



EIVM News

III INTERNATIONAL SUMMER SCHOOL OF MATHEMATICS



III INTERNATIONAL SUMMER SCHOOL OF MATHEMATICS MAGAZINE

- News, journal
- Articles
- Opinions,
interviews
- Language tips
- Puzzles,
problems
- Humor,
curiosities

Girls, boys: welcome to the III EIVM,

Just now you are participating in a gymkhana in Santa Cruz quarter. Knowing the city, its culture, is among the goals of this 3rd camp that take place in Seville from the 1st to the 15th of July. Another one, and even more important, is that you meet each other, fraternize and have a good time. In the sport activities, you will find a meeting point of friendly challenges. To the city context and the sport practice, we have added another aspect which will suppose also a link: the mathematical knowledge. Every day there are activities, problems, workshops, lectures, which will be useful for you to extend your knowledge and to satisfy your scientific curiosity.

Welcome to this III Camp in the name of the **Instituto de Matemáticas de la Universidad de Sevilla (IMUS)**, the **Sociedad Andaluza de Educación Matemática (SAEM)** Thales and of all the teachers and monitors, who are determined that this camp let you an unforgettable footprint, both scientifically and humanly. We expect from you a constructive attitude, disciplined, willing to learn and open to your peers. And we are convinced that it will be this way.

by Antonio Pérez, the coordinator of ESTALMAT Andalucía.

III INTERNATIONAL SUMMER SCHOOL OF MATHEMATICS



In the mornings, students attend Math lessons and lectures. But what do they do during the evenings? They are involved into different **sport activities** and competitions. They practice team sports, such as football, basketball and handball. They are also really into Spanish Traditional Games, because they have a lot of fun and interact between them. They even learn more about Spain! We cannot forget racquet sports, track and field performances and their favourite activity, games in the pool.

Students are split into eight different groups (formed by people from different places, for instance, two Russians, one from Galicia, two from Madrid...), and there are eight activities held at the same time. After one hour and fifteen minutes, they have a small break so they can keep playing, drink water or lie down in the grass. Then, they start a new activity because the swap with other group. All these activities are led by old ESTALMAT students who are still into Maths.

At the end of the day, they have one hour to practice freely any kind of activity, but most of them always choose the pool. Do you know the reason?

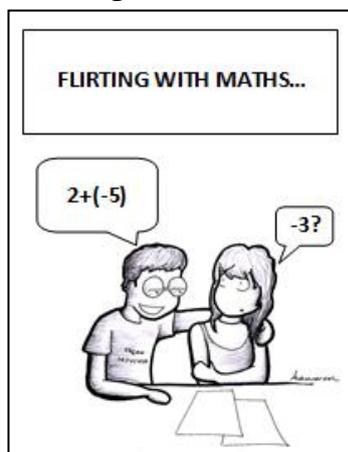
Here you can see some pictures about the games and the activities we have just been talking about.

By Luis Aranda.



Wednesday 2nd July: MATHEMATICAL COUPLES

Finishing the conference, students were provided with a label with Mathematical symbols, shapes, operations... During the lunchtime, their task was to find their couple among the rest. In the evening, the couples swapped their friendship presents in the garden. We made a photo and all we constructed a Maths glossary.



We have formed very cool couples. If any of them finally works, the only thing I ask is that the 1st son is called Alberto, like me.

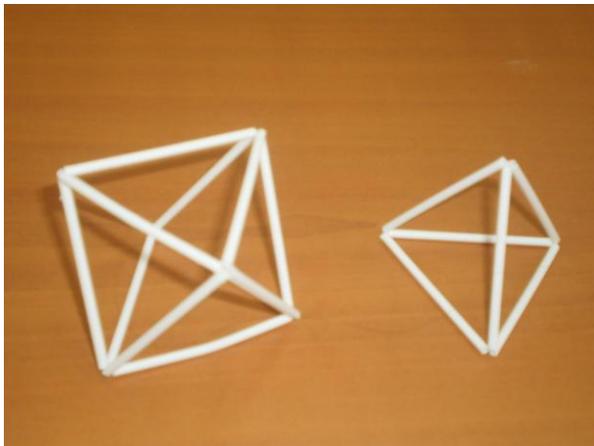
Who says that it's impossible to flirt with Maths?

by Alberto Herrero



Thursday 3rd July:

Having fun with TRUBOGRANNIK by Iulia Petrova



THE MAFIA

Throughout history, there have been lots of role-playing games, but one of them has risen and conquered this world of mystery and surprise and now shines like no other has shined before. Ladies and gentlemen, I bring you: " *The Mafid*".

This game was inspired by a sovietic game which appeared in the USSR during the decade of the 30` s. Cards in which their destinies are printed are distributed to the players of **THE GAME**. Wolves are killing machines without heart or soul which try to kill all the other players, while the helpless inhabitants of the Castronegro town try to defend themselves no matter the consequences. But not all of them are normal useless citizens: the witch fights the cruelty of the wolves with her magic potions of life and death; the medium faces the heartless beasts with the power of the fallen spirits; the hunter tries to shoot a monster upon his death; the rock absorbs the soul of a partner to gain his/her abilities; and Cupid plays with the hearts of the mortals in order to sustain peace. This are just some examples of the terrifying powers of the citizens of the Castronegro town. Who will win: the dark side or the light of life?!?!? You'll only find out if you play **THE GAME**.

