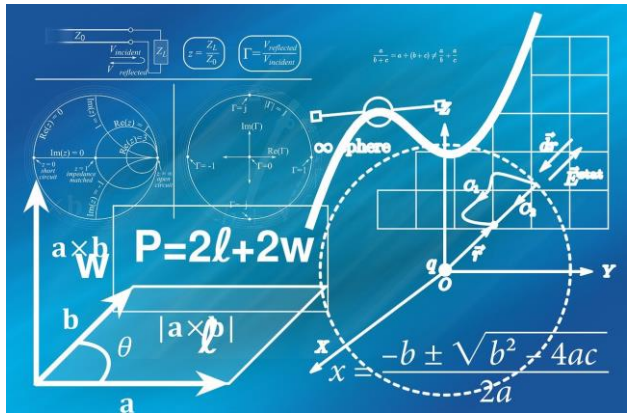
NOTRE DAME HIGH SCHOOL
NDHS
SURREY ST., NORWICH, NR1 3PB
MATHEMATICS

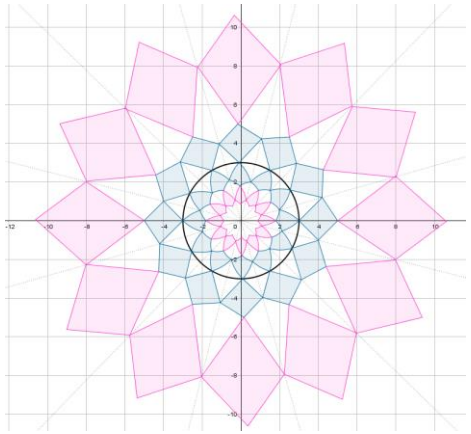
What is covered in A level Mathematics?

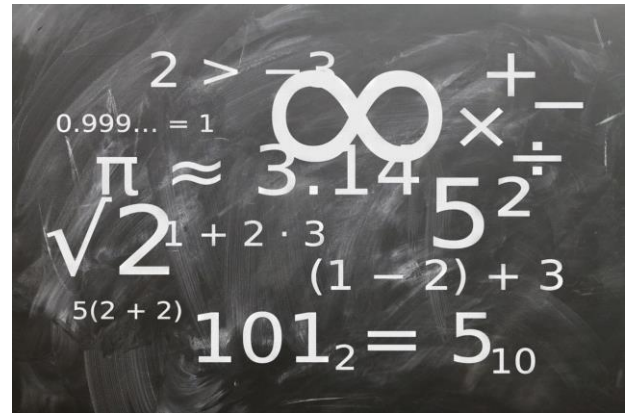
All of the content in the A level Mathematics qualification is compulsory and is the same for all examination boards.

What is Pure Mathematics?

Methods and techniques which underpin the study of all other areas of mathematics, such as, proof, algebra, trigonometry, calculus, and vectors







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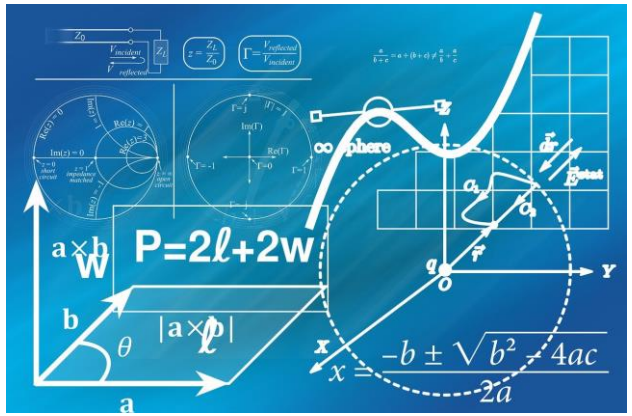
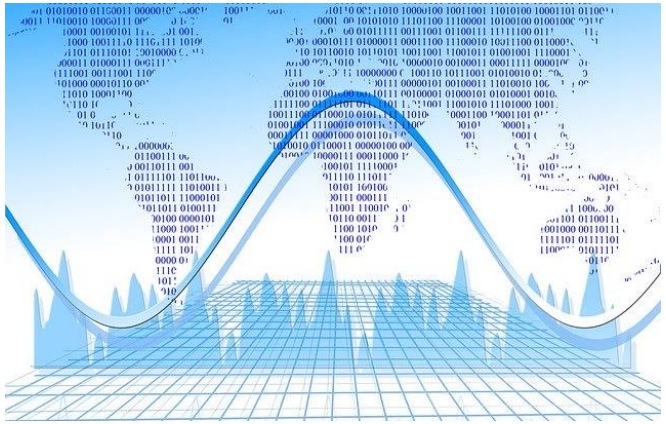


The points A and B have coordinates (4,-2) and (10,6) respectively.

