Srinivasa Ramanujan

The Conqueror of Infinity

"An equation means nothing to me unless it expresses a thought of God"

A Gupta, A Sharma

His Accomplishments

Mathematical Society in December 1917. He formally became a fellow of the Royal society in 1918, and he was elected A Fellow of Trinity College in Cambridge, being the first Indian to ever achieve this.

Srinivasa Ramanujan is renowned for many of his accomplishments, including his work on Infinite Sequences, and his novel investigations into mathematics.

Ramanujan Summation:

Ramanujan invented a novel way to "sum" divergent infinite series. Divergent series don't have a sum in a traditional way, so Ramanujan created a different method of summation for these. This isn't the traditional sum of the series, and it's denoted with unique syntax to allow it to be clear that it is using Ramanujan Summation. When Ramanujan was looking at the infinite series: $1 - 1 + 1 - 1 + 1 - 1...$, also known as the Grandi series, he determined that it has 2 clear values: 1 and 0. This, alongside multiple more advanced pieces of evidence, allowed him to state that the Grandi Series has a sum of 0.5 (R).

$$1 + 2 + 3 + 4 + 5... = -1/12 \text{ (R)}$$

From this fundamental fact, Ramanujan was able to calculate the sum of multiple divergent infinite series, like the sum of all Natural Numbers. Although this technique may seem like a simple party trick, Ramanujan's work on this can be applied to integrals, and can be used in advanced mathematics to provide plausible sums to compare the size of these complex sequences

Ramanujan Primes

A Ramanujan Prime is a prime number that has a certain amount of primes (n) between itself, and half of itself, which satisfies another one of Ramanujan's proofs; the prime counting theory. For example, 11 is a Ramanujan prime for (n=2) because between 5.5 and 11, there are 2 prime numbers: 7 and 11.

Ramanujan primes are useful to understanding the distribution of Prime Numbers. These can provide insight into prime numbers and the patterns between them.

Work on Number Theory

His work on Number Theory resulted in some of the most rigorous mathematical proofs of the time. These have been incredibly essential in modern mathematics.

Ramanujan's work with Hardy resulted in a lot of these advanced theorems, and together, their Mathematical proofs have become essential to modern mathematics and science. For example, Ramanujan's Master Theorem helps mathematicians solve complicated functions and integrals by changing their form. This is used in quantum mechanics to solve wave probability functions. This wasn't even all of his work. Ramanujan's work on number theory stretches from The Partition function, to Ramanujan's Tau Function. These constantly appear in mathematics, and it's thanks to the work of Ramanujan that this incredible world of mathematics has now been revealed.

The majority of these theorems are higher level proofs that you simply can't do justice by describing. His work is one of the many mathematical wonders.

The Srinivasa Ramanujan medal

Srinivasa Ramanujan was a renowned member of the Indian Mathematical Society, and his work was acknowledged in 1962, the Indian National Science Academy announced the Srinivasa Ramanujan Medal, awarded for work in the mathematical sciences. This award is handed out frequently, and honours Ramanujan for all of the work he has done.

Ramanujan's work reminds all of us that you need a passion for mathematics, not a professional education or money, to become a great mathematician. ■