



ST. ALOYSIUS COLLEGE EDATHUA

# DEPARTMENT OF MATHEMATICS

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E - GANITHAM



## THE INFINITE SPARKS OF A GENIUS

A Journey into the Brilliance of Srinivasa Ramanujan.  
Explore the remarkable life and enduring legacy of a self-taught  
genius who transformed the world of Mathematics.

Compiled by :  
I and II  
M.Sc. Mathematics  
Students

Staff Advisor:  
Ms. Aneesa Asharaf  
Assistant Professor on Contract  
Department of Mathematics

# Principal's Message

It gives me immense pride and joy to witness the publication of this special edition of E-Ganitham, titled **The Infinite Sparks of a Genius**. This newsletter, thoughtfully compiled by the I and II M.Sc. Mathematics students of St. Aloysius College, Edathua, serves as a fitting tribute to one of the greatest mathematical minds in history-Srinivasa Ramanujan.

Published in connection with the National Mathematics Day, December 22nd, this edition celebrates the 138th birth anniversary of the **Man Who Knew Infinity**.

Ramanujan's life is a profound testament to the power of intuition and perseverance. From his modest beginnings in Erode to the hallowed halls of Trinity College, Cambridge, he proved that true genius and mathematical insight can emerge from anywhere, regardless of formal training.

In these pages, we can find a journey through his extraordinary life-from his childhood queries about the 'Indeterminate' to his revolutionary work on infinite series, partition theory, prime numbers, hyper geometric functions and mock theta functions that continue to influence modern physics and supercomputing today. His legacy reminds us that an equation is not merely a calculation, but an expression of deep imagination and wonder.

I congratulate the Department of Mathematics, under the able leadership of Dr.Deena C Scaria, HOD, the staff advisor Ms. Aneesa Ashraf, and the student editor Josmy Antony for their tireless efforts in bringing this publication to life. I do congratulate and appreciate the contributors for popularising the life and contributions of Ramanujan. It is my hope that this magazine sparks a deeper appreciation for the beauty of mathematics among our students and inspires them to dream beyond boundaries.

May the **Sparks of a Genius** illuminate your academic journey and encourage you to pursue your ideas with unparalleled devotion which i remind you whenever i get an opportunity to address you.



Prof. Dr. Indulal G  
Principal  
St. Aloysius College, Edathua

# Editorial Note

We dedicate the pages of this edition of E-Ganitham to Srinivasa Ramanujan, the man whose life was a brilliant, enduring symphony composed in the language of numbers.

This E-Magazine is more than a tribute; it is a celebration of curiosity, perseverance, and the courage to think differently. Through articles, reflections, and explorations inspired by the life and work of Srinivasa Ramanujan, we seek to spark a deeper appreciation for mathematics not merely as a subject to be studied, but as a living language of creativity, imagination, and wonder.

Join us in exploring the beauty, elegance, and power of mathematics through the lens of a genius who truly knew infinity.

Josmy Antony  
Student Editor



# Srinivasa Ramanujan; The Unbounded Genius

One day, when Ramanujan was in primary class, his teacher was explaining that a number divided by itself equals one. Teacher explained, if you distribute 3 fruits amongst 3 persons then each will get one. Ramanujan questioned,

*'Is zero divided by zero also one? If no fruits are distributed among any one, will still each get one?'*

The prodigy was thinking of limits and limit processes. He was talking about the 'Indeterminate'. He showed flashes of brilliance which were not to be seen in any ordinary kid at that age.

Srinivasa Ramanujan's life and works are a testament to unbounded genius and exemplary dedication. Despite lacking formal Mathematical training, his profound, intuitive grasp of mathematics led to the independent discovery of hundreds of revolutionary theorems and formulas. His activities meticulously filling notebooks with groundbreaking results on number theory, infinite series, mathematical analysis and game theory were more than just research; they were an act of sublime, isolated creation. His unwavering pursuit of mathematical truth, culminating in his pivotal collaboration with G. H. Hardy at Cambridge, serves as an enduring inspiration. He redefined what was possible, proving that true Mathematical insight can emerge from anywhere.

Srinivasa Ramanujan, an unbounded genius whose phenomenal, largely self-taught intuition reshaped twentieth-century Mathematics. The Government of India declared his birthday, December 22nd, as National Mathematics Day in 2012 to honor his enduring legacy and encourage the spirit of Mathematical discovery among future generations, recognizing his life as a testament to the limitless potential of the human mind.

