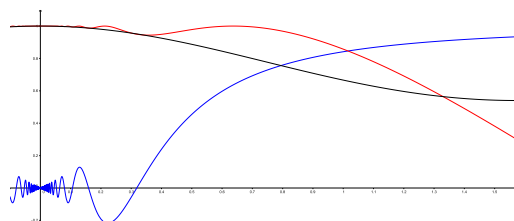# Year 13 Advanced mathematics problems course 2022/2023.

The graphs of $y = x \sin\left(\dfrac{1}{x}\right)$, $y = \cos\left(x \cos\left(\dfrac{1}{x}\right)\right)$ and $y = \cos(\sin(x))$

are shown below. Which is which?



## Course aims and description

This **free** course will be offered both as **face-to-face** and **distance/online** formats. The latter is intended primarily for students who are not **local** to Leicester.

\* The face-to-face format consists of twelve year 13 problems classes each of 1.5 hours duration, in university venues between September 2022 and March 2023.

\* The distance/online format involves the same materials as the face-to-face option but with the **addition** of slides to guide students through the problems. Students taking this option will need to complete a small assignment per problem sheet to signify attendance.

The course is **calculator free** and is suitable for students who intend at the present time to either pursue an undergraduate degree in a mathematical subject, sit one of the STEP examinations in summer 2023 or who just have a passion for mathematical problem solving.

If, in January 2023, students on the course have a university offer requiring STEP grades, then we can offer STEP support additional classes in both face-to-face and distance/online formats.

To apply for places in the course or for further enquiries contact: **mathsor@le.ac.uk**

The topics and frequency for the both face-to-face and distance/online options are given in the table below. The face-to-face classes will be in university venues, 4.30 pm to 6 pm.

## The course schedule

| Class topic(s) | Date |
|---|---|
| Algebra 1 | Sept 20 |
| Trigonometry | Sept 27 |
| Differentiation | Oct 11 |
| Coordinate Geometry | Nov 1 |
| Algebra 2 | Nov 8 |
| Inequalities | Nov 22 |
| Sequences and Series | Jan 10: |
| Exponentials and Logarithms | Jan 17 |
| Curve Sketching | Jan 31 |
| Proof | Feb 14 |
| Vectors | March 7 |
| Integration | March 21 |

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