

2017 Quantum

Department of Mathematics
Lady Shri Ram College for Women

In conversation with the Union 2016-17

Enigma & ADPP 2017

The year at a glance

Articles

Reflections

In conversation with the Union 2016-17

Q.) What is your vision for the department?

Our vision for the department is to bring out the best in students. Especially, looking at the energy of the current first year students, we definitely expect the future of the department to be ever so jovial and warm because it is this holistic approach which leads to the development of a better individual. We believe in our motto to never stop trying, be it any sphere of life. Having the courage to take up something new and pursue it to culmination.

Q.) How was it working so closely with one another considering that there wasn't much acquaintance with one another before the elections?

Even though we weren't acquainted with one another before the elections, there wasn't any kind of awkwardness, instead the 'getting to know each other phase' worked in our favour and we hit it off from the very beginning. To put it across in better words- our complementing vibes made things comfortable and helped us to settle in and start working together as a team.

Q.) How do you plan on making this year's Enigma different from the last year?

We started planning for Enigma early this year. In 2017, Enigma is going to be a two day event, comprising of inter college events on the first day and on the second day, we are having a guest lecture followed by a paper presentation session. This is the first time that we are hosting an inter college paper presentation event.

Q.) What is your fondest memory as a union member of the mathematics department?

Akshita: I wish I could say there was one but that would be lying. There are many unforgettable memories that we've made as the union. I recall our first event which was right after the investiture ceremony where we were hunting for volunteers, characteristic of every union's untold struggles. Later, for the formal freshers' party, we surprised everyone by serving them ice creams and juices. Unfortunately, due to unprecedented circumstances, our two department trips were called off. I remember bugging Balbir sir for a cordless mic for Dr. Kaneenika Sinha's lecture. It seems like all of it just began yesterday and if given a chance, I would do it all over again.

Sanya: From going around and looking for volunteers to managing every event in a limited budget, it has all been indelible. To say that I have had just one favourite memory would be unfair to the rest of the enthralling memories I have made.

Be it the treat that Mitali gave us on the day of the farewell or the never ending calls to Balbir Sir. Be it when our venue got cancelled at the last moment for our very first event or the failure of the two trips we had planned, we surely have learnt to deal with it all gracefully. The words of appreciation from our teachers after every event or the wonderful experience of working with the simpatico student body, it shall all be edged in our minds for time to come.

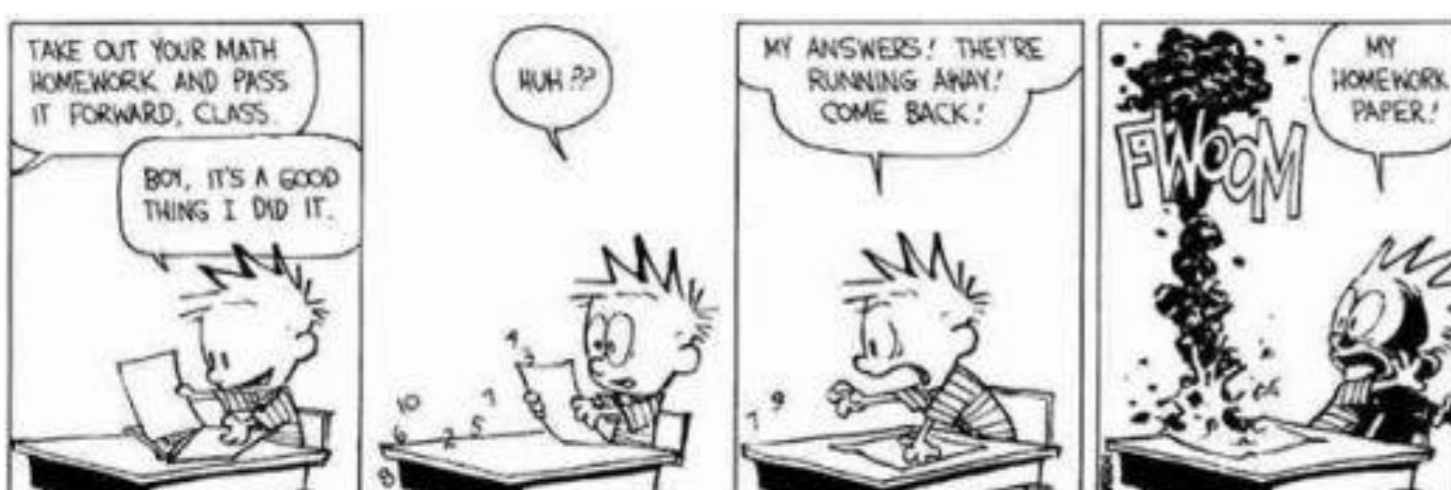
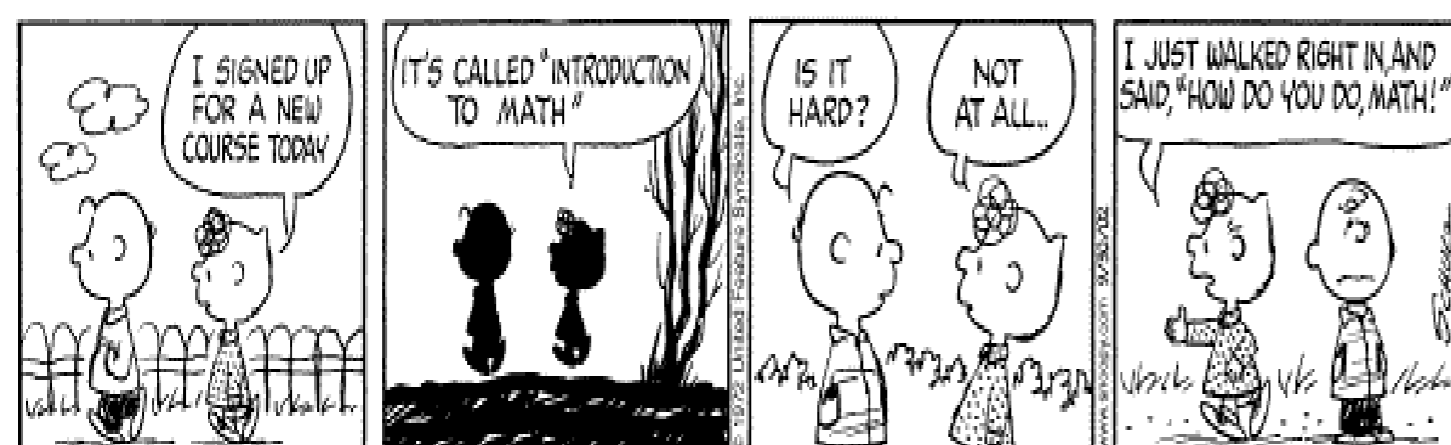
Q.) Finally, what is your message as the outgoing president?

Mitali: It is truly hard to believe how quickly a year has passed and I'm filled with a sense of gratitude while writing this message. It was an incredible year with endless beautiful memories which is why it passed in the blink of an eye. The journey began in April 2016 when I was chosen as the President of Mathematics Department along with Akshita, the general secretary and Sanya, the treasurer. The three of us under guidance of our Teacher In-Charge Sucheta Ma'am and Association In-Charge Yograj Sir have worked hard to make every department event successful and memorable for everyone. But I feel that it takes a collective effort to make an association viable and for that I'm grateful to our stupendous committee heads, editorial board, Quantum heads, event heads/subheads/ volunteers and lastly the entire student body of Mathematics Department for making every event happen so smoothly. While there is still much to do, we're working towards making Enigma 2017 a prodigious event. I hope that every year the department is served with even more hardworking and talented students who keep up the enthusiasm and take the department to greater heights.

