

SHAKUNTALA DEVI: AN INNATE MATHEMATICAL PRODIGY

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Abstract

Ms. Shakuntala Devi, an Indian mathematician, earned the moniker "human computer" for her remarkable ability to solve complex mathematical problems mentally. Despite lacking formal education, she astounded audiences worldwide with her innate mathematical prowess from a young age. Throughout her international tours, Devi showcased her extraordinary talent by effortlessly tackling challenging numerical calculations without the aid of electronic devices. Ms. Devi does things differently; instead, she doesn't do different things. She possessed an extraordinary mastery of mathematics, a woman transcending boundaries, and a prodigious talent. Shakuntala Devi learned a few mathematical concepts from her grandfather, including those that predated the invention of zero. She honed her skills by practicing during card games with her father, showcasing them in numerous shows. She authored approximately twenty books, with three of them published in the United States. Her feats earned her recognition, including Guinness World Records and accolades from various countries. This paper highlights Devi's contributions to mathematical education, numerology, astrology, and social work while respecting her privacy by refraining from discussing personal matters. She battled solo against societal evils. She stands as a symbol of empowered Indian women, inspiring others with her exceptional abilities and achievements.

Keywords: Shakuntala Devi, math prodigy, human computer, math wizard

INTRODUCTION

Numbers are indispensable to our daily lives, from mundane tasks to significant endeavors. Yet, there's often an underlying apprehension towards them, leaving us feeling uncertain. In the Indian context, mathematics remains predominantly male-dominated, with limited representation of female scholars in the field. Women mathematicians are often overlooked in the historical records. Enter Shakuntala Devi, the renowned Mathematical wizard, who not only simplifies the use of numbers but also infuses them with intrigue, making them accessible and captivating for all. This article aims to shed light on the significant contributions of one notable Indian female mathematician, Ms. Shakuntala Devi. Vedic Mathematics, a unique ancient system originating from India, offers techniques for solving complex numerical problems using 'sutras' or aphorisms. Despite not being formally integrated into the education system, Vedic Mathematics is gaining popularity for its mental calculation methods, wherein numbers are represented by symbols with specific place and absolute values. Efforts have been made to introduce Vedic Mathematics as an optional subject in certain schools, including in the NEP-2020 education system.

Shakuntala Devi's early exposure to mathematical concepts, possibly through her father's circus performances, shaped her exceptional abilities. Even at the age of three, she displayed remarkable memory skills, memorizing card numbers and sequences. Her father recognized her potential and taught her mnemonic techniques and memory enhancement methods. Devi's achievements in mental mathematics, accolades, and societal contributions exemplify her as an empowered woman and a proud daughter of India. This article will explore Shakuntala Devi's prowess in mental mathematics, her accolades, and her societal impact, showcasing her as an inspirational figure and a beacon of empowerment for women. Furthermore, it will delve into her aptitude in astrology, numerology, and her endeavors as a social activist. The breadth of this article underscores the significance of mental calculations in numerical domains and aims to serve as a fundamental guide for enthusiasts delving into the realm of speed mathematics.

EARLY LIFE AND INFLUENCES OF SHAKUNTALA DEVI

Shakuntala Devi was born into a humble Brahmin family in Bengaluru, India, on November 4th, 1929, to Smt. Yogini and Shri. Bishaw Mitra Mani. Unlike traditional Brahmin rituals, her father worked in a circus, showcasing talents as a trapeze artist, lion tamer, and magician. From the age of three, Shakuntala accompanied her father to circus shows, where she observed card games and their mathematical patterns. Remarkably, she consistently outplayed her father in these games, prompting him to train her in memory tricks, probability prediction, and quick calculations. Despite her natural aptitude for mathematics, formal schooling was a challenge due to financial constraints. However, her grandfather, a family priest and Veda's scholar, imparted

knowledge in mathematical operations, Vedic mathematics, and astrology. Shakuntala independently developed 'Mind Dynamics' and showcased advanced mathematical abilities by the age of three and a half, earning her the title of a 'child prodigy.' By age five, she could mentally calculate complex arithmetic problems and extract square and cube roots. Despite enrolling in school at St. Theresa's Convent in Chamaraipet, Bangalore, at the age of ten, financial hardships forced her to discontinue her education. Raised in a semi-slum area, poverty, and her father's shows significantly influenced her character and social skills. Despite her lack of formal education, Shakuntala's early experiences with numbers and performances paved the way for her illustrious career in demonstrating her remarkable mathematical abilities.

