

# S03E21 - Srinivasa Ramanujan: A Life in Numbers

## The Multiverse Employee Handbook - Season 3

The Multiverse Employee Handbook has this to say about Maths:

Maths (plural) is the collective noun for humanity's ongoing attempt to describe reality without arguing about it.

It is plural because it contains multitudes: algebra, geometry, calculus, statistics, and the quiet terror of being asked to show your working. To call it "math," singular, suggests a single tidy discipline, which is charming but inaccurate—rather like referring to the oceans as "water." The plural form acknowledges that mathematics is not one thing but many cooperating systems, occasionally agreeing, frequently proving each other wrong, and always insisting on precision.

Certain countries prefer the singular. This is the same group that continues to measure distance in feet, weight in pounds, and temperature in feelings. The Handbook does not claim causation, merely correlation.

Maths itself is indifferent to naming conventions. It operates regardless. Two plus two remains four whether expressed in metric, imperial, or interpretive dance. Prime numbers continue their quiet rebellion. Circles persist in refusing to have corners. And somewhere, a mathematician is calmly proving something that will be considered obvious in three centuries.

The handbook notes that maths is less about numbers than about structure. Numbers are merely the props. The real work lies in patterns, relationships, and the astonishing fact that the universe appears to obey equations that humans, improbably, can write down.

In summary, maths is not a subject. It is a language, a tool, and occasionally a stern reminder that reality does not negotiate. Pluralized, properly.

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You're tuned into The Multiverse Employee Handbook.

Today, we're exploring the genuine mystery of mathematical intuition—specifically, how a self-taught clerk from colonial India produced thousands of theorems without formal training, claimed they were delivered by a goddess in his dreams, and turned out to be solving twenty-first-century physics problems in nineteen-twenty with a fever and absolutely no computer.

We're talking about a man who looked at numbers the way you or I might look at old friends, who could spot patterns in mathematical expressions that professional mathematicians with decades of training couldn't see, and who responded to "this number seems rather dull" with instant recognition of properties that would take others hours to calculate—if they could calculate them at all.

It's the story of Srinivasa Ramanujan, and it remains one of the most peculiar incidents in the history of human thought.

But first, gather 'round the photocopier, dear audit-resistant colleagues, for a cautionary tale of mistaken identity, accidental competence, and the corporate tendency to promote people based on superficial pattern recognition rather than actual qualifications.

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In the fluorescent-lit realm of Quantum Improbability Solutions, specifically in the Catering Services Department—which existed in a superposition of "adequately staffed" and "one broken espresso machine away from collapse"—a new intern named Srini was having what could charitably be called an unremarkable first week.

He'd been hired to serve coffee and maintain the break room facilities, tasks he performed with quiet competence. The coffee was consistently decent. The biscuit tin remained adequately stocked. And when the temperamental espresso machine began making sounds that suggested it was attempting interdimensional communication, Srini simply removed the back panel, jiggled something that probably shouldn't be jiggled, and restored it to proper function.

It was during this repair that the square-haired boss happened to walk past.

He stopped. Stared. His eyes narrowed with what he presumably believed was insight.

"Srini," he said slowly. "That's short for Srinivasa, isn't it?"

"Yes, sir," Srini replied, replacing the panel.

The boss's expression shifted through several states of excited realization. Here was a young man of South Indian heritage. Named Srinivasa. Who displayed unusual intuition with complex systems.

The conclusion was obvious.

"Why," the boss said, "are you working in catering?"

By Monday morning, Srini had been promoted to Chief Mathematician.

The actual Mathematics Department received this news with the sort of stunned silence usually reserved for violations of thermodynamics. Dr. Pembridge, who had spent seventeen years working toward a senior position, found her carefully worded objection met with a dismissive wave.

"Clearly," the boss explained, "we've been blessed with extraordinary talent. I have a sense about these things."

Srini, bewildered but polite, accepted.

His first departmental meeting did not go well.