Signing off, I thank you all for allowing me to serve you over the last year. It has been an honour, a joy and an experience I'll always cherish.



Math for laughs



EDITORIAL BOARD

Firstly, we would like to thank the department for giving us the opportunity to work on the newsletter. For this year's newsletter our endeavours entailed introducing new categories of articles so as to bring about greater diversity in the content of the newsletter and to increase the aesthetic appeal of the newsletter. We hope that we have lived up to the expectations of the department and that the students find it both enriching and engaging.

We would like to extend our heartfelt gratitude to Mahesh Sir for his constant support and guidance without which it would have been impossible to materialize the newsletter. We would also like to thank the department association for their assistance. Last but not the least, we would like to thank everyone who sent in their entries. Irrespective of whichever articles made it to the newsletter, we truly appreciate the spirit and enthusiasm of the students for their contribution which encouraged us to take the newsletter to greater heights.

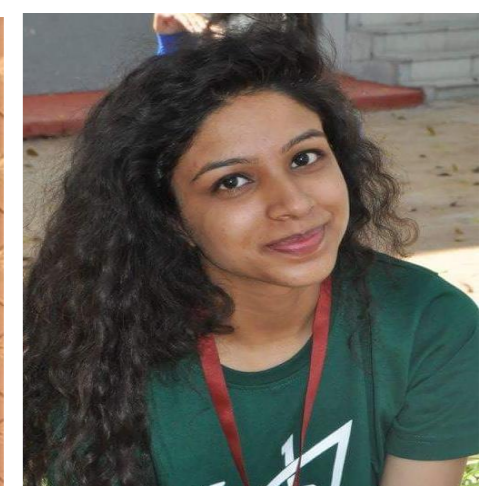
Best,
The Editorial Team,
Quantum.



Arunima Raavi
3rd Year



Kanak Lata Tripathi
2nd Year



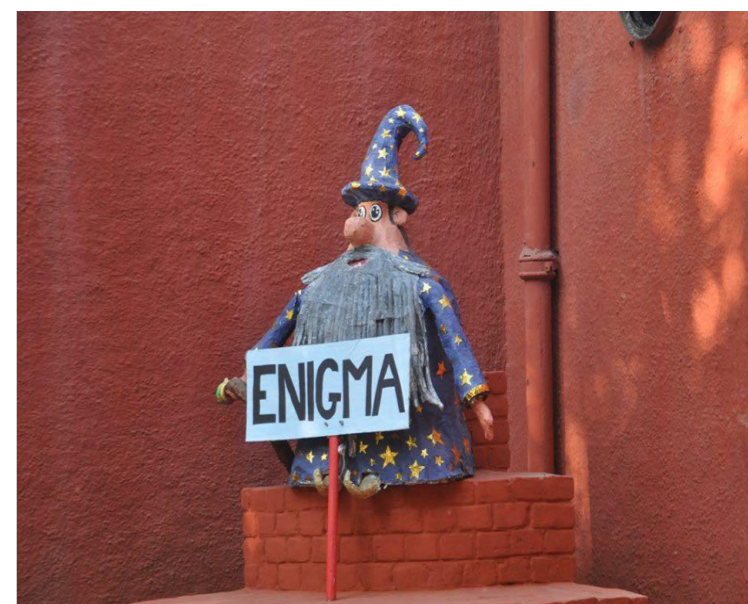
Anusha Ponia
1st Year

DAY 1

BINARY CODE

This quizzing event was headed by Priya Jain, Rupinder Kaur, Vaishali Rathi and Nivedita Singh and saw the participation of 15 teams comprising of two members each. The quiz was conducted by two students of our department Rashi and Simran Bhatia. The participants' enthusiasm could be seen in their promptness to answer questions and score the maximum points. In all, Binary Code was a successful event which served not only as a platform for Math enthusiasts to put their knowledge to test but also as a learning experience for everyone present there.

Priya Jain
3rd Year



MATHEMATICS

Mathletics, a perfect blend of mathematics and athletics was conducted on the first day of Enigma, headed by Nupun and Neha with subheads Himani Niranjani, Saheba Priyadarshini and Kanak Lata Tripathi. With three rounds that not only required brainstorming through math puzzles but also tested their athleticism, the event was a huge success, thanks to the Mathletics team and the participants.

Mugdha Khandelwal
1st Year



SHERLOCKED

Sherlocked, inspired by Arthur Conan Doyle's famous detective, was tailor made for crime fiction lovers. The event comprised of four captivating rounds of mystery solving. The response for this event was overwhelmingly positive, and over 115 teams registered. Friday, 3rd March, saw the culmination of all the brain storming sessions and hard work of the entire team. The event proved to be a great success, and this was made possible by the relentless hard work put in by the entire Sherlocked team- the volunteers, heads and subheads. They were guided by Mr. Ankur and Ms. Sucheta Nayak, the teachers in charge of the event, who helped them at every step. We hope the legacy continues, and Sherlocked 2018 is even bigger and better.

Devika Kapoor
3rd Year



CLICK - O - MATH

Many photography enthusiasts sent in their marvellous entries on the topic 'infinity' for the online round. The best 7 entries made it to the following offline round whose topic was 'curves'. The participants were allotted an hour to click a picture on the campus and another 15 minutes to caption their clicks. The participants' zeal and zest was apparent in their clicks and their vision was well elucidated in their captions. The judge for the event was Dr. Ravi from the Department of Statistics. The event turned out to be a huge success which can be credited to the hard work and collective effort put in by the heads: Snigdha Jain, Sonal Bajoriya, Mansi Yadav and Tanya Behl; the subheads Kanak Lata Tripathi and Shubhra Aggarwal and the volunteers. The event was a true learning experience for everyone and we look forward to hosting it next year again.

Shubhra Aggarwal
2nd Year

DAY 2

EREVNA

Erevna, meaning "research" in Greek was an Inter College Paper Presentation Competition organised for the very first time by the Department of Mathematics, LSR on the 4th of March, 2017. The initiative was taken up to provide a platform for students at graduate level from renowned colleges of Delhi to present their ideas of research in the field of Mathematics. The event received an overwhelming response as 13 teams of two poured into the LSR premises on the morning of 4th.

The event was graciously hosted by Anika Jain, a third year Mathematics student at LSR. The jury for the day comprised of two distinguished visiting faculty - Dr. Asha Mathur and Dr. Laxmisree Bandhopadhyaya. Shortly after the judges and the participants were seated in the Upper Seminar Room, rules for the proceeding were read out. Students were given 8 minutes of speaking time and 2 minutes of buffer time to wrap up their paper. This was followed by a rebuttal round in which at most two questions could be asked to each speaker.

The participants were being judged on the basis of their content, innovation in the presentation and confidence. The event commenced at 12:00PM with brilliantly framed and insightful presentations surfacing on interesting and practical topics like Quantum Computing, Mathematical Analysis and Range keeping, Crystallography, Cryptography, Queuing Theory, etc. Thus, breaking the pre conceived notion of Mathematics being a completely abstract discipline. The manner in which students presented their papers with utmost eloquence and maintained their calm during the much heated rebuttal round kept the audience completely engrossed. After a lot of contemplation and discussion, the judges decided that, S. Shivani who spoke on Banach-Tarski Paradox should be awarded the second position and she was also given a cash prize of ₹900. Her thorough knowledge and the way she validated every aspect of her presentation by citing examples endeared her to the judges' hearts. Also, Mugdha Khandelwal and Vibhuti from LSR who presented their paper on Mathematics in Movies were given a consolation prize by the Judges. Karan Jain and Roopal Jain, both engineering students from NSIT who impressed upon the judges by presenting their research paper on 'Relation between Sine and Gamma Function' were adjudged the best team and won a cash prize worth ₹1000. It is worthy to note that Karan Jain has developed a simple algorithm to find a certain complex integral using Euler's equation. His work has gained positive response from Harvard University! This clearly reinstates the fact that youth in India is highly experimental and can do wonders when given the right platform and LSR always strives to provide the right opportunities to nurture the talents of students.

