UK Mathematics Trust News

United Kingdom Mathematics Trust

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In this issue

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The UKMT is a company limited by guarantee (no. 3271283) and a charity registered in England and Wales (no. 1059125)

Brand new website coming soon

In early July we will launch our brand new website, allowing schools and colleges to order their competition entries online, view results in one place and have streamlined access to past competition materials.

As an existing contact in a UKMT centre, you will be pre-approved, making the sign-up process as straightforward as possible. Simply create an account by entering your email address and selecting your UKMT centre. After verifying your account, you will be able to enter the 2019-20 Mathematical Challenges without delay!

We have worked hard to make ordering online convenient and efficient. Users will be able to download an invoice immediately after placing an order or choose to pay upfront by debit or credit card.

As well as making it easier to enter our competitions, you will be able to access results through a dedicated results page.

No longer will you have to send off entries to the Team and Senior Team Maths Challenges hoping to get your first choice of Regional Final — our new registration system will show availability in real time allowing you to guarantee a spot at your venue of choice or find a suitable alternative.

The changes are designed to help the whole organisation run more efficiently, allowing us to concentrate on our mathematical offering and our aim of advancing the education of young people in mathematics.

Our new website will launch in early July.

After launch, sign up for an account at **www.ukmt.org.uk** to access discounted entry to the Mathematical Challenges.

The *Intermediate Mathematical Challenge* page

Recent Mathematical Challenges and follow-on rounds

Junior Mathematical Challenge

We are delighted to report that over 272 000 students took part in the Junior Mathematical Challenge on Tuesday 30 April. The paper, which aims to stimulate mathematical thinking and encourage a problem-solving attitude, is open to students in Year 8 and below (England and Wales), S2 and below (Scotland) and Year 9 and below (Northern Ireland).

The 60-minute multiple-choice paper is designed so that at least some questions are accessible to all but also to stretch your most enthusiastic mathematicians.

JMC 2019 Question 10

10. What is the last digit of the smallest positive integer whose digits add to 2019?

   A 1   B 4   C 6   D 8   E 9

Question 10 of the 2019 paper (inset) proved quite taxing with only 29% of participants selecting the correct answer. The whole paper, as well as solutions and extension exercises can be downloaded from our website.

Following the Junior Mathematical Challenge, a Certificate of Participation is available to download and present to all students who take part. We award the highest-scoring 40% of participants with Gold, Silver and Bronze certificates in the ratio 1:2:3 and the highest-scoring participant in each school year is awarded a Best in Year certificate. The Best in School Certificate recognises the top-scoring participant in each centre.

Junior Mathematical Olympiad and Kangaroo

We invite around 1000 high-performing students from the Junior Mathematical Challenge to sit the Junior Mathematical Olympiad follow-on round, with a further 8000 or so students invited to sit the Junior Kangaroo.

It is a great achievement to be invited to a follow-on round and candidates should participate with pride, even if they find these harder papers tough.

Our most important objective is to inspire and energise as many students as possible with interesting problems. Please let us know what you think of the papers and how you think they could be made even better.

British Mathematical Olympiad

Each of our Mathematical Challenges is followed by an Olympiad paper. Past papers are available on our website and they provide an excellent source of high-quality problems for use in the classroom.

The follow-up Olympiad to the Senior Mathematical Challenge is the British Mathematical Olympiad, which has two rounds: around 1000 of the highest-scoring participants in the Senior Mathematical Challenge are invited to take part in Round 1, with 100 or so going on to sit Round 2.

These competitions help to select the teams to represent the UK at various international competitions, including the prestigious International Mathematical Olympiad.

The 60th International Mathematical Olympiad will take place in the UK in July of this year.

For more information about the British and International Mathematical Olympiads, and to try past questions, see our website.

Good luck to the UK IMO team

The much-anticipated 60th International Mathematical Olympiad is almost upon us. This year's competition will take place at the University of Bath and The Celtic Manor Resort, Newport, from 11 to 22 July.

The UK team members are **Alex Darby** (Sutton Grammar School for Boys), **Liam Hill** (Gosforth Academy), **Thomas Hillman** (St Albans School), **George Mears** (George Abbot School), **Benedict Randall Shaw** (Westminster School) and **Aron Thomas** (Dame Alice Owen's School).

Each team member will tackle six very challenging mathematical problems over two days of the competition, along with hundreds of students from all around the world.

We are very pleased to be supporting this prestigious event as a Parent Organisation and are confident that it will inspire a whole generation of young mathematicians.

Find out more about about IMO 2019 at
www.imo2019.uk

Birthday honours

We are very pleased to report that two of our volunteers were recognised in the Queen's Birthday Honours list.

Diane Crann, formerly the Royal Institution's representative on the UKMT Council was awarded an MBE for services to engineering education.

