

# Mathematics at Huntington



## What is covered in AS/A level Mathematics?

All of the content in the AS/A level Mathematics qualification is compulsory and is the same for all examination boards.

**Pure Mathematics (66%)**  
methods and techniques which underpin the study of all other areas of mathematics, such as, proof, algebra, trigonometry, calculus, and vectors.

**Statistics (17%)**  
statistical sampling, data presentation and probability leading to the study of statistical distributions

**Mechanics (17%)**  
the study of the physical world, modelling the motion of objects and the forces acting on them.

## What is Mechanics?

The modelling of the world around us, the motion of objects and the forces acting on them. For example:



*What angle should a cricketer aim to hit the ball in order to maximise the distance it will travel?*

Students planning careers in physics or engineering would find mechanics particularly useful.

## What is Statistics?

Reaching conclusions from data and calculating the chance of an event occurring



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

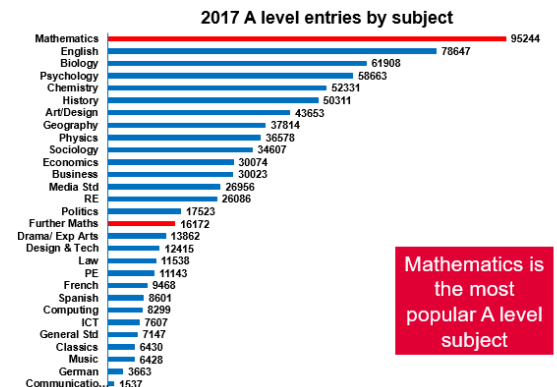
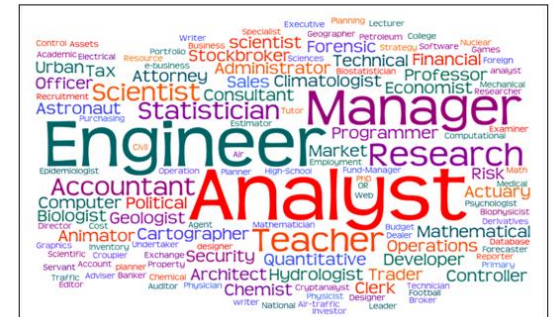


## What are the career opportunities?

"...the subjects that keep young people's options open and unlock the door to all sorts of careers are the STEM subjects (science, technology, engineering and maths). The skills gained from studying these subjects come in useful in almost any job you could care to name - from the creative and beauty industries to architecture."

*Nicky Morgan, former Secretary of State for Education*

## What are the career opportunities?



## A level Maths opens the door to leading universities

“Doing facilitating subjects, **particularly maths**, may be a sensible choice of A-level for those aspiring to a high-ranking university, even if the content is not required for the intended course.”

Report by Catherine Dilnot, Institute of Education, 2017

## Is A level Mathematics needed for entry to university degree courses?

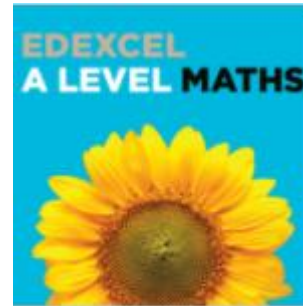
- It is important to have strong maths skills for progression to many degree courses at university.
- A level Mathematics is also essential or desirable for a wide range of degree courses including economics, computing, social sciences and business.
- According to research by UCL, students with an A level in Mathematics are more likely to attend a Russell Group university.
- Any student applying to study a degree in a STEM subject should also consider taking Further Mathematics to at least AS level alongside A level Mathematics.

## Other sources of information

- The mathematics teachers at your school
- FMSP website [www.furthermaths.org.uk](http://www.furthermaths.org.uk)
- Maths Careers website [www.mathscareers.org.uk](http://www.mathscareers.org.uk)
- Future Morph careers website [www.futuremorph.org](http://www.futuremorph.org)
- Universities and Colleges Admissions Service (UCAS) [www.ucas.com](http://www.ucas.com)
- Best course 4 me [www.bestcourse4me.com](http://www.bestcourse4me.com)
- Tomorrow's Engineers [www.tomorrowsengineers.org.uk](http://www.tomorrowsengineers.org.uk)
- The Institute of Physics (IOP) [www.iop.org](http://www.iop.org)

## Maths At Huntington:

The exam board is Edexcel and we currently use the following textbook. There is access to this textbook online via Kerboodle, so you will not need to carry a textbook.



## Kerboodle (online text book):

**Example 2** Work out the equation of the circle with centre  $(-4, 9)$ , radius  $\sqrt{11}$   
Write your answer without brackets.

$$(x+4)^2 + (y-9)^2 = 11$$

Use  $(x-a)^2 + (y-b)^2 = r^2$

$$x^2 + 8x + 16 + y^2 - 18y + 81 - 11 = 0$$
$$x^2 + y^2 + 8x - 18y + 86 = 0$$

**Example 3** Work out the centre and radius of the circle  $4x^2 - 4x + 4y^2 + 3y - 6 = 0$

$$4x^2 - 4x + 4y^2 + 3y - 6 = 0$$
$$x^2 - x + y^2 + \frac{3}{4}y - \frac{3}{2} = 0$$
$$\left(x - \frac{1}{2}\right)^2 - \frac{1}{4} + \left(y + \frac{3}{4}\right)^2 - \frac{9}{16} - \frac{3}{2} = 0$$
$$\left(x - \frac{1}{2}\right)^2 + \left(y + \frac{3}{4}\right)^2 = \frac{121}{16}$$

Hence the circle has centre  $\left(\frac{1}{2}, -\frac{3}{4}\right)$  and radius  $\frac{11}{4}$

Divide by 4

Complete the square terms using both  $x$  and  $y$  terms.

Use  $(x-a)^2 + (y-b)^2 = r^2$

You can check by drawing the circle on a graphics calculator.

Students usually have 2 maths teachers. The pure content is shared between both teachers, and then one teacher will cover Mechanics while the other teacher covers Statistics.

## Graphic Calculators:

For the current A levels, Ofqual states that calculators used must include the following features as the "technology must permeate the spec"; an iterative function, the ability to compute summary statistics and access probabilities from standard statistical distributions, and for Further Maths, the ability to perform calculations with matrices up to at least order  $3 \times 3$ .

This year we have offered the following calculators at the price shown. Students who wish to buy them have found the prices much cheaper than online prices.

Casio Fx-991EX (£19), Fx-9750G II (£55), Fx-CG20 (£80).

We hope to put in a similar order at the beginning of the next academic year.



