JSS Academy of Technical Education, Noida

DEPARTMENT OF MATHEMATICS

MATHEMATRIX

The Official Newsletter

Volume 3 : Issue 2

INDEX

THE INSTITUTE

VISION

JSS Academy of Technical Education, Noida aims to become an Institution of excellence in imparting quality Outcome Education that empowers the young generation with Knowledge, Skills, Research, Aptitude and Ethical values to solve Contemporary Challenging Problems.

MISSION

- Develop a platform for achieving a globally acceptable level of intellectual acumen and technological competence.
- Create an inspiring ambience that raises the motivation level for conducting quality research.
- Provide an environment for acquiring ethical values and a positive attitude.

ABOUT THE DEPARTMENT

VISION

To strive for excellence in mathematics and promote interdisciplinary collaborative research leading to futuristic solutions.

MISSION

- To empower students with mathematical knowledge that will enhance their problem-solving capability.
- To encourage faculty to engage in interdisciplinary research activity and scholarly writing.
- To give an exposure to real-world problems and methods of solving, using tools and techniques of mathematics.

The Mathematics Department at JSSATEN, Noida, established in 1998, is located in Academic Block-V with a team comprising 1 Associate Professor, and 6 Assistant Professors, each holding a PhD in a distinct mathematics specialization.

Our faculty imparts mathematics education through regular and elective courses for undergraduates and postgraduates (B.Tech. and M.Tech.). The department's collective effort has led to consistently outstanding results. Several faculty members have authored textbooks for students and educators, along with over 100 research papers published in reputable international and national journals/conferences. Over time, the department has played a significant role in nurturing a robust mathematical foundation for students, a fundamental requirement for producing successful engineers excelling in their professions, both in India and worldwide.

PRINCIPAL'S DESK

*"**Mathematics**: the elegant art of solving life's intricate puzzles, the language of the universe, and the key to understanding the world's hidden order."*

DR. AMARJEET SINGH
(B.Tech. , M.Tech. , Ph.D.)
PRINCIPAL
JSSATE, NOIDA

With the divine blessings of his holiness Jagadguru Dr. Sri Sri Shivarathri Deshikendra Mahaswamiji, JSS Academy of Technical Education, Noida (JSSATEN) is recognised as one of the leading technical institutions. JSSATEN's vision is to impart quality outcome-based education (OBE) that empowers the young generation with the knowledge, skills, research aptitude and ethical values to solve real-world challenging problems. I am delighted to know that the Department of Mathematics is bringing out yet another issue of their famous newsletter during the current semester.

The collection of information summed up in this issue has all the necessary steps to educate aspiring students about the world of mathematics and its vast dimensions & its applications. I hope that the students and the readers will benefit from such an endeavour by the Department of Mathematics at JSSATEN.

I congratulate Dr. Bhupender Parashar, HoD (Mathematics), Dr. Ranu Pandey, Editor, the entire team of the Department of Mathematics and all the students for bringing out the current digital newsletter edition of "MATHEMATRIX" and wish them a great success.

FIRST YEAR COORDINATOR

DR. R S JAGADISH
FIRST YEAR COORDINATOR
& CHIEF WARDEN

In my capacity as the first year coordinator and chemistry professor, I hope to cultivate a vibrant JSSATE community of talented and genial students, instructors, and staff who are motivated to share knowledge and explore the scientific community on a daily basis.

By giving students an education that is both demanding and inventive, our committed faculty and staff hope to inspire and develop the next generation of enlightened engineers, scientists, mathematicians, and scientific leaders.

Our goal is to inculcate in our students a scientific attitude and a lifelong fascination with the world around us through research, teaching, and intellectual engagement.

These are the greatest instruments available to deal with a world that is changing quickly and make significant contributions to its improvement. We've done our job when students think of themselves as engineers/scientists after they graduate.

HOD'S DESK

DR. BHUPENDER PARASHAR
ASSOCIATE PROFESSOR &
HOD, DEPARTMENT OF
MATHEMATICS, ALUMNI
COORDINATOR , JSSATEN.

Mathematics is the backbone of Engineering; without it, Engineering would lack meaning. The creation of this current issue is a testament to the immense efforts, hard work, dedication, and patience exhibited by our editorial team.

'MATHEMATRIX' is dedicated to nurturing creative thinking, enhancing expressive abilities, and enlightening students about the vital importance of mathematics. Through this newsletter, we aim to provide valuable insights into mathematical tools and techniques crucial for Engineering/Management mathematics. We extend our heartfelt wishes to B.Tech. students, wishing them success in all their endeavors."

