



Advanced Mathematics
Support Programme®



Year 12 & 13 Regular Problem Solving Classes

Oxford

17th September 2018

Overview

A series of maths problem-solving sessions designed to give students the confidence to apply for university courses that require or take into consideration achievement in an admissions test.

These regular classes offer students the opportunity to develop mathematical problem-solving skills through discussion and collaboration. They are designed to help students to develop strategies and confidence when tackling unfamiliar problems in maths and will help with preparations for taking advanced papers such as the MAT, TMUA and STEP examinations.

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 when dealing with maths problems
- To develop confidence when dealing with maths problems
- To develop resilience when dealing with maths problems
- To provide some initial information about the problem solving involved in university admissions tests
- To provide a platform on which to build secure problem solving techniques

Who will benefit from attending?

The course is designed for any A level Mathematics students who have an enquiring mind and wish to develop their problem solving ability for their A level studies and beyond.

It is particularly useful for those students who wish to make the first steps in preparing for university admissions tests such as the MAT, TMUA and STEP examinations.

Content

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

- Algebra: the difference between two squares and other identities
- Geometry: angles, triangle and circles
- Number: digits and divisibility
- Algebra: forming and solving equations
- Combinatorics: systematic counting
- Number: prime factorisation, fractions and irrationals
- Algebra: sequences and series
- Number: indices and logarithms
- Algebra: quadratics, cubics and other polynomials
- Geometry: trigonometry
- Combinatorics: further systematic counting and placement
- Geometry: coordinates and vectors
- Calculus: curve sketching and differentiation
- Calculus: integration
- Combinatorics: the binomial expansion

Materials and Equipment

Students do not need any special equipment for the course although a smartphone with the GeoGebra or the Desmos apps installed may be useful.

Other Information

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

Problem 1: How many primes greater than two can be found that are one less than a square number?

Problem 2: How many pairs of integers can you find that satisfy the equation $x^2 - y^2 = 45$?

Study Schedule

Date	Year 12 class	Year 13 class
17 September		Yes
1 October		Yes
15 October	Yes	Yes
5 November	Yes	Yes
19 November	Yes	Yes
3 December	Yes	Yes
14 January	Yes	Yes
28 January	Yes	Yes
11 February	Yes	Yes
4 March	Yes	Yes
18 March	Yes	Yes
1 April	Yes	Yes
13 May	Yes	Yes
17 June	Yes	
1 July	Yes	

Key Facts

Event ref:	#4723
Audience:	Students
Target year:	Year 12 & 13
Curriculum focus:	University admissions tests, A level Mathematics, A level Further Mathematics
Mathematical focus:	Pure, Problem solving
Event format:	Student course
Event length:	20 hours
Region:	South
Venue:	Mathematical Institute, University of Oxford, Andrew Wiles Building, Radcliffe Observatory Quarter, Woodstock Road, Oxford, Oxfordshire, OX2 6GG
Date:	Mon 17th Sep 2018
Course times:	17:15 - 19:15

Registration

For more information, or to register for this event, please visit <https://amsp.org.uk/events/details/4723>