

## Further Mathematics

Further Maths is highly recommended for degree courses in Maths, Science and Engineering: it is felt that students without Further Maths lack the required mathematical fluency. Some University departments require students without Further Mathematics to undertake additional catch up courses.

University Maths departments are so keen on candidates with Further Maths that they often accept them with lower grades in other subjects. Students looking for places on sought-after courses such as Medicine and Veterinary Sciences see Further Maths as a way to stand out.

Further Maths provides a greater level of challenge and inspiration than the standard Maths A level. We require a grade A in Mathematics at GCSE and a thorough understanding of all A and A\* topics.

### Course Content:

#### Year 12

**Further Pure 1:** complex numbers, introduction to matrices, conic sections, further calculus, roots of quadratic equations, reduction to linear form.

**Decision Maths:** graph theory, algorithms, linear programming

**Statistics 2:** discrete and continuous probability distributions, Poisson distribution, confidence intervals, hypothesis testing, chi-squared contingency tests.

#### Year 13

**Further Pure 3:** Polar co-ordinates, differential equations at 1<sup>st</sup> and 2<sup>nd</sup> order (both analytical and numerical solutions).

**Further Pure 4:** Matrices, inverses and determinants, vector algebra, vector product, triple products, eigenvalues and eigenvectors.

**Mechanics 2:** Moments and equilibrium, centre of mass, circular motion, variable acceleration, use of differential equations.

## Did you know?

If there are **30 people** in a room, it is **more likely than not** that at least **two** will have the same birthday.

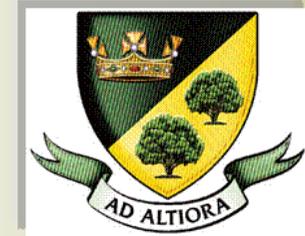


Can you prove this?

Can you work out how many people need to be in the room for the probability of some sharing birthdays to be over a half?

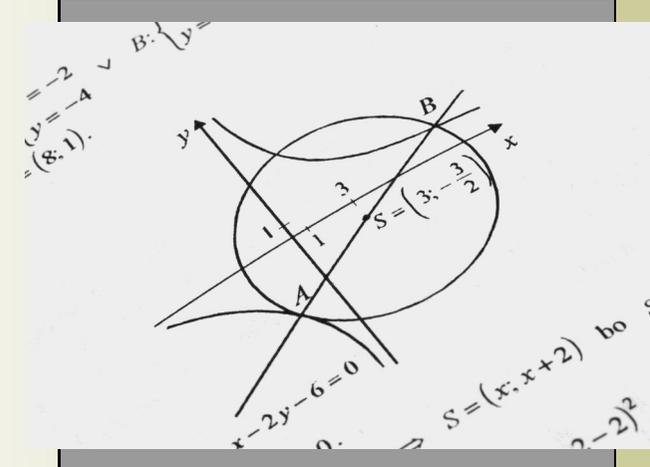
You may or may not be able to prove this now, but once you have studied year 12 maths you will be able to.

To prepare you for starting the A-level maths course we will be asking you to complete some questions on algebra and shape topics: we will hand these out on enrollment day in August to give you time to complete them by the start of the course in September.



## Mathematics Department

## A Level Mathematics And Further Mathematics



# Why Study Maths A- Level?

## A-level Maths makes you more employable-

A shortage of highly numerate candidates in the jobs market means employers pay a premium for the problem solving and number crunching skills of A level Mathematicians.

## You open up many career paths -

Popular career choices for those with A-level Maths include Engineering, Computing, Accountancy, Economics, Banking, Business, Retail Management, Surveying, Air Traffic Control, Architecture, Psychology and Accounting.

## It is necessary for many University courses -

University courses in physics, Business Studies, Psychology, Computing, Engineering and, of course, Maths all stipulate A-level Mathematics as completely necessary.

## You earn more money -

It has been reported that those with an A-level Maths qualification are set to earn around 10% more than those with other qualifications.

## Maths is rewarding -

not only in the financial sense but you also get a real buzz when you are able to solve complex problems – something that not every-one can do.

# What students have said...

I like the style of teaching at Arden, also, I know that the teachers here know what my ability is for Maths

I know the previous results have been high, so I think I will be pushed to do well

Through coming to Arden (late) I have been given a great opportunity

I knew and liked the teachers, I knew that there was good support both inside and outside the classroom

## Course Content:

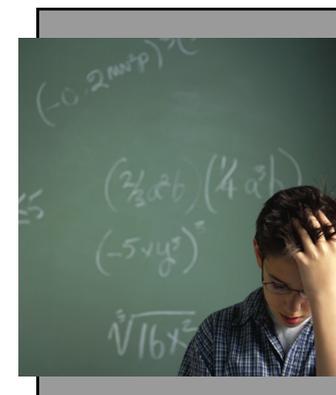
**A – Level Mathematics** - requiring grade B at GCSE (and confidence with algebra)

### Year 12

**Core 1** - consolidating GCSE Higher algebra skills and introducing calculus

**Core 2** – building on GCSE topics such as trigonometry and furthering understanding of calculus and series

**Statistics 1**- methods of basic statistical modeling including correlation, regression, normal distribution and probability



### Year 13

**Core 3** – inverse and modulus functions, numerical methods including Simpson's Rule and Mid-ordinate Rule, further calculus

**Core 4** – exponential growth and decay, vectors including 3 Dimensional, further calculus and trigonometry

**Mechanics** – basic mechanical modeling, forces & kinematics