

A level Mathematics

Introduction – an outline of the course

Welcome to A level Mathematics. During your time in the Sixth Form you will study Pure Maths, Statistics and Mechanics that will build upon and develop the skills that you have developed in Key Stage 4. The assessment at the end of Year 13 consists of three exams in which you can show your knowledge and understanding of the topics that you cover. There will also be more of an emphasis on applying your knowledge to unfamiliar situations. Two of the exams assess Pure Mathematics and one exam assesses Applied Mathematics which consists of Statistics and Mechanics, there is no NEA work in A level Mathematics which means that you're A level grade is based on your performance in these three two-hour exams.

What will we be studying in the first half term?

In September you will start by looking at consolidating and extending your algebraic skills. We focus on expressions, quadratics, equations and inequalities before we introduce you to The Binomial Expansion. In consolidating all the key algebraic work, we ensure you have a solid foundation to cover the A level content.

Algebraic Expressions

In this topic you will re-cap and extend your knowledge of the rules of indices, expanding and factorising as well as consolidating all knowledge of surds. These calculations are a development of the work that you covered at GCSE. They become more complex as you progress but don't worry your teachers are here to support you every step of the way.

Quadratics

Within this unit of work, we re-cap quadratic graphs and the manipulation of quadratic expressions. We look at the various different methods of solving quadratic equations and introduce you to the discriminant which helps you to determine the nature of the roots of a quadratic graph.

Equations and Inequalities

We will then look at solving linear and quadratic simultaneous equations using elimination, substitution or graphical methods. This skill is required for all future graphical units of work. We also cover linear and quadratic inequalities.

Binomial Expansion

The next topic we cover in the first Autumn half term is the Binomial Expansion. This is a completely new unit of work. Within this chapter we introduce you to Pascal's triangle to identify binomial coefficients and use them to expand simple binomial expressions. This helps us to expand long and complex expressions involving large indices. We use combinations and factorial notation, introducing you to new terminology on your A level calculators. Once you have mastered this, we then combine these skills in order to show you how to use the binomial expansion to expand brackets, find individual coefficients in a binomial expansion and make approximations using the binomial expansion.

Algebraic Methods

The final topic we cover in the first half term is that of Algebraic Methods. We start by re-capping your understanding of algebraic fractions and then progress to the division of polynomials using long division with algebraic expressions. You will learn how to divide a polynomial by a linear expression and will use the factor theorem to factorise a cubic expression. From this we will move on to the construction of proofs.

What can I do that will help me prepare for A level Mathematics?

One of the important ways that you can prepare is to make sure that you are familiar with the Mathematics that you have learnt for your GCSE. Some of the topics that you will study at A level expect you to have a good understanding of the work that you have covered during your GCSE. Make sure that you keep your knowledge organisers, revision guide or exercise book as a reminder of the work that you have covered.

You may wish to use some of your summer to carry out some background reading and preparation. You could complete an on-line university course (Mook). Log onto Unifrog to find out more;

<https://www.unifrog.org/student/moocs/start>

I highly recommend the advanced mathematics support programme;

<https://www.amsp.org.uk>

There are numerous books that you may be able to borrow – an extensive list is provided at the back of the Mathematics Transition Booklet

Summer Gap Task and where to find this

The best way to prepare for your A level Mathematics is to complete the summer gap task that has been set.

If you read the booklet and complete the tasks over the summer then you will be using the skills that you have developed during your GCSEs. It is easy to let these skills lapse which will make the start of your A levels more difficult because you will be trying to remember what you did at GCSE and learn new knowledge and skills.

On the [school website](#), if you click on Sixth Form and follow the list until you see Year 11 into 12 Gap Tasks. Click on this and find the maths task which is a PDF booklet. The answers for all the tasks are provided at the back of the booklet.