



## Women and Mathematics in the Indian Stance

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### Abstract

Mathematics, a fundamental pillar of human knowledge, plays a crucial role in shaping our understanding of the world. The article provides an overview of the multifaceted relationship between women and mathematics, spotlighting historical references where women's participation in this field was evident and the subsequent progress in promoting gender diversity. Knowledge of mathematics aim to inspire and support young women in technological pursuits. Emphasizing the benefits of gender diversity in mathematics, this abstract highlight the evolving landscape and the potential for a more inclusive and innovative discipline.

**Keywords:** Women in Mathematics, Sundari, Jain Mathematics, Siri Bhuvalaya, Vedic mathematics

### Introduction

#### The start of numerals

As per Jaina tradition, the knowledge given by first Tirthankar Shri Rishabh Deva to his two daughters was in akshar lipi and ank lipi i.e., characters and numerals, thousands of years ago. As it's explained, in Mahapurana <sup>[1]</sup>, that before going to salvation, he gave Bharat, the son of elder queen Yashaswati, the entire kingdom and Gommatesh Bahubali, son of younger queen Sunanda was given the state of Podanpur. On this Bharat, the name of our country was recognized as Bharat.

Lord Rishabh Deva thought in his mind that what is the use of giving him some worldly thing, something should be given that will maintain his fame even in the hereafter. Thinking in this way, Lord Rishabh Deva called his two daughters, thinking that they should be given the basic material of complete knowledge, and called Brahmi to sit on his thigh and complete the entire languages with the thumb of his right hand in her left palm and formed alphabets to be enough for all languages.

Second, by making his younger daughter named Sundari sit on the right thigh, wrote a zero 0 in her left palm with the thumb of his right hand, make two holes similar to it, and cut it in half 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 are written and explained how these numbers required to receive all the molecules and atoms of the world is sufficient. This is one of the earliest references of someone teaching a woman the knowledge of characters and numerals in human history and evolution. According to Sarvepalli Radhakrishnan <sup>[2]</sup>, a

professor of comparative religions and philosophy at Oxford who later became the second President of India, there is evidence to show that Rishabh was being worshipped during and before Vedic period and the Yajurveda mentions the name of three Tirthankaras – Rishabh, Ajitanatha and Arishtanemi.

Understanding the characters and numerals from his sisters and converting the entire word group into a sound and echo form of letter and noun, this number letter was created in the form of Chakrabandha by Gommatesh Bahubali, the son of Rishabh deva. From that day onwards, traditionally by shrut parampara (hearing and learning from gurus) it has come down to Sri Kumudendu Acharya (8<sup>th</sup> century AD) to create the Siri Bhoovalaya <sup>[3]</sup>, the only treatise written entirely in numerals. It has been explained in Siri Bhoovalaya that in this mathematical language, numbers are available in Linguistics which can be decided into 718 languages of the world.

- A numeral script is a writing system that uses numerical symbols to represent words or phrases. It is also known as a "numerical code" or "number cipher." In a numeral script, each letter or group of letters in a message is replaced with a corresponding numerical symbol or series of symbols. The recipient of the message can then use a key or decoding algorithm to translate the numerical symbols back into the original text.
- The Jains of ancient India attached excellent value and interest to the study of mathematics. Mathematics was considered an integral part of Jaina studies and religion.



**Fig 1:** An illustration of a Kannada numeral script of Siri Bhoovalaya

### Widespread expertise in mathematics

The Jain text *Tiloyapannati* <sup>[4]</sup> mentions a woman named Sulasa who was adept at calculation and was consulted by her husband in his business affairs. Similarly, the *Visheshavasyaka* text describes a woman named Sthulabhadra who was skilled in arithmetic and geometry.

In addition to these references in texts, archaeological evidence also points to the active involvement of women in mathematics. For instance, a Jain temple in Karnataka, known as the Chaturmukha Basadi, has a carving of a woman holding a geometrical instrument, indicating her involvement in mathematical activities.