Neha Patwal
2nd Year

LECTURE BY PROF. RAVICHANDRAN

The second day began with a lecture by Prof. Ravichandran, the head of the Department of Mathematics, Delhi University on the topic 'Polynomials in Complex Analysis'. He began the lecture by giving us real life example of paradoxes and step by step added complications to the examples which later seamlessly merged with the world of mathematics and eventually transformed into mathematical concepts like Russell's paradox and Lawyer's paradox. He posed many intriguing questions which left the students pondering over the solutions even after the lecture ended. Towards the end he guided the students on a pragmatic methodology of making paper presentations and how to deliver them succinctly. In the end, Ma'am Kakar felicitated our guest. The lecture was truly enriching for the students and the professor's knowledge laced with the perfect amount of humour kept them enraptured till the last minute.

Kanak Lata Tripathi
2nd Year



Anupama Dua Paper Presentation and Scholarship Function, 2017

Every year, the Department of Mathematics of Lady Shri Ram College for Women organises an event celebrating the spirit of Mathematics and remembering one of its own student Ms. Anupama Dua. The Anupama Dua Paper Presentation and Scholarship Function, 2017 continued this legacy on Wednesday, 15th February. The occasion was graced by Mr and Mrs Dua, Anupama's parents and her brother, Mr Aashish Dua. The event in room no 8 began with the lighting of the ceremonial lamp by Mr and Mrs Dua, which was followed by a beautiful rendition of 'Saraswati Vandana' by the students of the department. The Teacher In-Charge of the department, Ms Sucheta Nayak, addressed the gathering, followed by a few words by Mr Dua. A solemn silence of 2 minutes was observed, with everyone praying for the departed soul. The presentations began after the first two students of the second and third year were felicitated and given scholarships. The scholarship holders were - Anika Jain and Esha Saha (3rd Year), Puneesha Singla and Shubhra Aggarwal(2nd year).



The first half of the paper presentation saw topics like "The Black Scholes Model" and "Mathematical modeling for the army" being explored deeply by the participating students. Mr and Mrs Dua were then escorted to the tree growing in the college premises in memory of their daughter. Faculty members and students accompanied them as they watered the auspicious tree, continuing the beautiful legacy they started in her memory. The gathering then dispersed for a short tea break. The Principal, Dr Suman Sharma met Mr and Mrs Dua during the break. Mr and Mrs Dua were presented with a beautiful card made by the students before they left.

The programme resumed in the New Conference Hall. Ms Sonali Chhabra, an alumna of the department, joined the function and shared her experiences with the students and the faculty members. Spirited paper presentations on topics ranging from "Crime fighting Mathematics" to "Time travel and wormholes" followed. The faculty and students present, enjoyed the intriguing and thought provoking presentations.

Later, the participants were given certificates. Anika Jain from third year then addressed the gathering, thanking everybody for making the event a success. The vote of thanks was then given by Mr. Mahesh Kumar as the event drew to a close. The programme proved to be a great success, leaving all those present with something new to think about.



Devika Kapoor
3rd Year

The year at a glance

PYJAMA PARTY - FRESHER'S 2016

On 8th of August, the Mathematics department organized a Pyjama Party for the freshers hoping to break the ice and interact with the fresh faces. The newbies too were excited beyond measure for the college to wield its wand and cast the magic spell upon them. The seniors worked very hard to make the evening a memorable one for us and succeeded in making us open up to them. While the first years experienced something totally new, the seniors were able to relive one of the best days of their college lives. As the seniors danced to the tunes of Kala Chashma they enraptured the newbies with their melodious voices and perfectly timed cup beats. Hence, we became a part of an extremely close-knit family that was the Mathematics Department.



LATEX WORKSHOP

The Editorial Board of the Mathematics Department of Lady Shri Ram College organized the first session of the LaTeX workshop titled 'An Introduction to LaTeX' on 6 October 2016. The Editorial Board consisting of Anika Jain and Esha Saha successfully conducted the workshop which was attended by over 40 students while Editors Aakshi Malasi and Nikita Sobti assisted all students hands-on during the entire session. Ms. Sucheta Nayak, and Mr. Yograj Chauhan, Assistant Professor, Mathematics Department provided their support and guidance to the students. Ms. Neelam Malhotra, Professor, Economics Department also attended the workshop and enjoyed learning the basics of the software.

BIG IDEAS IN SMALL MARGINS

This session was conducted by our alumna Dr. Kaneenika Sinha. She graduated from LSR in the year 2000 with honours in mathematics. She did her post-graduation from Queen's University where she later went to pursue her PhD in Mathematics. Currently, she is working at IISER, Pune. Throughout the course of her session, Dr. Kaneenika Sinha spoke to us about some important theorems of Mathematics and about their inception and also discussed with us some of the important notes and theories from the ancient Greek mathematician 'DIOPHANTUS' BOOK 'ARITHMETICA'. We learnt about some very important proofs and concepts like the concept of 'Polygonal numbers' (with emphasis on Triangular and Square numbers), Fermat's theorem etc. Also, she enlightened us with the knowledge of some concepts and proofs stated by famous mathematicians like PIERRE DEFERMAT, LAGRANGE etc. The session made evident that learning and studying Number theory is fun.



APPLICATIONS OF MATHEMATICAL MODELS

An inter-department talk was organised on the 21st February, 2017 by the Department of Mathematics and Department of Statistics on the topic "Applications of mathematical models" by Dr.Sourish, who is an Assistant Professor at Chennai Mathematical Institute. The talk was about 2 mathematical models about the depletion of ice caps. It was indeed an enthralling experience as the students gained an insight into the real life problems.



DEPARTMENT ASSEMBLY

The Department organized its assembly on 28th September, 2016. Proceedings began with a soulful dance performances by Deepali, a 2nd year student and Mansi, a 1st year student. After this, Rachna Gautam, a 1st year student recited a self-written poem. Her poem was well acclaimed by the audience. This was followed by a revealing presentation on 'OM' by Rashi and Simran Bhatia- they explained the essence of the word and the impact created by the chanting of OM mantra. The assembly concluded with the semi contemporary dance form performed by Saheba, Rishika and Devika.



TEACHER'S DAY

The students of Mathematics Department organised a small event for their beloved teachers on the 8th of September, 2016. The students presented beautiful handmade cards to the faculty members. This was followed by an entertaining dance performance, where we were joined by our faculty members, which made the day even more fun filled! After this, we celebrated in the conventional way by cutting a delicious cake. This day ended with a small movie that showcased beautiful heartfelt messages from the department alumni to their teachers.



ONLINE POSTER DESIGNING

The Creative Committee of the Mathematics Department conducted a workshop on "Online Poster Designing", aimed at introducing the students of first and second years to www.canva.com, a virtual and dynamic space for making posters, invites and much more. The workshop was conducted by Avantika Banerjee and Anusha Ponia, who gave a basic introduction on how to design a simple poster and edit pictures with the help of a detailed presentation showing steps for the same.



