam, Silappatikaram, and the Sangam poems. Mathematical smoothness was represented by Tamil Intellectuals long before formal notation existed, from ratios and symmetry in temple design to poetic forms that reflect binary patterns and Fibonacci sequences. The discussion examines how these classic literary works demonstrate the innovation of Tamil Intellectual traditions by reflecting computational analysis, logic, and Mathematical precision.

Ancient writings such as Thirukkural are concise and logically sequenced, much like mathematical expressions. Even contemporary Tamil poetry reflects balance as well as justification, and order in life through the innovative use of numbers, patterns, and symmetry. While the literary works, cultural and linguistic components of Tamil poetry have been extensively studied, the relationship between Tamil poetry and mathematical theory has received very little attention from scholars. The related concepts can be found in [1-9].

## **2. Mathematical Concepts in Purananuru**

This section gives how the Mathematical concepts used in Ancient Tamil Literature, particularly in Purananuru.

The Purananuru is an important collection of Tamil literature from the Sangam period. It contains 400 songs. They mostly deal with issues

related to Puram (common life), politics, war, charity, heroic death, etc. Purananuru has references to the application of Mathematics in the way of life, Business and standards of the people of that era, but no explicitly stated mathematical poems. Specifically, the measurement of items, business transactions, and architecture all make use of numbers and geometry. In the Purananuru, words like "four directions", "four seasons", "five lands" are used to denote numbers. Apart from these, numbers were used when measuring the size of objects. For example, numbers were used when measuring the area of a piece of land, the depth of a well, etc.

**“துளிபதன் அறிந்து பொழிய**

**வேலி ஆயிரம் விளைக நின் வயலே” - (புறம்: 391: 20 - 21)**

In the Purananuru, Kalladanar, in the place where he greets the king, he has greeted him with, *“May the rain [drops] of your country, knowing the condition of your land. May your field produce a thousand paddy fields for every fenced area!”*

In Purananuru, *ma* is used as a specific unit of measurement. It often refers to one-twentieth ( $1/20$ ) of a quantity. In Purananuru, especially in song number 12, Pandyan, relying on his knowledge, speaks of taxation as "like an elephant entering a land". In this song, the word *ma* is used to refer to a measure of land or the size of a specific object. In Purananuru songs, although *ma* is used to refer to a specific measure of land or taxation, its precise measurement may vary depending on the context of the song. For example, in some songs, *ma* may refer to the size of a specific piece of land or the size of an object. Therefore, to know the exact measurement of *ma* in Purananuru, it is necessary to consider

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the context of the respective songs. The sense of mathematics is of great importance in the Purananuru poems. For example,

1. Purananuru 8 - **ஆயிரம் யானை;**  
One thousand elephants: Scale of army.
2. Purananuru 13 - **நூறாயிரம் தானம்;**  
One hundred thousand donations: Extent of donation.
3. Purananuru 190-**நான்கு பரப்பும்;** Four areas:  
King's territorial spread
4. Purananuru 53 - **அறுபது காலம் ;** Sixty periods: Lifespan
5. Purananuru 82 - **மூன்று குறுகிய நாள் ;** Three short days;  
Short duration

*Ayiram yanai* (Purananuru 8) is used to indicate the scale of the war, *Nurayiram dhanam* (Purananuru13) is used to indicate the size of the donation. *Nanku Parapum* (Purananuru 190) refers to the land spread of the state, *Arupatu kaalam* (Purananuru 53) refers to the length of a lifetime, and *thirty short days* (Purananuru 82) refers to the short duration of time.

**“அயர்க்கும் பெருநீர் பரந்த கடல் போல்**

**ஆயிரம் ஆயிரமா நிற்கும்...” - புறநானூறு - பாடல் 177**

Here, the word thousand is used as a metaphor for numbers, to indicate an innumerable multitude or a very large amount.

From this Chapter, we can observe that many poems contain mathematical concepts indirectly in Purananuru. These translations are

a small attempt. It supports inclusive education while preserving cultural heritage.

### 3. Conclusion

Mathematical concepts are not specifically discussed in Purananuru. However, it contains instances where it uses calculations, measurements, and other numerical data as examples or numbers. They show that the Sangam period's living made use of measurement, numbers and mathematical knowledge. Future research work can inspire innovative approaches to teaching, learning and using mathematics in academic and practical contexts while also preserving Tamil Intellectual Heritage by Integrating classical Literature with contemporary mathematics and technology.

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