



Studying Maths beyond GCSE

Further Maths

$$x^2) \frac{dy}{dx} - xy = 1$$

$$y = \frac{x}{1-x^2}$$

$$\int \frac{x}{1-x^2} dx$$

$$= \frac{1}{2} \ln |1-x^2|$$

$$= \ln \sqrt{1-x^2}$$



What is covered in A Level maths?

- A Level maths is a mix of two thirds PURE mathematics and one third application of mathematics.
- Pure units cover topics such as algebra, graphs. Sequences, calculus and trigonometry.
- Students also study applied topics in mechanics and statistics





What is statistics?

Statistics – collecting and analysing data and using this to make predictions about future events.

Actuaries study statistical information to calculate the risk of a driver of a certain age having a car accident. This information would be used by insurers in establishing the cost of the annual premiums.

What is mechanics

- Mechanics – modelling of the world around us.
- e.g. at what angle should a cricketer aim to hit the ball in order to maximise the distance the ball will travel?
- Students planning careers in physics or engineering would find mechanics particularly useful.





Why study **Employability** Maths?

- Mathematics A level students and graduates are in high demand by employers.
- Maths is the essential transferable component across all science, engineering, technology and maths subjects.
- Currently 59% of employers state they are having difficulty recruiting people with Mathematics skills.



Why Study Maths?

Money

- Those with **Maths A level** earn on average around 10% more than those without.
- The average graduate starting salary is £22 500. However, the average starting salary for a maths graduate is £25 000.

Why Study Maths?

Develops Transferable skills



- Analytical Skills
- Communication skills
- Investigative Skills
- Learning Skills
- Problem Solving Skills
- Self-management

These are all skills that employers are looking for and which help when you are applying for jobs and are filling in the personal statement on your UCAS form



Why Study Maths?

It's Required!

- You must have A level Maths if you wish to study : Maths, Statistics, Physics, Computer Science, Engineering or Accountancy at University.
- Geography, Psychology, Biology, Medicine and Sports Science degrees all use advanced maths skills



Why Study Maths?

A highly respected A level choice

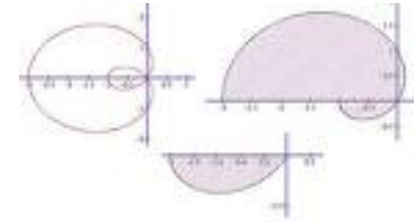
- Employers and University Admission tutors recognise A level Maths as an excellent qualification.
- Top Universities such as Cambridge value A level Maths and Further Maths along with the 3 Sciences as more suitable A level choices than others when applying for any science related degree.



With A level Maths what degrees can I study?

Pure Mathematics

- Algebra, Analysis, Topology, Calculus etc



Applied Mathematics

- Mechanics, Differential equations etc



Financial Mathematics

- Probability, Mathematical modelling, Statistics
- Statistics



With A level Maths what degrees can I study?

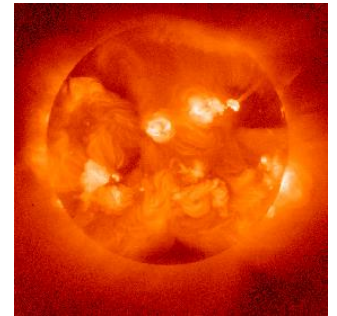
Mathematical Physics

- Fluid dynamics, thermal dynamics, MHD



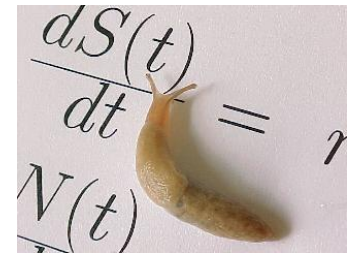
Mathematical Biology

- Differential equations, mathematical modelling



Operational Research

- Decision Mathematics (applicable to various industries)



Computing

- Programming, Database design, Maple

With A level
Maths what
degrees can
I study?

Combined Degrees: Mathematics with

- Management
- Actuarial sciences
- Philosophy
- Computing science
- French
- Etc etc etc.....

All engineering and science degrees
involve high level Mathematics
requirements...