Peter Ransom was awarded an MBE for voluntary service to mathematics education. Peter served on the Challenges Subtrust for a time and has contributed questions to various competitions for many years.

Senior Team Maths Challenge 2019-20

Run in collaboration with the Advanced Mathematics Support Programme, the Senior Team Maths Challenge tests mathematical, communication and teamwork skills.
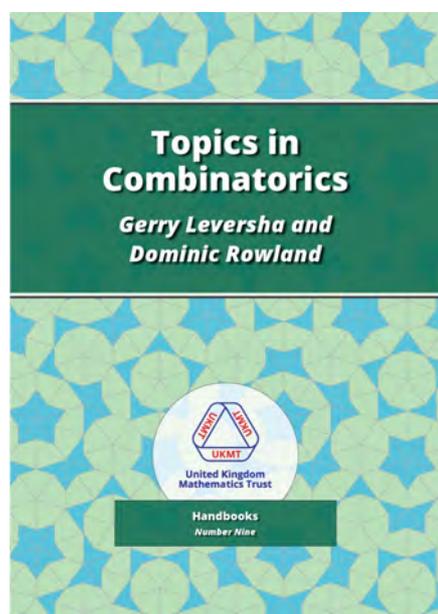
Students compete in teams of four against other schools and colleges in one of dozens of Regional Finals across the UK. Each school or college may enter a team of students from Years 11-13 (England and Wales), S5-S6 (Scotland) or Years 12-14 (Northern Ireland). Students from earlier year groups may take part but no more than two students from the highest eligible year group are allowed.

The entries to the 2019-20 Regional Finals will open in mid August. The list of available events will be available on our new website as soon as entries open.

Enter the Senior Team Maths Challenge through our website from mid August.

Publications snippets

We are pleased to introduce our newest publication *Topics in Combinatorics* by Gerry Leversha and Dominic Rowland.

The subject of combinatorics provides a rich source of material for mathematics competitions. At one level it can be thought of as a sort of extreme counting—how do we enumerate the number of ways of different ways of doing something?

However, the subject is broader than that. It addresses situations which involve organising things so as to satisfy certain criteria —placing tiles on a chessboard, seating people in a circle, chopping up a cube—and then asks whether or not a certain outcome is possible.

This accessible text is a sequel to *Introduction to Combinatorics*, by the same authors, and aims to give the enthusiastic student plenty of tips on how to tackle questions of this nature.

The structure of this book is, as befits the subject, problem-based. Each chapter proceeds through a series of challenges which introduce the important ideas slowly and carefully. In particular the authors have tried to show how to tackle each problem from first principles but building on previously acquired knowledge and technique.

Topics in Combinatorics, along with all of our other publications, is available from **www.ukmt.org.uk** and through Amazon.

Success at the European Girls' Mathematical Olympiad

The 2019 European Girls' Mathematical Olympiad (EGMO) took place in Kyiv, Ukraine between 7 and 13 April.

European countries, plus some invited teams from countries outside of Europe, each sent teams of four girls of school age to take part in the event. The UK was represented by Naomi Bazlov, Sarah Gleghorn, Yihua Luo and Yuhka Machino, with Lily Kearney as the non-travelling reserve. The team was accompanied by Jenny Owladi and Kasia Warburton.

The UK team put in a strong performance, finishing in fifth place out of 50 competing teams. Naomi, Sarah and Yihua were awarded Silver medals. Yuka was the highest-scoring of the UK team and, as well as being awarded a Gold medal, was placed joint ninth among 196 competitors, with her final score of 33 out of 42. In this year's competition there were only 19 Gold and 37 Silver medals awarded. Well done to all team members.

This was the eighth time the competition had been held since it started in the UK in 2012 and it continues to go from strength to strength. In its initial year there were 19 participating countries in total (16 official European countries and three guest teams) with 70 individual contestants taking part. This year in Ukraine there was a total of 50 countries (with 36 official European teams) and 196 individual competitors.

Next year's event will be held in Egmond aan Zee, Netherlands. Could one of your students make the team?

Visit **www.egmo.org** for more information about the competition and to access past competition papers.

Diary dates for 2019-20

Mathematical Challenges and follow-on rounds

Senior
Thursday 7 November

Intermediate
Thursday 6 February

Junior
Thursday 30 April

Senior Kangaroo
Friday 29 November

Grey and Pink Kangaroos
Thursday 19 March

Junior Kangaroo
Tuesday 9 June

British Mathematical Olympiad Round 1
Friday 29 November

Cayley, Hamilton and Maclaurin Olympiads
Thursday 19 March

Junior Mathematical Olympiad
Tuesday 9 June

Other events

Mathematical Olympiad for Girls
Tuesday 8 October

Senior Team Maths Challenge
Regional Finals
November-December

Team Maths Challenge
Regional Finals
February-April