EDITOR'S DESK

DR. RANU PANDEY
(EDITOR)
ASSISTANT PROFESSOR
DEPARTMENT OF MATHEMATICS
ranupandey@jssaten.ac.in

It's a delightful moment to introduce the second issue (Volume III) of the Newsletter from the Department of Mathematics. This volume is filled with a diverse array of articles contributed by our experts, current engineering undergraduates, and a special write-up from our esteemed alumnus Mr. Aakash Garg from the batch 2015-19. In addition, this edition offers engaging puzzles, brain teasers, current affairs updates, and numerous opportunities within the field of mathematics. It also provides a glimpse of the activities that have taken place during this session.

I extend my heartfelt appreciation to the dedicated team for their efforts in ensuring that this issue is released timely. I must mention the outstanding contributions of our team of student volunteers - Harsh Jain (IT-4th year), Shagun Singh (EC-3rd year), and Somiya (IT-2nd year) for their exceptional ideas and also introducing the current fields wherein Mathematics has its prime role to play.

Celebrating the another launch of our newsletter, "MATHEMATRIX," I emphasize the significant role of mathematics in driving innovation and progress. The mathematical concepts and insights presented in this issue will undoubtedly contribute to global advancement. I firmly believe that "MATHEMATRIX" will serve as a milestone for aspiring engineers and anyone interested in the power and beauty of mathematics.

We eagerly await valuable feedback and suggestions from our readers, as this input will help us improve and refine our future issues. Our goal is to continuously strive for excellence and remain at the forefront of progress as time advances.

Wishing you all joyful learning and a good luck!

MATHEMATICAL HERITAGE OF INDIA

Harish-Chandra (1923-1983): He was an Indian American mathematician who made fundamental contributions to representation theory, especially in the context of Lie algebras and Lie groups. His work has had a significant impact on mathematics and theoretical physics.

Bhaskara II (1114-1185 CE): Also known as Bhaskaracharya, he contributed to algebra, calculus, and trigonometry. His works include the Lilavati (a treatise on arithmetic), Bijaganita (algebra), and Siddhanta Shiromani (astronomy and mathematics).

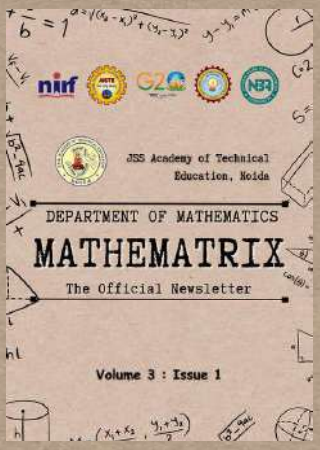
Madhava of Sangamagrama (1340-1425 CE): He is considered one of the founders of the Kerala school of astronomy and mathematics. He made significant advancements in calculus, including the discovery of infinite series for trigonometric functions.

Nilakantha Somayaji (1444-1544 CE): Nilakantha Somayaji made contributions to calculus and infinite series. He is known for his work on the approximation of π and the discovery of the series expansion for trigonometric functions like sine and cosine.

Radhanath Sikdar (1813-1870): He was a surveyor who is best known for his calculations during the survey of the height of Mount Everest. His accurate trigonometric calculations played a crucial role in determining the height of the mountain.

NEWS OF THE DEPARTMENT

- Dr. Z. K. Ansari, Professor & First Year Coordinator has got formally retired and bid adieu to the JSSATEN after serving more than 17 years in the month of October.
- Dr. Ranu Pandey invited as a judge in an ANNUAL TINKER FEST by Sarla Chopra DAV Public School, Sector-56, Noida held on 30 November 2023.
- Dr. Ranu Pandey discharged the responsibility as one of the core committee members in the two days' workshop on "Sustainable India 2023" held from 22-24 November 2023.
- Dr. Ranu Pandey delivered lecture as a speaker in one-week international FDP on "Applicability of Mathematical Sciences in emerging world" organised by Sathyabama Institute of Science and Technology, Chennai conducted from 07-12 August 2023.



- Successful release of the newsletter "MATHEMATRIX" edition, Vol. 3, Issue 1 in the month of August 2023.
- Ms (Dr.) Pragati Rajput joined the Department of Mathematics in the month of November 2023 as an assistant Professor. Her area of Research/ specialization is in Seismology from IIT, Dhanbad.

PUBLICATIONS/PATENTS

- Dr. Anushri Verma, Dr. Shalini Singh and Dr. Nikunj Aggarwal published the patent "A NOVEL METHOD FOR DEVELOPING FUZZY CODE WORD LENGTH IN NOISELESS CODING THEOREM", Application No.202311052783 A, on 01/09/2023.