There are lots of different versions and roles you can add to this **GAME** to make it even more enjoyable: playing with more than one role at a time, adding new rules that change how players should act or creating your own characters! by Alexander Romero & Marcos Giráldez & Pablo Baeyens & Clara Nicolás.

The Weekend



The light destroyed my eyes while admiring the beauty of my alarm clock. OMG!!" We were going on a trip to the "Reales Alcázares". I was worried about the sunshine rain we were about to suffer, but we survived and we could also enjoy OUTSTANDING Coliseum Carpas fights, Selfies and SWAGG.

OK, I survived the 3000C° temperature of Seville for one day, but for two days?! HOLY CRAP!! I still don't believe how we did it, I guess the white T-Shirts helped XD.

Getting lost in Seville, Selfies, Maths and more. Only in EIVM!!!!

by León W. Navarro Hilfiker & Fernando Santiago Rejón.





The Mathematical Gymkhana

OUR GOAL...To explore the "Barrio de Santa Cruz" in a different way.

Past Sunday we organized a "Math Gymkhana" around the "Barrio de Santa Cruz" and solved some mathematical problems related to houses, narrow streets, floor tiles, etc.

We will know the winner team shortly! Good luck! Here is the **MATHEMATICAL GYMKHANA GROUPS:**



OFF THE RECORD

From everyday chats with monitors and teachers, some participants discover new aspects of Maths and decide to write a summary

THE COMPLEX NUMBERS

They are an extension of the real numbers, and are defined as:

$$a+bi, \text{ with } a, b \in \mathbb{R}, i = \sqrt{-1}$$

They are very useful, as in \mathbb{C} every n-degree equation has n roots.

For example, in \mathbb{R} , the 2nd-degree equation $x^2 - 4x + 13 = 0$ is impossible to solve because we have a square root of a negative number:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{4 \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot 13}}{2 \cdot 1} = \frac{4 \pm \sqrt{-36}}{2}$$

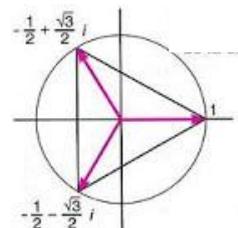
But in \mathbb{C} , if we replace the negative root by i :

$$x = \frac{4 \pm \sqrt{-36}}{2} = \frac{4 \pm \sqrt{36} \cdot \sqrt{-1}}{2} = \frac{4 \pm \sqrt{36}i}{2} = 2 + 3i \text{ and } 2 - 3i$$

We obtain two conjugate complex solutions.

In \mathbb{C} every number has n n-roots. We can represent the complex numbers on the plane (\mathbb{R}^2), and using the polar form, we can obtain all the roots. The roots are the vertices of a regular polygon (in this case an equilateral triangle):

$$\sqrt[3]{1} = \sqrt[3]{1_0} = \sqrt[3]{1_{0+360k}} = 1_{0^\circ}, 1_{120^\circ}, 1_{240^\circ}$$



by Francisco José Barbero and Laura Castillo

To continue.... PROBLEMS

1. Prove that there are almost two faces with the same number of edges at any polyhedron.
2. A group of couples goes to a party, the host **A** notices that everybody has greeted a different number of people: How many people has her husband **E** greeted?
3. Let $A = \{1, 2, \dots, 1000\}$ be a set with the first 1000 natural numbers. Prove that any 501 elements subset of A , has almost 2 elements so that one is multiple of the other one.

CURIOSITY

Buy your number!

Do you want to buy a number? Go to:

<http://gain-more.nl/nummer/member/index.php>

and for \$3.99, you can buy your number (in case it's available).



LANGUAGE TIPS

ENGLISH

hello

goodbye

thanks

water

swimming-pool

SPANISH

hola ['ola]

adiós ['aðjos]

gracias ['graθjas]

agua ['aɣwa]

piscina [pis 'θina]

RUSSIAN

привет [pri'iv'i'et]

пока [pek'a]

спасибо [spes'i'ibə]

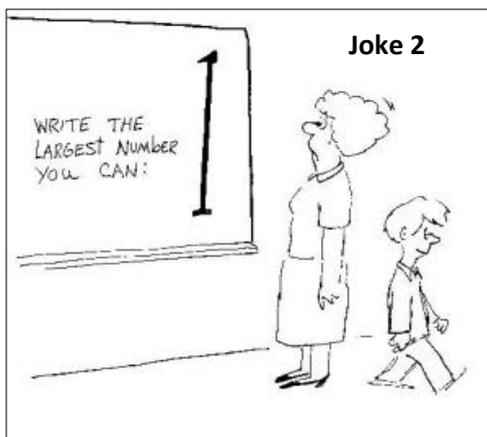
вода [v'odə]

бассейн [bes'i'ejn]

HUMOR

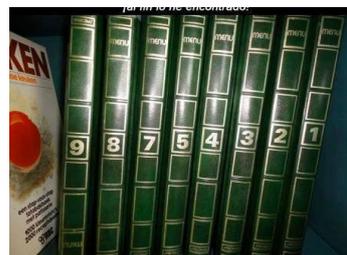
Joke 1

- Why are similar the Maths book and a Hollywood actress?
- Both are plenty of operations



Joke 2

Joke 3



I lost the volume 6 of my encyclopedia. After months looking for, I've found it!