# QUANTUM

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## IN THIS EDITION

Math Week 2019 Ri Day CRYPTOPEDIA



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#### **EDITOR'S NOTE**

Greetings from the Editorial Board of Quantum 2018-19. We would like to thank the department for giving us the opportunity to work on the newsletter. This year Quantum had three digital editions, this is the final digital edition for the session 2018-19, we hope that these digital editions kept you up to date with the department events. In this edition we have endeavored to display the buzz of the quarter. We hope that it's an enjoyable read and thank those who contributed in its making.

## MATH WEEK 2019



The Department of Mathematics celebrated "Math Week" from 7th March, 2019 to 14th March, 2019 with much ardour. The ending date was scheduled to coincide with Pi Day – 03/14, which depicts the first 3 digits of the number  $\pi$ . The formal events of the week included a career talk with an alumna – Ms. Anika Jain,an interactive session with , Professor Aparna Mehra (IIT-D) an assembly celebrating Pi, and a workshop on SQL. The informal events included various games and competitions conducted by the students of the department. All events saw the participation of students and teachers from various departments.

#### TALK ON ACTUARIAL SCIENCES BY ANIKA JAIN

#### INTERVIEW WITH MS. ANIKA



The pioneer event of Math Week was a talk on "Actuarial Sciences" organized on

8th March, 2019. The talk was conducted by Ms. Anika Jain, an alumna of the Mathematics Department from the batch of 2017. She is a part-qualified actuary and works in the field of general insurance.

Actuarial science is a discipline which uses statistical models in hypothetical situations to analyze risk in insurance and then apply this knowledge in real world situations. It is a combination of subjects such as mathematics, finance, economics, computer science and statistics.



The workshop started on a promising note as students were so eager to know about this career option. She began with the basic definition of Actuarial Science and gave insights on various areas of its application, namely risk management, finance related mergers, probability estimation and schemes related to insurance. She believed that actuaries are "saviours of the financial world" as they possess the knowledge to predict the future! She further elaborated on the admission process and concluded by sharing her insight in this field. Some of the perks of this field are that one can choose the order of exams they want to appear for, one can get a job after clearing a few papers and education support is also provided by some companies. Furthermore, actuarial science professionals are among the highest paid in India, UK, US and New Zealand. She illustrated that this career is a perfect blend of theory and application.

The simple yet engaging presentation made it easy for everyone to understand

and have a clear picture of how things function in this domain.

#### What motivated you to take actuarial science?

One thing that really motivated me to take up Actuarial Science is that I will be predicting future. I always had this question in my mind "Where is maths applied in real life?" – this was one of the guiding factors that pushed me towards this field. Also, I wanted to do something GRAND and challenging!

#### How did the teachers and environment of LSR shape you for actuaries?

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#### How do you describe the transition from college to the real world?

There was some time after I completed my graduation as I did not get a job first-hand. It came to me as a surprise, that I do not have a job yet. But I was not disheartened, I knew that it's a long journey and even if I must wait, the wait would be worth it. I wanted to get into general insurance and that is why I turned down a few offers. Four months down the line, I got a job of my interest.

## **SQL WORKSHOP**

SQL is a standardized query language which is used to access and manage data in a database. It is designed to be a common language which interacts with different databases from different vendors. It is used extensively for relational database management systems.

![](_page_4_Picture_2.jpeg)

A two-day workshop on "Standardized Query Language" was organized by Department of Mathematics as a part of the Math Week on the 12th and 13th of March. The session was conducted by Mr. Vibhor Gupta from Weekendr.