NEWS OF THE DEPARTMENT

- Dr. Bhupender Parashar published the paper entitled "An Experimental Study on Design Mixes of Pervious Concrete for Optimum Compressive Strength" in the International Conference on Materials for Emerging Technologies (ICMET-2021), held on 18-19 Feb 2022 at Lovely Professional University G.T. Road Phagwara Punjab (India) and on September 2023.

- Dr. Bhupender Parashar published the paper entitled "Experimental Study on Physico-Mechanical Properties of Expansive Soil by Using Wheat Straw Fiber" in the International Conference on Materials for Emerging Technologies (ICMET-2021), held on 18-19 Feb 2022 at Lovely Professional University G.T. Road Phagwara Punjab (India) on September 2023.

- Dr. Bhupender Parashar published the paper entitled "A Sustainable Design of Energy Efficient and Environment Friendly Residential Building for Tropical Climate" in the International Conference on Materials for Emerging Technologies (ICMET-2021), held on 18-19 Feb 2022 at Lovely Professional University G.T. Road Phagwara Punjab (India) on September 2023.

- Nikunj Agarwal presented and published the paper "Multiple-attribute group decision-making based on improved aggregation operators in intuitionistic fuzzy framework" at NIT Jalandhar, India, International Conference on Pure and Applied Mathematics (ICPAM 2023), October 26-28, 2023 (online-Mode).

CONFERENCES/WORKSHOPS/WEBINARS/FDPS(ORGANISED/ ATTENDED)

- Dr. Anushri Verma and Dr. Shalini Singh attended a webinar on "Biohydrogen: A Carbon Neutral Fuel" organized By the Department of Chemistry at JSS Academy of Technical Education, NOIDA held on 22 July 2023.

NEWS OF THE DEPARTMENT

- Dr. Anushri Verma and Dr. Shalini Singh attended a webinar on "Biohydrogen: A Carbon Neutral Fuel" organized By the Department of Chemistry at JSS Academy of Technical Education, NOIDA held on 22 July 2023.
- Dr. Vinita Khemchandani attended one-week International FDP on "Applicability of Mathematical Sciences in emerging world" by the Department of Mathematics, Sathyabama Institute of Science and Technology, Chennai from 07 august 2023 to 12 August 2023.
- Dr. Anushri Verma and Dr. Shalini Singh attended a two-week FDP on "Nanoscience and Instrumentation" conducted by Applied Science Department at NITTTR, Chandigarh from 11 September 2023 to 22 September 2023.
- Department of Mathematics & JSSATE, NOIDA Alumni Association organized the webinar on "Mathematics in Quantum Computation" by an alumnus Mr. Aman Gupta, M.Sc. Physics, IIT Roorkee on 16 September 2023 coordinated by Dr. Ranu Pandey and Dr. Vinita Khemchandani.

- Dr. Vinita Khemchandani completed Innovation Ambassador Advanced Training "Foundation Level" MoE's innovation cell & AICTE in the month of September 2023.
- Dr. Ranu Pandey completed Innovation Ambassador Training "Foundation Level" MoE's innovation cell & AICTE in the month of September 2023.
- Dr. Ranu Pandey attended one-week FDP "Industry 4.0 Skill Development using AICTE IDEA LAB" sponsored by AICTE Training and learning Academy, JSSATE, Noida department of Electrical and Electronics Engineering held on 20 Nov 2023 to 26 Nov 2023.

WORDS OF ALUMNUS

Aakash Garg - ECE Branch (2015-19)

Maths Gives Us Every Reason To Hope That Every Problem Has A Solution -Aulash Waudre

Aakash Garg
Scientist in Ministry Of Defence
DRDO (Defence Research & Development Organisation)

I am Aakash Garg, presently working as a Scientist in Ministry Of Defence in DRDO (Defence Research & Development Organisation).I did my B.Tech from JSSATE Noida in the Electronics and Communication Engineering from 2015-2019 and was the JSS Topper and AKTU rank holder.I feel humble to express my gratitude to JSS which laid the foundation for my following achievements:

- Selected in UPSC (Union Public Service Commission, New Delhi) for IES (Indian Engineering Services),2023
- Selected in ISRO (Indian Space Research Organisation) & served as Scientist /Engineer , Group 'A', Class-I (Gazetted),2023
- Selected in DRDO (Defence Research And Development Organisation) as Scientist ,Group 'A', Class-I (Gazetted),2023
- Selected in Ministry Of Home Affairs (MHA) 2023
- Selected in Ministry Of Civil Aviation - Airport Authority Of India, 2023
- M.Tech From IIT Delhi (Indian Institute Of Technology, Delhi) in Optoelectronics and Optical Communication,2023
- Qualified BARC OCES/DGFS Examination (Bhabha Atomic Research Center ,Bombay)
- Qualified GATE 2019, 2020, 2021, 2022, 2023, 2024(AIR 127).