Ms. Devi's Achievements and Contributions:

At the tender age of six, Shakuntala Devi stepped into the spotlight, showcasing her mathematical prowess in her inaugural public performance at Mysore University. Demonstrating her ability to effortlessly solve arithmetic problems, mental math puzzles, and extract complex square roots and cube roots, she quickly gained attention. By the age of eight, she astounded audiences at Annamalai University in Tamil Nadu with her arithmetic skills, handling numbers ranging from 13 to 200. Accompanied by her father, she embarked on a journey across India, captivating audiences with her remarkable mathematical abilities.

In her early twenties, Shakuntala Devi became the primary breadwinner for her family, eventually relocating to London with her father in 1944 to showcase her exceptional mathematical abilities. During an interview with the BBC, she faced a complex mathematical problem and swiftly provided a solution. Despite initial skepticism from the interviewer and his team, they later acknowledged Devi's correctness upon reevaluation. This incident earned her the moniker "The Human Computer," catapulting her to worldwide fame. Throughout the 1950s, Shakuntala Devi's popularity soared as she toured various countries, including England, the United States, and Japan, captivating audiences with her extraordinary mathematical skills. Known for her ability to calculate the day of the week for audience members' dates of birth without any mechanical aid, she garnered widespread acclaim. Despite her lack of formal education, Devi's intuitive grasp of numbers and rapid mental calculations earned her global recognition. Tragically, Shakuntala Devi passed away on April 21, 2013, at the age of 83, due to kidney failure, leaving behind a legacy of mathematical brilliance and inspiring countless individuals around the world.

Ms. Devi's Outstanding Demonstrations:

- During a 1944 interview on BBC, she swiftly solved a complex mathematical calculation, although her answer differed from the interviewer and team's calculations. After her insistence on the correctness of her solution, the team of math experts re-examined their calculations and admitted their initial error.
- In London, on October 5th, 1950, Shakuntala appeared on BBC TV, providing rapid solutions to problems posed by the network. The following day, she delivered a presentation at Leeds University.
- While at the University of Rome, a calculating machine initially found one of her answers incorrect, but upon reevaluation, it was discovered that the calculator had malfunctioned.
- During her 1951 European tour, she accurately extracted the cubic root of 640503928 as 862.
- In July 1952, in Washington D.C., she astonished a group of news reporters and mathematics professors by competing with and outperforming an electronic calculator, winning by 6 seconds.
- In 1970, she visited an institute in Germany, where she successfully competed against a computer in calculation, impressing them to the extent of receiving a gifted Mercedes Benz.
- In February 1973, in Sydney, Australia, she challenged the most sophisticated computer at the time, "UTEKOM" of the University of New South Wales, matching wits with renowned Professors Mr. R.G. Smart and Mr. Barry Thornton, Chief Mathematicians. Seconds before questions were fed to the computer, Shakuntala had the answers, leaving Mr. Thornton astounded.
- On September 27th, 1973, she appeared on the BBC show 'Nationwide' with host Bob Wellings, astonishing him by correctly answering all mathematical questions he presented.
- On January 26th, 1977, at Southern Methodist University in Dallas, US, she extracted the 23rd root of a 201-digit number, surpassing the speed of a UNIVAC-1108 computer.
- In 1980, on June 18th, at Imperial College London, she solved a multiplication problem involving 13-digit numbers, earning her a place in the Guinness Book of World Records in 1982.
- In 1988, at Stanford University, US, she calculated various roots within seconds.
- She performed before the King of Cambodia in Cambodia.
- On April 3rd, 2008, at Manipal University Dubai, she showcased remarkable calculations and predictions, including a magic square box demonstration.
- In 2009, she appeared on Russia Today, correcting an equation given by the host and showcasing her mathematical skills.
- Devi's accomplishments include achieving the Guinness World Record for accurately multiplying two 13-digit numbers within a mere 28 seconds—an unparalleled feat that remains unmatched.