IEWS ON DEMONETISATION

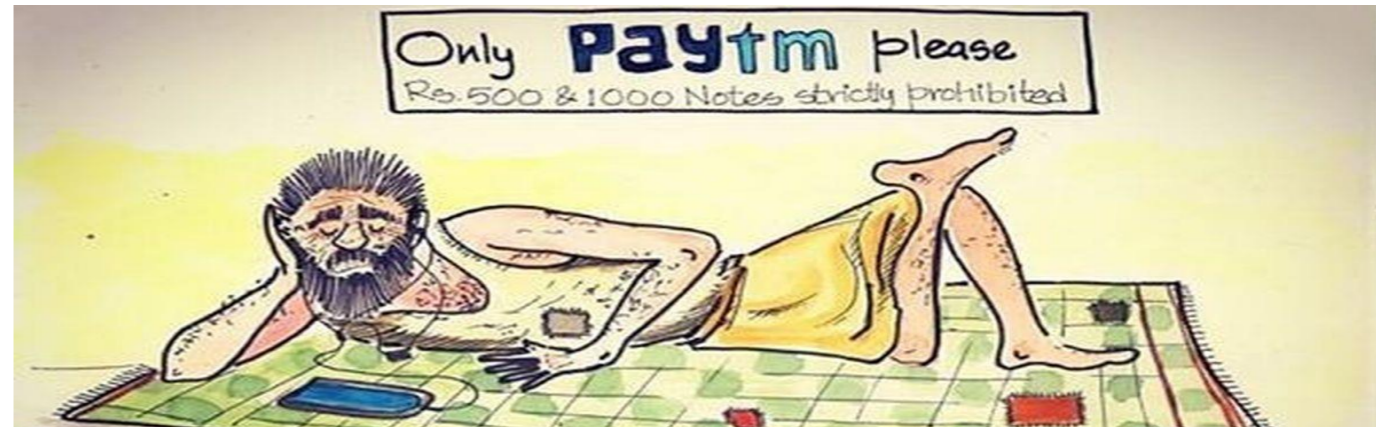
The demonetisation of Rupees 500 and 1,000 banknotes was a policy enacted by the Government of India on 8 November 2016, ceasing the usage of all Rupees 500 and 1,000 banknotes of the Mahatma Gandhi Series as legal tender in India from 9 November 2016. The government claimed that the demonetisation was an effort to stop counterfeiting of the current banknotes allegedly used for funding terrorism, as well as a crack - down on black money in the country. The move was also described as an effort to reduce corruption, the use of drugs, and smuggling. This section presents the views of some of the students of the college on the demonetisation policy, putting forth the pros and cons of the policy in their opinion.

The demonetization decision is a bold, bold move, one that stands to shape both the country's and the ruling party's future. And, for all the Opposition's hysteria, the move has all the bearings of a success, marked by good intentions and able implementation. The public has clearly been discomfited by it to an extent, but then the adage 'No pain no gain' is particularly relevant here. We now need to wait and watch. Rebuilding the country takes time, and the least that we can do is offer the government some time.

Puneesha Singla
2nd year

The recent move to demonetise bears honourable intentions that should be supported whole heartedly. However, not all roads to all destinations are devoid of bumpers, demonetisation shouldn't have been executed overnight. In a country of billions of population, replacing currency notes is a phenomenal task. The implementation could have been more effective. This currency swap has put the life of a common man, particularly him who has the least financial resources, into disarray. Banks are cashless and ATMs shuttered. People, especially the elderly have to stand in long queues, only to have the banks cashless at their turn. They consist of poor farm and construction labourers, those who earn their wages in cash and have no banks in their areas are out of clues about accessing their own legit hard earned money. Moreover, most of the black money is in the form of gold and real estate and not as cash. So by introduction of a demonetisation policy, we aren't completely wiping off the black money, but only a portion of it.

Aakshi Malasi
2nd year



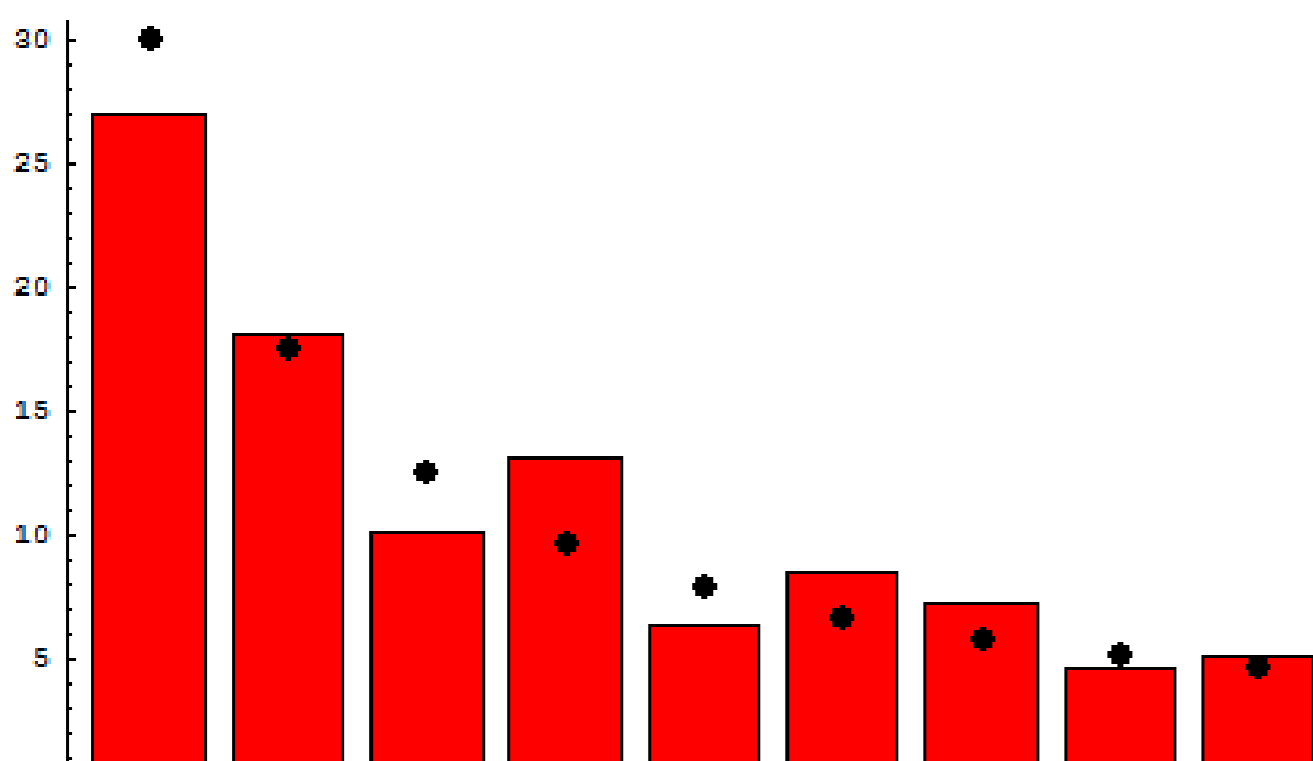
The intent of the policy is both commendable and characteristic of the dynamic Modi regime. Nonetheless, its primary fallacy lies in the misconceived notion of 'black money' hoarded in houses and conjures it as a stock quantity. The nation suffers due to poor implementation of the plan which fails to meet the demand of new notes. The worst hit are the economically and socially backward sections of the society. Also, the aim to convert India to a cashless economy sounds absurd to say the least considering that 90% of the labour force is employed in the informal sector, as rightly pointed out by Manmohan Singh. To add another flaw, this widely adulated move comes under question with the dismissal of RTI on political funding. I completely agree that there is a dire need to fight black money in the country but the efficacy of the demonetisation move is misleading and does not suffice in serving to this end.

Kanak Lata Tripathi
2nd year

Live Science

RANDOM PATTERNS

Weirdly, random data isn't actually all that random. In a given list of numbers representing anything from stock prices to city populations to the heights of buildings to the lengths of rivers, about 30 percent of the numbers will begin with the digit 1. Less of them will begin with 2, even less with 3, and so on, until only one number in twenty will begin with a 9. The bigger the data set, and the more orders of magnitude it spans, the more strongly this pattern emerges.