# Biography



Srinivasa Ramanujan Iyengar was born on December 22, 1887, in Erode, Tamil nadu, India. He was born in a poor Brahmin family. His father Kuppuswamy Srinivasa Iyengar worked as a clerk in a cloth shop. His mother Komalatamma was a homemaker and a devotional singer at a temple. She raised her son within traditional values and devotion. He

was considered a miracle child. He is the only one of his mother's 1st four children to survive infancy. For Ramanujan's first three years, he scarcely spoke. But it was soon realised that he was a child prodigy.

In 1892, Ramanujan's formal education began at a local school. Later he moved to Kangayan Primary School. In 1897, he stood first in the Tanjore District Primary Examinations, and this entitled him to a half-fee concession in the Town High School, Kumbakonam, where he had his schooling, from 1898 to 1903. When he was 16 years old, he obtained a copy of George Shoobridge Carr's 'Synopsis of Elementary Results in Pure and Applied Mathematics'. This collection of thousands of theorems, many presented with only the briefest of proofs aroused his genius. Having verified the results in Carr's book, Ramanujan went beyond it, developing his own theorems and ideas. Ramanujan was a devout worshipper of Hindu goddess Namagiri Thayar, believing she communicated complex formulas to him in dreams and visions.

In 1904 based on his strong high school performance, he was awarded a scholarship to the Government College in Kumbakonam. He lost this scholarship in 1905 because he neglected all subjects except mathematics. In 1906 he enrolled Pachaiyappa's College, Madras with the aim of passing the First Arts examination, which was required to enter the University of Madras. He again failed all subjects except mathematics. Without the required pass in the FA examination, he could not be admitted to the university, thus ending his pursuit of a formal higher education degree in 1907.

Despite his inability to complete a traditional university degree in India, Ramanujan's mathematical activities continued, primarily through self-study and filling his notebooks. Throughout his life, Ramanujan faced financial challenges, compelling him to navigate a path through employment struggles. In 1909, he entered into an arranged marriage with Janaki Ammal. Ramanujan's struggle for a livelihood after his marriage took a pivotal turn in late 1910 when he met V. Ramaswamy Aiyer, the founder of the Indian Mathematical Society. Ramanujan's only resume was his thick collection of notebooks filled with thousands of original mathematical results. Recognizing his potential, Aiyer introduced Ramanujan to R. Ramachandra Rao, the District Collector of Nellore, whose support then provided Ramanujan with a stable clerical post at the Madras Port Trust in 1912 and essential financial stability, allowing him to dedicate himself fully to his mathematical research.

His reputation as a mathematician began to grow. Ramanujan began to publish his results in the Indian Mathematical Society's Journal. His first paper, 'Some properties of Bernoulli's numbers', stemmed from research undertaken in his teens, when he had discovered and developed the Bernoulli numbers in complete ignorance of any prior research on the subject. His growing circle of mathematical friends in the Madras area became convinced that his work should be brought to the attention of mathematicians in Britain.

It was then, in January 1913, that Ramanujan wrote a letter to G. H. Hardy, a lecturer at Trinity College, Cambridge, who was one of Britain's foremost pure mathematicians. Ramanujan introduced himself as a clerk from Madras, with no university education, who was working on mathematics in his spare time and detailed groundbreaking mathematical work on divergent series, the gamma function, and prime numbers, and requested Hardy's review and guidance. The letter contained numerous formulas without proofs, shocking Hardy with their originality and prompting the mathematician to invite Ramanujan to Cambridge.

Hardy soon began to consider ways in which he could be brought to Britain to receive formal training and an advanced degree from Cambridge. Hardy recognized the depth of Ramanujan's work and arranged a special scholarship at the University of Madras and a grant from Trinity College, Cambridge. In 1914 Ramanujan moved to England, where he worked alongside Hardy. Ramanujan spent nearly five years in Cambridge collaborating with Hardy and Littlewood, a close collaborator and friend of Hardy. Within months he was publishing papers in British journals, including a 60-page paper in the Proceedings of the London Mathematical Society in 1915.