One example of women's involvement in mathematics during the Vedic period is the *Rigveda* <sup>[5]</sup>, one of the oldest sacred texts of Hinduism. The *Rigveda* contains several references to women who were skilled in mathematics and astronomy. For example, in the hymn 10.85, the female seer Gargi Vachaknavi engages in a philosophical debate with the sage Yajnavalkya, during which she demonstrates her knowledge of mathematical concepts such as infinity and the nature of the universe. This exchange is notable for the fact that Gargi is one of the few women mentioned in the *Rigveda*, and her expertise in mathematics and philosophy is acknowledged and respected.

Another example of women's involvement in mathematics during the Vedic period <sup>[6]</sup> is the *Sulba Sutras*, a collection of mathematical texts that were used to guide the construction of altars and other ritual objects. The *Sulba Sutras* <sup>[7]</sup> were written by priests, but they contain references to women who were involved in the construction process. For example, the *Baudhayana Sulba Sutra* refers to a group of female workers who were responsible for measuring and cutting the bricks used in the construction of altars. The text also contains mathematical formulas for the construction of geometric shapes, such as squares and circles, which were used in the construction of these objects.

In addition to these examples, there are also several references to women who were skilled in mathematics and astronomy in the *Puranas*, a collection of ancient Hindu texts. For example, the *Vishnu Purana* contains a story about the female sage Maitreyi, who was a renowned scholar and mathematician. Maitreyi was said to have developed a system of mathematics that was based on the movement of

the planets and stars, and she was regarded as one of the foremost experts in the field.

While these examples demonstrate that women were involved in mathematics during the Vedic period, it is important to note that their contributions were often overlooked or understudied. Women's participation in mathematics and science was often discouraged or outright forbidden, and their contributions were often attributed to male scholars. As a result, the role of women in mathematics during the Vedic period is not well understood, and many of their contributions have been lost or forgotten over time.

In addition to the *Rigveda*, other ancient Indian texts that mention women's education include the *Smritis*, which are a collection of Hindu texts that were written between 200 BCE and 1200 CE. The *Smritis* provide guidelines for social and religious behavior, and they emphasize the importance of education for both men and women. The *Manusmriti*, for example, states that "the mother is the first guru, the father is the second guru, and the teacher is the third guru" (2.145), highlighting the importance of women in the education of their children.

Another important ancient Indian text that mentions women's education is the Buddhist *Jataka* tales, which were written between 300 BCE and 400 CE. The *Jataka* tales are a collection of stories that recount the past lives of the Buddha, and they often feature women who are educated and skilled in various disciplines. For example, the *Jataka* tale "The Birth of Mahosadha" tells the story of a woman named Bimbadevi, who is skilled in the art of diplomacy and helps her husband navigate political challenges.

There are records of women's involvement in mathematics education dating back to ancient times. For example, the mathematician and astronomer *Aryabhata* <sup>[8]</sup>, who lived in the 5th century CE, wrote about women's education in his treatise on mathematics and astronomy, the *Aryabhatiya*. He noted that women were taught mathematics and other subjects, and that they were just as capable as other gender.

### Ensuing the path

The story of *Brahmi* highlights the importance of education and intellectual curiosity in Jainism. *Brahmi*'s dedication to the study of languages and scripts not only led to the development of a new script, but also had a lasting impact on Indian culture and society. Her story also serves as an inspiration for girls <sup>[9]</sup> and women to pursue education and intellectual pursuits, regardless of societal norms or expectations. In modern times, the story of *Brahmi* has inspired initiatives to promote education and literacy, particularly among girls and women.

According to the latest *Census of India* <sup>[10]</sup> data released in 2011, the Jain community in India has the highest women's literacy rate at 94.91%. This is significantly higher than the national average of 74%, and higher than the literacy rates for women in other religious communities in India. The Jain community has a strong tradition of valuing education and has established several schools and colleges throughout the country, offering education to students of all backgrounds. Additionally, the Jain community places a strong emphasis on gender equality, with women encouraged to pursue education and careers alongside men. These factors have contributed to the high literacy rates among Jain women in

India.