The first session covered basics of SQL such as commands for defining how your data is stored, manipulating your data and transactions. During the second session students were given a lot of examples to solve which made their understanding better. A questionnaire was given to students, which required some brainstorming and hence helped the students to grasp the applications of basic commands. Within the short time period, the workshop proved to be fruitful and enjoyable. "I think the workshop was immensely beneficial. We covered various questions of different kinds which have a lot of applications in real life. The teacher was well versed with the subject and was patient throughout the workshop. Overall, I think it was an instructive and informative experience." Suhani Mathur, a second-year student

### ASSEMBLY FOR PI DAY

On 12th March, the Department organized an assembly to celebrate Pi Day. A video was screened, which talked about the origins, applications and other fun facts about the number Pi. This was followed by a short discussion about the same. The event team then conducted a fun rapid fire quiz, with questions such as naming movies with a mathematical name, or clicking a geometrical picture. The questions received prompt and witty answers from both students as well as teachers. Although it was a short assembly, it was fun and informative.

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![](_page_4_Picture_9.jpeg)

#### **GUEST LECTURE BY PROF. APARNA MEHRA**

On 14th March, Professor Aparna Mehra from the Department of Mathematics, IIT - Delhi, gave a lecture on the topic -"Experiences in the field of Mathematics". She shared many insights with the students and teachers about her experiences as a teacher as well as a learner.

Firstly, she talked about the kind of environment and outlook needed for learning beyond books and prescribed syllabi. She stressed on the importance of freedom - for teachers to choose what to teach, and for students to explore subjects and topics of their interest. If such freedom is imparted, students automatically become more inquisitive and updated with latest information, as opposed rote learning. On the other hand, teachers have to constantly learn new things to be able to guide their students. In such an environment, the focus is not just on marks and conventional learning but on maximizing knowledge and implementation. She shared her own experiences of sitting in lectures with her own students, simply to learn a new topic. Further, she talked about the emerging subjects related to mathematics such as Financial Mathematics, Machine Learning, Data Analysis etc. She then elaborated on the various topics of mathematics used in Machine Learning, such as Topology,

"The best thing about the lecture was that it didn't feel like a lecture at all, it was very interactive. Ma'am was very gracious and explained everything in a simple manner. She left us feeling like we could do anything, whether it was understanding Differential Geometry or blockchain." Vandita Shankar, a second year student Differential Geometry, Measure Theory and advanced Statistics. She also mentioned the usage of Galois Theory in Blockchain and Cryptocurrency. Similarly, many other fields which use various mathematical theories at their core were talked about. As a student, she was not made aware of the applications of such topics in real life, so she was unable to relate to them. On gaining the knowledge of these applications later, she has taken up the subjects again with much more enthusiasm and insight. She recommended all students to do the same and suggested online resources for related information.

Among all the mathematical insights, she shared many lighthearted moments with the students and teachers. Her anecdotes cracked everyone up and kept everyone thoroughly engaged. All in all, the session was very informative, interactive yet entertaining. She kept the interaction simple and understandable and prompted curiosity in the audience. Questions on course options and mathematical concepts were raised by the audience, which were met by detailed answers. Her drive for knowledge and humbleness inspired one and all. At the end of the session, Dr. Aparna was presented with a card and a token of appreciation on behalf of the Department, which was followed by a group photograph of all audience members with her.

"Ma'am's talk was the perfect mix of information and motivation. She had me hooked at the need for more experimental and flexible learning. I enjoyed her lucid presentation of Advanced Mathematics applied to financial markets and machine learning. Overall, a great initiative and a wonderful experience!" Khuisangmi Khongay, a second year student

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## **INFORMAL EVENTS**

#### MATHEMATICAL PICTIONARY

To flag off Math Week on 7th March, a fun and challenging version of Pictionary was conducted by the Department. The game was played in teams of two, with few simple rules. One team member drew chits, and had to draw the object written in the chit. The other team member had to decipher the object in 3 guesses. The mathematical twist here was that only certain shapes, such as – circle, square, straight line, trapezium etc. could depict the object. As it's easier said than done, the competition between the teams was intense, with strict scoring and time-keeping by the event management team. All teams kept a keen watch on their opponents' game play. Richa Sharma and Jaya Sharma (2nd Year, Mathematics) became the winning team. Srishti Bhardwaj and Rajshree Chandel (1st Year, Mathematics).