WORDS OF ALUMNUS

While mathematics undoubtedly serves as the foundational bedrock for every subject, navigating its complexities can prove daunting without proper guidance or ingenious tricks.At JSSATE Noida, my journey with mathematics transcended mere textbook theories and numerical problem-solving. Here, I delved into its transformative potential, learning how it intricately intertwines with diverse aspects of life, offering not just solutions but also the power to mould and elevate our existence. Armed with a profound grasp of mathematics, when other subjects put my math skills to the test,I excelled and emerged victorious, thanks to the invaluable support and guidance from the mathematics department.

But math isn't just about crunching numbers on paper; it's a life lesson, a guiding principle that shapes our approach to challenges. It's like the mod function of life; whenever I encounter an obstacle, I'm reminded that with the right attitude and confidence, I can transform any negative situation into a positive outcome. This sense of assurance and empowerment stems directly from my experiences with mathematics.

Indeed, the achievements I've garnered wouldn't have been possible without JSS; it has sculpted me into the individual I am today. I extend my heartfelt gratitude to the JSS Management, ECE department and the first year faculty members and an Administrative staff for their unwavering support in helping me to attain the goals of my life. Lastly, I'm grateful to be a part of "Mathematrix: The newsletter of mathematics department" for giving me the opportunity to express and share my views to the juniors through this medium. Looking forward to meet you all in days to come.

"Mathematics is the language in which God has written the universe," and through its intricate patterns, I've found the blueprint to realize my dreams.

AAKASH GARG

GUEST COLUMN

DECISION-MAKING UNDER UNCERTAINTY:

An introduction to different approaches

by

Dr. Rajkumar Verma

Postdoctoral Research Fellow School of Economics and Business Universidad de Talca, Ruta 118, Talca, Chile

rkver83@gmail.com

In today's complicated environment, the ability to make decisions despite the presence of ambiguity is not only a skill but also a necessity. The presence of uncertainty is a continuous companion in business, politics, and everyday life. This makes it challenging to make judgments that are properly informed and to navigate through ambiguity. To create strategies for surviving and thriving in unpredictable situations, highly developed decision-making approaches make use of probabilistic reasoning, mathematical models, and cognitive techniques. Let us have a look at some of these innovative methodological approaches:

Probability Theory

One of the most conventional approaches to dealing with uncertainty is the utilization of probability theory. Numerous numerical values are assigned to uncertain events in accordance with the theory of probability. These values represent the likelihood that the events will take place. For the purpose of making well-informed decisions based on probabilities, decisionmakers can compute predicted values, evaluate risks, and make decisions based on probabilities.

Bayesian Decision Theory

The idea of updating beliefs in response to new information is central to Bayesian decision theory. Adding new information and updating existing knowledge offers a framework for decision-making in the face of uncertainty. Decisions in Bayesian decision-making are based on the expected utility of each option, and probabilities are assigned to different possibilities. Even in situations where information is lacking or unclear, this approach enables reasonable decision-making

GUEST COLUMN

Monte Carlo Simulation

Monte Carlo simulation is a strong technique for making decisions in complicated systems with many unknown variables. To simulate the potential outcomes of a decision, thousands or even millions of simulations must be done. Monte Carlo simulation creates a variety of potential scenarios by sampling from probability distributions of input variables, enabling decisionmakers to evaluate the impact and likelihood of various outcomes. This approach is very helpful for scenario planning, optimization, and risk analysis.

Fuzzy Decision Theory

Traditional decision-making techniques frequently depend on precise information and clearly stated criteria. However, decision-makers frequently deal with ambiguity, imprecision, and vagueness in real-world situations, which makes it difficult to employ conventional procedures efficiently. Herein lies the application of the fuzzy approach to decision-making. The fuzzy approach recognizes and encourages the innate ambiguity and imprecision in many decision-making situations. Utilizing fuzzy logic and degrees of membership provides decision-makers with an adaptable and user-friendly framework that enables them to deal with subjective or partial data. The fuzzy approach's fundamental inspiration is human reasoning, which frequently works with compromises rather than restrictions. With linguistic variables and fuzzy sets, fuzzy logic enables representing ambiguous or uncertain concepts instead of strictly categorizing things or occurrences into discrete categories. The idea of membership functions, which gives elements degrees of membership based on how much they resemble a certain category, is one of the main ideas of the fuzzy approach. Fuzzy inference systems, which draw conclusions from fuzzy inputs using fuzzy logic rules, are another crucial component of the fuzzy approach. These systems imitate human decision-making using fuzzy logic and linguistic norms to handle uncertainty and ambiguity successfully.

