CHRYSALIS

THE MATHEMATICS DEPARTMENT NEWSLETTER 2007 - 2008

It took one ECA period and a four - way discussion for CHRYSALIS, the idea to be born. It took six weeks and loads of enthusiasm (some published and some unpublished) from the student body for CHRYSALIS, the ms word document to take shape. And finally, it took the untiring efforts of our production team for CHRYSALIS, the newsletter to emerge.

It has been our endeavour to make this newsletter, a channel for creative expression. With this newsletter, we give you snapshots of what the mathematics department of LSR is really like. We would like to thank the faculty for their constant support and unconditional belief in us.

With this, the maiden edition of CHRYSALIS is ready to take flight. We hope you enjoy reading it as much as we enjoyed creating it….

— TEAM CHRYSALIS

THE INSIDE STORY

OF MATHEMATICS AND MATHEMATICIANS showcases how are amateur mathematicians have discovered mathematics in nature. Also, a tongue in cheek take on mathematical jargon and a witty account of the havoc unleashed by the weapons of math destruction.

In MOSAIC, you will discover that mathematicians are essentially philosophers and poetry is intrinsic to them.

Find out about all that the department has been up to in the last one year in GLIMPSES OF THE YEAR GONE BY. includes reports of all our major events and also a photo spread.

In MUSINGS our budding writers have tried to shatter the myth that mathematicians cannot write. From angst against gender bias to the power of positive thinking, there's something for everyone.
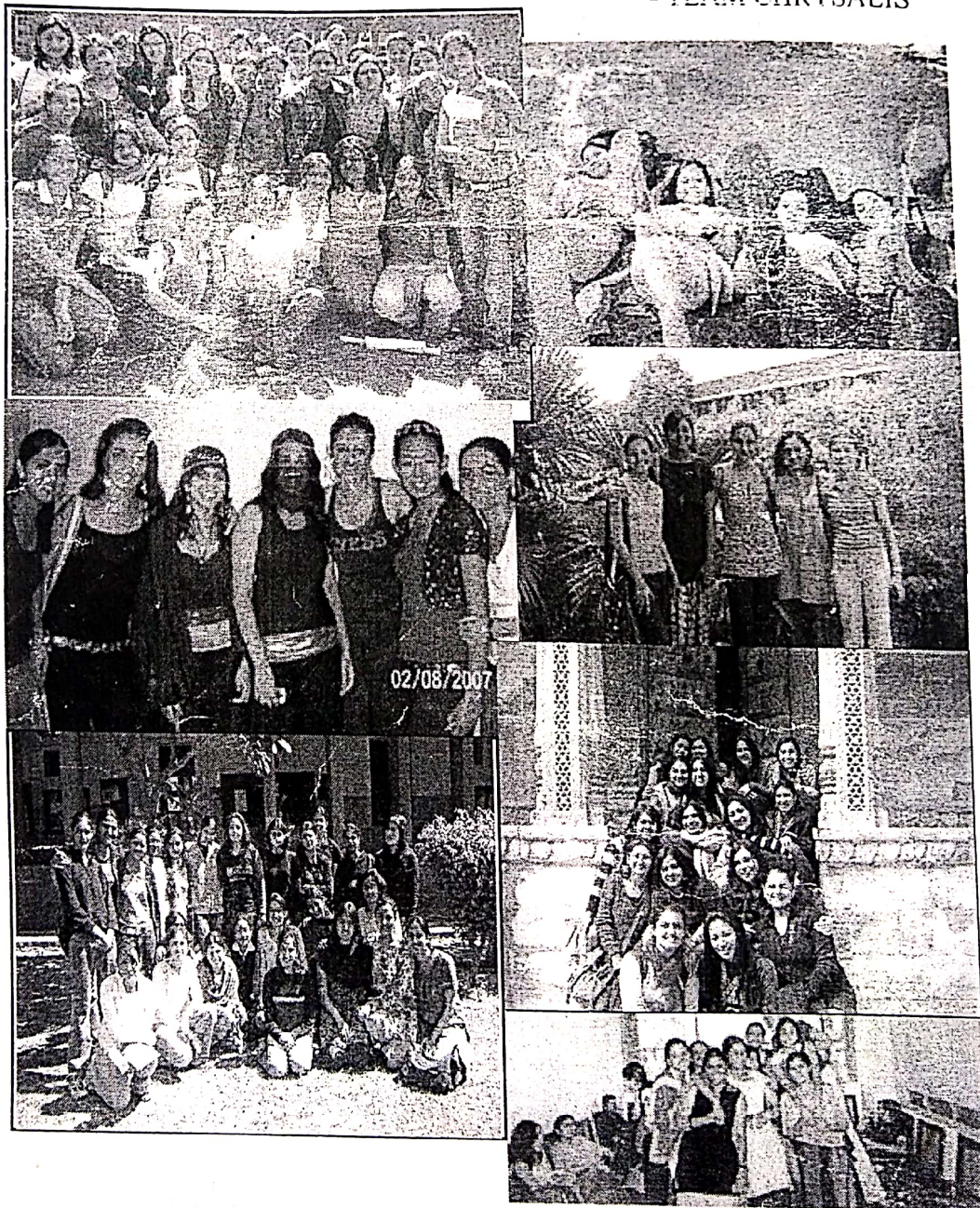
MOSAIC