The mathematicians were discussing modular forms. Srini stared at the whiteboard with the expression of someone watching a foreign film without subtitles. When pressed for his thoughts, he asked, with genuine curiosity, whether anyone had tried turning the equation off and then on again.

Dr. Pembridge made a sound like a small animal in distress.

"Revolutionary," the boss declared. "Fresh perspective!"

Over the following weeks, a pattern emerged. Srini's mathematical contributions remained conspicuously absent. His proofs, when attempted, collapsed under the weight of not actually being proofs. His understanding of number theory could be charitably described as "optimistic."

However, the office printer—which had achieved a quantum superposition between "working" and "existing purely to cause suffering"—was suddenly functional. The dodgy light in Conference Room B, which had flickered ominously for three years, now operated correctly. The mysterious third-floor toilet situation had been resolved through methods Srini declined to specify.

The mathematicians began quietly leaving broken equipment on his desk.

The crisis came during a presentation to potential investors. The boss, beaming with pride, invited Srini to explain his "mathematical intuition."

Srini looked at the assembled crowd. He looked at his boss. He looked at Dr. Pembridge, who was radiating second-hand embarrassment at a frequency visible to the naked eye.

"I don't know maths," Srini said finally. "I'm very good at fixing things. The espresso machine. The printer. That toilet situation, though I'd prefer not to discuss it. I understand why machines stop working and how to convince them to start again. But I don't know anything about modular forms."

The silence was profound.

"I always knew," the boss announced, recovering with impressive speed, "that facilities management is just practical topology. The man's a genius. Promote him to Head of Facilities. With a raise."

Srini accepted gratefully. He was transferred to a department where his actual skills were valued. The printer remained functional. Dr. Pembridge was quietly promoted to Chief Mathematician, a position she'd deserved all along.

And the mathematicians, somewhat grudgingly, admitted that Srini's approach to problem-solving—assuming nothing works the way it should and investigating why—was not, actually, terrible advice for tackling impossible proofs.

Though they still wouldn't let him near the equations.

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And that brings us to the genuine mystery of Srinivasa Ramanujan, who wasn't fixing coffee machines but was doing something considerably stranger—receiving complete mathematical theorems from a Hindu goddess and transcribing them before breakfast.

Unlike our fictional Srini, the real Ramanujan was extraordinary at precisely the thing he claimed to be good at. The problem was convincing anyone to believe him.

The story begins not in India, but on a cold January morning in nineteen-thirteen, at Trinity College, Cambridge. G.H. Hardy—a man who viewed mathematics as the ultimate form of austere, logical beauty, and who held approximately the same opinion of emotional displays as he did of badly formatted proofs—receives a large, dirt-stained envelope from Madras.

Inside are nine pages of theorems. No proofs. No logical steps. No "showing your working," as the Handbook so charmingly puts it. Just raw, startling conclusions about infinite series, continued fractions, and prime numbers.

To a professional like Hardy, this looks like a hoax. Some of the formulas are

already known—basic results any undergraduate might recognize. Others are frustratingly close to being wrong, the mathematical equivalent of a sentence with almost correct grammar. But others, specifically those regarding modular equations, are so complex they seem to have arrived from another dimension entirely.

Hardy's initial assessment is appropriately cynical: "A fraud."

But as the sun sets over the Great Court, the logic of the fraud begins to collapse. If this were a prank, the prankster would need to be a mathematician of the highest order. They'd need to know enough to create theorems that Hardy himself couldn't immediately verify.

Which raises the rather inconvenient question: why would a mathematical genius waste time pretending to be an uneducated clerk in India?

Hardy calls in his colleague, J.E. Littlewood. They spend hours analyzing the pages. Some results they can verify.

Others will take decades to prove. A few appear to describe mathematical objects that won't be formally defined for another fifty years.

"They must be true," Hardy finally concludes, "because if they were not true, no one would have the imagination to invent them."

