

## STEP Advice 2016

### **Interview Preparation Advice**

- Read a few books (2-3) that have a good level of mathematical content. You should not spend a lot of time reading Popular Maths Books e.g. 'Fermat's Last Theorem' as, although interesting, they are not written to improve your mathematical ability, rather to spark an interest.
- Work through all the interview questions and Trinity College quizzes on Topics.
- Obtain a rudimentary understanding of certain fundamental topics:
  - Graph sketching
  - Mathematical notation
  - Basic logic (converses, contrapositives etc.) and the precise meanings of connectives in maths
  - Modular arithmetic
  - Probability and combinatorics
  - Proof techniques
  - Analysis
  - Euclidean geometry
  - Derivations of A-Level Maths results (e.g. derivative of sine)
- Make good use of Mock Interviews.
- In the summer it would be immensely useful if you worked through the Dr Siklos booklet/did STEP I questions.
- Prioritise MAT (for Imperial/Oxford), then interview preparation, then STEP preparation (as the school year progresses).

### **STEP Preparation Advice**

- STEP classes with Dr Luciano Rila (weekly course running for 10 weeks):
  - The classes are useful if there are one or two Cambridge Maths offer holders because you would meet other offer holders and you would be able to work through problems together/help each other. The course is also useful for building an arsenal of tricks for approaching problems *however* if you had thoroughly prepared for your interview (e.g. having done all interview questions you have access to) and have done some STEP I in the summer,

you are likely to know the vast majority of these tricks already. If there are three or more people with offers for maths at Cambridge (in Latymer) and you are all reasonably confident with standard tricks (such as the ones on the trick sheet) then it may be most optimal to not attend as you will thus not lose time weekly. You could meet up regularly and discuss STEP – going through questions together is very useful.

- A valuable positive of the Dr Rila class is the marking and feedback they provide as well as presenting an opportunity to ask them questions about your problem-solving technique. It is nice to meet other candidates, however it can take up the whole after school working time as the journey there is tiring.
  - You may be able to obtain partial funding for the course from school.
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- When you work through a paper, try to attempt the whole paper before moving on - at least all the pure questions. There are bound to be questions you cannot do even after many hours, in this case, early on you should move onto another paper and come back at a later date. As you work through more papers, you are likely to be able to attempt and complete the questions you previously could not. At the start of your preparation avoid looking at solutions – if you have a complete answer confer it with other people before checking it. If you disagree between yourselves, you may have to redo it, if you agree, you are likely to be correct and should verify this by looking at a solution. It is particularly important to check the method in STEP, more so than A-Level, as the exam truly tests methodology and markers will not simply see a correct answer and then give you the method marks generously. Nearer to the exam, you cannot afford to spend three hours or more on a single question that you are stuck on, so it is wise to look at the solution after trying a question for about one hour.
  - We recommend starting from 1996 and doing up the 2016 papers, because there are model solutions for all these questions, so it is easy to check answers. **(Use Integral Maths - see resources sheet)**
  - Some papers have proper mark schemes (in STEP Folder 2016) – these would be the best and most accurate mock exams to use. So definitely make sure to do these properly under timed conditions (STEP 2015 I, II, III etc.).
  - Do not try to find a universal strategy for every STEP paper. This is possible for all other exams but not for STEP – instead it is an exam of good judgement (and of course luck). However you will see similarities between the structure of questions – this can help in choosing the right questions.

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- We recommend that you do at least two questions a day starting from after you get your offer however you should construct your own detailed plan – maybe use a daily calendar.
- Utilise the ticksheet to track your progress.
- Try and get through your other A-Level studying and note creation early (e.g. before the end of March) so that you can optimise STEP time.
- Do not overwork as it is counterproductive and yields diminishing returns, especially so in STEP.
- Organise your STEP work effectively from the start.

### **STEP Advice for exam day**

- Read all questions from the collection you may attempt (e.g. Pure and Mechanics/Pure and Statistics/All Questions).
- In our opinion, in your mind you need to choose 6 questions that will form your test. It is not beneficial to attempt a seventh or eighth (unless you are a prodigy/very confident).
- Bring a digital watch to the exam that has a lap function – useful for time management on each question.

—GOOD LUCK—

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