Find the equation of the circle that has AB as a diameter.

What is Statistics?

Reaching conclusions from data and calculating the likelihood of an event occurring.



What is Statistics?

Reaching conclusions from data and calculating the likelihood of an event occurring.

What is the probability of two '100 year floods' happening within the space of 5 years?

What assumptions have you made?

"The majority of private sector organisations believe the use of data analytics will be the most important factor in increasing growth in UK businesses"

Professor Sir Adrian Smith

Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630488/AS_review_report.pdf

What is Mechanics?

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

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

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

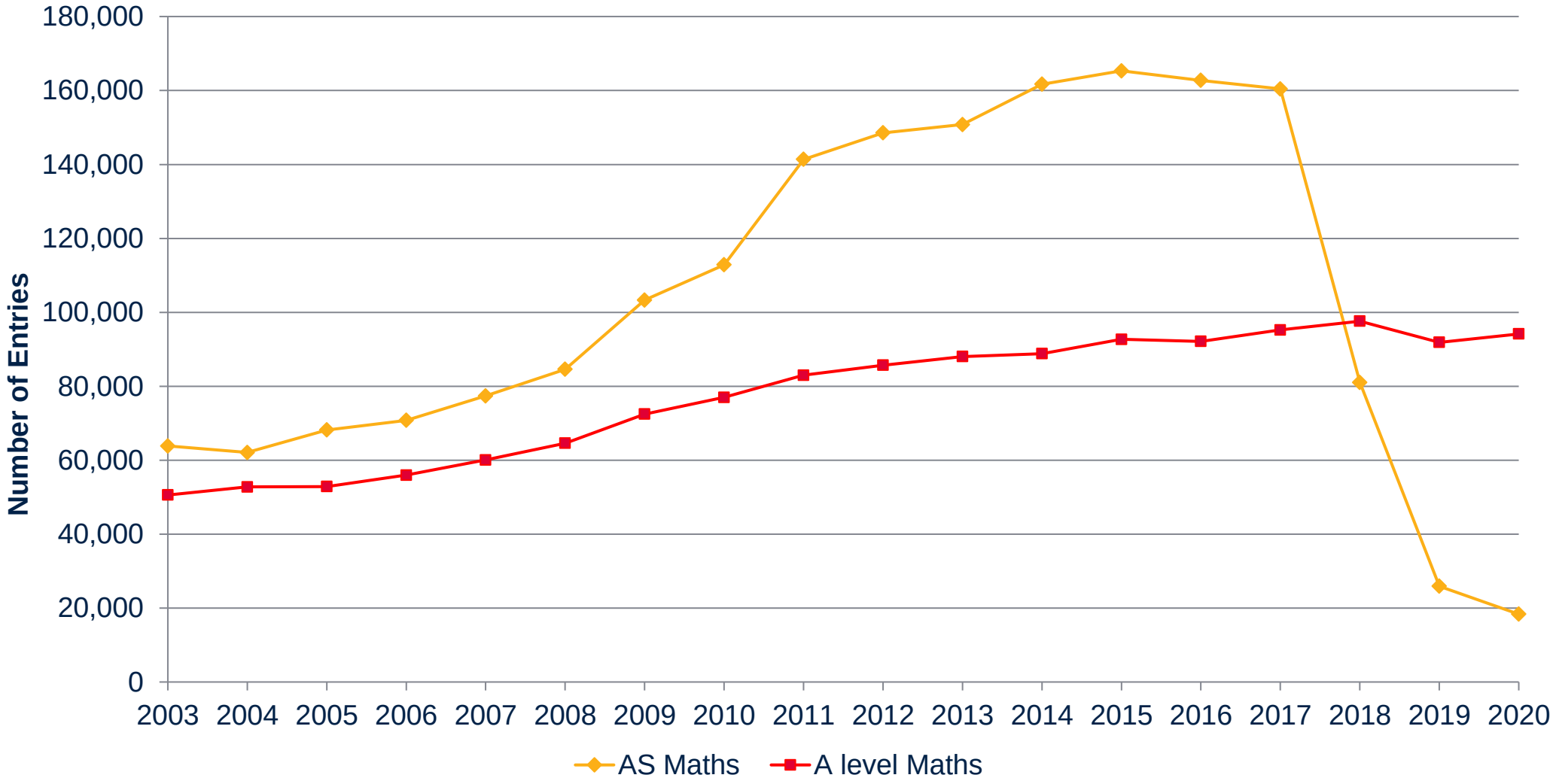
A golfer drives their ball from a tee on horizontal ground so that it has an initial velocity of 50ms^{-1} at an angle of 40 degrees above the horizontal.