Among the states, having strong history of Vedic influence, the state of Kerala has the highest women's literacy rate in India at 92%. Kerala has been recognized for its achievements in the field of education, with the state government making significant investments in schools and universities, as well as promoting adult literacy programs. As a result, Kerala has become a model for other states in India, particularly in terms of promoting women's education and empowerment.

### **Contribution to society**

Educated women can play a crucial role in changing the thinking of a family, as they possess knowledge, skills, and values that can have a significant impact on their family members. They foster critical thinking, educated women can help their family members develop critical thinking skills. By encouraging independent thought and questioning, they can help their family members develop a deeper understanding of the world around them. Women can influence decision-making within their families. They can provide valuable insights and perspectives on a range of issues and help their family members make informed decisions.

Women with better knowledge of Mathematics <sup>[11]</sup> can contribute to a society by advancing scientific research as they can apply their knowledge to fields such as engineering, physics, and computer science, where mathematical principles are fundamental. Can improving data analysis, with their knowledge of statistics and data analysis, women can contribute to various fields such as medicine, economics, and public policy. They can help analyze data to identify trends and patterns, make informed decisions, and develop effective policies. Women with strong mathematical skills can help develop innovative solutions to complex problems. They can use mathematical modeling to design efficient systems and processes, improve product design, and optimize resource utilization and women with expertise in math can help manage financial systems more effectively. They can help organizations make informed decisions, analyze investment opportunities, and develop robust financial strategies. By leveraging their skills and expertise, they can help drive progress and create a more equitable and prosperous society.

### **Conclusion**

The impact of women's education on society and humanity cannot be overstated. Education empowers women, enabling them to make informed decisions about their lives, families, and communities. Education also plays a key role in promoting economic development and reducing poverty. Studies have shown that increasing the level of education among women is associated with improved health outcomes for mothers and children, reduced gender-based violence, and greater political participation.

### **References**

1. Bharatiya Jnanpith publications, Mahapurana (Bhaag 1), Nameychariu, Delhi: Bhartiya Jnanpith Publications; c1981.
2. Radhakrishnan S. Indian Philosophy, The Macmillan Company; c1923.

3. Desh Bhushan Ji Maharaj, Shri Bhoovalaya Desh Bhushan Ji Maharaj, Siri Bhoovalaya, Delhi: Shri Bhoovalaya Prakashan Samiti; c1957.
4. Vrushabhacharya, Upadhye AN, Jain H, Shastri B. Tiloyapannatti, Solapur: Jain Sanskruti Samrakshak Sangh Solapur; c1953.
5. Gadkari, Jayant. Society and Religion: From Rugveda to Puranas. Popular Prakashan c1996. ISBN 978-81-7154-743-742.
6. Revathy KM. Vedic manuscripts in Kerala, Dept. of Vyakarana, S.S.U.S. Kalady
7. Sharma KL. Sutras S. New Delhi: Motilal Banarsidass; c2004.
8. Roy R. Aryabhata and His Contributions to Mathematics, Resonance. 2010;15(7):630-638. DOI: 10.1007/s12045-010-0082-5
9. Shah P. Women Education and Empowerment in Jain History: A Study of Brahmi and Sundari. International Journal of Scientific Research and Review. 2019;8(3):220-231.
10. Distribution of Population by Religions, [https://censusindia.gov.in/nada/index.php/catalog/40443/download/44077/DROP\\_IN\\_ARTICLE-04.pdf](https://censusindia.gov.in/nada/index.php/catalog/40443/download/44077/DROP_IN_ARTICLE-04.pdf)
11. Chakravarty K. Women and Mathematics in Ancient India. Indian Journal of Gender Studies. 2001;8(1):49-67.