

MEI and FMSP sessions at BCME8, 2014

Monday 14 April

16:15 - 17:45

A21 - Making connections - Starting to teach Further Mathematics

Sue de Pomerai & Sharon Tripconey

This workshop is for teachers who have recently started or are just about to begin teaching Further Maths in the sixth form. It will focus on making connections between the new ideas in Further Maths and prior knowledge and experience at GCSE and A level, with an opportunity for delegates to try some hands on activities.

Tuesday 15 April

09:05 - 10:05

B3 - Using log tables and slide rules: linking the past and present-day Maths classrooms

Clare Parsons

Before the arrival of electronic calculators in classrooms in the late 1970s, secondary school children were taught to perform difficult calculations using 4 figure log tables and/or slide rules – rarely understanding why these techniques worked. Looking at these erstwhile everyday tools and the mathematics behind them can deepen understanding of the log function in the A level classroom of today. In this hands-on session, the more mature of you will be able to take a trip down memory lane, others should enjoy doing calculations in a novel way, and all will be able to take away resources to use with students.

09:05 - 10:05

B7 - Promoting and delivering Further Mathematics

Richard Lissaman

The proportion of state-funded schools in England with students taking A level Further Mathematics has risen from below 40% in 2005 to nearly 65% in 2012. In the same time the number of students in England taking A level Further Mathematics has more than doubled. In this session, we'll look at how the Further Mathematics Support Programme (FMSP) has worked with schools to increase access to Further Mathematics and look at how national Further Mathematics provision may continue to develop and grow. The session will include ideas and pointers for promoting Further Mathematics and suggestions and resources for delivering effective Further Mathematics courses. It will also include a look at FMSP resources for helping KS4 and KS5 students to develop better problem-solving skills.

10:15 - 11:15

C3 - Changes to the English mathematics curriculum and qualifications and their implications for classroom teachers

Charlie Stripp

Huge changes are taking place in school mathematics in England. During the next three years a new National Curriculum, new GCSEs and new A levels will be introduced. It is now necessary for post 16 students who have not achieved a grade C or above in GCSE Mathematics to continue to work towards it post 16, and the government is keen that new level 3 mathematics courses are developed so that a far larger proportion of students who do achieve a grade C or above in KS4 will continue to study mathematics. These changes have profound implications for classroom mathematics teachers. This session will discuss these changes and how the challenges they raise might be met.

10:15 - 11:15

C8 - Connecting A level Mathematics and Further Mathematics with the mathematics in undergraduate STEM degrees

Kevin Lord

Since 2012 the Further Mathematics Support Programme (FMSP) has collected data on the mathematics entry requirements for STEM degree courses. The FMSP has produced resources to help students make connections between A level and the mathematics in 1st year undergraduate science and engineering courses. This session will provide an overview of entry requirements and compare these with the demands of STEM degree courses. There will be discussion of the difficulties students encounter mathematically in their first year as well as an opportunity to look at the resources being developed to help students prepare for university. This session is for anyone advising students about choosing A level mathematics and anyone in higher education admissions or STEM departments.

10:15 - 11:15

C10 - Making connections - Starting to teach A-level Mathematics

Simon Clay

This workshop is designed to support those who are teaching A level core mathematics for the first time this year or expect to be doing so next year. Only knowledge of GCSE mathematics will be assumed. The session will be centred around a couple of A level topics that are natural developments of ideas met at GCSE and will focus on developing subject knowledge and experiencing effective pedagogy. The session will contain plenty of opportunities to do some A-level mathematics using ideas from MEI's highly successful Teaching Advanced Mathematics (TAM) course.

10:15 - 11:15

C11 - Connecting Statistics to Other Subjects

Stella Dudzic

This session will look at some of the statistics used in other subjects at A level and provide some resources for enabling mathematicians to understand the applications as well as helping students of other subjects understand the statistics. Examples will include contexts from biology and psychology.

11:45 - 12:45

eXtra Session - Introduction to the Integral online resources

Catherine Berry

An introduction to the Integral online teaching and learning resources, including AS/A level Mathematics / Further Mathematics for AQA, Edexcel, OCR, OCR(MEI) and WJEC. The student resources include interactive resources and online tests as well as notes and exercises. There are also a wide range of teaching materials.

16:15 - 17:45

E14 - Hands on Mechanics: Exploring, noticing and discussing

Sue de Pomerai & Sharon Tripconey

This session provides ideas to make mechanics lessons fun, engaging and related to the 'real world' with short, easy practicals and thought experiments. This is for teachers who have some experience of teaching Mechanics 1.

Wednesday 16 April

09:05 - 10:05

F9 - Improving teachers' access to professional development: One way forward **Sharon Tripconey & Sue de Pomerai**

How can you improve your subject knowledge without taking time out of the classroom? As opportunities for real-time online collaboration have rapidly developed in recent years, over 500 teachers have joined an online course through the innovative Live Online Professional Development (LOPD) programme. Course are designed to support participants to teach A level Mathematics and A level Further Mathematics with confidence. Small groups of teachers meet weekly online with a tutor for sessions that aim to cover subject content common to all current specifications and facilitate the exchange of teaching ideas between the teachers involved.