OF BEING AT LSR

The excitment
The nervousness, all mixed together

The rain and a stranger girl
Asking for space under the umbrella
The 'Oh I missed' reaction
for Economics
The breakthrough moment
of entering the college gate

The Saree clad women
Oh the seniors
The perfection, the grace
The 'Passage De Tour'
to another world of
Freedom, Independence, Empowerment
Of being a Feminist
The Pride of being an LSRian
The realization of being an achiever
Amongst numerous applicants across the country

Mg's welcome note,
Nidhi Razdan speaking of her
Glorious college days

The desire, the ambition, the aspiration
To put oneself
Onto another level,
A Higher degree
To unlearn now what we had learnt.\

Deepika Guglani
B.A.(Hons.) Mathematics, 1st Year

new place
new face
new identity
new friends
new love
new sanity
new me,.??..NO
i don't
i wont
u cant
let me lose me...
i shan't
am not...

i promise..

ADIBA KHAN
B.A.(Hons) Mathematics
Second Year

THIS SHALL PASS AWAY.....

All rejoice to the hilt
All celebrate to the maximum
For this shall pass away
The stars shone last night
For today is another day
This shall pass away.
People dwell into thoughts
Rise up and shine and move away
For this shall pass away.
The darkness gone
The sunlight bright
All days seem bygone
another star,galaxy,light
All come and go
For this shall pass away
Another fight, another feud
Now forbidden and forgotten
A new day has arrived
And now it has gone
For this shall pass away.....

DEEPIKA GUGLANI
B.A.(Hons) Mathematics First
Year

REALISATION

Like dust on cover I blow it away
Like moisture on glass I wipe it off
And now I cleanse myself off you
And now the new ways I adopt

I don't see you anymore walk past me now
I don't fear your shadows that once haunted me
Yes I have broken free from your chains-my past
And now in a new bright light I see

Lived a fake dream
You painted me a fake picture
With all the colors I desired
Spun a story with all the characters
And now I douse the stage with my fire

Erasing all your memories
But recollecting all the pain
I wake up to myself and move on
And wish that I don't take the same road again.

ADIBA KHAN
B.A.(Hons) Mathematics Second Year

FRIENDS

The old man turned to me and asked.
"How many friends have you?"
Why 10 or 20 friends have I,
And named off just a few.
He rose quite slow with effort,
And sadly shook his head,
"A lucky child you are,
To have so many friends", he said.
"But think of what you're saying,
There is so much you do not know,
A friend is not just not someone,
To whom you say 'Hello'.
A friend's a tender shoulder,
On which to softly cry.
A well to pour your troubles down,
And raise your spirits high.
A friend is a hand to pull you up,
From darkness and despair.
When all your other 'so called' friends,
Have helped to put you there.
A true friend is an ally,
Who can't be moved or bought.
A voice to keep your name alive,
When others have forgot.
But most of all a friend is a heart,
A strong and sturdy wall.
For from the hearts of friends,
There comes the greatest love of all!
So think of what I've spoken,
For every word is true.
And answer once again my child,
How many friends have you?"
And then he stood and faced me,
Awaiting my reply,
Softly I answered
"If lucky...one have I,
And that is you!!"

NIKHITA MEHRA
B.A.(Hons) Mathematics Second Year

GLIMPSES OF THE YEAR GONE BY

THE MATHEMATICS DEPARTMENT TRIP

One of the most awaited weekends for almost everyone in the mathematics department, the trip to Jodhpur delivered to everyone's expectations and much more.

It officially began at the "comesum" restaurant at Old Delhi Railway station and the excitement in the air was palpable. Everywhere you looked you could see a bunch of girls laughing and clicking photographs. When everyone had arrived, attendance was taken, and goodbyes were said, no one could wait to leave for Jodhpur immediately. The people traveling by "Mundor Express" were in for a shock when 46 loud and eager girls got on and immediately started singing, playing cards or roaming from one seat to another. The "antakshari" continued late into the night even after everyone else had miraculously managed to go to sleep despite the amount of noise around and the freezing gusts of wind which kept entering through the stubbornly open windows. What felt like a minute later, we were being woken by Rashmi and Anushree to hurry up and get ready as we were about to reach. Even after only a few hours of sleep, we all were full of energy and excitement over our impending days in Jodhpur.

We reached the "Shriram International" hotel by about 9 am and checked into our rooms furnished for 4 girls each, but which were still very comfortable. Breakfast was by the pool side, which, if it weren't for the cold, looked extremely inviting. Everybody enjoyed the food and then we were told to hurry up and assemble within an hour. With four girls to a bathroom, it was a miracle how we managed to get ready even in two hours. We left by bus for Mehrangarh fort which is located on top of a hill and from where you could see exactly why Jodhpur is called the blue city. Everyone was dumbfounded by the sheer beauty of the fort, the exquisite handcrafted windows and the truly spectacular rooms. Nobody wanted to leave but we had to, in order to reach our next destination, Umaid Bhavan palace, where we visited the museum and art gallery. We reached back in time for lunch and the after an hour or two "rest" (which basically included washing our faces and chatting) we left to go the market for shopping. Almost everyone picked up either a juti or a bandhini dupatta. Once back in the hotel, we all got together in the party hall and danced for a few hours; even Sucheta Ma'am and Arunima Ma'am joined us enthusiastically, and after dinner, we went back to our rooms. Nobody could even think of sleeping and once again we were up with only a few hours of sleep, ready to go see the sand dunes of Jodhpur. The journey took 2 hours and we stopped on the way to see some temples, but the highlight, of course, were the dunes themselves. Almost everyone enjoyed a camel ride; people were shrieking all over for someone to click their photographs on the camel or just on the dunes. We enjoyed rolling in the sand, running down the slopes and just enjoying the beauty of the place for a few hours and then left for the hotel one last time. A few girls stayed back while a few went shopping one last time and then, after a group photograph or ten, we left for the station, back on the "Mundor Express" we came by.