Decision Trees and Influence Diagrams

Graphical tools for depicting and analyzing decision issues under uncertainty include influence diagrams and decision trees. Decision-makers can assess the expected value of each decision path by using decision trees, which show the sequential decisions and random occurrences that result in various outcomes. Influence

GUEST COLUMN

diagrams provide a more thorough framework for decision analysis by expanding this idea to include additional elements like dependencies, correlations, and objectives. Making decisions in complex situations is made easier and more organized with the help of these visual aids.

Real Options Analysis

Real options analysis, which originated in finance, applies the idea of financial options to actual decision-making. It entails determining the importance of adaptability and making intelligent choices in ambiguous situations. Real options analysis presents decisions as options that can be exercised, postponed, or abandoned in response to new information. This allows decisionmakers to see chances to create and capture value in market dynamics. This approach is especially applicable to sectors with high levels of uncertainty and extended time horizons for investments, such as technology, oil and gas, and pharmaceuticals.

Behavioral Decision Theory

An examination of how individuals make decisions when confronted with ambiguity is the focus of behavioral decision theory, which takes into consideration cognitive, heuristic, and psychological biases. By understanding the ways in which human judgment is distinct from normative theories of rationality, decision-makers can lessen the impact of biases and improve the quality of their decisions. It is possible that strategies such as scenario planning, debiasing, and decision framing could assist individuals in making more rational decisions when confronted with ambiguity. These strategies take into account the cognitive and affective limitations that individuals have.

Machine Learning and Artificial Intelligence

Decision-making has been transformed by artificial intelligence and machine learning developments, which have made it possible for computers to analyze huge amounts of information, recognize patterns, and make predictions in the face of ambiguity. Financial forecasting and medical diagnosis are only examples of the many choice issues that may be solved with supervised learning, reinforcement learning, and Bayesian inference. Machine learning algorithms are able to provide previously unthinkable insights and support for decision-making by utilizing the power of algorithms and computer resources.

GUEST COLUMN

To sum up, mastering uncertainty demands a blend of cognitive techniques, analytical tools, and probabilistic thinking. Cutting-edge decision-making techniques provide useful strategies for navigating uncertainty, evaluating risks, and taking advantage of opportunities in everchanging contexts. Individuals and organizations can make better informed, resilient, and successful judgments in the face of uncertainty by implementing these techniques into their decision-making processes.

About Dr. Rajkumar Verma

Dr. Rajkumar currently serves as a postdoctoral research fellow at the School of Economics and Business, University of Talca, Chile. Prior to this role, he held a position as a FONDECYT postdoctoral research fellow in the Department of Management Control and Information Systems at the University of Chile, Santiago, Chile. Dr. Verma earned his M.Sc. degree in Mathematics from Chaudhary Charan Singh University, Meerut (U.P.), India, in 2006 and later obtained a Ph.D. degree in Applied Mathematics with a specialization in information theory and computational intelligence techniques from Jaypee Institute of Information Technology (Deemed University), Noida (U.P.), India, in 2014. His scholarly contributions comprise over 70 research articles published in various reputable international journals, including the International Journal of Intelligent Systems, Expert Systems with Applications, Kybernetika, Journal of Intelligent and Fuzzy Systems, International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems, International Journal of Machine Learning and Cybernetics, Neural Computing and Applications, Informatica, Soft Computing, Cybernetics and Systems, Iranian Journal of Fuzzy Systems, Granular Computing, Applied Soft Computing and Applied Intelligence Review. Dr. Verma has actively participated in the scientific community by serving on the scientific advisory committees of numerous international conferences and acting as a reviewer for various refereed international journals. His current research interests encompass a broad spectrum, including information measures, aggregation operators, multiple attribute group decision-making, computational intelligence techniques, game theory, and computing with words.

https://scholar.google.co.in/citations?hl=en&user=pZI3kecAAAAJ
https://www.webofscience.com/wos/author/record/C-7011-2011?state=%7B%7D

MATHEMATICS' CONTEMPORARY RELEVANCE

The Aditya-L1 mission: an Indian solar observatory

Mathematics plays a crucial role in ISRO's (Indian Space Research Organisation) recent missions, as it does in all space missions. Some key areas where mathematics is applied in ISRO missions include:

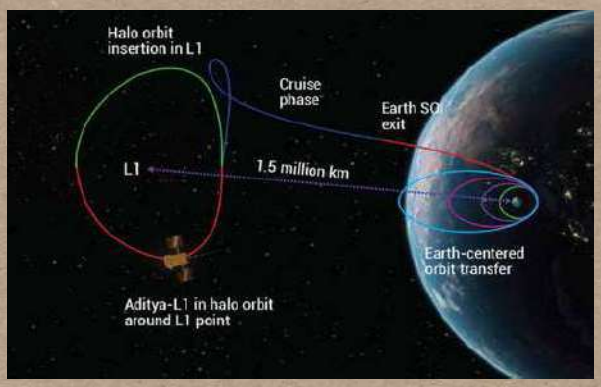
Mathematics is foundational to the design, operation, and optimization of **Aditya L1**, enabling it to fulfill its scientific objectives effectively in studying the Sun and its dynamic processes.
Some of the crucial role in its functioning and development:

Algorithm Development: Mathematics is fundamental in creating algorithms for various computations and simulations that Aditya L1 performs, such as data processing, image analysis, and numerical modeling.

Data Processing: Mathematical techniques are used extensively in processing the data collected by Aditya L1's instruments. This includes signal processing, statistical analysis, and error correction methods.

Orbit Calculations: Mathematics is essential for calculating and predicting the orbit of Aditya L1 accurately. This involves celestial mechanics, differential equations, and numerical methods.

Instrument Calibration: Mathematical models are used to calibrate the instruments on Aditya L1, ensuring accurate measurements and data collection.



Optimization: Mathematics helps in optimizing various aspects of Aditya L1's operations, such as power management, communication protocols, and data storage efficiency.

Simulation and Testing: Before deployment, Aditya L1's systems are simulated and tested extensively using mathematical models to predict performance, identify potential issues, and optimize operations.

MATHEMATICS' CONTEMPORARY RELEVANCE

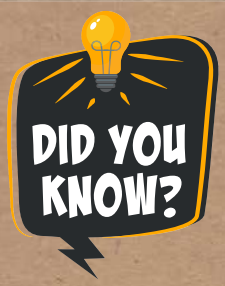
Image Processing: Mathematics plays a crucial role in image processing tasks onboard Aditya L1, such as image enhancement, segmentation, feature extraction, and pattern recognition. Techniques like Fourier transforms, convolution, and matrix operations are commonly used for these purposes.

Solar Dynamics Modeling: Mathematical modeling is used to understand and simulate various aspects of solar dynamics, such as solar flares, coronal mass ejections, and solar wind. Differential equations, numerical simulations, and computational fluid dynamics are employed to study these phenomena.

Navigation and Guidance: Mathematical algorithms are used for navigation, guidance, and control of Aditya L1 during its journey to and around its designated orbit. This includes trajectory calculations, attitude control, and orbit adjustments.

Error Analysis and Correction: Mathematical tools are used for error analysis to identify and correct inaccuracies in Aditya L1's measurements and observations. This ensures the reliability and accuracy of the scientific data collected.

Communication Protocols: Mathematics is involved in designing efficient communication protocols and encoding schemes for transmitting data between Aditya L1 and ground stations. This includes error detection and correction codes like Reed-Solomon codes and convolutional codes.



Why India's first-ever Mission to the Sun is named Aditya – L1, of course, Aditya means the sun itself but what about L1, what does it mean?

L1 means a point in space where the gravity between the two celestial bodies cancels each other enabling the spacecraft to hang around there with minimum effort and fuel.

STUDENT'S COLUMN

'The Mathematical Marvels Behind the IPL: A Cricket Enthusiast's Guide'

-Harsh Jain

Cricket fever is in full swing as the Indian Premier League (IPL) captivates fans worldwide with its electrifying matches, star-studded lineups, and nail-biting finishes. But did you know that behind the glitz and glamour of the IPL lies a world where mathematics plays a pivotal role? Let's delve into the fascinating ways mathematics influences the IPL and how it adds a unique dimension to the cricketing spectacle.

- **Player Auctions**: The IPL auctions are a high-stakes affair where teams bid for the best cricketing talents. But how do they determine a player's worth? It's all about mathematical analysis! Teams use complex algorithms to assess players' past performances, predict future contributions, and allocate their budget efficiently within the salary cap constraints.

- **Game Strategy:** Every match in the IPL is a strategic battle where team makes crucial decisions that can turn the tide of the game. Mathematics comes into play here through statistical analysis. Teams analyze player data, pitch conditions, and historical trends to devise optimal batting orders, bowling rotations, and field placements, maximizing their chances of victory.