It's one of the great statements in the history of mathematics. And it raises a rather uncomfortable philosophical question: if the theorems are true but arrived without proof, without formal logic, without any of the usual machinery of mathematical reasoning—what, exactly, are we to make of their author?

Ramanujan claimed the family goddess, Namagiri of Namakkal, showed him these formulas in dreams. He'd wake, transcribe them onto a slate, and later transfer them to notebooks. Not derived. Not solved. Received.

When we return from this brief quantum intermission, we'll explore how a self-taught clerk from a small town in Tamil Nadu became one of the most important mathematicians of the twentieth century, why his work on mock theta functions is now calculating black hole entropy, and whether divine mathematical inspiration is methodologically reproducible.

Spoiler: the HR department tried. Results were disappointing.

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Welcome back, my numerically-inclined audit survivors!

Before the break, we left G.H. Hardy staring at nine pages of theorems from an unknown clerk in India, trying to determine whether he'd discovered a genius or been magnificently pranked by someone with far too much time and mathematical training.

The answer, it turns out, was considerably stranger than either option.

So Hardy brings Ramanujan to Cambridge in nineteen-fourteen. What follows is one of the most productive and philosophically uncomfortable collaborations in the history of mathematics.

Hardy believed mathematics was discovered, not invented—that mathematical truths existed independent of human minds, waiting to be found through rigorous logical deduction. But they needed proof. Formal, step-by-step, peer-reviewable proof. Mathematics without proof was just speculation, however beautiful.

Ramanujan believed mathematics was revealed. The goddess showed him the answers. Why would she show him something incorrect? And if it was correct, why did it need proof? The truth was self-evident.

Hardy tried to teach Ramanujan proper mathematical methodology. Ramanujan tried to explain that he already knew the theorem was true because Namagiri had shown it to him on a scroll whilst he slept. This created a certain philosophical tension.

And yet, they produced extraordinary work. Ramanujan was contributing to partition theory—the ways you can break numbers into sums. He developed new approaches to analytic number theory. He was exploring what would later be called mock theta functions, though no one, including Ramanujan, fully understood what they were for.

His notebooks were filling with results that professional mathematicians would spend decades verifying. Some were refinements of known theorems. Others were entirely new. A few were solving problems that hadn't been formally posed yet.

But England was killing him.

The climate was damp and cold. Ramanujan was a strict vegetarian for religious reasons. This was nineteen-fourteen through nineteen-nineteen—the First World War. Rationing was severe. Fresh vegetables were scarce. The food he could eat was inadequate. His health collapsed.

He was hospitalized repeatedly with what was likely tuberculosis, though the exact diagnosis remains unclear. He fell into deep depressions. And still, from his hospital bed, he continued producing mathematics.

It's during one of these hospitalizations that the famous taxi incident occurs.

Nineteen-eighteen. Ramanujan is ill at Putney. Hardy visits, attempting small talk, mentions he arrived in taxi number seventeen-twenty-nine. "Rather a dull number," Hardy remarks. Probably hoping it wasn't an unfavorable omen.

Ramanujan's response is immediate: "No, Hardy! It is a very interesting number. It is the smallest number expressible as the sum of two cubes in two different ways."

One cubed plus twelve cubed. Nine cubed plus ten cubed. Both equal seventeen-twenty-nine.

This wasn't a calculation. Ramanujan didn't pause to work it out. He simply knew. The way you might know an old friend's birthday. Seventeen-twenty-nine was, to Ramanujan, personally familiar.

Years later, mathematicians found this exact property explored in Ramanujan's notebooks, dated well before the taxi incident. He'd been thinking about it already. Hardy's random small talk had merely activated something Ramanujan had filed away in whatever extraordinary filing system his mind maintained.

The number is now called the Hardy-Ramanujan number. Or the first taxicab number. It appears in Futurama as Bender's serial number, because apparently even cartoon robots deserve mathematical easter eggs.