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![](_page_6_Picture_4.jpeg)

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Informal games were organized on11th March, 2019 during the lunch break. The games began with a lot of zest and excitement as students from various departments participated to challenge their mental abilities. In the first game, the player had to look at mathematical graphs and crack the Bollywood dialogue hidden in it. The second game was a two-player game in which numbers from 1 to 20 were displayed on the table. The players had to divide those numbers into 6 piles such that the sum of the numbers in each pile should be 35. The game triggered participants to use their knowledge of permutation as it may sound simple but was certainly a tremendous task.

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![](_page_7_Picture_1.jpeg)

## MATHLETICS

On 12th March, a fun competition to test mathematical and athletic abilities together was organized. Students were invited in teams of two and the event saw participation from multiple departments. One team member had to draw a chit having some exercise written on it, such as - jumping jacks, one leg hop etc. The other team member had to solve as many mathematics questions as possible, while the first member does the exercise for as long as she can. To add to the difficulty, the questions had to be solved mentally, without the use of calculators. The teams faced tough competition, with each competitor willing to exercise till their legs give out. To watch a solo exercise regime was somewhat a spectacle to behold in itself. Finally, Jaya Sharma and Richa Sharma (2nd Year, Mathematics) emerged victorious.

## MATHEMATICAL TAMBOLA

The Mathematical Tambola was held on the 13th March, 2019 and witnessed enthusiastic participants who wanted to grab the lucky ticket. There were three winning positions for completing each row on the ticket. The mathematical twist in this tambola was that the answer of each question was a numerical digit, which may or may not be on your ticket. For instance, "How many times did Ross got married in Friends?", "How many kids did Robert have in the Game of Thrones?" and so on. This series of intriguing questions kept on going until someone from the crowd shouted that she had crossed out an entire row. The winners of the Mathematical Tambola were Diya Basu (1st year, Mathematics), Navya Saini(2nd Year, Mathematics) and Saumya Singh (2nd Year, Mathematics).

## PI DAY (3/14)

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#### HAPPY PI DAY!

As the name suggests, Pi Day is an annual celebration of the mathematical constant Pi or  $\pi$ —the ratio of the circumference of a circle to its diameter. It is celebrated on 14th March every year. According to the Pi Day website, 'Pi Day is an annual opportunity for math enthusiasts to recite the infinite digits of Pi, talk to their friends about math, and to eat Pie.'

This year, the Department of Mathematics, Lady Shri Ram College for Women endeavoured to celebrate Pi Day—Math Week 2019 culminated to Pi Day. This special occasion was graced by Professor Aparna Mehra, from the Department of Mathematics, IIT Delhi.

While all of this sounds very fancy, it definitely begs the question-

'Why Pi?'

Pi is a constant—this means that it is the same for all the circles in the world.

As an irrational and transcendental number, Pi will continue infinitely without repetition or pattern. Owing to computers, today, we know over 10 trillion digits of Pi. This constant is highly useful and has a wide variety of applications. Aviation experts use Pi to gauge flight time and fuel use. Airplane engineers use Pi to help design airplanes. Pi is also used to design pendulums for clocks. Biochemists use Pi to understand DNA. Structural engineers use Pi to design buildings that can withstand earthquakes. It is used by NASA scientists to explore the features of planets like Mars.

Here's where you use Pi every day, whether a mathematician or not—GPS systems use Pi to calculate specific locations. If you knew all of that, go treat yourself to some Pi(e) (I would recommend Banoffee Pie) as you read on about Maths Week 2019. Actually, just go treat yourself to some pie anyway.

> ~ Compiled by Rajlaxmi Adwant, 2nd Year Sources: Raytheon, www.piday.org USA Today

## CRYPTOPEDIA

#### Fact Of The Day Series

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