Nobody wanted to leave but alas, we had to. Everyone was exhausted but no one could stop raving about how much fun we all had.

Thank you Sucheta Ma'am, Arunima Ma'am, Rashmi and the entire department for making this trip as great as it was!

RUSHIL PRAKASH
B.A.(Hons) Mathematics First Year
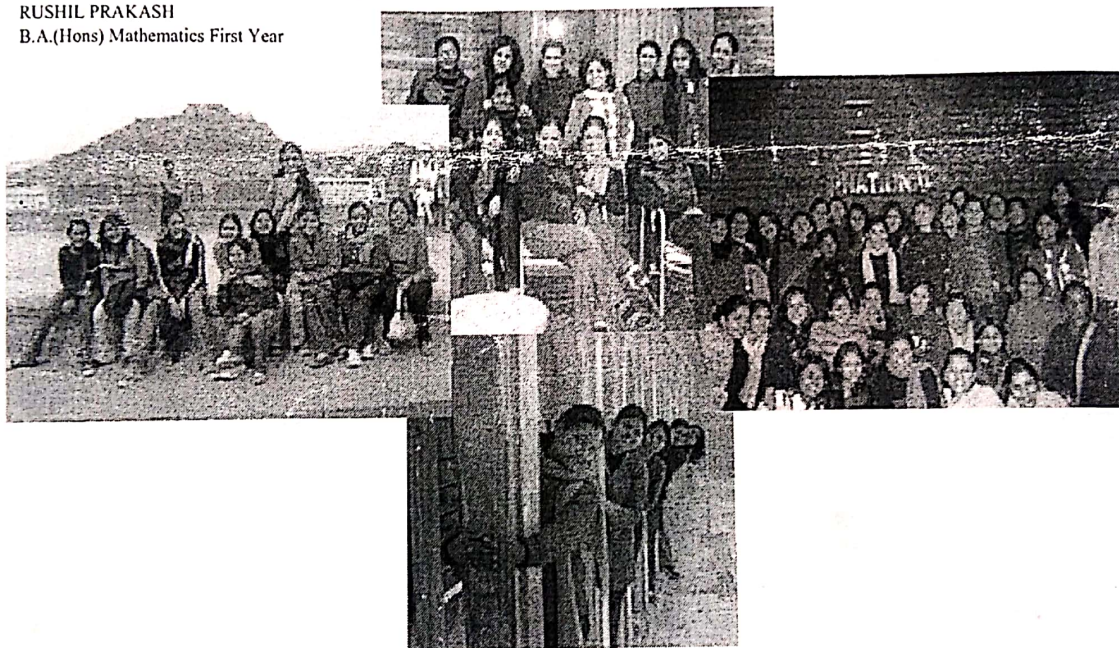
FRESHER'S PARTY

The batch of 2010, Mathematics Honours, was welcomed with customary flourish and fanfare by their seniors at LSR College on a bright, sunny Thursday afternoon on August 2, 2007.

The exotic Arabian Nights theme provided the freshers an ideal opportunity to go all out and dress up, and the results were dazzling. Mystical veils, sparkling tiaras, and hipster harems were the order of the day. Some girls resembled Arabian princesses, some belly dancers, others genies and some not remotely Arabian at all! Each fresher was required to give a brief introduction of herself to the entire department- the seniors and members of the faculty.

As part of the entertainment, the freshers presented a hilarious, side splitting spoof on south Indian movies. They also danced to the energetic beats of 'Glamorous.' Sakshi's melodious rendition of

'Jadu hai nasha hai...' was enjoyed by all, as was the song sung by a group of first year students.

The second year girls, very appropriately, danced to the seductive beats of 'Mayya, Mayya ...' in keeping with the Arabian theme of the party.

The third year seniors also presented a dance item, making the experience of the fresher's party a highly memorable one.

The Miss Fresher contest had five finalists---H.B. Sahana, Rushil Prakash, Tara Sharma, Sneha Gupta and Kriti Badhwar. Finally, the confident and articulate H.B. Sahana was adjudged Miss Fresher, and the lady in black, Rushil Prakash, the Best Dressed.

The certificates for the years Anupama Dua Paper Presentations were also distributed.

The fresher's party provided an ideal informal forum for interaction between the new entrants, the seniors and the faculty. The curtains descended on yet another Fresher's Party with all assembled moving to the LSR Café for the much needed (after all the exertions) and much awaited refreshments.

