

# STEP INFORMATION

## The Papers

The Sixth Term Examination Papers (STEP) are administered by the Cambridge Assessment examination board. They are taken in the summer at about the same time as A-levels. There are three mathematics papers.

The syllabus for Mathematics I and II is based on a typical single subject A-level syllabus: the Pure Mathematics content is very slightly more than the A-level common core and the Mechanics and the Probability and Statistics sections are each equivalent to slightly more than two modules. Since there is no common core for these areas, the material may not coincide with the first two modules of your A-level specification. Paper I is intended specifically for candidates who are not taking Further Mathematics (or the equivalent).

The syllabus for Mathematics III is based on a typical Further Mathematics syllabus.

Each STEP paper consists of 13 questions, including 3 on mechanics and 2 on statistics/probability. You are assessed on 6 questions. There are five grades: S,1,2, 3 and U.

## Why STEP?

Colleges like to make offers involving STEP for four reasons.

1. STEP is a better predictor of success in the Mathematical Tripos than A-levels. One reason for this is that the questions are less standard and less structured, which helps to distinguish between ability (or potential) and good teaching.
2. Preparation for STEP also serves as useful preparation for our course.
3. The STEP marks and the scripts themselves are available for inspection by college staff. This means that it is possible to make allowances for a near miss and to make judgements on the actual work rather than on the marks.
4. The meaning of A-level grades may differ significantly between the different boards, so STEP provides a fairer 'across the board' comparison.

## Some Advice

Here are two important pieces of advice:

- **Do not worry if your school is not able to provide much help with STEP.**

There is plenty of material with which you can help yourself (see overleaf). The best preparation for STEP is to work through past papers, and you are most strongly advised to work through as many as you can before the examination.

- **Do not worry if the STEP questions seem very difficult.**

STEP is supposed to be difficult: it is aimed at the top 2% or so of all A-level mathematics candidates. It is therefore important to adjust your sights when tackling a STEP paper. The questions are much longer and more demanding than A-level questions, so you should not be daunted. A typical A-level question might take in the region of 10 minutes for a good mathematician such as yourself to polish off; and you would expect to do all or almost all of the paper. Typically, good answers to four (out of six) STEP questions are sufficient for a grade 1; a good answer means about 15/20. The papers are three hours long that means you should be expecting to take about 45 minutes per question. That is a big difference.

## STEP Resources

A great deal of material is available to help you to prepare yourself for STEP.

- Cambridge Assessment has a web site devoted exclusively to STEP:

**<http://www.stepmathematics.org.uk>.**

Downloads of past papers and (shortly) ‘hints and answers’ for recent papers can be obtained (free of charge) from this site

- You may also find the booklet *Advanced Problems in Mathematics* useful; it consists of 43 STEP-like problems with discussion, hints and full solutions. The problems are mainly from Paper II and III, and date from the time when the syllabus was a bit wider than the current syllabus. Currently, this can be obtained from OCR Publications Department, but it should be transferred to the STEP web site shortly.
- The booklet *Advanced Problems in Core Mathematics* is similar to *Advanced Problems in Mathematics*, except that the syllabus for these problems is the current syllabus for Papers I and II. It also contains an introduction giving some ideas on how to tackle STEP problems and an appendix containing the STEP syllabuses. It would be a good idea to start on these problems before tackling either *Advanced Problems in Mathematics* or past papers. The latest draft of can be downloaded from [www.maths.cam.ac.uk/undergrad/advancedproblems](http://www.maths.cam.ac.uk/undergrad/advancedproblems).
- You can get personal help from the Mathematics Millennium Project on-line maths site, NRICH:

**<http://www.nrich.maths.org/>**.

This includes the AskNRICH facility: you can e-mail any difficulties you have (with STEP or any other piece of mathematics) and you will be put in contact with someone who will discuss the matter with you by e-mail.

- Another useful site is

**<http://meikleriggs.org.uk/>**.

This is run by Dr Peter Mitchell (who has for a long time been involved with all aspects of STEP). His site contains a great deal of interesting mathematics, including solutions to past STEP papers in the style that you would want to use in an examination.

- You can find the full syllabus specification in various places including

**<http://www.maths.cam.ac.uk/undergrad/step/syllabus/syllabus.html>**

- The Faculty of Mathematics organises a four-day course at Easter intended to ‘kick start’ the STEP preparation of those students, who have received conditional offers to read Mathematics, from (non-selective, state, UK) schools that are unable to provide STEP support. It is partly funded by the Sutton Trust and partly by the Cambridge colleges. Students are nominated for the course by the college that has made them conditional offers. Invitations to attend are sent out in mid-February.