PRIME SPIRALS

Because prime numbers are indivisible (except by 1 and themselves), and because all other numbers can be written as multiples of them, they are often regarded as the "atoms" of the math world. Despite their importance, the distribution of prime numbers among the integers is still a mystery. There is no pattern dictating which numbers will be prime or how far apart successive primes will be.

The seeming randomness of the primes makes the pattern found in "Ulam spirals" very strange indeed.

In 1963, the mathematician Stanislaw Ulam noticed an odd pattern while doodling in his notebook during a presentation: When integers are written in a spiral, prime numbers always seem to fall along diagonal lines. This in itself wasn't so surprising, because all prime numbers except for the number 2 are odd, and diagonal lines in integer spirals are alternately odd and even. Much more startling was the tendency of prime numbers to lie on *some* diagonals more than others — and this happens regardless of whether you start with 1 in the middle, or any other number.

Even when you zoom out to a much larger scale, as in the plot of hundreds of numbers below, you can see clear diagonal lines of primes (black dots), with some lines stronger than others. There are mathematical conjectures as to why this prime pattern emerges, but nothing has been proven.

$$e^{i\pi} + 1 = 0$$

THE SONNET

"Like a Shakespearean sonnet that captures the very essence of love, or a painting that brings out the beauty of the human form that is far more than just skin deep, Euler's Equation reaches down into the very depths of existence."

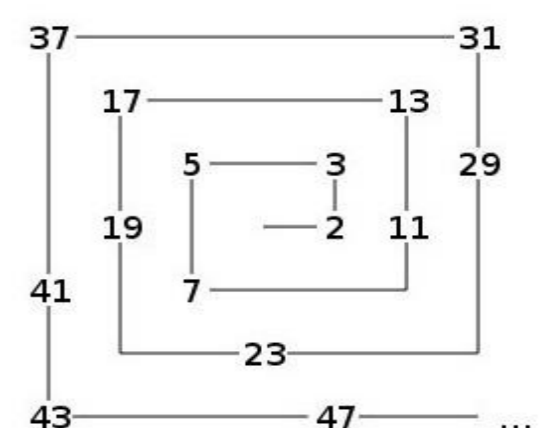
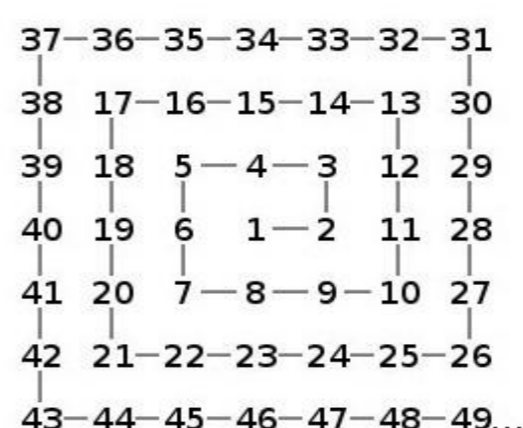
Stanford mathematician Keith Devlin wrote these words about the equation to the left in a 2002 essay called "The Most Beautiful Equation." But why is Euler's formula so breath-taking? And what does it even mean?

First, the letter "e" represents an irrational number (with unending digits) that begins 2.71828... Discovered in the context of continuously compounded interest, it governs the rate of exponential growth, from that of insect populations to the accumulation of interest to radioactive decay. In math, the number exhibits some very surprising properties, such as — to use math terminology — being equal to the sum of the inverse of all factorials from 0 to infinity. Indeed, the constant "e" pervades math, appearing seemingly from nowhere in a vast number of important equations.

Next, "i" represents the so-called "imaginary number": the square root of negative 1. It is thus called because, in reality, there is no number which can be multiplied by itself to produce a negative number (and so negative numbers have no real square roots). But in math, there are many situations where one is forced to take the square root of a negative. The letter "i" is therefore used as a sort of stand-in to mark places where this was done.

Pi, the ratio of a circle's circumference to its diameter, is one of the best-loved and most interesting numbers in math. Like "e," it seems to suddenly arise in a huge number of math and physics formulas.

Putting it all together, the constant "e" raised to the power of the imaginary "i" multiplied by pi equals -1. And, as seen in Euler's equation, adding 1 to that gives 0. It seems almost unbelievable that all these strange numbers — and even one that isn't real — would combine so simply. But it's a proven fact.



Arunima Raavi
3rd Year



Tulika Rawat
2nd Year



Arundhati Srivastava
2nd Year



Tulika Rawat
2nd Year



Arundhati Srivastava
2nd Year



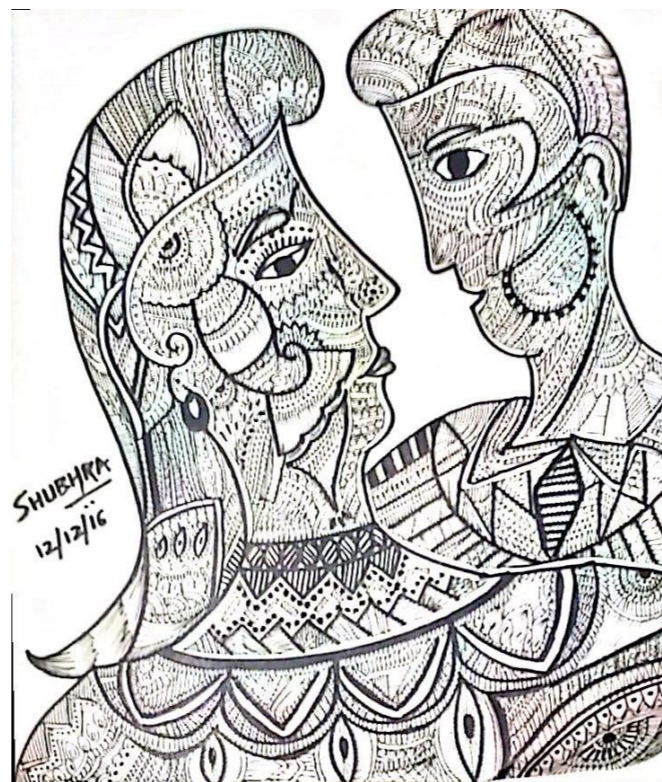
Arundhati Srivastava
2nd Year



Shubhra Aggarwal
2nd Year



Shubhra Aggarwal
2nd Year



Shubhra Aggarwal
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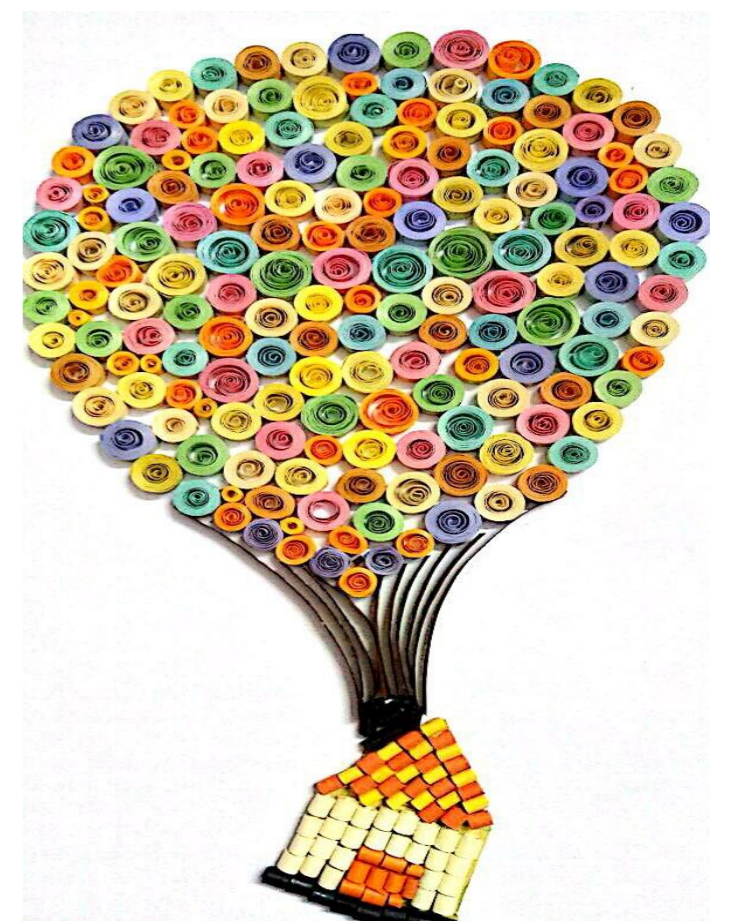
Shubhra Aggarwal
2nd Year