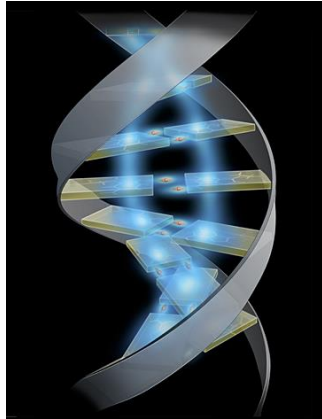
What Careers can Maths lead to?

Finance and banking

Some of the most lucrative career prospects working in the world's financial capitals...

- Accountants
- Auditors
- Credit Managers
- Investment Bankers
- Stockbrokers
- Financial Advisors





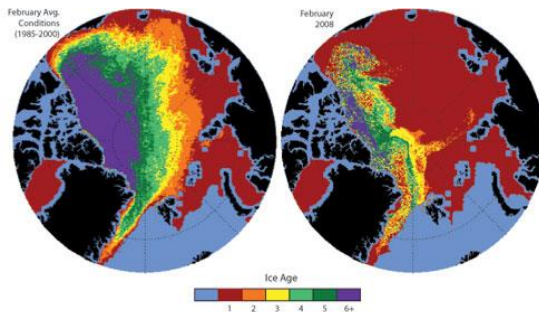
What Careers can Maths lead to?

Natural and Life Sciences

Describing the world requires mathematical language.

The range of careers in this area is expanding greatly. Many Masters courses relating to these areas are fully funded, unlike many other Masters courses.

- Bioinformatician
- Climatologist
- Meteorologist
- Geneticist



National Snow and Ice Data Center, courtesy of Swedish Univ. of Colorado, Boulder





What Careers can Maths lead to?

Art & Design

The expanding Media and Computer games industry has a shortage of computer scientists and games designers who can combine a passion for art and creativity with mathematical knowledge and skills.

- Multimedia Specialist
- Computer Game designer
- Designers

What Careers can Maths lead to?



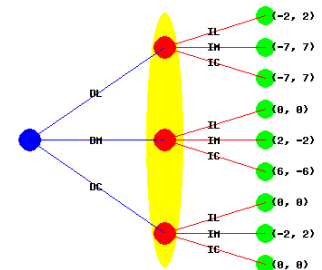
High performance. Delivered.

Business Consultancy and Operational Research

Many large consultancy firms seek out Maths graduates to employ. This involves finding optimal solutions to complex business problems. Maximising profits and minimising costs...

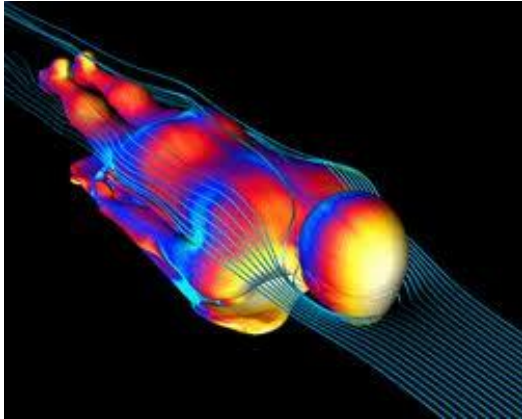
- Data Analyst
- Business Development Manager
- Operational Researcher
- Management Consultant

Egaloid Game Theory
Doc Holliday's Game Tree





What Careers can Maths lead to?



Engineering

Engineering is based heavily on maths and the majority of engineers will come from a maths background

- Aerospace engineer
- Civil engineer
- Design engineer
- Sports engineer
- Mechanical engineer
- Marine engineer
- Electrical engineer
- Structural engineer
- Naval engineer
- Building Technician



What Careers can Maths lead to?



Actuary and Insurance

Actuaries use financial and statistical skills to make predictions relating to risk and investment. Trainees earn approx £30K a year. Senior actuaries can earn six figure salaries.

- Actuary
- Risk Manager
- Insurance Broker
- Pensions Manager

What Careers can Maths lead to?

IT and Computers

Maths is essential to the design and development of computer software. Most other industries and professions use specific software which is developed by mathematicians and computer scientists.