JAZA BHAVANI
B.A.(Hons) Mathematics First Year

"Small minds discuss persons. Average minds discuss events. Great minds discuss ideas. Really great minds discuss mathematics."
Anonymous

And thus came that time of the year again for the gathering of the "really great minds" of Delhi University. Adrian Mathesis had once said: "The greatest unsolved theorem in mathematics is why some people are better at it than others." Yet on this day the allegedly mathematically challenged set aside their fears and the small minds, the average minds, the great minds and also the really great minds congregated to celebrate and spread the forgotten message of the beauty, the fantasy and the sheer joy that is mathematics.

Thus on the 21st of September, 2007, the Mathematics Department of Lady Shri Ram College organized its annual Mathematics Festival, Horizon. The event saw the participation of 47 colleges across Delhi University including the likes of IIT-Delhi, Hindu College, Jesus and Mary College together with an enormous group of enthusiasts from the hosting college. Perhaps the most fascinating attribute of the event was that, despite the fear and revulsion which many from other disciplines feel for Mathematics, the festival was largely attended by those pursuing other subjects.

The festival was inaugurated by Professor Rajendra Bhatia of Indian Statistical Institute, an eminent Mathematician who has authored and edited a collection of books on Mathematics and has been invited across the globe to speak on the subject. The Principal of Lady Shri Ram College, Dr. Meenakshi Gopinath also graced the occasion. The opening ceremony began with the traditional lighting of the lamp of knowledge signifying the rejuvenation of enlightenment. After a brief speech by the Principal, the opening event of day commenced- A Talk on Infinity by Professor Rajesh Bhatia.

An eloquent speaker, a prolific scholar with an in-depth knowledge on the subject, Professor Bhatia enthused teachers and students alike with an invigorating presentation on infinity. The most engaging aspect of his presentation was that it was interspersed with interesting quotations and practical examples. This made it easier for non-Mathematicians to grasp the technicalities of the subject. Beginning his talk with how the process of counting dawned on the human mind when stones were used to count cattle, he went on to relate the one to one correspondence between two groups such as stones and cattle, two circles or a man with his shadow. After defining infinity with various every day examples, he wondered how strange it is that the series of prime numbers is infinite when one expects larger numbers to have more factors. Since according to Euclid the whole is greater than the part, according to Cantor an infinite set is one which can be placed in one to one correspondence with a proper subset of itself. Galileo had inferred that the totality of all numbers is infinite and therefore operations such as equality, greater than or lesser than do not apply to infinite quantities. Here Professor Bhatia stated the paradox that states whether there exists a consistent arithmetic of infinities. He then began to explain the significance of cardinal numbers and countability and the fact that from any infinite set one can extract a countable set.

In a lighter vein, Professor Bhatia remarked that Mathematicians often describe Mathematics as a 'beautiful' subject. The toothy grins on the faces of the LSR Mathematics students bore proof to his statement. The Professor artfully continued by saying that he had listed the attributes that made the subject 'beautiful': depth, an element of surprise, power, the strength of generality, economy and elegance. The contented smiles on the faces of the departmental teachers were unmistakable.

The college premise was brimming with energy as the other events of the day proceeded. The Mathematical Quiz was not a competition for the faint-hearted as it tested the true spirit of the budding Mathematician. The honour went to the team from IIT-Delhi. Another intriguing event was the Mathematical Rangoli in which the participating teams were to design rangolis using any Mathematical symbols. The vibrant and innovative creations of the participants re-established the 'beauty' of Mathematics. The winner of this event was the team from Jesus and Mary College. Tangrams, an event which everyone enjoyed, were incorporated for the first time in Horizon. Tangrams are Chinese puzzles which consist of seven geometric shapes to be pieced together in such a way so as to form a particular figure. It was perhaps the first time that such a competition was organized at a college level Mathematical festival and it turned out to be a giant success as it invigorated the logical and the creative minds and enhanced the fun quotient while the participants engaged in animated discussions. The final event of the day was What's the Good Word? It was a medley of rounds like crosswords, guess the mathematician, etc; and the winners at this event were the team from LSR.

And hence concluded another mammoth effort sincerely put together by the teachers, the executive board and the student body of the department. As a concluding thought, it would be apt to reiterate the quotation from William Shakespeare's Romeo and Juliet with which Professor Bhatia ended his talk.

".......My bounty is as boundless as the sea, my love as deep; the more I give to thee, the more I have, for both are infinite...."

As contradictory to the very characteristic of Mathematics as the above lines may seem, it is in fact in absolute coherence with the yet undiscovered poetry that lies in the very essence of the subject of Mat'

RANJAVATI BANERJI
B.A.(Hons) Mathematics Second Year

IN MEMORY OF ANUPAMA ...

The Anupama Dua Scholarship Function holds a very special place in the annual calendar of the department of Mathematics because it is the day when we celebrate the spirit of a very special person -Anupama Dua.

Anupama was, in many ways the sort of woman each one of us aspires to be. A brilliant student and a dedicated mathematician, she was a ray of sunshine for all those who were blessed enough to know her. The function is a tribute to her various facets. We pay homage to her academic excellence by recognizing the efforts of meritorious students from within our department. We celebrate her inherent quest for pushing the boundaries of her mathematical knowledge by presenting papers on a vast array of mathematical concepts, which extend beyond the limits of our curriculum. And finally, we commemorate her vibrant and friendly nature by coming together to make the event possible.