Shubhra Aggarwal
2nd Year



Shubhra Aggarwal
2nd Year



Tulika Rawat
2nd Year

THE WOMEN'S POSITION-WHERE DOES SHE STAND

In the words of Rabindranath Tagore, "woman is the builder and moulder of a nation's destiny."

Indeed rightly said, in this age, even today it's a debatable topic if women should take up and be included in all the professions. I ask why not?

Woman is the magnificent creation of God, a multifaceted personality with the power of benevolence, integrity and tolerance. She is the companion of man who is gifted with equal mental faculty. Woman has played a significant role in the progress of a nation. For the hand that rocks the cradle rules the world. Though delicate and soft as a lily, she has a heart, far stronger and bolder than that of a man. With the dawn of independence, the position of a woman has undergone a change. Earlier, the women were subjugated and not treated as equal. She was rejected, dejected and treated as a puppet in the hands of men. Then, it was realized that women of the country should be uplifted and granted equal status in all the walks of life. India could never progress in economic, political, social, domestic and educational fields without their participation.

At present, a large number of women have attained dignity and individuality in their respective fields. They have become doctors, engineers, scientists, astronauts, legislators and even prime ministers and presidents. They have proved themselves to the test of time. They are less selfish and more dedicated towards work.

Lately, women, a fairer and nobler sex, are becoming aware of their rights, their goals are rising up. However, mere legislation cannot help liberate women from social taboos, this patriarchal society needs a change. There has to be a radical mental set up of men and their view towards women needs a change.

The statement 'BY EDUCATING THE WOMEN WE EDUCATE AND UPLIFT THE WHOLE NATION' seems definitely true. It is said women add beauty and charm in every aspect of life. She is emotional, caring and yet firm. Not only she handles work outside home but is also a praiseworthy homemaker. She is the backbone of the country and if this backbone is malfunctioned, the country cannot stand erect smartly.

Indeed, a society runs on two wheels, both the wheels must be equally strong to run smoothly. Although legally and theoretically women are now regarded equal to men, but the institutions of caste and the prevailing value system are still prevalent. Let us all give up our fears and prejudices against women. Let no girl be uneducated and every man on this earth should work for women empowerment.

Vibhuti Pandey
1st year

OUT FROM THE SHADOWS OF A 'GREAT' MAN

Mileva Marić was a Serbian physicist. She was the only woman among Albert Einstein's fellow students at the Zurich Polytechnic and was the second woman to finish a full program of study at the Department: Mathematics and Physics. After their marriage in 1903, they had two sons, Hans Albert and Eduard.

In 1908, the couple constructed, with Conrad Habicht, an ultra-sensitive voltmeter. It was registered under the Einstein-Habicht patent. When Habicht questioned Mileva's choice not to include her name, she replied making a pun "Why? The two of us are but one stone."

But in 1912, Albert started an affair with his cousin, Elsa Löwenthal while visiting his family who had moved to Berlin. They maintained a secret correspondence over two years. This caused their marriage's collapse. Mileva moved back to Zurich with her two sons.

In 1919, she agreed to divorce, with a clause stating that if Albert ever received the Nobel Prize, she would get the money. Her son, Eduard developed schizophrenia and was eventually internalised. Due to these medical expenses, Mileva struggled financially all her life and eventually lost everything.

Albert wrote in his will that the Nobel Prize money was his sons' inheritance. Mileva strongly objected, stating the money was hers and considered revealing her contributions to his work. Albert sent her a letter stating "You made me laugh when you started threatening me with your recollections. Have you ever considered, even just for a second, that nobody would ever pay attention to you if the man you talked about had not accomplished something important. When someone is completely insignificant, there is nothing else to say to this person but to remain modest and silent. This is what I advise you to do."

Their letters and the numerous testimonies show that Mileva Marić and Albert Einstein collaborated closely from their school days up to 1914. Albert referred to it repeatedly in his letters, like when he wrote "our work on relative motion". She abandoned her own aspirations, happy to work with him and contribute to his success, feeling they were one unique entity. Once started, the process of signing their work under his unique name became impossible to reverse. She probably agreed to it since her own happiness depended on his success. Why did Mileva remain silent? And as is always the case in close collaborations, the individual contributions are nearly impossible to disentangle

Simran Bhatia
2nd year

MATH SUPERHERO!

Maryam Mirzakhani, the math genius from Iran, was born on May 3, 1977. She became the first woman to be awarded the Fields Medal, the highest award in mathematics, aka the Nobel Prize of math. The International Mathematical Union chose to give the honor to Mirzakhani after she discovered new advances in the theory of Riemann surface. The organisation gives out awards every four years to some of the best mathematicians under the age of 40. In an interview to Stanford News she said, "This is a great honor. I will be happy if it encourages young female scientists and mathematicians. I am sure there will be many more women winning this kind of award in coming years. I think it's rarely about what you actually learn in class... it is mostly about things that you stay motivated to go and continue to do on your own."

सोचा था-

हौसलों के पंख लगाकर उड़ जाऊँगी,

अपने रूप पर थोड़ा-सा इठलाऊँगी,

बस यूँ ही मुस्कराते हुए जीवन पथ पर आगे बढ़ जाऊँगी!

पर था ना पता-

समाज इतना कुरूप हो जायेगा, मुझको आगे बढ़ते देख कैसे सह पायेगा?

जंजीरों से जकड़े जायेंगे पाँव मेरे,

हौसलों की चाबी से अगर खोलू भी मैं जंजीरें,

तो ईर्ष्यालु समाज की ईर्ष्या तले, बस चंद छीटों

में,

खाक में मिल जायेंगे सपने सारे!

तेज़ाब की इन छीटों ने, कलेजे को ठंडक पहुंचा दी उसके तो,

पर उन छीटों ने जीवन को झुलसा दिया मेरे! वो अपराधी होकर भी, निरपराध घूम रहा

और मैं निर्दोष दुपट्टे की आड़ में, इन चार दीवारों में कैद हूँ।

कहने को मैं आज़ाद हूँ, मैं आज़ाद हूँ!

Neetika Verma
1st Year

THE HUNTED

She was a butterfly.

To her, the forest was her world. She moved all around the forest - sitting on the vibrant orchids, passing over the sparkling stream, spreading colours across the forest like a rainbow to the sky.

Everything was beautiful just the way she was!

Every night when it got dark, she would settle somewhere terrified by the screams of nocturnal predators.

All her friends convinced her that the animals were way too far to cause a scar. She was more afraid on the nights when even the animals were quite. It was one of those nights when she was sleeping peacefully dreaming about fairies, rainbows and flowers. In her dream, she saw the fairies turn into demons.