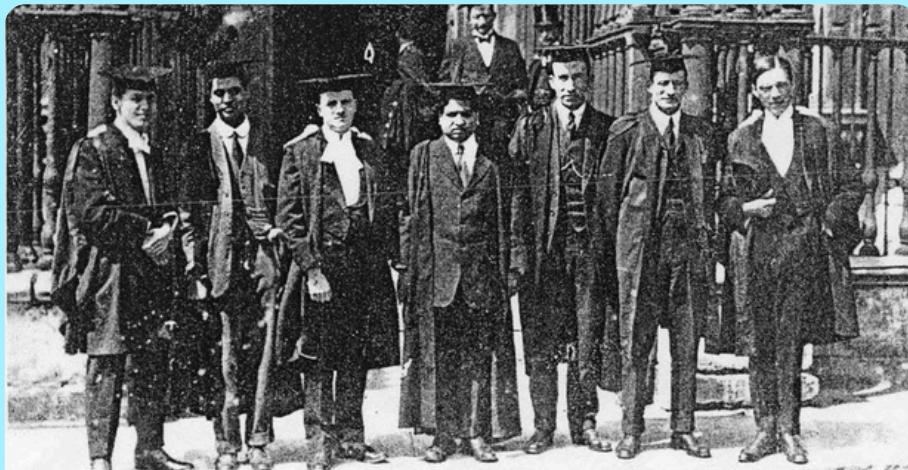
Ramanujan was awarded a Bachelor of Arts by Research degree (renamed as PhD) by the University of Cambridge in March 1916 for his work on 'Highly composite numbers'. Despite being unfamiliar with modern mathematical developments, he made substantial contributions.

In 1917, Ramanujan was elected to the London Mathematical Society. Ramanujan's papers were published in English and European journals, leading to his election to the Royal Society of London in 1918. At age 31, Ramanujan was one of the youngest Fellows in the Royal Society's history. He was elected for his investigation in Elliptic functions and the Theory of numbers. On 13 October 1918, he was the first Indian to be elected a Fellow of Trinity College, Cambridge.

Ramanujan got diagnosed with tuberculosis and vitamin deficiencies, prompting his return to India in 1919. Despite ongoing health struggles, he continued working on mathematical problems until his untimely death on 26th April 1920 at the age of 32.

He left behind three notebooks and a 'lost notebook' containing unpublished results that continue to resonate across the decades, serving as a boundless source of new theorems and a testament to his eternal genius.

# A Glimpse of the Genius



Ramanujan (centre) and his colleague G. H. Hardy (rightmost) with fellow scientists at Cambridge

(1) (2) Mallock Sunday  
Add me in 94 (3)

Dear Mr Hardy, In one of my letters I wrote about the least number of terms which will give the mean not integer to the actual coefficient in  $\sqrt{5}$  problem. It will be extremely difficult to prove such a result. But we can prove this much as follows.

$$\sum_{n=1}^{\infty} x^n = \frac{1-5x+\sqrt{5-4x}}{2(1-x)}$$

$$d_n = C \left\{ e^{i\pi n} + (-1)^n \frac{e^{i\pi n}}{2} + 2 \cos\left(\frac{\pi n}{\sqrt{5}} + \theta\right) \frac{e^{i\pi n}}{3} + \dots + \left\{ \cos\left(\frac{\pi n}{\sqrt{5}} + \theta\right) \dots + 2 \cos\left(\frac{\pi n}{\sqrt{5}} + \theta + \pi\right) \right\} \frac{e^{i\pi n}}{16} \right\}$$

where  $C = \frac{1}{2} \frac{1}{\sqrt{5}}$  = .94373...

We shall first prove that, if we take only

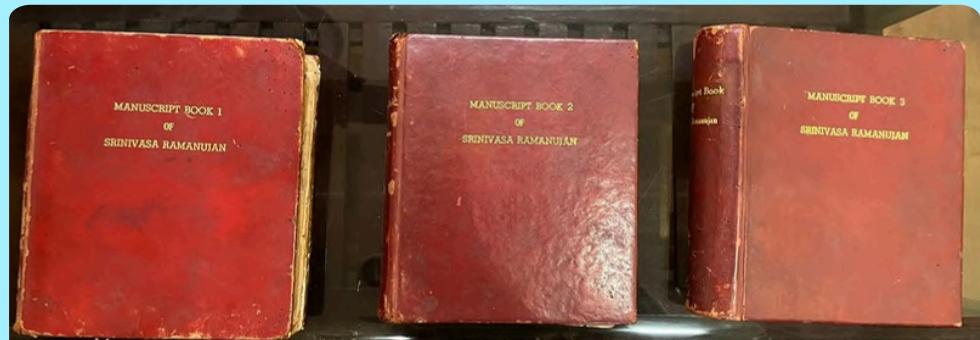
$$\left[ \cos\left(\frac{\pi n}{\sqrt{5}} + \theta\right) \dots + \cos\left(\frac{\pi n}{\sqrt{5}} + \theta + \pi\right) \dots \right]$$

terms in the right hand side of (1),  $C$  being any positive number less than 1 and  $\theta, 1, 2, 3, 4, \dots$  are fractions of  $\pi$  for which  $d_n$  is, then it is possible to find an infinite series of values of  $n$  for which  $d_n$  is not the nearest integer to the sum of the asymptotic series up to  $(2)$  terms. Suppose that  $\sigma(N)$  is the number of sum of any two squares such as  $1, 2, 4, 5, 8, 9, 10, 13, 16, \dots$  not exceeding  $N$  and that  $\tau(N)$  is the number of sum of two squares that are prime to each other such as  $1, 2, 5, 10, 13, 17, 25, \dots$  not exceeding  $N$ . Then it is easy to see that

