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12th Middle European Mathematical Olympiad
■ 27.8-2.9.2018 ■ Bielsko-Biała ■ Poland ■

MEMO

MEMOLETTER

www.memo2018.abel.bielsko.pl • August 31, 2018

MEMO Bowling tournament

I Poland	**455 points**
II Slovakia	**435 points**
III Switzerland	**413 points**
III Hungary	**413 points**
V Czech Republic	398 points
VI Austria	395 points
VII Croatia	380 points
VIII Germany	369 points
IX Slovenia	352 points
X Lithuania	318 points
XI Ukraine	311 points

This picture comes from: http://nszzfipw.olsztyn.pl

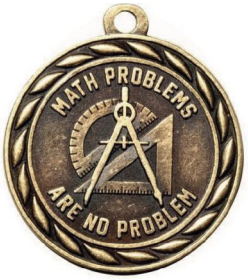
MEMO Team competition

MEMO 2015

Individual competition

Let $ABCD$ be a cyclic quadrilateral. Let E be the intersection of lines parallel to AC and BD passing through points B and A, respectively. The lines EC and ED intersect the circumcircle of AEB again at F and G, respectively. Prove that points C, D, F and G lie on a circle.

Can you solve it?



Pictures were taken by Michał Knefel
student of High School No 5, Bielsko-Biała

MATHCAMP + MBL

Some of the middle-european countries have extremely rich maths-olympiad culture, with a plethora of contests, correspondence seminars, maths journals targeted specifically at students and mathematical camps. People tend to enjoy the camps most, and little wonder, what may be better for properly delving into some new exciting maths, making great friends by deep or just cool conversations and simply having fun hiking or playing board games/mafia until very late? These are truly highlights of 'maths olympiad careers', producing memories that stay with you for long, long after…

Some of the countries don't have that. If you ask people what maths workshops they went to, they give you a look which says "Eee… What?!". They maybe know about one pre-imo camp organised by their mathematical olympiad, but there aren't too many people that go there and it is extremely hard to get in…

Independent of which group your country falls into, there is great news for you! There are a few amazing mathematical camps which all high and middle school students can apply to!

Canada/USA Mathcamp is a five-week-long summer program held in United States every summer. 120 awesome students from all over the world go there to do math and have fun. On every weekday there are multiple math classes to choose from, as well as TAU (Time Academic Unscheduled), which is a time to think about math on one's own or with the mentors' help. There are also weekly events such as olympiad-based Team Problem Solving and Relays, which are quite similar to Náboj competition.

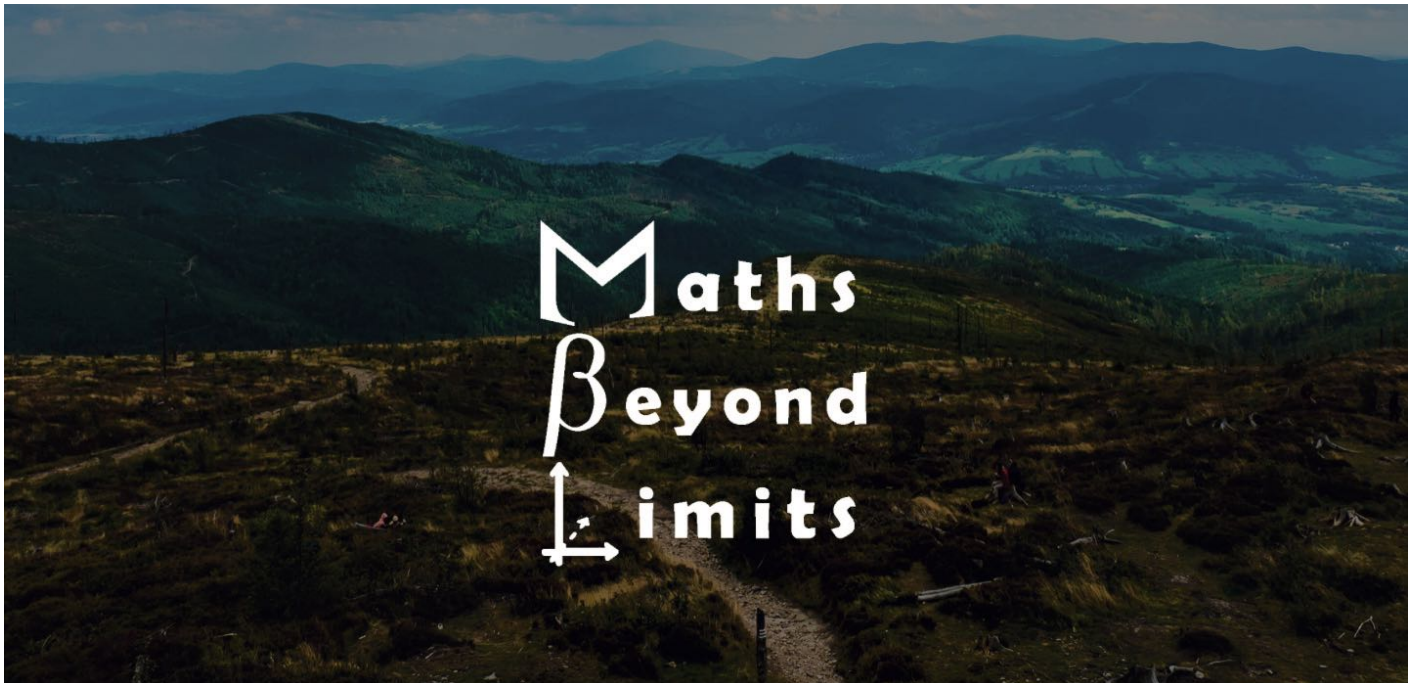
Math is not the only thing that the camp is about though! Tones of crazy activities are taking place every day, from salsa dancing or singalongs, through puzzles, language tables and night-walks, to baking banana pizza or shrimp cupcakes. What is more, everyone can post their own events on the "Schedule board" — a place for posters about everything happening at the camp.

