



Seeking Guidance on Independent Mathematical Research

10 messages

Jayant Sharma <jayantsharmahere@gmail.com>
To: head_smu@isid.ac.in

Wed, Apr 30, 2025 at 10:06 AM

Dear Prof. Shanta Laishram,

I hope this message finds you in good health and spirit. My name is Jayant Sharma, a 16-year-old high school student with a deep and growing passion for mathematics.

Since the age of 15, I have dedicated myself to self-guided mathematical exploration, often spending my days in silent immersion with abstract ideas, patterns, and structures. Over time, I've found myself gravitating towards number theory, function hierarchies, and generalizations of prime behavior — often wandering beyond standard curricula into uncharted regions.

However, despite the fire within, I find myself in a state of intellectual solitude and occasional despair, struggling to maintain the momentum of my research without formal guidance or academic structure. I believe that someone of your caliber and insight could illuminate my path, even if with a few words of direction.

I have attached a few of my preliminary papers — though they are not yet complete or formally proven in all parts, they represent the directions I am exploring. A few highlights of my work include:

1. Hierarchical Differentiation of Superfunctions: Defining a generalized derivative framework for functions such as tetrations using structures like

$$\lim_{h \rightarrow 1} \log_h \left(\frac{f(xh)}{f(x)} \right)$$

2. New Integer-Valued Functions: Discovering periodic and divisibility behaviors among certain constructed functions, potentially extending known theorems.
3. Landau Problems and Totient Extensions: Working on the asymptotics and error terms of generalizations of Euler's totient function for non-finite cases.
4. Meta-Number-Theory: An experimental framework generalizing number theory across higher operations, with implications for prime structures and even the P vs NP domain.

Though one of my papers, Synopsis of Elementary Results, contains some known errors (left intentionally due to time constraints), I share it in full transparency. My goal is not perfection but growth — and a genuine desire to contribute meaningfully.

If any of these ideas resonate with you, I would be deeply grateful for your mentorship or any suggestions on how to further pursue this path — academically or independently. Your guidance could become the turning point in a young mathematician's journey.

Thank you for your time, and I hope to hear from you.

Warm regards,
Jayant Sharma

Jayant Sharma <jayantsharmahere@gmail.com>
To: head_smu@isid.ac.in

Wed, Apr 30, 2025 at 10:12 AM

This is another peice of research I worked on yesterday.
However, the "Conjecture 2" is inaccurate for values greater than 10^4 . My main intention is to find an error bound and I believe it lies somewhere near the range $(-n, n)$ [n denotes number of primes used in the formula].

This is approximately the error bound (for now), and counts the formula's off from the prime counting function.

Thanks

Yours sincerely
Jayant Sharma
[Quoted text hidden]

Head SMUD <head.smud.isi@gmail.com>

Wed, Apr 30, 2025 at 11:03 AM

Reply-to: head.smud.isi@gmail.com

To: jayantsharmahere@gmail.com <jayantsharmahere@gmail.com>, Shanta Laishram <shanta@isid.ac.in>

Dear Jayant,

I am forwarding your email to Prof. Laishram.

Best wishes,
Tanvi Jain
[Quoted text hidden]

Jayant Sharma <jayantsharmahere@gmail.com>

Thu, May 1, 2025 at 7:07 AM

To: head.smud.isi@gmail.com

Cc: Shanta Laishram <shanta@isid.ac.in>

Dear Prof. Tanvi Jain,

Thank you for kindly forwarding my earlier message to Prof. Laishram — I truly appreciate your support. I feel too honoured by receiving your email as a response of mine.

I recently came across your lecture “Finite Discussions on the Infinite” on your homepage. It inspired me to share with you a short theoretical note I’ve written on indeterminacy within infinite expressions, under a model I call . I thought it might interest you given your work on related ideas.

The paper is attached, while I acknowledge, this paper doesn't touch the standards of modern mathematical rigour, and especially the last section, seems incomplete, yet I assure that, I am working on improving this model rigorously as well as my other mathematical matters too. I would be honored if you find the time to take a look.

Deeply Grateful,

Yours sincerely

Jayant Sharma

[Quoted text hidden]

Jayant Sharma <jayantsharmahere@gmail.com>

Wed, May 7, 2025 at 9:29 AM

To: amartya@isical.ac.in <amartya@isical.ac.in>

Greetings prof. Amartya Kumar Dutta.