STUDENT'S COLUMN

'The Mathematical Marvels Behind the IPL: A Cricket Enthusiast's Guide'

- **Tournament Format**: Have you ever wondered how IPL's tournament format is designed? It's a mathematical marvel! The round-robin format, playoffs, and finals are carefully structured to ensure fairness and excitement throughout the season. Mathematical calculations determine team standings, net run rates, and qualification criteria for the playoffs, adding a layer of complexity to the tournament.

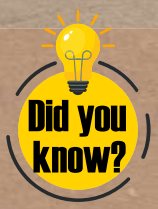
- **Broadcasting and Analytics**: Ever noticed those captivating graphics and statistical insights during IPL broadcasts? They're made possible by mathematics! Real-time data analysis, graphical representations, and statistical models provide viewers with a deeper understanding of the game, enhancing their viewing experience and appreciation for the sport.

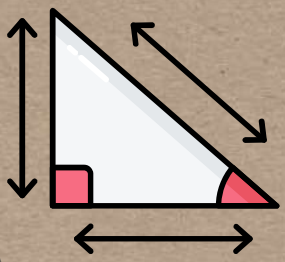
- **Fantasy Cricket**: For many fans, IPL isn't just about watching matches; it's about participating in fantasy leagues where they can create their dream teams. Mathematics is at the heart of fantasy cricket, as participants use statistical models to select players, predict their performances, and compete against friends based on points earned from real-life matches.

In conclusion, mathematics is not just a subject confined to textbooks; it's a fundamental part of the IPL's DNA. From player auctions to match strategies, fantasy cricket to tournament formats, and broadcasting to analytics, mathematics adds an intriguing dimension to the cricketing extravaganza that is the IPL. So, the next time you watch a match, remember the mathematical marvels happening behind the scenes, and let it amplify your enjoyment of the game!

INTRIGUING FACTS

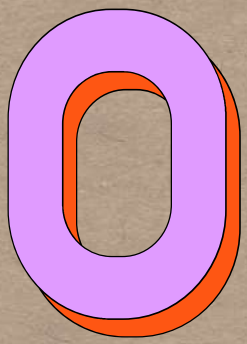
National Mathematics Day *is celebrated on* ***December 22nd*** *in honor of the birth anniversary of the renowned Indian mathematician, Srinivasa Ramanujan.*





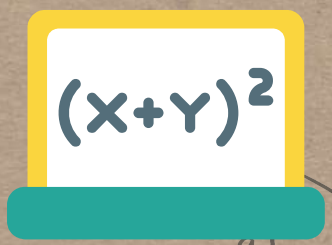
Trigonometry: Indian mathematicians made significant contributions to trigonometry. The trigonometric functions sine, cosine, and tangent were studied in ancient India for their applications in astronomy and geometry. Aryabhata and Brahmagupta, among others, made important advancements in trigonometry.

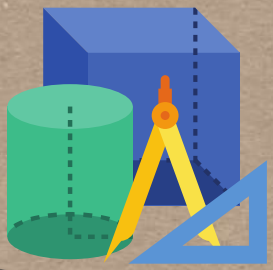
Zero and Decimal System: The concept of zero as a number and the decimal system were introduced to the world by Indian mathematicians. Aryabhata, an ancient Indian mathematician and astronomer, is credited with developing the concept of zero as a number around the 5th century CE. The decimal system, including the use of decimal points, was also refined in India during this time.



Indian Numerals: The numerals we use today (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) are known as "Arabic numerals," but they actually originated in India. They were introduced to the West by Arab scholars who learned about them from Indian mathematicians. These numerals revolutionized mathematics and made complex calculations much more accessible.

Algebra: Indian mathematicians developed algebraic techniques, including solving quadratic equations and indeterminate equations. Bhaskara II, a 12th-century mathematician, made significant contributions to algebra with his works on algebraic equations and number theory.





Geometry: Indian mathematicians were adept in geometry, particularly in the context of astronomical calculations. They studied geometric shapes, angles, and measurements, which were crucial for their work in astronomy and architectural design.