How far down the fairway will the ball land?

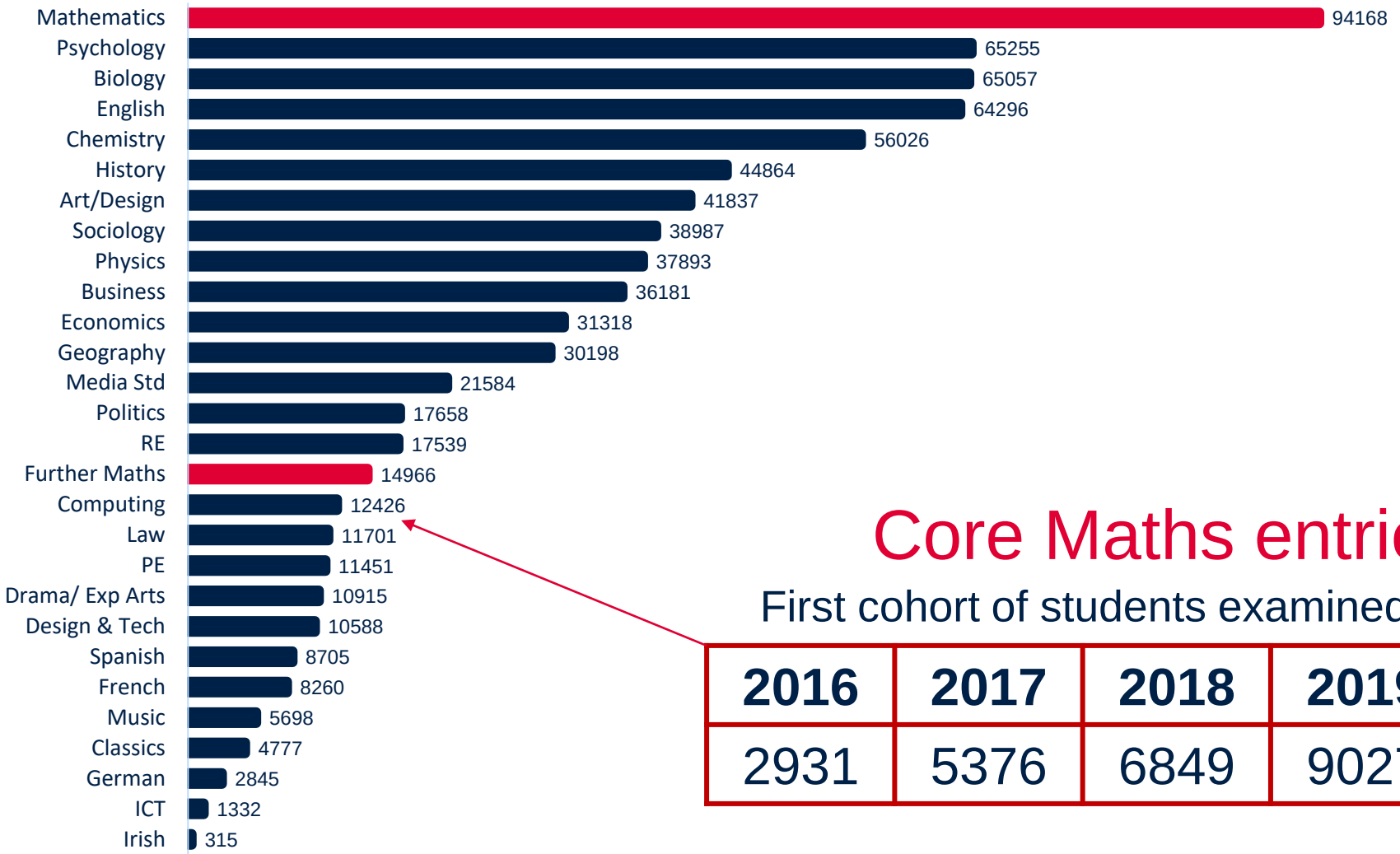
A Level Maths course requirements:

