A Level Maths

Please find some further resources below to help any Y11s prepare for A Level Maths and maybe Further Maths too. I do hope you find this useful.

**Bridging Tests**

These 'Bridging Tests' are produced by MEI - and cover a wide range of the topics that are important for the transition from GCSE to Year 12. There are twelve tests, with associated answers, and I recommend that you complete and mark a test regularly - perhaps one a week - to help you stay practiced at those skills and to help you identify anything that you may require additional practice/study.

To break things up at first for you:

**Task 1:**Do this Test:[https://mei.org.uk/files/pdf/fam/famas1q.pdf](https://www.google.com/url?q=https%3A%2F%2Fmei.org.uk%2Ffiles%2Fpdf%2Ffam%2Ffamas1q.pdf&sa=D&sntz=1&usg=AFQjCNFsw_F0cDSuIE37d_ky0exHlTa69g)

**Task 2:** Mark your test here: [https://mei.org.uk/files/pdf/fam/famas1w.pdf](https://www.google.com/url?q=https%3A%2F%2Fmei.org.uk%2Ffiles%2Fpdf%2Ffam%2Ffamas1w.pdf&sa=D&sntz=1&usg=AFQjCNHqQ3Xh3rQLhK4ybkijWT6YfvaCuQ)

**Extended Task:** [Go to this site for all 12 tests and solutions](https://www.google.com/url?q=https%3A%2F%2Fmei.org.uk%2Fbridging_tests&sa=D&sntz=1&usg=AFQjCNGuhJ1fHQFFjlgENfOigVpKtPlT-g) and do one a week for the Summer before you start your A Level

**Getting Started in Branching Out**

Here links to four excellent Maths websites. If you want to practice your problem solving, and have a go at some fun challenges, then have a go at some of the problems on Brilliant.org. The other three websites have lots of interesting videos covering topics that go beyond the GCSE (and A-level) syllabi. If you think that you might be interested in studying Maths or a Maths-related subject at university, these videos will give you a feel for what university Mathematics is like, and exposure to these broader aspects of Maths can be really helpful if you do choose to apply for a Math-related degree.

[Daily Challenges - Brilliant.org](https://www.google.com/url?q=https%3A%2F%2Fbrilliant.org%2Fdaily-problems%2F&sa=D&sntz=1&usg=AFQjCNHmldJc0fw-INeX7g39T8Hewr6v-A)

[Fascinating Maths away from the curriculum - Numberphile](https://www.youtube.com/user/numberphile/)

[Difficult problems solved by a great presenter - Black Pen Red Pen](https://www.youtube.com/user/blackpenredpen)

[Some really hard, some easier - A great maths general interest channel - Mathologer](https://www.youtube.com/channel/UC1_uAIS3r8Vu6JjXWvastJg)

Transition to A Level - GCSE Tasks

Along with generally broadening your mathematical landscape, you will want to perfect your GCSE skills. Here are a few places to go that highlight the specific skills that are developed at A Level. Most schools and colleges will have some kind of transition test early in Y12. These are most likely to be the skills that are tested.

**Task 1:** Go here, it is a great starting point. Choose the topic you are least comfortable with. There are Hegarty links which you may have access to but it also has maths genie links which is free to access. <https://drive.google.com/file/d/15Zs82wCIeLEisbzvL9C_7FS3tdAXQIde/view>

**Task 2:** An excellent Transition Booklet from Maidstone Grammar School: <https://drive.google.com/file/d/1nH0ShVy3V887ghGFp6muXxcdUURV_44h/view>

**Task 3:** A Transition Booklet from Bristol Cathedral Choir School - No answers at the moment but some additional thinking questions and links at the bottom: <https://docs.google.com/document/d/174N09MuHTB8Q_1DudxBor8TJAHCqtQTbeOcexrX4LDY/edit?usp=sharing>

**Challenge 1**: **Could you construct a line which has a length of the square root of 13?**

Have a think about why this might be difficult. What is it about the nature of surds that makes this type of construction seemingly impossible? Is it possible to have a line that has an irrational length? Thinking about these things is as important as solving this puzzle.