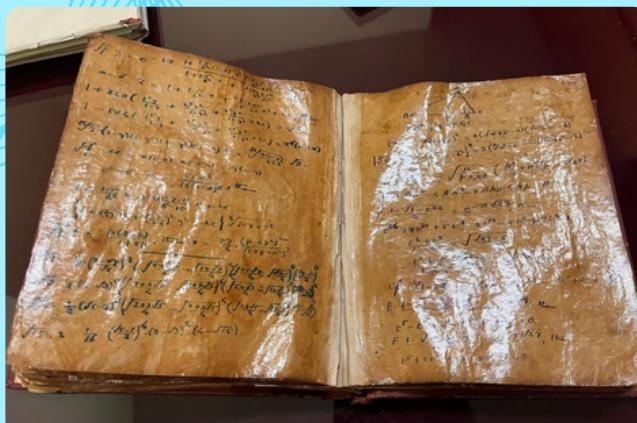
Page from a letter written by Ramanujan to Hardy



The ancestral house of Ramanujan in Kumbakonam



The manuscript notebooks of Srinivasa Ramanujan



Pages from the manuscript book of Ramanujan



The ancestral house of Ramanujan in Kumbakonam, now maintained as the Ramanujan International Monument

# Some Mathematical Contributions

Ramanujan recorded most of his mathematical discoveries in three notebooks during his time in India. These notebooks contain thousands of theorems and formulas without formal proofs, which he developed largely in isolation. The lost notebook which is a sheaf of over 100 pages of his unpublished manuscripts, discovered in the library at Trinity College, this notebook, containing discoveries from his last year of life (1919-1920), caused great excitement among mathematicians and is a significant source of his later work.

## Infinite Series for $\pi$

In 1910, Ramanujan developed several formulas to calculate  $\pi$ , the most famous of which is a rapidly converging infinite series:

$$\frac{1}{\pi} = \frac{(2\sqrt{2})}{9801} \sum_{k=0}^{\infty} \frac{(4k!)(1103 + 26390k)}{(k!)^4 396^{4k}}$$

Each term in this series adds approximately eight decimal places of accuracy to  $\pi$ , making it incredibly efficient for high-precision calculations. The formulas for the calculation of  $\pi$  developed by Ramanujan are not just mathematical curiosities; they are the bedrock of many modern algorithms like chudnovsky algorithm used by supercomputers today to compute the trillions of digits of  $\pi$ .

## Theory of Partitions

Ramanujan developed groundbreaking work on the partition function, introducing innovative formulas that enabled the precise calculation of partitions for large numbers. The partition function  $p(n)$  which counts the number of ways a positive integer  $n$  can be expressed as a sum of positive integers. As  $n$  increases  $p(n)$  become larger.

Ramanujan's collaboration with Hardy led to significant advancements in partition theory, including the Hardy-Ramanujan asymptotic formula, which provided an approximation for the partition function.

# Hardy Ramanujan Asymptotic Formula

The Hardy-Ramanujan formula for the partition function,  $p(n)$  was a landmark achievement by G H Hardy and Srinivasa Ramanujan around 1918. By using partition function  $p(n)$  , he derived a number of formulae in order to calculate the partition of numbers. An asymptotic expression for  $p(n)$  is given by

$$p(n) \sim \frac{1}{4n\sqrt{3}} e^{\pi\sqrt{\frac{2n}{3}}}, n \rightarrow \infty$$

This formula provides an extremely accurate approximation for the number of partitions of a large integer  $n$ . The value derived from this asymptotic formula is often so close to the actual integer value of  $p(n)$  rounding to the nearest integer yields the exact result. Later, in 1937, Hans Rademacher proved this by using special functions and then KenOno gave the algebraic formula to calculate partition function for any natural number  $n$ .