The 14th edition of this function was no exception. The day started on a somber note, with the department observing a minute's silence for the departed soul. The teachers, then, shared their memories of Anupama, the student. Thereafter, Mrs.. and Mr.. Dua gave away the scholarship instituted by them in their daughter's memory. The recipients of this year's scholarship were Pooja Kumra (3rd year), Neha Kalra (3rd year), Shruti Johari 2nd year) and Prarthna Singh (2nd year).

The presentations that followed covered the gamut of mathematical subjects from the classical graph theory to the fairly recent chaos theory. Some participants explored the role of mathematics in areas as diverse as architecture, animation and astrology. These were interspersed with presentations on topics in applied mathematics like cryptography and origami.

The emotional climax of the day was however, the nurturing of the tree planted in LSR in memory of Anupama. It was indeed a poignant moment as the bereaved parents watered the, now in bloom, bottle brush tree. I pray that Anupama's memory continues to inspire us for all times to come.

RASHMI MEHROTRA
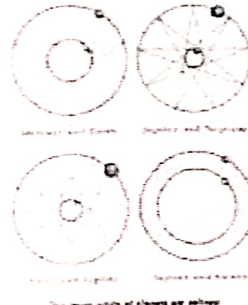B.A.(Hons) Mathematics Third Year

HIDDEN GEOMETRY

Geometry is present everywhere, whether we see it or not. It is present sometimes so blatantly that we do not even see it and then it is present in such ways across the world that we cannot help but be amazed by its uses through the ages and in the present.

The term geometry comes to us from two Greek words: "geo" meaning "earth" and "metrein" meaning "to measure". This is an accurate description of the works of the earliest geometers, who were not only interested in measuring the size of fields and laying out accurate right angles for corners of buildings, but also in measuring distances in space. The Greeks, in particular, seemed to be obsessed with measuring the size of the earth, the distance of the moon from the earth and the distance of the earth from the sun. They used simple techniques like the properties of reflection and alternate angles and their knowledge of lunar eclipses to solve these, and succeeded in determining their values extremely accurately. Geometry was also used in other countries and by other civilizations. In ancient Egypt, it was used to re-establish boundary lines on the plots of land affected by the Nile overflowing its banks. It was also used in the building of the pyramids to lay out bricks at exact right angles for the corners, to create a stable pyramid by designing it so that its height equaled 2 diameters of a circle and its base equaled the circumference of the circle. It was also used to provide the pyramid with a concave centre of about ½ ° , providing the pyramids mantle with greater stability from the inside. This makes the pyramid an 8 sided figure rather than a 4 sided one.

The Chinese used geometry to measure heights by using complementary rectangles and consecutive triangles. The also proved the Pythagoras theorem, as it is known to us today. The geometry used in the Indus valley was equally advanced. The perfect grid pattern of the cities of Harappa and Mohenjodaro are evidence of this. Moreover, the used bricks of dimensions 4:2:1 which are considered today as the best dimensions for bonding. But the best example of the monument constructed for geometry and by geometry is Stonehenge. The placement of the megaliths was governed by the cycles of the moon, sun and other celestial bodies. It is angled such that the sun rises exactly through the gaps between the megaliths on the equinoxes and solstices. By advancing just one of the movable stones by one space about every 300 years at Stonehenge, it is possible to predict every lunar event and eclipse accurately. The "heel stone" marks the beginning of summer as the sun rises in perfect alignment to this stone on the first day of summer. It was thus an astronomical observatory created only due to the knowledge of geometry. Interestingly, Stonehenge also incorporates multiple geometries of square, pentagon, hexagon and heptagon; combinations of which give rise to an invisible geometric matrix which defines the mean orbits of planets.
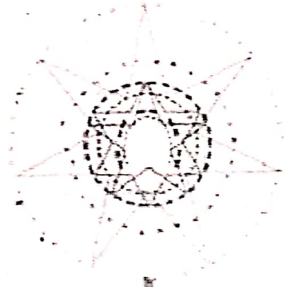
The complex geometrical structure hidden in Stonehenge

Geometry is thus one of the most important aspects of Mathematics. Its continued use for various purposes through the ages gives it a rich history and the use to which it is being put today, like in the restoration of ancient figures and building modern structures, ensures its glorious future.

H.B.SAHANA
B.A.(Hons) Mathematics First Year

WEAPONS OF MATH INSTRUCTION

At New York's Kennedy airport today, an individual later discovered to be a public school teacher was arrested trying to board a flight while in possession of a ruler, a protractor, a setsquare, a slide rule, and a calculator.

At a morning press conference, Attorney General John Ashcroft said he believes the man is a member of the notorious al-gebra movement. He is being charged by the FBI with carrying weapons of math instruction.
"Al-gebra is a fearsome cult," Ashcroft said. "They desire average solutions by means and extremes, and sometimes go off on tangents in search of absolute value. They use secret code names like "x" and "y" and refer to themselves as "unknowns," but we have determined they belong to a common denominator of the axis of medieval with coordinates in every country. "As the Greek philanderer Isosceles used to say, there are 3 sides to every triangle," Ashcroft declared.

When asked to comment on the arrest, President Bush said, "If God had wanted us to have better weapons of math instruction, He would have given us more fingers and toes. I am gratified that our government has given people a sine that it is intent on protracting us from these math-dogs who are willing to disintegrate us with calculus disregard. Murky statisticians love to inflict plane on every sphere of influence," the President said, adding: "Under the circumferences, we must differentiate their root, make our point, and draw the line."