The rainbows cracked and broke into pieces and fell all around her. The flowers turned black as if it was burnt. The two legged animal robbed her of all the dignity she had. She was never the world to the forest. The colours of the butterfly splashed all across the woods.

Began with colours, ended with colours. Bright then, faded now.

Soumya Singh
1st year

MATH GIRLS

Hello Ladies! My goal of writing this article is to make everyone finally understand that there is no such thing as being a 'math person'. People say "I'm not a math person," as if some of us emerge from the womb with a pi-shaped birthmark on their ankle, while others don't.

When I entered LSR with math as my core subject, I was scared and unsure of my decision. Back in school I was more of what you call an artsy person, and artsy people can't do math, right? Yes math is tough and people's comment on when I told them I was pursuing math, really didn't help as well. "Well, you don't look like a math person. Are you really able to get it?"

I was surprised with the fact that there are a TON of people out there who abide by the stereotype of what a 'math person' looks like. And I Did not fit this stereotype because? Because I didn't wear glasses? Because I wasn't a quiet and shy person? Because...I'm a girl? It was just not the outlook of the outside world, even in college it wasn't expected out of a math student to be creative, interactive OR EVEN FUN.

I was confused, because when I look at my math batch, it is full of highly talented, creative, smart and beautiful girls. They too felt the baggage that came with being or not being a "math person", but these dedicated girls took upon themselves to show the whole college and the world, that they are more than just a "Math person".

Mathematics department here at LSR taught me a few things, that yes math is "tough", but is extremely simple when taught and learnt the right way, and that everybody can do great things, but most importantly, I learned that even though some things don't come easy, that with enough perseverance and perspective that those things do come one way or another.

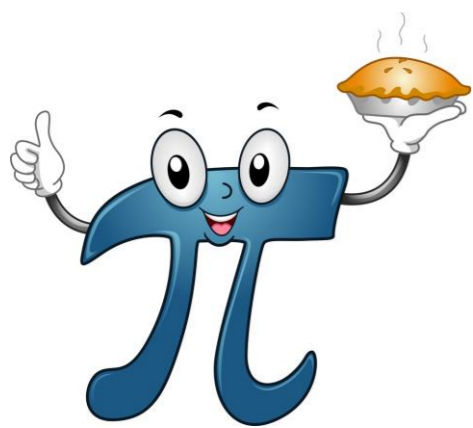
It meant that I could actually do something that I had been convinced that I never had the capacity to do. It meant that all of us can do anything we put our minds into, regardless of what society tells us we should be able to do.

Girls are constantly told that 'they can't'. We need to encourage girls to do math to show them they can and create a diverse generation of problem solvers to defy stereotypes once and for all. Here in LSR's mathematics department we get this opportunity and for this I would like to thank the teachers and students of the mathematics department of LSR (which is extremely cool).

Aayushi Pokharna
3rd year



SIX MATH HOLIDAYS YOU SHOULD CELEBRATE



PI DAY

Pi Day is the quintessential math holiday. On Pi Day we celebrate pi, the constant that tells us the ratio of a circle's circumference to its diameter. March 14 written numerically is 3/14, as in 3.14, the first three digits of pi's endless sequence of numbers.

On March 12, 2009 the U.S. House of Representatives passed a resolution declaring every March 14 "National Pi Day." So, convince your teacher to buy you a pie in class and get the most out of this best-known math holiday.

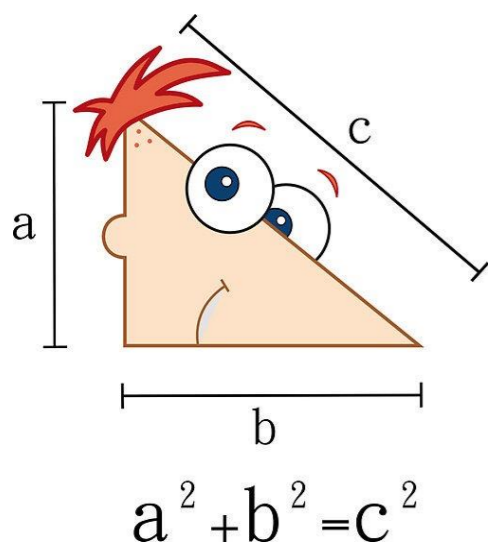


FIBONACCI DAY

Here's a day that should be celebrated by math lovers and artists alike. On Nov. 23 we celebrate the Fibonacci sequence, a sequence of numbers that creates a spiral, beginning with 1, 1, 2, 3. That's how we get to Nov. 23 (11/23).

One of the great things about Fibonacci's sequence is that it's frequently found in nature where spirals are encountered, making for endless applications and reasons to engage with the famed sequence.

There are no rules to Fibonacci Day, so draw a spiral, make a mural, or eat ice cream with a chocolate syrup swirl.



PYTHAGOREAN THEOREM DAY

Celebrate some triangles on this irregularly occurring holiday.

Here we celebrate the Pythagorean Theorem, which states the length of the sides of a right triangle always adhere to the equation $a^2 + b^2 = c^2$. So, the holiday occurs any time the date aligns to the Pythagorean Theorem. The next one will be Aug. 15, 2017. ($8^2 + 15^2 = 17^2$)

Try to figure out the next couple of dates you can celebrate this math holiday after 8/15/17. (Hint: They will happen in 2020 and 2025.)

SONIA KOVALEVSKY MATHEMATICS DAY

This day doesn't occur on any specific date and is usually just celebrated in schools. On this day we celebrate the life and career of Russian mathematician Sonia Kovalevsky to encourage young women to get involved in math.

She was born in 1850 and was the first major female mathematician in Russia. You can even use the holiday to celebrate other female scientists and mathematicians.



WORLD MATHS DAY

While maths as a plural looks funny to Americans, this title comes from the day truly being global.

This math holiday is celebrated on March 1 of each year. It's far less specific than many of the holidays above, and is aimed at getting people excited about math and interested in math-related jobs or fields of study.



MATH 2.0 DAY

On July 8 we celebrate the intersection of math and technology. It's a growing overlap that includes every device in your pocket or bag.

Early July is dominated by another holiday, so give Math 2.0 Day a little love and remind everyone to celebrate their math holidays - even if they're tired out from days of fireworks and grilling in the backyard.



THE HUMAN MAGNET

The following is the story of Morris Goodman also called The Miracle Man (Adapted from 'The Secret' by Rhonda Byrne.

"My story begins on March 10, 1981. This day really changed my whole life. It was a day I'll never forget. I crashed an airplane. I ended up in the hospital completely paralyzed. My spinal cord was crushed, I broke the first and second cervical vertebrae, my swallowing reflex was destroyed, I couldn't eat or drink, my diaphragm was destroyed, I couldn't breathe. All I could do was to blink my eyes. The doctors, of course, said I'd be a vegetable the rest of my life. All I'd be able to do is blink my eyes. That's the picture they saw of me, but that didn't matter what they thought. The main thing was what I thought. I pictured myself being a normal person again, walking out of the hospital.

The only thing I had to work with in the hospital was my mind, and once you have your mind, you can put things back together again.

I was hooked to a respirator and they said I'd never breathe on my own again because my diaphragm was destroyed. But a little voice kept saying to me, "Breathe deeply, breathe deeply." And finally I was weaned from it. They were at a loss for an explanation. I could not afford to allow anything to come into my mind that would distract me from my goal or from my vision.

I had to set a goal to walk out of the hospital on Christmas. And I did. I walked out of the hospital on my own two feet. They said it couldn't be done. That's a day I will never forget.

For people who are sitting out there right now and are hurting, if I wanted to sum up my life and sum up for people what they can do in life, I would sum up in six words: "Man becomes what he thinks about."