## Ramanujan's Congruence

Srinivasa Ramanujan observed that the number of partitions for certain arithmetic progressions are always divisible by specific prime numbers. He discovered the congruences

$$p(5n + 4) \equiv 0 \pmod{5}$$

$$p(7n + 5) \equiv 0 \pmod{7}$$

$$p(11n + 6) \equiv 0 \pmod{11}$$

These statements assert that for non-negative integers  $n$ , the value of the partition function  $p(n)$  is divisible by 5, 7, and 11, respectively, when the argument  $n$  is in the corresponding arithmetic progression. These simple and elegant formulas were published in his papers around 1919. After Ramanujan died in 1920, G. H. Hardy extracted proofs of all three congruences from an unpublished manuscript of Ramanujan on  $p(n)$  .

# The Rogers-Ramanujan Continued Fraction

Srinivasa Ramanujan was a master of continued fractions, especially the famous Rogers-Ramanujan Continued Fraction. This continued fraction discovered by Rogers in 1894 and independently discovered by Srinivasa Ramanujan around 1913, and closely related to the Rogers-Ramanujan identities. It is an infinite fraction, given by the formula

$$R(q) = \cfrac{q^{\frac{1}{5}}}{1 + \cfrac{q}{1 + \cfrac{q^2}{1 + \cfrac{q^3}{1 + \dots}}}}$$

Where  $q$  is a complex number satisfying  $|q| < 1$

This continued fraction is used in number theory, particularly in evaluating  $\pi$ , solving algebraic equations, proving identities related to partitions and modular forms, and exploring connections to elliptic functions and class fields, offering elegant ways to express complex numbers as nested radicals.

## Highly Composite Numbers

In 1915, the London Mathematical Society published in its Proceedings a paper of Ramanujan entitled 'Highly Composite Numbers', defining them as numbers with more divisors than any smaller number.

A number  $M$  is said highly composite if  $M < N$  implies  $d(M) < d(N)$ , where  $d(N)$  is the number of divisors of  $N$ . In this paper, Ramanujan extends the notion of highly composite number to other arithmetic functions, mainly to  $Q_{2k}(N)$  for  $1 \leq k \leq 4$  where  $Q_{2k}(N)$  is the number of representations of  $N$  as a sum of  $2k$  squares and  $\sigma_{-s}(N)$  where  $\sigma_{-s}(N)$  is the sum of the  $(-s)$ th powers of the divisors of  $N$ . Moreover, the maximal orders of these functions are given.

# Ramanujan Prime

The  $n$ th Ramanujan prime is the smallest number  $R_n$  such that  $\pi(x) - \pi\left(\frac{x}{2}\right) \geq n$  for all  $x \geq R_n$ , where  $\pi(x)$  is the prime counting function (number of primes less than or equal to a real number  $x$ ). In other words, there are at least  $n$  primes between  $\frac{x}{2}$  and  $x$  whenever  $x \geq R_n$ . The smallest such number  $R_n$  must be prime, since the function  $\pi(x) - \pi\left(\frac{x}{2}\right)$  can increase only at a prime. In 1919, Ramanujan proved a result which implies that  $R_n$  exists, and he gave the first five Ramanujan primes as  $R_n = 2, 11, 17, 29, 41$  for  $n = 1, 2, 3, 4, 5$  respectively.

## Hardy Ramanujan Number

Around 1918, G.H. Hardy visited sick Srinivasa Ramanujan in a London hospital, arriving in a taxi numbered 1729, which Hardy called a dull number, prompting Ramanujan to instantly declare it interesting as the smallest number representable in two ways as a sum of two cubes.

$$1729 = 1^3 + 12^3 \quad 1729 = 9^3 + 10^3$$

This unique property placed 1729 at the front of a class of numbers known as taxicab numbers. The  $n$ th taxicab number, denoted as  $Ta(n)$  is the smallest number that can be expressed as the sum of two positive cubes in  $n$  distinct ways.

Srinivasa Ramanujan derived nearly 3900 theorems and identities, many highly original and complex and generated groundbreaking results that continue to shape modern mathematics. His original contributions concentrated heavily on number theory and mathematical analysis, covering areas like elliptic functions and continued fractions. His most advanced work included fundamental advancements in the theory of modular forms and the pioneering introduction of mock theta functions. His extensive notebooks contain numerous unproven conjectures that continue to inspire and drive mathematical research over a century later. His work laid foundational groundwork that mathematicians continue to explore and expand upon today.

# Did You Know?



**💡** By age 13, Srinivasa Ramanujan had already independently mastered S.L. Loney's dense textbook on Advanced Trigonometry which is a classic university level text.