- A minimum of a grade 4 in GCSE English (Language) or GCSE English (Literature), AND
- A minimum total GCSE points score of 39 for the best eight individual GCSE subjects, AND
- A minimum of a grade 6 in GCSE Mathematics

A and AS level Mathematics entries in the UK 2003-2020 (JCQ data)



2020 UK A level entries by subject (JCQ data)



Core Maths entries

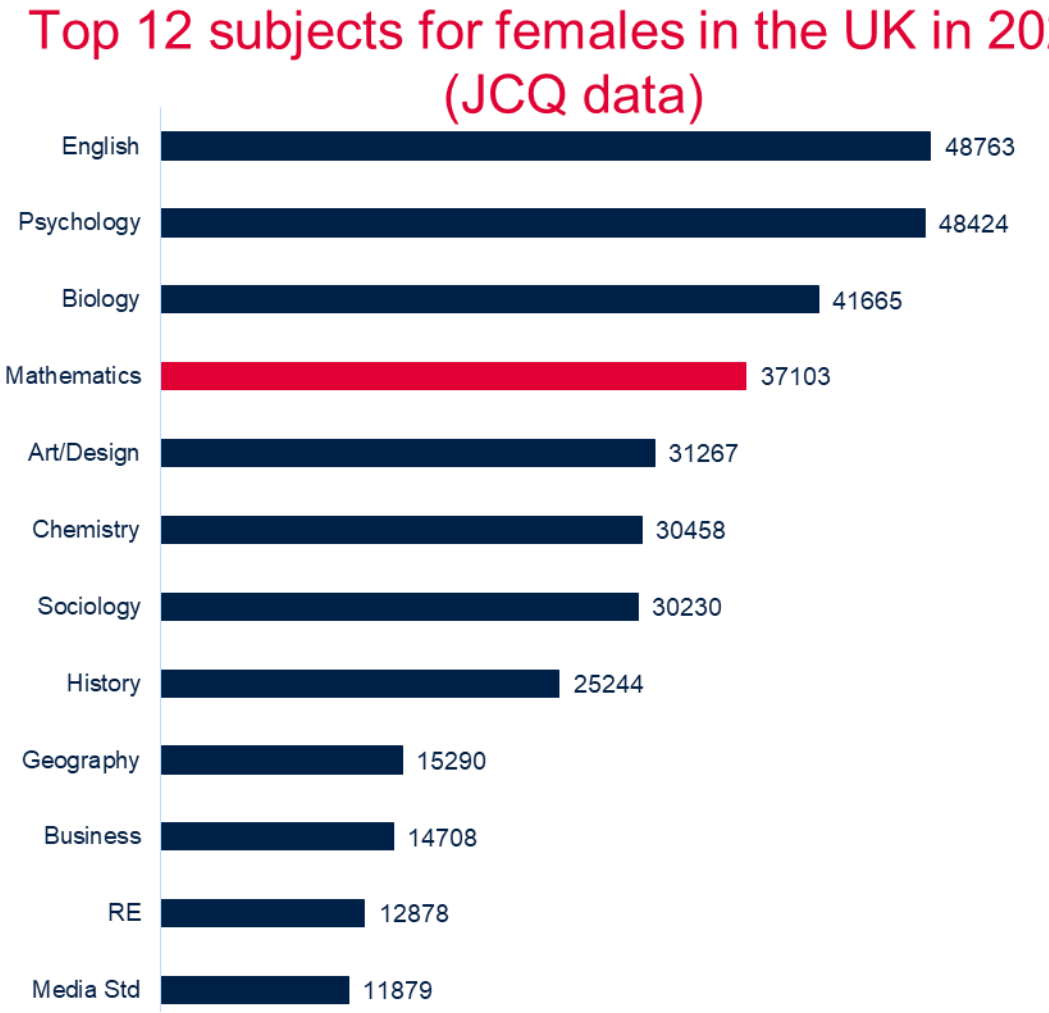
First cohort of students examined in 2016