Prayer; we take this word as in an orthodox manner, as a plea or a request. But, prayer is the 'Demand of the Soul'. As Sensei Daisaku Ikeda rightly says "Prayers are neither light dreams nor vague wishes. They should be firm pledges of determination. Prayers made with such strong resolve invite clear results as magnets attract iron."

Sri Sri Paramhansa Yogananda once said "The secret of effective prayer is to change your status from beggars to the child of God; when you appeal to Him from that consciousness, your prayer will have both power and wisdom."

A prayer is not a plea but a resolve. At times while praying we limit ourselves to some 'Can't's' that lie within us.

Before praying we must have strong conviction in what we are praying for, in the possibility of what we are praying for. We must make our will stronger. When the can't's disappear from our minds, divine power comes in.

Our prayer i.e. our firm resolute must be powered by our constructive actions in that direction.

The universe follows a law of attraction. A slightest thought of 'no', 'can't' or any doubt on ourselves or accomplishment of our wishes, unknowingly attracts that negativity towards us.

If we pray for something and should that contradictory thought take root in our minds, the law of attraction plays its part and the negativity is attracted to us.

We in our lives mostly face what we always wanted to avoid or move away from. We are mostly encountered by those 'no/s' and 'not/s', 'shouldn't/s' and 'don't/s' we wished.

Thus the law responds to our thoughts no matter what they might be.

While praying, if we have slightest doubts or are thinking of anomalies and contradictions that can take place, then we are actually focusing or putting our entire strength and concentration on that thing that we are wishing is not supposed to happen. Hence it becomes more important to us than our prayer. So, we attract it and universe gives it to us.

If you think about what you want in your mind, make a prayer (a resolution) and make that your dominant thought: you will bring it into your life.

The law of attraction of the universe is supported by the law of karma. The strong prayer and law of attraction will bring to us what we desire without any doubt but to completely achieve it, it should be backed by strong will power, determination and our constructive actions.

The entire universe is centred around us, our will, wishes and desires.

We are the most powerful magnet in the entire universe. We have a magnetic power to attract our wishes to us.

The Universe and God will respond to the prayer behind which the will force is continuous.

Behind human will is the divine will that never fails. Even death has no power to deter divine will.

Kushagri tandon
1st year

19/1, Tan-IX Integral

Sin Road

Calculator-II

Dear Pal,

I am quite well and fully charged in capacity and I hope that you will also be in trigonometry. When we first met at an electric spark, my heart started beating with a frequency of 50Hz. Now you are sitting at the axial line of my heart. We are perpendicular to each other. Your algebraic activity is very handsome because it does not depend upon your sin and cos angles. Then you do not allow me to apply cos and sin angles, my mechanics will fail.

There are many similarities between you and me. The real image of your love is in my heart mirror which is made up of flint glasses. When the image of your love falls upon my focal point, my heart begins to vibrate alternatively. In the end, I request you to meet at 1, Newton Road. If you don't come, the circuit of my heart will break and after that I will be a dead body. In the end, all is good with a lot of ohms.

My new address

Miss Physics

50 Volt, Henry Road

Electro Magnetic Induction

Vanshika Jain
1st Year

THE BEAUTY OF THE CONCEPT OF MATHEMATICS

Mother Nature is a complex web of life and the lifeless. The very state of it being so perfect is the reason for life and death. Whereas mathematics is man-made to understand nature and beyond.

Every day there are new discoveries that are made in nature, and in maths as well. Maths is founded on simple yet powerful elements — numbers. Numbers, just like the elements of nature, share a complex relationship with every other element in that set.

This relationship is universally valid. The equation, $(a+b)^2 = a^2+b^2+2ab$, stands true on Earth, on Jupiter and even if the sun goes down. Maths exists entirely in the human mind, it's a mental concept, and I think this is the most beautiful concept ever made by the human mind. Maths and human beings are co-dependent to aid each other's growth.

When we get to the bottom of it, we see that math is an abstract representation of nature — element to element, shape to shape and relation to relation. This fundamental reason suggests that maths is no different from nature. Hence, any real-world problem can be solved in maths and any maths solution is effective in the real world.

What is the largest number your mind can conceive? What is the size of the universe? The answer to both these questions is the same- not infinity, but zero. Yes! The size of the universe is zero, and so is the largest number!

Let me explain. For every positive number there exists a negative number in maths. For every matter there exists anti-matter in nature. This is the big picture. Therefore when you put everything together, the size of the universe is zero. Zero is thus simultaneously everything as well as nothing. That's why it's called a whole number. You add or remove anything from this whole, it still remains a whole.

This beautiful conception was made in ancient India at a time when the rest of the world was busy figuring out whether the earth is flat or round.

It's really astonishing and makes me proud of the intellectual wisdom of ancient India, making such a ground-breaking revelation that changed the human thought process once and for all!

Kanak Lata Tripathi
2nd Year



Three years here at LSR felt like a gust of wind, full of beautiful memories. I remember how our seniors showed us around the campus and made sure we had everything we needed, and now, we are the seniors- time sure does fly! I will miss how we used to sing and dance on Bollywood songs whenever we would get the chance. I know it is easy to take our teachers for granted but it is difficult to forget their inspirational words. It is easy to misbehave in class but it is difficult to overlook their constant support. Thank you for overlooking our EASY's and never forgetting to do your DIFFICULT's. Thank you for supporting and enlightening us every time we felt low.

To my friends, I hope we always stay in touch and grow together. In the end, I think I'll always hold on to the dream of going on a department trip with you guys- praying that this turns true!

Avantika Banerjee
(Batch of 2017)



"After graduating I've taken a road not frequently travelled often by most Math department alumni. June - July were spent backpacking through Europe. In August I worked with the Ministry of Rural Development. September and October were spent in a completely different environment; I interned at a start up. In November I did my teacher's training course in yoga in an Ashram in Kerala and in December I served as staff at that same Ashram. I spent the first week of January turning a very dark shade of brown lying on a beach in Kerala and now I'm back home. Next month I will potentially be starting a new project. My takeaways from LSR are very honestly more personal and less academic. I got to meet many types of people. Some of whom I'm so glad to have in my life. Some of whom have changed parts of me. I would take this opportunity to acknowledge Ma'am Kakar, who has been a huge inspiration for me. I truly admire the lady for her unblemished passion and single minded zeal towards her subject. So, I thank LSR for being an ecosystem where I could find such beautiful specimens and evolve as an individual."

Vaani Chopra
(Batch of 2016)

This April marks 15 years since I first set foot in the red brick corridors that would be my home for the next 3 years.

I graduated in 2005 with a vague dream of becoming a Professor in Math, and I was evaluating suitable courses to pursue my Masters. However, life really must be seized in the moment - you never know what opportunity presents before you. I was recruited by McKinsey & Company in an unexpected campus drive and was put on a corporate rocket ship for the next 15 years filled with many surprise turns and new opportunities. It took me to live in Seattle, San Francisco and Dubai where I was in charge of 'Making Sense of Corporate Data'.

Problem Solving, Critical Thinking, Curiosity and a general *Friendship with Numbers* are the most valuable skills in the new era of Technology and Big Data. Some of these can be learnt at later stages as well, but acquiring these skills in school and college gives one a definite edge.

Every class, every lecture and all notes are precious - you never know which one ends up helping you and changing your life. The Newton-Raphson method was one of my interview question and my life was forever changed. (Thank you Ma'am)

I now run a company called GreyEquationConsulting which conducts Workshops on Data Analytics. I also consult SMEs and Large Enterprises on the application of Analytics in solving various Business Problems. I've travelled the world and I'm back to Delhi (for now) not far from campus. Life comes full circle.

Carpe' Diem! (*Seize the Day!*)



Sonali Chhabra
(Batch of 2002)