President Bush warned, "These weapons of math instruction have the potential to decimal everything in their math on a scalene never before seen unless we become exponents of a Higher Power and begin to factor-in random facts of the vertex."

Attorney General Ashcroft said, "As our Great Leader would say, read my ellipse. Here is one principle he is certain of: though they continue to multiply, their days are numbered as the hypotenuse tightens around their necks."

Anyone who cannot cope with mathematics is not fully human. At best he is a tolerable subhuman who has learned to wear shoes, bathe, and not make a mess in the house.

~Robert Heinlein, *Time Enough for Love*

The cowboys have a way of trussing up a steer or a pugnacious bronco which fixes the brute so that it can neither move nor think. This is the hog-tie, and it is what Euclid did to geometry.

~Eric Bell, *The Search for Truth*

THE DICTIONARY: WHAT MATH LECTURERS SAY AND WHAT THEY MEAN BY IT:

* **Clearly:** I don't want to write down all the "in-between" steps.
* **Trivial:** If I have to show you how to do this, you're in the wrong class.
* **It can easily be shown:** No more than four hours are needed to prove it.
* **Check for yourself:** This is the boring part of the proof, so you can do it on your own time.
* **Hint:** The hardest of several possible ways to do a proof.
* **Brute force (and ignorance):** Four special cases, three counting arguments and two long inductions and a partridge in a pear tree.
* **Soft proof:** One third less filling (of the page) than your regular proof, but it requires two extra years of course work just to understand the terms.
* **Elegant proof:** Requires no previous knowledge of the subject matter and is less than ten lines long.
* **Similarly:** At least one line of the proof of this case is the same as before.
* **Two-line proof:** I'll leave out everything but the conclusion, you can't question 'em if you can't see 'em.
* **Briefly:** I'm running out of time, so I'll just write and talk faster.
* **Proceed formally:** Manipulate symbols by the rules without any hint of their true meaning.
* **Proof omitted:** Trust me, It's true.
* **Obviously:** I hope you weren't sleeping when we discussed this earlier, because I refuse to repeat it.
* **Recall:** I shouldn't have to tell you this, but for those of you who erase your memory tapes after every test..
* **WLOG (Without Loss Of Generality):** I'm not about to do all the possible cases, so I'll do one and let you figure out the rest.
* **It can be easily shown:** Even you, in your finite wisdom, should be able to prove this without me holding your hand.
* **Sketch of a proof:** I couldn't verify all the details, so I'll break it down into the parts I couldn't prove.
* **Canonical form:** 4 out of 5 mathematicians surveyed recommended this as the final form for their students who choose to finish.
* **TFAE (The Following Are Equivalent):** If I say this it means that, and if I say that it means the other thing, and if I say the other thing...
* **By a previous theorem:** I don't remember how it goes (come to think of it I'm not really sure we did this at all), but if I stated it right (or at all), then the rest of this follows.
* **Let's talk it through:** I don't want to write it on the board lest I make a mistake.
* **Quantify:** I can't find anything wrong with your proof except that it won't work if x is a moon of Jupiter (Popular in applied math courses).

TEN COMMANDMENTS FOR MATHEMATICS
(King James Version)

1. Thou shalt read Thy problem.
2. Whatsoever Thou doest to one side of ye equation, Do ye also to the other.
3. Thou must use Thy "Common Sense", else Thou wilt have flagpoles 9,000 feet in height, yea ... even fathers younger than sons.
4. Thou shalt ignore the teachings of false prophets to do work in Thy head.
5. When Thou knowest not, Thou shalt look it up, and if Thy search still elude Thee, Then Thou shalt ask the all-knowing teacher.
6. Thou shalt master each step before putting Thy heavy foot down on the next.
7. Thy correct answer does not prove that Thou hast worked Thy problem correctly. This argument convinces none, least of all, Thy teacher.
8. Thou shalt first see that Thou hast copied Thy problem correctly before bearing false witness that the answer book lieth.
9. Thou shalt look back even unto Thy youth and remember Thy arithmetic.
10. Thou shalt learn, speak, write, and listen correctly in the language of mathematics, and verily A's and B's shall follow Thee even unto graduation.

MATHS IN MUSIC AND ART

MATH - THE MUSICIAN
"We shall therefore borrow all our Rules for the Finishing our Proportions, from the Musicians, who are the greatest Masters of this Sort of Numbers, and from those Things wherein Nature shows herself most excellent and compleat."
-Leon Battista Alberti (1407-1472)

Right from the time of Euclid(325-265 BC), and even before, there has been a mathematical way of talking about music. Musicians talk about pitch, that is how high or low a note is. Today scientists use a sound's frequency to describe its pitch in mathematical terms. Before the concept of frequency was discovered mathematicians talked instead about the **length of a string that would produce a particular note.**
Music theorists often use mathematics to understand musical structure and communicate new ways of hearing music. This has led **to musical applications of set theory, abstract algebra, and number theory.** Music scholars have also used mathematics to understand musical scales, and some composers have incorporated the **Golden ratio and Fibonacci numbers** into their work, the most famous one being Mozart and the most recent one being Bela Bartok, a Hungarian composer.

