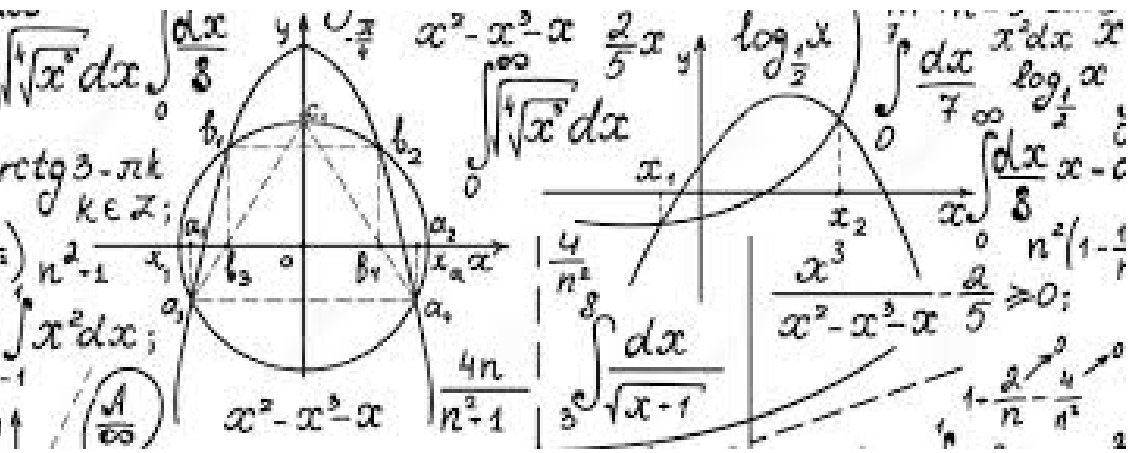




Cardinal  
Newman  
CATHOLIC SCHOOL



***Maths A level...***

***opening the door to  
your future!***

# NEW A-LEVEL MATHEMATICS

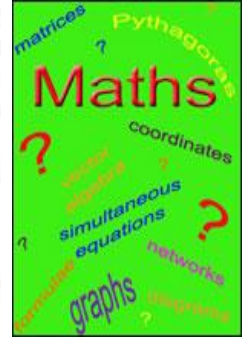
## EXAM BOARD: EDEXCEL PEARSON

Head of Key Stage: Mr H FANYO  
 (hfanyo@cardinalnewmanschool.net)

A Level Maths is widely recognised as a highly valued A Level and will open many 'doors' for you. Students who study Maths at this level are regarded as being the 'elite'.

**YOU MUST SECURE AT LEAST A GRADE 7 AT GCSE  
 ANYONE WITH GRADE 6 WILL SIT AN ENTRANCE TEST BEFORE BEING  
 ADMITTED ON THE COURSE**

**A Level Maths is NOT an easy option** – it does require a lot of self-motivation, determination and self-study. We recommend that you do a minimum of 5 hours work outside the classroom each week. You will need to 'love a challenge' and be willing to accept that a question has 'gone wrong' – and be prepared to have another attempt (and another and maybe even another).



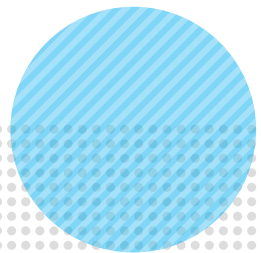
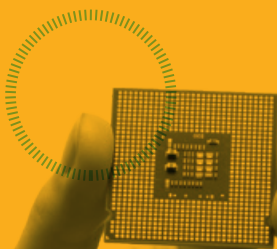
Year 1 Mathematics		Year 2 A level Mathematics	
<p><b>Paper 1: Pure Mathematics</b></p> <p>Written examination: 2 hours                      66.66% of the qualification 100 marks</p>	<p><b>Content overview:</b> Proof, Algebra and functions, Coordinate Geometry in the (x, y) plane, Sequences and Series, Trigonometry, Exponentials and logarithms, Differentiation, Integration, Vectors</p>	<p><b>Paper 1: Pure Mathematics 1</b>                      Written examination: 2 hours                      33.33% of the qualification 100 marks</p>	<p>AS level pure mathematics content – the same content as AS Paper 1 but tested at A level demand</p>
<p><b>Paper 2: Statistics &amp; Mechanics</b></p> <p>Written examination: 1 hour 33.33% of the qualification 50 marks</p>	<p><b>Content overview</b>  <b>Section A: Statistics</b></p> <ul style="list-style-type: none"> <li>• Topic 1 – Statistical sampling</li> <li>• Topic 2 – Data presentation and interpretation</li> <li>• Topic 3 – Probability</li> <li>• Topic 4 – Statistical distributions</li> <li>• Topic 5 – Statistical hypothesis testing</li> </ul> <p><b>Section B: Mechanics</b></p> <ul style="list-style-type: none"> <li>• Topic 6 – Quantities and units in mechanics</li> <li>• Topic 7 – Kinematics</li> <li>• Topic 8 – Forces and Newton's laws</li> </ul>	<p><b>Paper 2: Pure Mathematics 2</b></p> <p>Written examination: 2 hours                      33.33% of the qualification 100 marks</p>	<p><b>Content overview</b></p> <ul style="list-style-type: none"> <li>• Topic 1 – Proof</li> <li>• Topic 2 – Algebra and functions</li> <li>• Topic 3 – Coordinate geometry in the (x,y) plane</li> <li>• Topic 4 – Sequences and series</li> <li>• Topic 5 – Trigonometry</li> <li>• Topic 6 – Differentiation</li> <li>• Topic 7 – Integration</li> <li>• Topic 8 – Numerical methods</li> </ul>
		<p><b>Paper 3: Statistics and Mechanics</b>                      Written examination: 2 hours                      33.33% of the qualification 100 marks</p>	<p><b>Content overview</b>  <b>Section A: Statistics</b></p> <ul style="list-style-type: none"> <li>• Topic 1 – Statistical sampling</li> <li>• Topic 2 – Data presentation and interpretation</li> <li>• Topic 3 – Probability</li> <li>• Topic 4 – Statistical distributions</li> <li>• Topic 5 – Statistical hypothesis testing</li> </ul> <p><b>Section B: Mechanics</b></p> <ul style="list-style-type: none"> <li>• Topic 6 – Quantities and units in mechanics</li> <li>• Topic 7 – Kinematics</li> <li>• Topic 8 – Forces and Newton's laws</li> <li>• Topic 9 – Moments</li> </ul>