**Task 1:** Once you have considered these questions, [take a look at the image here](https://www.google.com/url?q=https%3A%2F%2Fundergroundmathematics.org%2Fthinking-about-numbers%2Firrational-constructions%2Fdownload%2Fproblem.pdf&sa=D&sntz=1&usg=AFQjCNEGVaWNln0sboHe-qTOECllybRYrA). Does this help you to construct the line? Are you satisfied that it is possible to do so?

**Task 2:** Consider what other questions you could ask about the image in Task 1. Try to answer the questions that you come up with.

**Extended Work:** Have a look [here](https://www.google.com/url?q=https%3A%2F%2Fundergroundmathematics.org%2Fthinking-about-numbers%2Firrational-constructions%2Fdownload%2Fpossible-questions.pdf&sa=D&sntz=1&usg=AFQjCNFjtFGJuJhvLNKDoIq9iDkaSBfJ-A) for some suggestions for what you may have come up with in task 2. Can you answers the questions suggested on the bottom of the sheet. A discussion on the solutions is [here](https://www.google.com/url?q=https%3A%2F%2Fundergroundmathematics.org%2Fthinking-about-numbers%2Firrational-constructions%2Fdownload%2Fthings-you-might-have-noticed.pdf&sa=D&sntz=1&usg=AFQjCNFXbj1k2XAWW2vitfmibaqAHngbtA).

Sumaze

Can you complete this highly addictive maths game? Download the App! [https://sumaze.mei.org.uk/](https://www.google.com/url?q=https%3A%2F%2Fsumaze.mei.org.uk%2F&sa=D&sntz=1&usg=AFQjCNFzwYtvIkSNrw6USFYp4-3CEmJrTg)

**Problem Solving**

Whatever you go on to do next, problem solving will be one of the key take-aways from your Maths A Level. Here are some starting points.

***Advice: This doesn't apply to all these videos, but...***Give these tasks a go on your own first before looking for the solutions. *At least 20 minutes of struggle before you watch an explanation!!!*. This is not 20min wasted! Why not wait a day, mulling the problem over in your mind as you do other stuff. Sometimes the solution will come to you in your sleep. That is not a joke. All of you need to be prepared for extended thinking on one question, attacking it from various angles. GCSE doesn't necessarily prepare you well for this. The process of attacking a problem from multiple angles is an absolutely invaluable skill - practice it!

**Task 1: The Josephus Problem** <https://www.youtube.com/watch?v=uCsD3ZGzMgE> Watch the first bit, have a go at solving it, then listen to the methodology of solving the problem as much as finding what the answer is!

**Task 2: The Cat and Mouse Problem** <https://www.youtube.com/watch?v=vF_-ob9vseM>

**Task 3: The Problem in Good Will Hunting** <https://www.youtube.com/watch?v=iW_LkYiuTKE&list=RDCMUCoxcjq-8xIDTYp3uz647V5A&index=17>

**Extended Task:** [As ever, a Brilliant Course](https://www.google.com/url?q=https%3A%2F%2Fbrilliant.org%2Fpractice%2Frelating-quantities-and-data%2F%3Fchapter%3Dintro-math-competition-fundamentals&sa=D&sntz=1&usg=AFQjCNEFFVgksB7zhU5vA_xz0rxgzkUf-Q)

Euclidea

A brilliant set of puzzles to get stuck into. Maddeningly difficult and a fantastic insight into some greek geometry. There's an app or you can play in a browser - just get an account so it knows where you got to. [https://www.euclidea.xyz/](https://www.google.com/url?q=https%3A%2F%2Fwww.euclidea.xyz%2F&sa=D&sntz=1&usg=AFQjCNHTu_JCgPQnbOx6ZDXZ2fJA-Mtu7A)