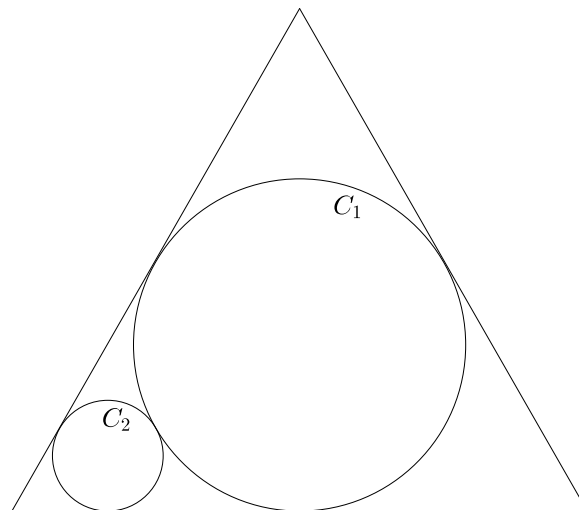


Year 12 Advanced mathematics problems course 2021-2022.

Sample problem. The diagram below shows a circle C_1 inscribed in an equilateral triangle of side 6 units. C_2 is a circle that touches C_1 and two sides of the triangle as shown. Given that the base of the triangle is on the x axis with the origin at the lower left vertex. Find the coordinates of the centres and equations of C_1 and C_2 .



Course aims and description

The aims of the year 12 advanced problems course are:

1. The development of students' mathematical thinking.
2. Increasing students' confidence in solving unstructured problems.
3. Improved preparation for the MAT, AEA and STEP examinations.

The problems in the course are based year 12 pure mathematics topics but are unstructured and challenging. Students on the course are expected to do preparatory reading prior to the problems classes.

The course is free for all year 12 students. Students should email mathsor@le.ac.uk to apply for a place on the course.

The classes will be face-to-face in university venues.

Students who attend regularly will obtain a School of Mathematics and Actuarial Science Certificate of Participation. Students who attend regularly and submit the course assignment will obtain a School of Mathematics and Actuarial Science Certificate of Achievement.

The topics and dates for the classes are given in the table below.

The course schedule

Class topic:	Date/times
Algebra 1	Oct 5: 4.30 to 6 pm
Coordinate Geometry 1	Nov 2: 4.30 to 6 pm
Series 1	Nov 23: 4.30 to 6 pm
Calculus 1	Dec 7: 4.30 to 6 pm
Algebra 2	Jan 25: 4.30 to 6 pm
Coordinate Geometry 2	Feb 8: 4.30 to 6 pm
Series 2	March 8: 4.30 to 6 pm
Trigonometry	March 22: 4.30 to 6 pm