# Why study maths?

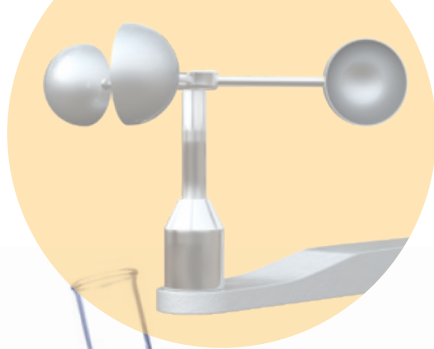
The skills developed through the study of maths are in high demand from employers and universities. In addition to developing the ability to solve problems and think logically, the study of maths provides opportunities to develop team-working skills, resilience, effective communication of complex ideas and the ability to use your own initiative.



Whatever maths means to you, the breadth of applications is immense. Maths underpins most of science, technology and engineering and is also important in areas as diverse as business, law, nutrition, sports science and psychology. There are many opportunities to use maths to make a difference in society, for example through the analysis involved in medical research, developing new technology, modelling epidemics or in the study of patterns of criminal activity to identify trends.



# Which maths qualification is suitable for me?



Continuing to study maths is a fantastic choice because of the wide range of applications of the subject. If you gain a good pass in GCSE Mathematics by the end of Year 11 you should consider taking maths further.

Your options are:

- **Core Maths.**
- **A level Mathematics.**
- **A level Further Mathematics.**

**Core Maths** is a new Level 3 qualification which develops the mathematical skills gained at GCSE. It focuses on using and applying maths to solve problems drawn from other subjects, work and real life. The Core Maths course includes new content such as statistics, financial maths and using algebra. Core Maths helps with the maths needed for a broad range of other subjects.

**A level Mathematics** supports the study of a wide range of other AS/A level subjects. Physics, Chemistry and Biology rely on good algebraic and graphical skills, statistical techniques and the use of a range of functions including logarithms and trigonometry. In addition, Economics, Psychology, Business, Computing and Geography all benefit from students having fluent and confident numerical, algebraic, graphical and statistical skills.

Many students take A level Mathematics in conjunction with non-related subjects in order to maintain a broad range of subject choices until they make decisions about their future study and career plans.

Mathematics is a qualification that is highly valued by employers and universities and is one of the most popular subjects for both boys and girls. The vast range of degree courses and careers that require solid mathematical skills ensures that taking maths to AS level or beyond will open doors to a world of opportunities!

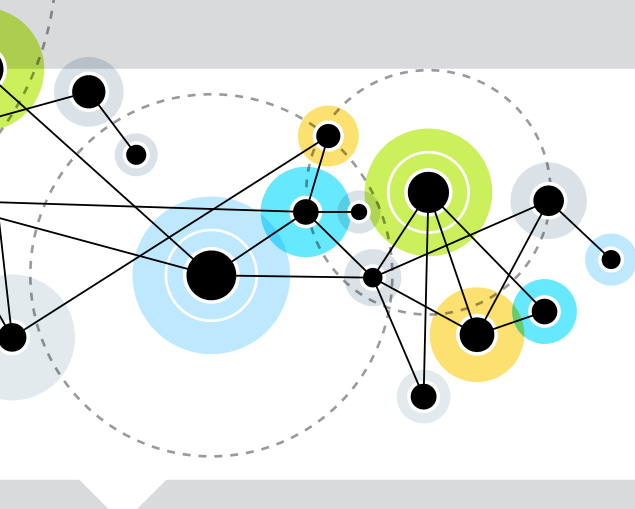
**Further Mathematics** provides a great opportunity for enthusiastic mathematicians to broaden and deepen their subject knowledge. If you plan to apply for a STEM (Science, Technology, Engineering and Mathematics) degree you should consider taking Further Mathematics. Further Mathematics is also a fantastic qualification for those students who love maths and want to devote more time to the studying wider aspects of the subject.