In Bartok's Music for Strings, Percussion, and Celesta, the xylophone progression occurs at the intervals 1:2:3:5:8:5:3:2:1.

French composer Erik Satie used the golden ratio in several of his pieces, including Sonneries de la Rose Croix. His use of the ratio gave his music an otherworldly symmetry.

Some musical instruments display the use of of Fibonacci numbers and the Golden Ratio, for example, the violin and the piano. The foundation of a scale is based around the third and the fifth tones, there are eight notes in an octave and thirteen notes that separate each octave.
The Piano's keyboard is another obvious example. Within the scale of thirteen keys, there are eight white keys and five black ones, which are divided into groups of two and three. There is some golden ratio involved in the construction of a violin as well.
The roots of mathematics are closely connected with those of music. The rational structure or system of mathematics is implicitly aesthetic, given its properties of order and harmony; in this sense it is musical, even though in it there are no explicit digits or other mathematical signs, and music is implicitly mathematical in and through its amplitude, frequency, quality, rhythm, melody, form and style.
There are many things in music that are obviously math-related, and many musical notions can be explained in numbers. But it is important to note that numbers are not some way to describe music-- instead think of music as a way to listen to numbers, to bring them into the world of our senses.

MATH FOR THE LAST SUPPER!

• Christ and his disciples are pictured inside a giant dodecahedron.
• The Apostles are seated in groupings of three.
• There are three windows behind Jesus
• The shape of Jesus' figure resembles a triangle.

MATH IN THE MONA LISA

• If you measure the length and the width of the painting itself, the ratio is, of course, Golden.
• If you draw a rectangle around Mona's face you will notice that this, too, is a Golden rectangle.

MATHEMATICS- THE GREAT ARCHITECT
Mathematics and art have a long historical relationship. The ancient Egyptians and ancient Greeks knew about the golden ratio , regarded as an aesthetically pleasing ratio, and incorporated it into the design of monuments.
• Fibonaccis golden ratio the most aesthetically pleasing proportion, phi,1.618, has been utilized by numerous artists since (and probably before!) the construction of the Great Pyramid.

NATASHA PRAKASH AND SHIVANGNI TANDON
B.A.(Hons) Mathematics First Year

MUSINGS

BODY LANGUAGE

What people say is often very different from what they feel or think. Body language enables us to read a person's thoughts by his/her gestures. Over half a million people have thus benefited from Alleen Pease's book 'Body Language'. Body Language enables us to tell if someone is lying, to make ourselves likable, to get co-operation from others and to interview and negotiate successfully.

How the Body Points to Where the Mind Wants to Go

The angle at which people orient their bodies gives non-verbal clues to their attitudes and relationship patterns. A speaker who takes on a strong stance and displays attitude to his listeners while standing straight and facing the audience is perceived as aggressive. The speaker who delivers exactly the same message but points his body away from the listener is seen as confident, goal-oriented but not aggressive.

To avoid being seen as aggressive, we should stand with our bodies angled at 45 degrees to each other during friendly encounters to form an angle of 90 degrees. This will result in the formation of a triangle which invites a third person to join the group and take part in the conversation. If a fourth person is accepted in the group, a square is formed and for a fifth and sixth person either a circle or two new triangles are formed.

When two people want intimacy, their body angle changes from 45 degrees to 0 degrees, that is they face each other.

Can You Fake Body Language?

The general answer to this question is 'no' because of the lack of congruence that is likely to occur between the main gestures, the body's micro-signals and the spoken words.

For examples, open palms are associated with honesty but when the faker holds his palms out and smiles at you as he tells a lie, his micro-gestures give him away. His pupil may contract, one eyebrow may lift or the corner of his mouth may twitch and these signals contradict the open palm gesture and the sincere smile. The result is that the receivers, especially women tend to not believe what they hear.

Thus research has shown convincingly that if you change your body language, you can change many things about yourself. A change in body language means that we interact differently with people around us and hence they treat us differently.
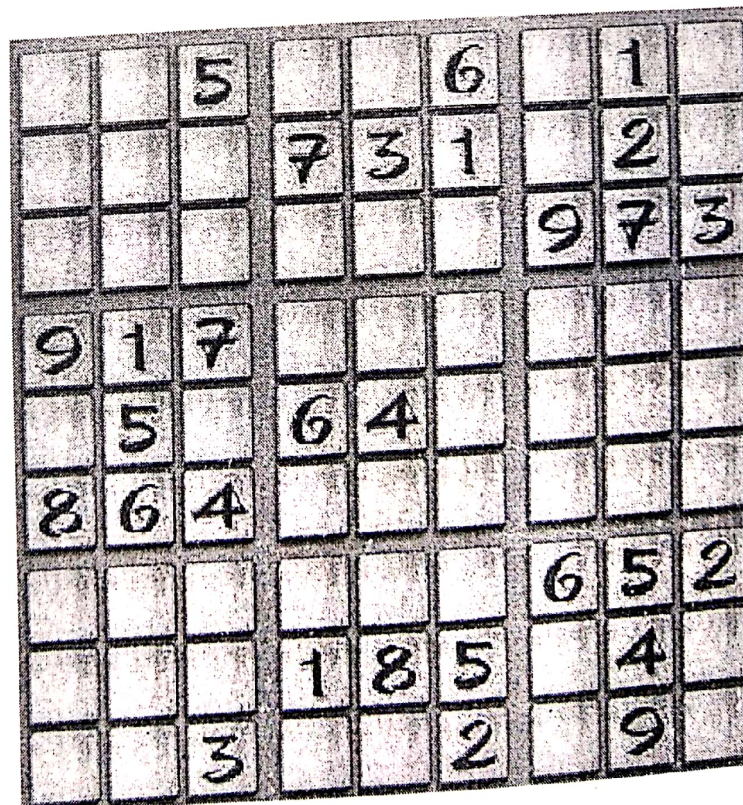
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Go down deep enough into anything and you will find mathematics. ~Dean Schlicter

SUDOKU CORNER

Instructions:
Solve the 9x9 Sudoku so the numbers 1 to 9 appear once in each row, column and 3x3 box.