**💡** Ramanujan often used a slate and chalk to work out his complex mathematical derivations due to the high cost of paper in colonial India. Once he arrived at a final result, he would simply write the result and formula down in his notebooks.

**💡** Ramanujan claimed that the Goddess of Namagiri appeared to him in dreams, sometimes proposing complex mathematical formulas and theorems that he would then have to verify and formally prove. He once said 'An equation for me has no meaning unless it expresses a thought of God.'

**💡** Ramanujan found a **Magic Square**, which is a  $4 \times 4$  grid where rows, columns, diagonals, four corners, center  $2 \times 2$  square, and other specific groups also summing to 139. Also the first row contains his birth date (22/12/1887)

22	12	18	87	DD	MM	CC	YY
88	17	09	25	YY+1	CC-1	MM-3	DD+3
10	24	89	16	MM-2	DD+2	YY+2	CC-2
19	86	23	11	CC+1	YY-1	DD+1	MM-1

Try it with your birth date to see your magic number!

**DD** = Date of birth.

**MM** = Month of birth.

**CC** = Century of birth.

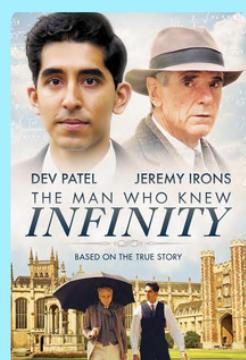
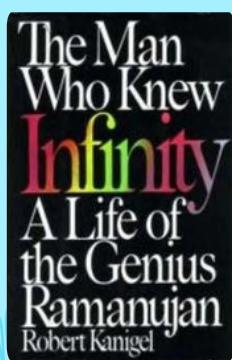
**YY** = Year of birth

 To honour the world renowned mathematical genius, Ramanujan Museum was established in 1993 in Royapuram,Chennai by Mr P.K. Srinivasan a Math educator who spent almost 25 years collecting the resources which celebrate Srinivasa Ramanujan's life and massive contributions to the world of mathematicians.



 The Man Who Knew Infinity: A Life of the Genius Ramanujan is a biography of the Indian mathematician Srinivasa Ramanujan, written in 1991 by Robert Kanigel. The book gives a detailed account of his upbringing in India, his mathematical achievements and his mathematical collaboration with mathematician G. H. Hardy.

In 2015, Based on this book, a British biographical drama film named The man who knew infinity, directed by Matthew Brown was released.



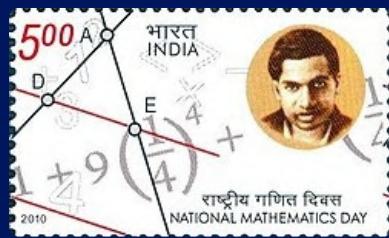
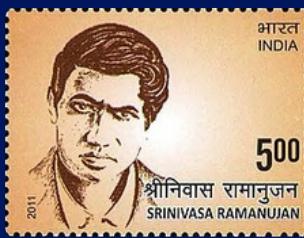
 The Tamil film Ramanujan (2014), directed by Gnana Rajasekaran, is a biopic about Srinivasa Ramanujan, the movie won multiple honors, including four 2013 Tamil Nadu State Film Awards.



 SASTRA University purchased Srinivasa Ramanujan's house in Kumbakonam, renovated it, and established it as the Srinivasa Ramanujan Centre (SRC), housing a museum called the 'House of Ramanujan', which was declared an international monument Dr. A.P.J. Abdul Kalam, showcasing his life, works, and hosting annual conferences and awards for mathematical research.



 India has honored Srinivasa Ramanujan with postage stamps on multiple occasions, notably in 1962 (75th birth anniversary), 2011 (125th birth anniversary, coinciding with the declaration of National Mathematics Day), and as part of the 2016 definitive series.



 The renowned legacy of Srinivasa Ramanujan is honored by national and international mathematics awards:

The DST-ICTP-IMU Ramanujan Prize, which recognizes young mathematicians (under 45) from developing countries for research in any field of mathematics.

The SASTRA Ramanujan Award, which is given to mathematicians (under 32) worldwide for contributions in areas influenced by Ramanujan's work.

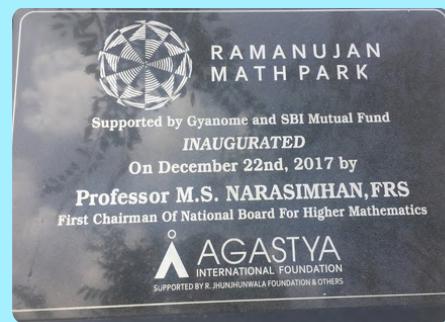
The Srinivasa Ramanujan Medal awarded by the INSA is a National award for outstanding work in mathematics within India, honoring Indian scientists.