If you are thinking of applying for a medical degree, consult individual university websites to check for any special rules relating to Further Mathematics.

NOTE:

**YOU CAN ONLY STUDY FURTHER MATHS IF YOU ARE STUDYING MATHS.**

# A level Mathematics



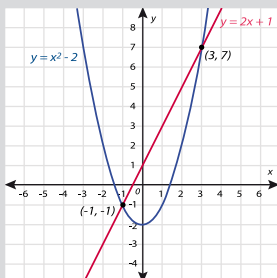
**We offer Maths as an A level only, not as an AS qualification.**

**All students study the same mathematical content, which extends techniques covered at GCSE and introduces new methods and concepts.**

The A level Mathematics course builds on familiar mathematical topics learned at GCSE such as **algebra, co-ordinate geometry, trigonometry** and **probability**. New topics introduced at A level include: **sequences and series; differentiation and integration**, together known as calculus; **Newton's laws of motion; and statistical hypothesis testing**.

Students are expected to use technology such as graphical calculators, graphing software and spreadsheets throughout the course.

Students starting A level Mathematics courses in September 2017 or later will take all examinations at the end of the **two year** course.



All qualifications include the same content, covering three broad areas:

## Pure maths

is the methods and techniques which underpin the study of all other areas of maths. This includes **proof, algebra, trigonometry, calculus, and vectors**.

## Mechanics

is the maths used to study the physical world, modelling the **motion** of objects and the **forces** acting on them. This includes **moments**, where the turning effect of a force is considered.

## Statistics

involves **statistical sampling, data presentation and probability**, all of which follow on from topics met at GCSE, leading to the study of statistical distributions with special properties, such as the **Binomial Distribution**.

# A world of opportunities



## Amanda Kaminski

Research Manager, BBC

*I am responsible for radio and music reporting for the BBC and am the company's expert in both radio data and statistics. Part of my role includes providing reports on the performance of the BBC's summer music festivals including Glastonbury and the BBC Proms. I have also provided important figures for key publications such as the BBC's Annual report.*



## Tomasz Szyrowski

Project Manager, Marine Engineer

*Three years of undergraduate study gave me a solid foundation not only in terms of knowledge but also allowed me to build a great academic network. After I finished the course I applied for a research based PhD position. I now work on developing mathematical and statistical tools for data acquisition, processing and interpretation in simulation and real time. The project focuses not only on the sensors used on marine applications but mainly on innovative mathematical and statistical methods for data analysis.*



## Coralie Colmez

Author, tutor, speaker & businesswoman

*I co-wrote a popular maths book, *Math on Trial*, about real-life criminal trials where there was an attempt to use a mathematical argument as evidence, and where a mistake was made. I use mathematics when I am tutoring and giving talks, and in business when I have to deal with big databases and make sense of them. Mostly, I use my capacity for clear and logical thinking, which was certainly developed through studying maths.*





## Want to know more?

If you are unsure about whether A level Mathematics is suitable for you, talk to your maths teacher. If you have a career in mind, research the entry requirements to ensure you are choosing the best subject combinations. Some degrees require or prefer A level Mathematics and/or Further Mathematics.



Advanced Mathematics  
Support Programme

The **Advanced Mathematics Support Programme (AMSP)** provides a range of support for students including:

- mathematical articles, challenges and puzzles
- Information about university courses
- enrichment and revision materials

The AMSP can also help provide tuition support for Further Mathematics if your school or college does not offer it.

See [amsp.org.uk](http://amsp.org.uk) for more information.

Other websites where you will find useful information are:



- **Mathscareers** – detailed information about careers that are available for students who have taken A level Mathematics and Further Mathematics and Mathematics degrees [mathscareers.org.uk](http://mathscareers.org.uk)



- **NRICH** – interesting resources to help you develop your problem solving skills, and information on preparing for university [rich.maths.org/secondary-upper](http://rich.maths.org/secondary-upper)



- **+ plus magazine** – articles, podcasts and puzzles designed to introduce readers to the beauty and applications of mathematics [plus.maths.org](http://plus.maths.org)



- **Future Morph** – outlines career opportunities from science and mathematics for 14–16 and 16+ age groups [futuremorph.org](http://futuremorph.org)



- **STEM Learning** – information about STEM (Science, Technology, Engineering and Mathematics) Ambassadors and STEM Clubs [stem.org.uk](http://stem.org.uk)