TOMORROW IS ANOTHER DAY

There was a man who failed in business at the age of 21, was defeated in a legislative race at age 22, failed again in business at 24, had his sweetheart die at the age of 26, had a nervous breakdown at the age of 27, lost a congressional race at age 34, lost a senatorial race at age 45, failed in an effort to become Vice President at age 47, lost yet another senatorial race at age 49, and was elected President of the United States at age 52. This man was

ABRAHAM LINCOLN!

Life is not about failures and the despair attached to it. In fact, it is about trials and learning from one's mistakes. Success and failure are two faces of the same coin. While success makes us joyous, failure leads to dejection. However, it should be perceived as an opportunity. An opportunity to turn things around, an opportunity to explore new avenues, to do something you never expected yourself to do. One who can keep one's calm when things don't seem to be going well is the one who will make a mark. So don't lose hope and keep trying!

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If you think dogs can't count, try putting three dog biscuits in your pocket and then giving Fido only two of them. ~Phil Pastoret

WINGS

The penguin has wings but she does not fly.

It did not start out like this. It is believed that some unfortunate mutation millions of years ago prevented flight and the penguin was grounded. Women were not meant by nature to lead lives of submission and suppression. They were not meant to be subjugated and enslaved. Something, someone convinced them that 'flight' was beyond them and they believed it.

They became passive, powerless victims of an oppressive and exploitative male sanctioned ideology. They mutely accepted the emotional, sexual and psychological stereotype imposed on them by a male dominated society. They agreed to live in a world pervaded by inequality, oppression, violence and curbs. They accepted it as the norm. They had the wings but they did not fly.

I don't judge those girls who choose to accept the stereotype. I judge those people who perpetuate it. I am not a feminist, but I condemn all crimes against women and all restrictions imposed on them as any self respecting member of a civilized society should.

It is appalling that instances of eve teasing, rape, dowry deaths, domestic violence and flesh trade are treated with chilling casualness. Mere statistics added to an already shameful record.

It is equally appalling to see advertisements showing demure, sari clad women fitting so beautifully into the stereotype, extolling the virtues of a Vim bar, using Ariel to wash away a ketchup or ink stain, making Tata tea for a prospective groom and his entire clan, cooking in Sa fola, or advocating the virtues of a life-altering, groom-winning fairness cream. Or worse still, advertisements using a half naked female to sell a bike or a mattress. Or some vulgar and highly objectionable MTV item number where a Rakhi Sawant and her ilk make a complete mockery of womanhood.

Why do women do this? Are we saying that the two main requisites in a woman are that she be one, adept in domiculture and two, proficient in the Kama Sutra? An ideal and enviable blend of a housekeeper and whore. I condemn those women who help perpetuate this reprehensible mindset

Today's 'modern' society is probably worse than the medieval times. To appear liberated and 'modern', parents pretend to be serious about educating their daughters, when what is really expected of them is to settle down with someone the parents consider appropriate and produce a couple of kids, preferably male.

Why give them wings when you will clip them?

Why give them a dream when you will break it?

For many unfortunate girls their aspirations and ambitions lie dead at the door of domesticity. At the end of the day, their education and careers, no matter how successful, are of less consequence than a man's. When a growing child or an ailing parent requires urgent attention, it is obvious and expected that the women will put her career on hold or quit altogether to attend to the demands of domesticity. For some unfathomable reason this level of sacrifice is neither 'obvious' nor 'expected' of a man.

Why is a women required to build the world by destroying herself?

Why is it that all men are born equal, and all women are born slaves?

Slaves of the male mindset.

Slaves of societal stereotyping.

Slaves of antiquated traditions.

Slaves of their own fears and insecurities.

Women have become their own jailers and their own prisons. It's time they broke free and became their own liberators.

They thing that women must learn is that nobody gives you freedom and power. They are your birthright. Like they are a man's.

Again, it is not a question of power over men, but over themselves and their destinies. Like men have.

Equality is not just that you be treated equally to a man, but that you treat yourself the way you treat a man.

Most importantly, it is about loving and respecting oneself.

Women need to reacquaint themselves with the power and ability of their wings. They must have the wings of knowledge, courage, confidence and awareness to negotiate with a world that has always given them a secondary status. I want the wings that cripple the penguin to enable it to soar high again. The eagle is stronger. The pigeon lighter. But in my mind's sky, the penguin flies higher than them all. She believes she can and I do too.

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As far as the laws of mathematics refer to reality, they are not certain, and as far as they are certain they do not refer to reality. ~Albert Einstein

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