Awards & Achievements:

- She conducted numerous public demonstrations and performances showcasing her extraordinary mathematical skills, earning admiration and acclaim from audiences worldwide.
- Shakuntala Devi won the 'Distinguished Woman of the Year Award' in 1969, from the University of Philippines along with a gold medal.
- In 1970, she was invited by an institute in Germany where she bet a computer in calculation. Impressed by her performance, the institute gifted her a Mercedes Benz car.
- Devi achieved international recognition when she earned a place in the Guinness World Records in 1980 for her remarkable ability to mentally compute large numbers.
- In 1988, she was honored with the 'Ramanujan Mathematical Genius Award' in Washington D.C., conferred to her by the then Indian Ambassador to US.
- Her name was listed in the '1995 Guinness Book of World Records' edition for her outstanding mathematical feat where she beat the world's fastest computer at multiplying two thirteen-digit numbers.
- A month before her death, she was honored with the 'Lifetime Achievement Award' in Mumbai, in 2013.
- Google has celebrated Shakuntala Devi's 84th Birthday (4th November 2013) with a 'Google - Doodle' with the fonts of a calculator with Shakuntala Devi's picture in its 'search' page.

Performance at National & International Universities:

- India: Mysore University –Karnataka, Osmania University – Hyderabad, Vizag University-Andhra, Annamalai University-Tamilnadu, and Benarus Hindu University-UP.
- Philippines: University of Philippines
- England: University of Leeds – Yorkshire, Kings College of London, Surrey University, University of London, University of Manchester, University of Birmingham
- USA: Southern Methodist university - Dallas, Texas, USC - University of Southern California - Los Angeles, UCLA - University of California - Los Angeles, Stanford University – California, Lehigh University in Pennsylvania, Columbia University - New York, Princeton University - New Jersey, Massachusetts Institute of Technology-Boston, George Washington University - Washington DC, Georgia University - Atlanta Georgia, State University of Pennsylvania, Buffalo University and many others in the USA
- Canada: MC Gill University – Montreal, University of Toronto, MC Master University, York University – Toronto
- Australia: University of New South Wales – Sydney, University of Melbourne
- Italy: University of Rome
- Japan: Tokyo University

Shakuntala Devi as an Author

Books by Shakuntala Devi on Mental Calculations, Memorization Techniques and with social aspects include:

- Super Memory: It Can Be Yours (New Delhi: Orient Paperbacks, 2011)
- More Puzzles to Puzzle You. (New Delhi: Orient Paperbacks -2006)
- In the Wonderland of Numbers (New Delhi: Orient Paperbacks, 2006)
- More Puzzles to Puzzle You (New Delhi: Orient Paperbacks, 2006)
- Book of Numbers (New Delhi: Orient Paperbacks, 2006)
- Employment of Labour and Rural Development (Sarup Book Publishers, 2006)
- Environment and Rural Development ((Sarup Book Publishers, 2006)
- Puzzles to Puzzle You (New Delhi: Orient Paperbacks - 2005).
- Awaken: The Genius in Your Child. (2005). (New Delhi: Orient Paperbacks – 2005)
- Figuring: The Joy of Numbers. (New Delhi: Orient Paperbacks- 2005)
- Mathability: Awaken the Math Genius in Your Child. (Orient Paperbacks – 2003)
- Awaken: The Genius in Your Child: A Practical Guide for Parents by Shakuntala Devi and Jennifer Day (Element, 1999)
- Caste System in India – Women's Status and Social Change (South Asia Books, 1999)
- Tradition and modernity among Indian women. (New Delhi: Point publishers, 1998)
- The blessed fisherman and other stories by Shakuntala Devi (India: HarperCollins Publishers, 1997)
- Figuring: The Joy Numbers Record Breaking Mathl Magic from World's Fastest Human Computer (Penguin Group, 1990)
- Astrology for You (New Delhi: Orient Paperbacks, 1983, 2023).
- Figuring made easy – Discover the secret of this mathematical super star (Hind Pocketbooks, 1978)
- Figuring: The Joy of Numbers (New York: Harper & Row, 1977)
- The World of Homosexuals. (New Delhi: Vikas Publishing House, 1977)
- Perfect Murder (New Delhi: Orient, 1976)
- Holy Faith Mathematics 1 (Kids book edition)