Maths Beyond Limits is a twelve-day long international mathematical camp held in Milówka, Poland in September. MBL 2018 is the third edition of this initiative. In the structure, it resembles Canada/USA Mathcamp, but it is more international and all student-run, with big engagement of the participants.

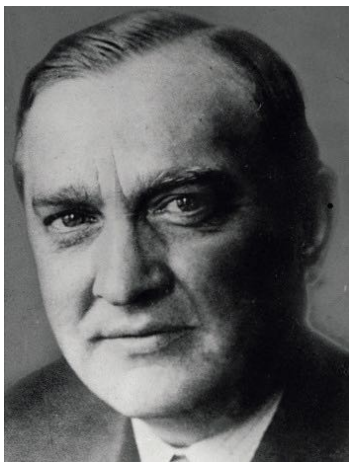
Both of them have a Qualifying Quiz to solve in order to get in, as well as a personal essay to write. Visit mathcamp.org and mathsbeyondlimits.eu for more details!

Anna Łeń
student at the University of Warsaw

Paweł Piwek
student at the University of Cambridge



Stefan Banach



On the 31st of August 73 years ago in Lviv, Stefan Banach, one of the greatest Polish mathematicians died.

He was born in Kraków on 30th March 1892. He passed his final school examination in 1910 and afterwards moved to Lviv, where he studied engineering, not maths, because of his presumption nothing more could be discovered in mathematics.

However, during World War I Banach returned to Kraków where he befriended Hugo Steinhaus. After Banach solved numerous maths problems considered difficult by Steinhaus, the two published their first joint work.

In 1919, along with several other mathematicians, Banach formed the Polish mathematical society. In 1920 he received an assistantship at the Lviv Polytechnic. He soon became a professor of the Polytechnic and a member of the Polish Academy of Sciences. He organized the "Lviv School of Mathematics". Around 1929 he began writing his greatest work "Théorie des opérations linéaires".

He showed the importance of following one's passion and challenging oneself.

Picture was taken from wikipedia.org

The Extraordinary Effectiveness of the Mathematical Description of the World III

It transpires that natural theories are, to a significant degree, 'shaped' by mathematical categories. I believe that the impact of mathematics is realized on the "content level", because mathematical structures bring certain senses, or information, with them. A confirmation of this statement is the way mathematics can influence the content of natural theories, and how the choice of mathematical methods determines the content and scope of natural theories and how mathematics verifies the natural models of the world that are constructed.

It is a fact that we build 'mathematicalized' models of the areas of the world that are unavailable to direct observation or basically unobservable. Aside from these models, we do not have another way to access reality. Everything we know about it, we know on the basis of researching appropriate mathematical structures, and through highly abstract mathematical apparatus, we can approach given problems [1]. Only mathematics referring to particular areas of micro- and macro- world allows for conceptualization of experimental content. Regardless of what the reality is in itself, its areas in the mic-o- and mac-o- scale can be only imagined and learned about through mathematical structures and concepts that often take us beyond commonsense ideas based on everyday experiences.

It is through the lens of mathematical categories that we perceive and understand the world. This is connected with a profoun epistemological issue, namely that matheatical structures in general allow us to perceive some aspects of reality we are often ignorant of, until the existence of these aspects is not suggested to us by such constructs. Many constituent elements of reality manifest themselves in such a way, it seems as if mathematical structures forced us to supplement the image of the world with traits and objects previously unknown, often even transcending our imagination. Scientific discoveries can serve here as an example, being the consequence of understanding the content of mathematical structures, such as the expanding universe model, the discovery of positron or the discovery of relict background radiation.

Mathematical structures are a 'formal background' for the epistemological content of natural sciences. Therefore, the image of the world, depends to a certain degree on which type of mathematics is used. We cannot determine the degree of fidelity of this image without access to the original, to the world 'in itself'. We can only create images of the world using our epistemic faculties on the basis of experimental data and notions conceived by us.

dr hab. Krzysztof Śleziński prof. UŚ

[1] M. Heller, Mechanika kwantowa dla filozofów, Biblos, Kraków 1996, p. 14.

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