Ramanujan's profound work in infinite series, modular forms, and mock theta functions, which detailed on his deathbed, have demonstrated a stunning connection to modern physics by perfectly calculating the entropy of black holes, a concept that didn't exist in theoretical physics during his time.



The Ramanujan Math Park is an Indian museum and activity center dedicated to mathematics education inside the Agastya Campus Creativity Lab located in Kuppam, in Chittoor, Andhra Pradesh.



Many educational and research institutes are named after Srinivasa Ramanujan, honoring his mathematical genius. Some of them are;

The Srinivasa Ramanujan Institute for Basic Sciences (SRIBS), a KSCSTE institute in Kerala, established in 2013 is an institute dedicated to advancing knowledge and fostering research in the fundamental sciences.

The Ramanujan Institute for Advanced Study in Mathematics (RIASM) is a prestigious research center for mathematics, established in 1967 by amalgamating the University of Madras's Mathematics Department and a UGC Centre for Advanced Study, located in Chennai, focusing on advanced studies and research in pure and applied mathematics.

Ramanujan Mathematical Society is an Indian organisation of persons formed with the aim of "promoting mathematics at all levels". The Society was founded in 1985 and registered in Tiruchirappalli, Tamil Nadu, India.

# ശ്രീനിവാസരാമാനുജൻ; അതുല്യനായ ഗണിതശാസ്ത്രപ്രതിഭ



ശ്രീനിവാസ രാമാനുജൻ എന്ന പേര് കേൾക്കുന്നേം, എത്രതാരു ഗണിത സ്കോപ്പിയുടെയും ഹൃദയത്തിൽ അഭിമാനത്തിന്റെയും അഭ്യാസത്തിന്റെയും തിരയിളക്കമുണ്ടാകും. പ്രചോദനത്തിന്റെ, പിന്തുടരാൻ ആരെയും മോഹിപ്പിക്കുന്ന ഒരു വലിയ മനുഷ്യന്റെ ചിത്രം ഉള്ളിൽ വരയ്ക്കപ്പെട്ടു. ഭാരിത്യത്തിന്റെയും പ്രതികുലസാഹചര്യങ്ങളുടെയും ഇരുട്ടിൽ നിന്ന്, ഒരു മിന്നൽപ്പിന്നർ പോലെ ലോക ഗണിതഭൂപടത്തിലേക്ക് അദ്ദേഹം ഉയർന്നു വന്നു. മദ്രാസിലെ ഇടവഴികളിൽ, പ്രത്യേകിച്ച് നിയതമായ പുന്തകങ്ങളോ എണ്ണപ്പെടുത്താവുന്ന ശുരൂക്കങ്ങളാരോ ഇല്ലാതെ, ആ യുവാവർത്തന്റെ മനസ്സിന്റെ ആഴങ്ങളിൽ ഗണിതത്തിന്റെ അനന്തമായ ലോകം കണ്ടെത്തി. അതോരു സാധാരണ പഠനമായിരുന്നില്ല, മറിച്ച് ദിവ്യമായ ഒരു ദർശനമായിരുന്നു.

രാമാനുജൻ നോട്ടുബുക്കുകളിലെ ഓരോ താളും, പ്രപഞ്ച ഹൈസ്യങ്ങൾ കൂടിച്ചിട്ട് പുരാതനതാളിയോലകൾ പോലെയാണ്. 3,254 സമവാക്യങ്ങളും സിഖാന്തങ്ങളും നിരിഞ്ഞെതാ ആ നോട്ടുബുക്കുകൾ, അദ്ദേഹത്തിന്റെ ഹൈസ്യമായ ജീവിതത്തിന്റെ തീവ്രമായ ഗണിതപണ്ഡിതന്റെ സാക്ഷ്യപത്രമാണ്. ഫോറ്റിൽ എഴുതിയും മായിച്ചും പിന്നെയും എഴുതിയും ഗണിതഹൈസ്യങ്ങൾ കണ്ണുപിടിക്കുന്ന രാമാനുജൻ അധ്യാപകർക്കും സഹവിദ്യാർത്ഥികൾക്കും നിത്യപരമലഹരി പകരുന്ന കാഴ്ചയായിരുന്നു.