Shakuntala Devi's social works

Devi's expertise extended beyond mathematics, earning recognition as an astrologer advising numerous individuals, including notable figures like celebrities and politicians. She passionately advocated for mathematics education, emphasizing its significance in developing critical thinking and problem-solving abilities among both children and adults. Her legacy as a mathematical prodigy continues to inspire successive generations, underscoring the profound impact of human intellect and the elegance of mathematics. Initiating the 'Educational Foundation Public Trust' in Basavanagudi, Bangalore, Devi aimed to advance studies in mathematics, astrology, and philosophy. Her visionary goals included founding a mathematics university to simplify math education and encourage research in Vedic mathematics. Posthumously, the 'Shakuntala Devi Educational Foundation' emerged, dedicated to providing quality education to underprivileged children, exemplified by the operation of a college in HSR layout and the construction of a Mathematics Research Block. Devi's aspirations also encompassed establishing a mathematics university and R&D center to enhance numerical aptitude through modern techniques, particularly advocating for education, particularly for women, and emphasizing the significance of nurturing mathematical skills in children. Her involvement in providing astrological guidance and her political endeavors during the 1980 Lok Sabha elections, where she competed against Smt. Indira Gandhi, further illustrates her multifaceted engagement in societal and political arenas.

CHALLENGES AND OBSTACLES

She engaged with audiences during her demonstrations and performances, which might suggest an ability to be outgoing and comfortable in social settings, traits often associated with extraversion. Shakuntala Devi, despite achieving remarkable success in mathematics, encountered various challenges in her life and career. She confronted gender discrimination prevalent in her time, where women struggled to enter male-dominated fields like mathematics. Financial constraints during her childhood hindered her formal education and access to resources for honing her mathematical skills. Devi's exceptional mathematical prowess was largely self-taught due to her limited formal education in the subject. Throughout her career, she faced skepticism and criticism regarding the accuracy of her calculations. Despite these challenges, Devi's legacy as a mathematician remains influential.

CONCLUSION

Shakuntala Devi, the renowned Indian Mathematician and 'Child Prodigy,' didn't attend school in her youth but authored numerous books spanning mathematics, astrology, and even cookbooks. Despite not discovering famous theorems or solving complex mathematical problems, her lightning-fast calculations of large multiplications, powers, and roots were nothing short of astounding. She was not only a mathematical prodigy but also a pioneer in her own right. She learned foundational mathematics from her grandfather, including concepts predating the invention of zero. Her unique approach to mathematics was evident in her unconventional methods, such as practicing during card games with her father and showcasing her skills in numerous shows. Devi's approach to math was both engaging and accessible, presenting patterns in a playful manner. Regarded as a math evangelist, human computer, and social worker, she served as a role model with her inspirational and charming personality. Additionally, Devi excelled as an astrologer, offering remedies based on birth details, with a clientele including celebrities and prominent figures from various fields. Her calendar skills were unparalleled, effortlessly determining the day of the week for any date in the last century and swiftly correlating week names with corresponding dates in any given year. She didn't simply do things differently; she did different things, making her a remarkable figure in the world of mathematics and beyond.

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