Speaking of mathematical properties hidden in plain sight, if you find yourself fascinated by the hidden lives of specific integers, you should revisit **Season 3, Episode 13: "2025 As a Mathematical Concept."** In that episode, we took a deep dive into how a single year can be a playground for number theory, much like 1729 was for Ramanujan. It's the perfect companion piece for anyone who suspects that numbers have personalities and secrets they only reveal to the truly attentive.

By nineteen-nineteen, Ramanujan's health had deteriorated beyond recovery. He returned to India. He died in April nineteen-twenty. He was thirty-two years old.

He left behind three notebooks filled with theorems. And a sheaf of loose papers that would later be called the "Lost Notebook," though it was never technically lost, just misfiled in the Trinity College library for fifty-six years, which is

essentially the same thing.

For decades, mathematicians assumed these final papers were the desperate scribbles of a dying mind. Interesting, perhaps, but not particularly significant.

They were catastrophically wrong.

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Nineteen-seventy-six. George Andrews, an American mathematician, is rummaging through the archives at Trinity College Library. He's looking for something else entirely—because that's how mathematical discoveries work, apparently. Serendipity with better footnotes.

He finds a sheaf of papers. A hundred and thirty pages of Ramanujan's handwriting. Formulas, theorems, the usual lack of proofs. It's dated to the last year of Ramanujan's life—written whilst he was dying, probably feverish, certainly in considerable pain.

Andrews begins working through it. And realizes, with mounting astonishment, that Ramanujan had been exploring something called mock theta functions.

Now, theta functions were well-known in Ramanujan's time. They're particular types of infinite series with lovely symmetry properties. Mock theta functions were Ramanujan's invention—functions that behaved almost like theta functions but not quite. They were near-misses.

Mathematical objects that seemed to want to have certain properties but stubbornly refused at the last moment.

At the time of Ramanujan's death, no one knew what these were for. They were beautiful, certainly.

Mathematically interesting, probably. But applications? Purpose? Context?

None whatsoever.

Fast forward to the late twentieth century. Physicists are working on string theory, trying to unify quantum mechanics and general relativity. They're calculating the entropy of black holes—essentially, how much information disappears when something falls past the event horizon.

And they discover they need mock theta functions.  
The exact mathematical objects that Ramanujan had been scribbling on his

deathbed in nineteen-twenty, with no access to quantum mechanics, no knowledge of black holes, no concept of string theory—those objects are now essential to calculating how black holes store information.

Ramanujan was solving twenty-first-century physics problems in nineteen-twenty. With a fever. In a notebook. Without knowing what black holes were.

The goddess Namagiri, if she exists, has an excellent grasp of modern theoretical physics.

This keeps happening, by the way. Mathematicians will be working on some contemporary problem, get stuck, and discover that Ramanujan sketched the solution in a notebook ninety years ago, probably between breakfast and lunch on a Tuesday.

His work on partition functions—the number of ways you can break an integer into sums—anticipated developments in statistical mechanics. His continued fractions relate to quantum field theory. His formulas appear in crystallography, computer science, the study of prime numbers.

It's as if Ramanujan was receiving signals from mathematics' future. Not discovering results that were useful in his time. Transcribing results that would become useful a century later.

Which brings us to the question that still bothers mathematicians and philosophers: what exactly was Ramanujan doing?

Was it genuine divine inspiration? An extraordinary form of pattern recognition we don't understand? Some unusual neurological configuration that let him perceive mathematical relationships other people couldn't see?

Hardy called him a phenomenon comparable to Newton or Gauss. But Newton and Gauss derived their results. Ramanujan received his. Different epistemology entirely.

We still don't fully understand his methods. His notebooks contain results we can verify as correct but cannot reproduce his process for finding them. It's rather like being handed a completed crossword puzzle with no idea how someone knew that seventeen-down was "phosphorescence."

The theorems work. They predict reality. They calculate black holes. The mathematics is sound.

