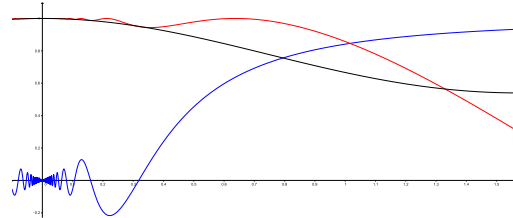


## Year 13 Advanced mathematics problems/STEP course 2018/19.

The graphs of  $y = x \sin\left(\frac{1}{x}\right)$ ,  $y = \cos\left(x \cos\left(\frac{1}{x}\right)\right)$  and  $y = \cos(\sin(x))$  are shown below. Which is which?



### Course aims and description

This course is in two parts:

**Part 1** consists of seven year 13 problems classes of 1.5 hours duration scheduled on Saturdays between September and December. These classes extend knowledge and skills introduced in the Department of Mathematics/FMSP year 12 advanced problems course. The course is suitable for students who intend at the present time to either pursue an undergraduate degree in a mathematical subject or sit one of the STEP examinations in summer 2019.

**Part 2** consists of eight fortnightly STEP preparation classes of two hours duration (except for the last two which are 3.5 hours) scheduled between February and May 2019. The course is suitable for students who have an offer to study undergraduate mathematics which requires STEP grades.

Participating students are expected to solve challenging problems in class on whiteboards and to attend regularly.

The course is free for all year 13 students. To apply for places on either part of the course or for further enquiries contact: [mathsor@le.ac.uk](mailto:mathsor@le.ac.uk)

The topics and timings for the classes are given in the table below. Participating students will be informed of the room venues, all of which will be in the main university campus on University Road, Leicester.

### The course schedule

Class topic(s)	Date
Algebra	Sat Sept 8: 2 to 3.30 pm
Mathematical Proof	Sat Sept 22: 2 to 3.30 pm
Trigonometry	Sat Oct 6: 2 to 3.30 pm
Calculus	Sat Nov 3: 2 to 3.30 pm
Coordinate Geometry inc Curve Sketching	Sat Nov 17 : 2 to 3.30 pm
Sequences and Series	Sat Dec 1: 2 to 3.30 pm
Inequalities	Sat Dec 15: 2 to 3.30 pm
STEP Coordinate Geometry	Tue Feb 5: 4.30 to 6.30 pm
STEP Inequalities	Tue Feb 19: 4.30 to 6.30 pm
STEP Calculus	Tue Mar 5: 4.30 to 6.30 pm
STEP Vectors	Tue Mar 19: 4.30 to 6.30 pm
STEP Trigonometry	Tue April 2: 4.30 to 6.30 pm
STEP Numbers and Series	Tue April 16: 4.30 to 6.30 pm
STEP III Hyperbolic Functions, Further Calculus, Proof	Sat May 4 : Noon to 3.30 pm
STEP III Differential Eqns., Complex Numbers, Polar coods.	Sat May 18 : Noon to 3.30 pm