09:05 - 10:05

F10 - Using GeoGebra in A level Mathematics **Tom Button**

GeoGebra is a dynamic-geometry/graph plotting package that demonstrates the link between geometry and algebra. This hands-on session will provide examples of the effective use of GeoGebra in the teaching and learning of A level Mathematics with opportunities to try using the resources and developing some of your own. There will also be a discussion of good ways to integrate the use of GeoGebra into your teaching. No previous experience of using GeoGebra is assumed. Delegates are requested to bring a laptop/tablet with GeoGebra installed to this session.

14:15 - 15:45

H14 - Support for students and teachers with STEP and AEA Mathematics **Richard Lissaman**

Several university courses require or encourage students to take the Sixth Term Examination Paper (STEP) and/or Advanced Extension Award (AEA) mathematics examinations. Past papers from both provide an excellent problem-solving resource which will be of interest to many students of A level Mathematics. Mathematics in Education and Industry and the Further Mathematics Support Programme have been providing support for teachers and students with STEP and AEA for five years. This includes working directly with Cambridge University, Warwick University and University College London, CPD courses for teachers and online tuition for students. This session will take a look at the examinations themselves as well as resources and methods for supporting students to develop deeper mathematical problem-solving skills that are required for success with STEP and AEA.

14:15 - 15:45

H16 - Problem solving in the A level classroom **Phil Chaffe**

This workshop will give teachers the chance to try out a number of problems that make connections between A level units. It will feature examples from MEI and the Further Mathematics Support Programme's A level problem solving materials and will cover the range of abilities from initial problems for AS level students through to problems for students preparing for STEP, AEA and MAT papers. Techniques for improving problem solving skills will be discussed as well as methods for introducing problems in the classroom.

16:15 - 17:45

I14 - Problem solving in the Key Stage 4 Classroom

Phil Chaffe

This workshop will give teachers the chance to try out a number of Key Stage 4 problems that make connections between the concepts encountered at GCSE. It will feature examples from the Further Mathematics Support Programme's successful Key Stage 4 Extension and Enrichment project as well as several from MEI's own problem bank. Techniques for improving problem solving skills will be discussed as well as methods for introducing problems in the classroom. During the session teachers will have the opportunity to work in a team as part of a problem solving challenge.

On Tuesday and Wednesday, MEI and the FMSP (Further Mathematics Support Programme) will have stands in the Publishers Exhibition

Talk to our staff, browse our literature, see live demonstrations of Integral Online Resources from our Resource Developer Catherine Berry, and register your interest in a BCME8 delegate-only Integral subscription offer.

Thursday 17 April

09:05 - 10:05

J2 - My Top 20 pictures for making links in A level Core Mathematics

Bernard Murphy

20 pictures that explain concepts in Core Maths, make me (and you, I hope) think differently about familiar ideas or encourage students to ask important questions themselves. Come in the knowledge that you'll be the ones doing all the work! Every 3 minutes I'll briefly explain why I like a picture leaving you to discuss its benefits and limitations. Suitable for all teachers of A level Core Maths, regardless of experience.

09:05 - 10:05

J6 - Supporting non-specialist teachers in teaching GCSE Mathematics

Debbie Barker

This workshop will explore some of the professional development approaches and the classroom resources from MEI's successful professional development course, Teaching GCSE Mathematics (TGM). As well as active participation with a selection of TGM resources, we will have an opportunity to discuss some of the challenges facing non-specialist teachers and to share some of the solutions learned from experiences on TGM. This workshop is for anybody interested in reflecting upon the challenges of supporting the professional development of teachers of other subjects who are now teaching GCSE Mathematics.

09:05 - 10:05

J8 - Further Pure Mathematics with Technology

Tom Button

Further Pure Mathematics with technology (FPT) is MEI's new A2 Further Mathematics unit in which students have access to a graph-plotter, spreadsheet, computer algebra system (CAS) and programming language in the teaching, learning and assessment. The first examination for this unit was taken in June 2013. This session will present the development of the unit and experiences from centres that have delivered it. There will also be an opportunity to try some of the teaching and learning resources. The session will conclude with a discussion of how technology can be further embedded in the teaching, learning and assessment at A level.

09:05 - 10:05

J12 - Using Mathematics to Make Informed Decisions

Terry Dawson & Stella Dudzic

Critical Maths is a new level 3 curriculum specifically for post 16 students with a GCSE C or better who are not studying mathematics at AS. Participants will examine some of the draft resources, and gain an insight into the aims and ethos of the curriculum.

10:15 - 11:15

RK19 - Research paper on technology to assist student learning

From the physical classroom to the online classroom – providing tuition, revision, enrichment and professional development in 16-19 education

Stephen Lee

Techniques for teaching and learning evolve over time through both innovation and the development of best practice. A specific area of mathematics education which moves at a fast pace is that of using technology. In recent years Mathematics in Education and Industry (MEI) has undertaken extensive work to develop techniques for utilising online classroom technologies to deliver tuition, revision, enrichment and professional development in 16-19 education. Interaction using these technologies has involved tens of thousands of students and many hundreds of teachers. In this discussion paper the practices used across the whole range of this work will be detailed, along with feedback from participants. A discussion of best practice that has been established will also be given.