Advanced Mathematics Support Programme®

Year 12 & 13 Regular Classes for Building Confidence in Problem Solving

Online

11th January 2022

Overview

A series of maths problem-solving sessions designed to give students key strategies and increased confidence with problem-solving in mathematics.

These classes are not aiming specifically for admissions tests although they will include some questions from MAT and TMUA. They are designed for students currently expecting to achieve grades B or C and will focus more on AS content as the vehicle for a range of problem-solving strategies.

Students will develop mathematical problem-solving skills through discussion and collaboration, and build resilience and confidence when tackling unfamiliar problems in maths. The classes will help with preparations for AS and A level examinations, and will benefit students from both year 12 and year 13.

At the same time, the problems used in the course are fun and rewarding. Attending the sessions will greatly enrich students' mathematical experience and help them to develop a better understanding of A level Mathematics.

Aims

- To develop initial strategies and boost confidence for dealing with maths problems
- To develop reasoning and proof skills
- To support the development of self-efficacy, self-esteem and aspiration

Who will benefit from attending?

The course is designed for AS or A level Mathematics students who have an enquiring mind and wish to develop their problem solving ability for their A level studies and beyond, and are currently expecting to achieve grades B or C.

Students expecting higher grades are more likely to benefit from the Regular Problem Solving Classes – search the events page for Y12 Regular Problem Solving Classes and Y13 Regular Problem Solving Classes.

Content

The course covers a wide range of AS mathematical disciplines with problems. These can include

- Algebra: manipulating equations including polynomials, linking to curve sketching
- Algebra: sequences and series
- Calculus: simple differentiation and integration
- Combinatorics: systematic counting
- Geometry: angle, triangle and circle properties
- Geometry: trigonometry, coordinates and simple vectors
- Number: divisibility, prime factorisation, fractions, indices and irrationals
- Problem solving, logic and proof – strategies and techniques

Materials and Equipment

While the classes are being held online, you will need access to suitable equipment. You are advised to use a headset or headphones with an inline microphone to provide the best sound quality and to prevent audio issues for other users. A laptop with a built-in webcam and microphone may be sufficient if you're in a quiet area but please take the time to check this before the session. BBB is designed to be used on a variety of platforms but you will get the best experience via a desktop or laptop computer, running either Google Chrome or Mozilla Firefox as the browser.

Some of the problems will be presented via Desmos Classroom, and students accessing the classes via a smartphone will not find it as easy to swap between the two tabs.

Note: Internet Explorer and Edge are not suitable currently.

Access to GeoGebra or Desmos graphing tools will also be useful.

Other Information

The following problems provide a taste of the sort of problem solving that will be encountered in the classes:

A series has 5 terms. The middle term is 7. The sum of the series is 35. How many series can you find that satisfy these conditions? What about when the sum is 7a? *Hint*: what types of series do you know? Can you use algebra to help you get started, or try a value to get a sense of what happens?

Consider the set of points (x, y) with integer coordinates where both 0?x?3 and 0?y?3. A straight line is constructed joining two of these points. How many different lengths can be found? How many different angles? *Hint*: Would a sketch help? Can you classify the joining, or be systematic?

Study Schedule

These classes begin in January to allow Year 12 to have covered sufficient content before beginning the classes.

Dates: Jan 11, 18, 25 Feb 1, 15, Mar 1, 8, 22, 29 Apr 5, 26 May 3

Key Facts

Event ref:	#9152
Audience:	Students
Target year:	Year 12 & 13
Curriculum focus:	A level Mathematics
Mathematical focus:	Problem solving, Reasoning
Event format:	Student course
Event length:	20 hours
Region:	West Midlands
Next session:	Tue 1st Feb 2022
Course times:	16:30 - 18:00
Fee:	Free
State-sector subsidy:	Worcestershire

Registration

For more information, or to register for this event, please visit https://amsp.org.uk/events/details/9152