STAR PERFORMERS

SR. NO.	ROLL NO.	NAME	BRANCH	MARKS (100)
1.	2200910200024	PRIYANSHU VARSHNEY	EE	100
2.	2200910100172	SURYANSH BHATI	CSE	99
3.	2200910130109	MOHIT KUMAR	IT	98
4.	2200910130017	AKSHAY GOEL	IT	98
5.	2200910100127	PRIYANSHI NEGI	CSE	97
6.	2200910100134	RIYA AGGARWAL	CSE	97
7.	2200910100181	VANSH BHARDWAJ	CSE	97
8.	2200910130135	PULAK JAKHMOLA	IT	97
9.	2200910100153	SHREY AGRAWAL	CSE	96
10.	2200910130110	MOHIT NEGI	IT	96
11.	2200910130131	PRAKHAR GUPTA	IT	96
12.	2200910130069	DISHA PANDEY	IT	96
13.	2200910100060	DHRUVA GUPTA	CSE	95
14.	2200910130038	ARYAN ADITYA BANSAL	IT	95

STAR PERFORMERS

SR. NO.	ROLL NO.	NAME	BRANCH	MARKS (100)
15.	2200911530085	PUSHPENDRA KUMAR RATHOUR	AIML	95
16.	2200910100049	BHAVANA TIWARI	CSE	94
17.	2200910100111	NIHARIKA MOTWANI	CSE	94
18.	2200910130185	VANSHIKA CHAUHAN	IT	94
19.	2200910130028	ANSHIKA GOEL	IT	94
20.	2200911540106	SHREYA SHUKLA	CSDS	93
21.	2200911540122	VANSH GUPTA	CSDS	93
22.	2200911530047	HARSHVARDHAN SINGH	AIML	92
23.	2200910100115	NITIN KUMAR	CSE	92
24.	2200910100157	SHREYANSH SAINI	CSE	92
25.	2200910100164	SHUBHANKIT CHATURVEDI	CSE	92
26.	2200910100103	MITHUN RAJPUT	CSE	91
27.	2200910310088	KASHISH GUPTA	ECE	90
28.	2200910100190	VEDANT SANGAL	CSE	90
29.	2200911540130	VISHAL YADAV	CSDS	90

STAR PERFORMERS

SR. NO.	ROLL NO.	NAME	BRANCH	MARKS(150)
1.	2100910310014	AISHWARYA SRIVASTAVA	CSE	144
2.	2100911540058	VIKRAM SINGH	CSE	144
3.	2100910100150	SARVESH CHANDRA MISHRA	CSE	143
4.	2100910310142	SHREYANSH DUBEY	CSE	141
5.	2100910310005	ABHINAV AIRACHIA	CSE	140
6.	2100910100158	SHREYA MAURYA	CSE	140
7.	2100910310017	AKASH MISHRA	CSE	139
8.	2100910100029	AMAN VERMA	CSE	136
9.	2100910130090	SAKSHAM SHARMA	CSE	136
10.	2100910200013	AMISHA VERMA	EE	136

MATH-E-MAGIC

- From the number 0 to the number 1000, the letter "A" appears only in?
- Which 3 numbers have the same answer whether they're added or multiplied together?
- At a Christmas party, everyone shook hands with everyone else. There were a total of 66 handshakes that happened during the party. How many people were present?
- A man is currently 4 times older than his son. In 10 years, the man will be three times older than his son. What is the man's age presently?
- What will be the last number in the following series of numbers? 32, 45, 60, 77, ?
- 1=3, 2=3, 3=5, 4=4, 5=4 then 6=?

ANSWERS:

- 1,000 (One thousand)
- 1,2 & 3
- 12
- 80 years
- 96
- 3

THE EDITORIAL TEAM

DR. BHUPENDER PARASHAR
ASSOCIATE PROFESSOR & HOD,
DEPARTMENT OF MATHEMATICS, ALUMNI
COORDINATOR, JSSATEN.

DR. RANU PANDEY
(EDITOR)
ASSISTANT PROFESSOR
DEPARTMENT OF MATHEMATICS

STUDENT VOLUNTEERS

As we set sail on this mathematical adventure, I extend my warmest wishes to all our readers. May it serve as a beacon of knowledge and motivation for mathematics lovers worldwide. I'd like to take a moment to express my deep gratitude to Dr. Bhupender Parashar Sir & Dr. Ranu Pandey Ma'am to give me the chance to work on the newsletter. In the end, I'd also like to thank the team for their tireless effort and dedication .

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As we embark on this mathematical journey, I extend my heartfelt best wishes to this newsletter for luck, inspiration, and boundless success. May it become a remarkable resource and a beacon of motivation for mathematics enthusiasts everywhere. I also want to take a moment to express my deep appreciation for the team's unwavering hard work, dedication, and collaborative effort in bringing this newsletter to life.

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I wish to emphasize the indispensable role played by our Mathematics newsletter in nurturing a vibrant academic community and facilitating the exchange of knowledge among peers. Let us persist in our endeavors, for it is through our collective commitment that we can further enrich our academic environment. Your steadfast guidance is deeply appreciated.

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