- IT product developer
- Technical support technician
- Software developer
- Web designer

What Careers can Maths lead to?

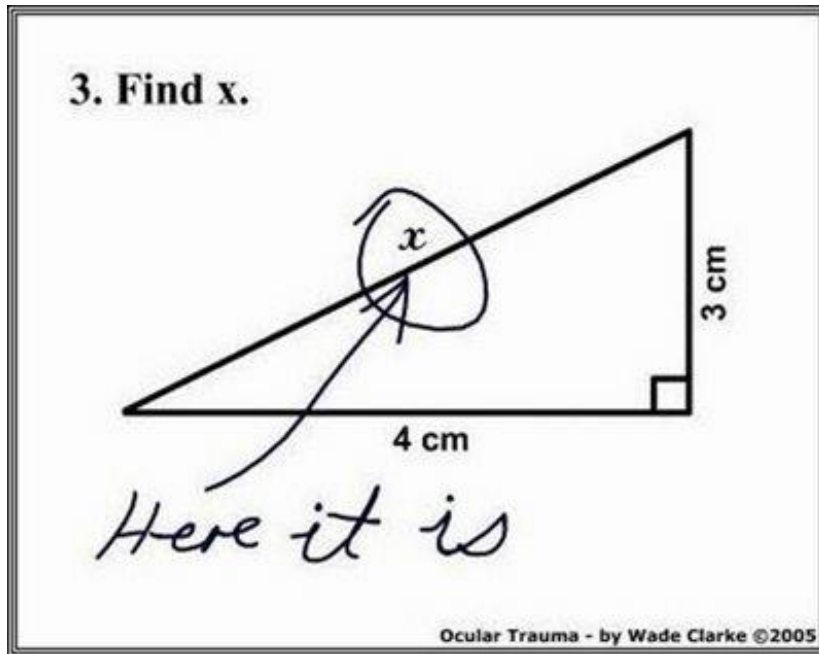


Medicine and Health

The NHS and pharmaceutical industry rely heavily on maths and statistics. Careers as medical statisticians can be accessed with a masters or PhD following a maths or statistics degree

- Medical statistician
- Medical laboratory assistant
- Medical physicist

What Careers can Maths lead to?



Education

Maths teachers are in great demand in schools especially in mainland UK.

- Maths teacher
- Numeracy coordinator
- Special needs teacher
- Head teacher
- Research mathematician

Why Study Further Maths?

What is Further Mathematics?

- Further Mathematics is an AS/A level qualification which both broadens and deepens the mathematics covered in AS/A level Mathematics.
- Further Mathematics is designed to be learnt alongside the A-level Mathematics course.
- 50% of the course is compulsory Pure content. The other 50% you can choose modules from further pure, statistics, mechanics or decision maths.



Why Study Further Maths?

- Students taking Further Mathematics overwhelmingly find it to be an enjoyable, rewarding, stimulating and empowering experience.
- For someone who enjoys maths, it provides a challenge and a chance to explore new and/or more sophisticated mathematical concepts.
- It enables students to distinguish themselves as able mathematicians in the university and employment market .
- It makes the transition to a mathematics-rich university course easier.
- Some prestigious university courses will **only** accept students with Further Maths qualifications.



Universities value Further Maths

- 46% of Mathematics BSc degree courses mention Further Mathematics in their entry requirements, including it in their A level offers or encouraging students to take it if possible. For those universities in the Russell Group, this proportion is 74%.
- Over 25% of Physics undergraduates have studied Further Mathematics and at some universities this proportion is considerably higher
- Birmingham, Lancaster, Leeds, Loughborough, Nottingham, York plus many more will give lower or flexible grade offers for students studying Further maths at A level wishing to study maths.



Universities value Further Maths

- Only a small number of engineering degree courses specifically mention Further Mathematics in their entry requirements, but many course leaders encourage students to take Further Mathematics if possible as it is a valuable introduction to the mathematical requirements of engineering degrees.
- In consequence, at some of the leading universities a significant proportion of engineering undergraduates have studied Further Mathematics A level



More
Information

Please talk to a member of the Maths team if you are interested in studying A Level Maths and Further Maths