Over the past few months, roughly from the last year, I have compiled some of my results in mathematics. However, being an independent researcher, with no mentorship. I deeply feel that, I won't be able to continue it, in the daily scenarios I live.

I am sharing a fraction of my research, although I haven't shared the entirety of proofs due to the fact that you might have limited time. I am sharing the foundations and some good intriguing proofs I worked upon.

I have been also working on an infinite hierarchy of derivative rates, and integrals, and in the topology, working on the inscribed square problem.

To detail more about my work, I have attached an email, I sent to ISI Delhi, however, probably got ignored.

I will soon post as much other results as possible.

Yours sincerely
Jayant Sharma
[Quoted text hidden]

Jayant Sharma <jayantsharmahere@gmail.com>

Wed, May 7, 2025 at 9:33 AM

To: amartya@isical.ac.in

Cc: head.smud.isi@gmail.com

Here is my another foundational idea for the proof of the inscribed square problem.

However, some family of shapes are concave, and hence they make the "values jump", when we localize the function for a certain point. However changing the location of that point solves this issue, that is what I am working next on, which will lead to an entire proof of inscribed square problem.

[Quoted text hidden]

Jayant Sharma <jayantsharmahere@gmail.com>

Wed, May 7, 2025 at 9:51 AM

To: amartya@isical.ac.in

Cc: head.smud.isi@gmail.com

I deeply seek forgiveness, I attached the wrong paper by mistake, the paper I attached highlights a recent draft on Oppermann's Conjecture, however it is wrong in some scenarios, I am actively working on the major "bound problem" and got a good progress.

Here is the correct paper regarding the inscribed square problem draft.

[Quoted text hidden]

Head SMUD <head.smud.isi@gmail.com>

Wed, May 7, 2025 at 7:03 PM

Reply-to: head.smud.isi@gmail.com

To: Jayant Sharma <jayantsharmahere@gmail.com>

Dear Jayant,

That is fine. I am travelling this week. Will get back to you in a fortnight.

Best wishes,
Tanvi

[Quoted text hidden]

Jayant Sharma <jayantsharmahere@gmail.com>

Wed, May 7, 2025 at 8:14 PM

To: head.smud.isi@gmail.com

No worries, I'm extremely sorry for interruptions in your journey.
I wish you a great, and happy journey.

Given this time, I will work towards some major projects to showcase, as we will continue the connection again.

Thank you so much
Yours Sincerely

Jayant Sharma
Greetings

[Quoted text hidden]

Jayant Sharma <jayantsharmahere@gmail.com>

Wed, May 21, 2025 at 8:11 AM

To: head.smud.isi@gmail.com

Greetings Mam,

I hope this isn't interrupting you, and your travel was well and comfortable.

In this fortnight, I got an idea of a new branch of mathematics, which deals with **evolution** (When something changes from one to another), **transform ** (the set of rules that guide how the initial block will change to the final block), **framework** (it is a restriction on how we can compose transforms, like in non-transcendental algebraic framework, transforms can be only algebraic functions), **entropy** (how much disordered an evolution is, w.r.t. a framework, the evolution which maps the natural numbers to the corresponding nth-prime has an infinite entropy in algebraic Framework, hence they seem chaotic and we can't capture them in algebraic framework (yet working more on it)), and many more, but I haven't listed them in the paper.

Some future ideas are- **Derivatives** of an evolution. They are when **n-evolutions** have something in common (sub-blocks : detailed in paper), this makes the **intuitive idea of patterns** more rigorous.
And several other things, I am still working on it.

Some, potential applications of this new field include, **the potential to study a very generalised version of Schinzel Hypothesis, which I generalised to all *meta/organic functions* (meta function : those functions which are only composed by, addition, multiplication, exponents, ect and their respective inverses subtraction, division and logarithms ect.*

I have explored it's deep connections to the theory.

As well as, the famous problem P vs NP, is deeply tied to the theory, since we can somehow explore *why the entropy of non-polynomial time problems* is infinite in the polynomial framework.

I got a lot more to show, I worked in this fortnight.

However, I understand that your time is very limited. So, I'm attaching a non-detailed paper on the study.

If any of my study amazed you, please guide me further, on how can I continue my research in the adverse conditions I live in. And if they didn't, It's my responsibility, to refine, and work on ideas, until they do.

Yours sincerely

[Quoted text hidden]