ഹാർഡി എന്ന മഹാഗുരു കണ്ണടത്തിയ ആ എളിയ തമിഴ് ബോഹമൻൻ, കോംബിയജിലെ തണ്ണേപ്പിലേക്ക് പറിച്ചു നടപ്പടപ്പോൾ, ഗണിതലോകം തെട്ടിത്തരിച്ചു. ഹാർഡി കൊതതിയെടുത്ത ഗണിതവിഗ്രഹമാണ് രാമാനുജൻ. അദ്ദേഹത്തിന്റെ വിഭജന സിഖാന്തങ്ങൾ (Partition Function), മോഡ്യൂലാർ രൂപങ്ങൾ (Modular Forms), എലിപ്പറ്റിക് ഫംഗ്ഷനുകൾ (Elliptic Functions), സംഖ്യാ സിഖാന്തത്തിലെ (Number Theory) കണ്ണടത്തലുകൾ എന്നിവയെല്ലാം ശുഭഗണിതത്തിന്റെ നേരുകയിൽ കൊത്തിവെച്ച കവിതകളായിരുന്നു.

1729 എന്ന സംഖ്യ, രാമാനുജൻറെ ഹ്യൂമൻ ടെലിഗ്രാഫിക് സംഖ്യയാണ്. രണ്ടു വ്യത്യസ്ത സംഖ്യകളുടെ കൂടുമ്പിന്റെ തുകയായി എഴുതാവുന്ന ഏറ്റവും ചെറിയ സംഖ്യ എന്ന നിലയിൽ ഒരു ഗണിതവിസ്മയംകൂടെയാണ് ഈ സംഖ്യ. കേവലം ഒരു ഗണിതപ്രശ്നയാണ് എന്നതിലുപരി, ഗണിതത്തെ ഒരു ദൈവികാനുഭവമായി കണ്ട ആളായിരുന്നു അദ്ദേഹം.

ഗണിതം അദ്ദേഹത്തിന് കേവലം കണക്കുകളായിരുന്നില്ല, മറിച്ച് ഇഷ്ടശ്രദ്ധനുമായുള്ള സംഭാഷണമായിരുന്നു എന്നുതന്നെവേണം കരുതാൻ. ബുദ്ധിയുടെ, പ്രതിഭയുടെ മായികലോകത്തുനിന്ന് അദ്ദേഹം ദർശിച്ചുട്ടതെ ഗണിതസമവാക്യങ്ങൾ ഇന്നും ഗണിതപരിതാക്കളെ പൂജകം കൊള്ളിക്കും. ചെറുപ്പത്തിൽത്തന്നെ ലോകത്തോട് വിച്ചറഞ്ഞ ആ പ്രതിഭയുടെ നഷ്ടം, ഇന്നും ഗണിത ലോകത്തിന് നികത്താനാവാത്ത വേദനയാണ്. എകിലും, അദ്ദേഹത്തിന്റെ ഗണിത പെത്യുകം, തലമുറകൾക്ക് വഴികാട്ടിയായി, ഒരു കെടാവിളക്കായി എന്നും ജുലിച്ചു നിൽക്കും. അദ്ദേഹത്തോടുള്ള ആദരസൂചകമായി ശ്രീനിവാസരാമാനുജൻറെ ജമദിനമായ ഡിസംബർ 22 ദേശീയഗണിതദിവസമായി ഭാരതസർക്കാർ പ്രഖ്യാപിച്ചു. ഇന്ത്യൻ ഗണിതത്തിന് ലോകത്തിന് നൽകാൻ കഴിഞ്ഞ ഏറ്റവും വലിയ സംഭാവനയാണത്; ബുദ്ധികൊണ്ട് ഹ്യൂമൻ തെളിവാണ്!

**പ്രൊഫ ഡോ ഇന്ദുലാൽ ജി  
പ്രിൻസിപ്പൽ**

# Conclusion

This edition of E-Ganitham takes us on a journey through the extraordinary brilliance of Srinivasa Ramanujan, reminding us that intuitive genius knows no boundaries and has the power to transform mathematics forever.

Rising from modest beginnings to remarkable intellectual heights, Ramanujan's journey stands as a compelling testament to the power of intuition, perseverance, and an unwavering devotion to knowledge. His formulas were not merely numbers on paper; they were expressions of imagination, courage, and an unshakable belief in one's inner voice. Even today, his ideas continue to shape modern mathematics, inspiring researchers, students, and dreamers across generations.

May Ramanujan's life remind you that your questions matter, your ideas are worth pursuing, and your beginnings do not define your limits. His legacy lives on not only in mathematics, but in every mind that dares to dream beyond boundaries.

Thank you for joining us on this intellectual adventure! Until next time, keep exploring and embracing the wonders of mathematics.

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