The methodology remains baffling.

And somewhere, one suspects, Namagiri is quietly amused that it took humanity fifty-six years to find the Lost Notebook and another several decades to realize what it was for.

Though one suspects the goddess had a schedule and Ramanujan's thirty-two years were precisely what the universe had allocated for that particular download.

Take, for instance, his jaw-dropping approach to calculating  $\pi$ . Most of us are happy to stop at **3.14**, but Ramanujan saw  $\pi$  as the output of an incredibly complex infinite series. He wrote down a formula involving the number **9801** and the square root of two that looked, to any other mathematician in 1914, like total gibberish.

But, while the standard formulas of his day were slow and clunky, Ramanujan's version was a mathematical lightning bolt.

Every single time you ran the calculation, it added eight new decimal places of accuracy. It is important because it wasn't just a party trick; it fundamentally changed how we handle large-scale computations. In fact, modified versions of his "fever-dream" formula are still what modern supercomputers use today to calculate  $\pi$  to trillions of digits.

He didn't just find a new way to do the math; he provided the high-speed engine for a digital age he would never actually get to see.

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Well, my divinely-inspired integer enthusiasts, we've reached the end of another quantum employment assessment.

Today we've learned that the greatest mathematical collaboration of the twentieth century involved a rigorous atheist trying to teach proof methodology to a mystic who received theorems from a goddess whilst sleeping. We've discovered that mathematical genius doesn't require formal training, prestigious degrees, or even passing marks in subjects that aren't mathematics—sometimes it requires exactly the opposite, plus a direct telecommunications line to divine revelation.

The story of Srinivasa Ramanujan isn't simply "talented person overcomes adversity," though there's certainly that. It's "person receives signal from mathematics' future and transcribes it whilst dying of tuberculosis in nineteen-twenty, and then fifty-six years later someone finds the notebook and realizes he was solving black hole entropy."

Which raises some uncomfortable questions about the nature of mathematical

truth. If Ramanujan was genuinely receiving these theorems—whether from a goddess, from some extraordinary pattern recognition we don't understand, or from whatever strange configuration his mind possessed—then where were they coming from? Do mathematical objects exist independent of human minds, waiting to be discovered? Or do we invent them, and some people are just extraordinarily good at inventing things that turn out to be useful a century later?

The equations work. They predict reality. They calculate phenomena Ramanujan couldn't possibly have known about. Which suggests he was accessing something real, even if we can't quite explain the access method.

Want to explore more mathematics, divine inspiration, and the unsettling question of whether genius can be summoned through proper devotional practice? Visit us at [multiverseemployeehandbook.com](http://multiverseemployeehandbook.com) and if you've been enjoying The Multiverse Employee Handbook, we'd be tremendously grateful if you'd fill out our listener survey. The link is in the show notes. It helps us understand what's working, what isn't, and whether anyone actually wants more stories about mathematicians who operate on completely different epistemological principles than the rest of humanity. Your feedback genuinely matters, even if it arrives via conventional channels rather than divine revelation.

And if you've enjoyed today's numerically-blessed adventure, why not share it with a fellow pattern recognition enthusiast? Perhaps you know someone who's convinced they could have been a mathematical genius if only they'd had access to the right goddess. Or someone who works in facilities and deserves recognition for keeping reality functional when it would much rather achieve quantum superposition between "working" and "existing purely to cause suffering."

This is your quantum-coherent correspondent, reminding you that in the multiverse of mathematical discovery, we're all just trying to hear the signal through the noise—though some people apparently have better reception than others, possibly due to superior divine telecommunications infrastructure.

And if you're wondering whether your own mathematical intuition might be divinely inspired, ask yourself this: when you see the number seventeen-twenty-nine, do you immediately recognize it as the smallest number expressible as the sum of two cubes in two different ways?

No?

Then you're probably not Ramanujan.

Though on the bright side, you're also probably not dying of tuberculosis in Putney, so there are compensations.