2016	2017	2018	2019	2020
2931	5376	6849	9027	11792

Maths in other A levels

Geography	(no specific percentage but geographical skills include quantitative and qualitative skills equally)
Economics	(at least 20%)
Biology	(at least 10%)
Business	(at least 10%)
Psychology	(at least 10%)
PE	(at least 5%)
Sociology	(no specific percentage but you will be analysing data)

Girls' participation in Mathematics



Maths is the fourth most popular A level for girls.

Parents and carers play a **key** role in positively influencing girls' A level and future career choices towards mathematics in both STEM and non-STEM disciplines

"We are moving, albeit slowly, towards greater gender equilibrium in entries"

Michael Turner, JCQ's Director General

What are the career opportunities?

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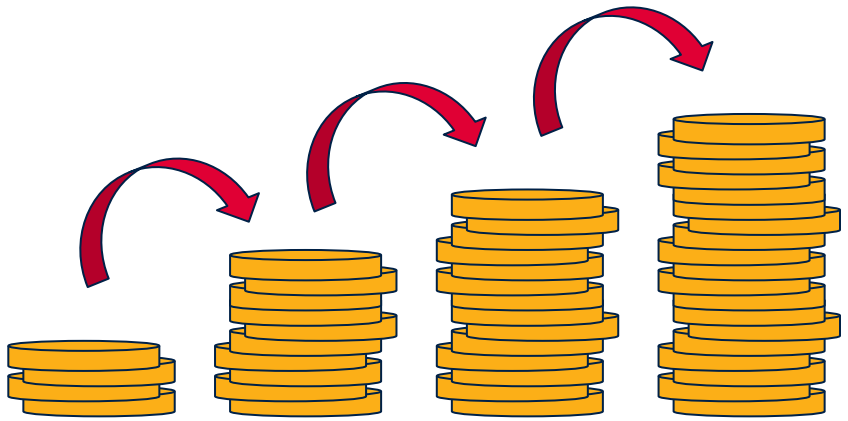
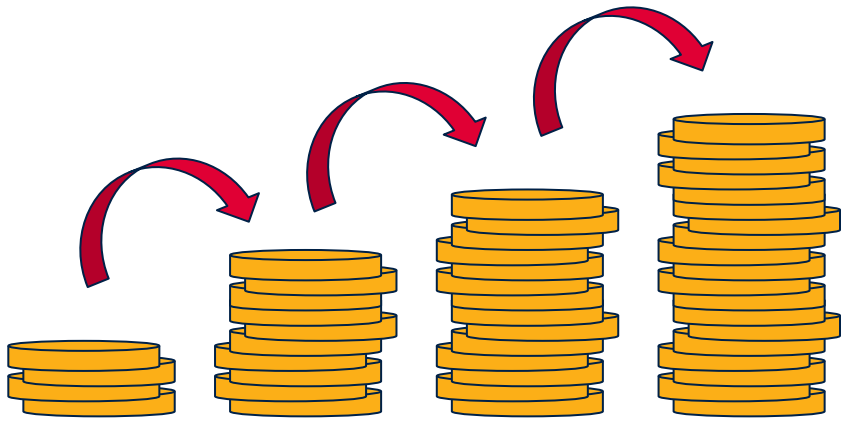


"…analysis highlights the economic value of good mathematical skills and of higher level qualifications… There is compelling evidence of continued wage returns of up to 11% to A level Mathematics."

Rethinking the Value of Advanced Mathematics Participation
http://www.nottingham.ac.uk/education/documents/research/revamp-final-report-3.1.17.pdf

What are the career opportunities?



PUTTING A PRICE ON EXAMS

Average salary six years on, by subject taken at A-level

Further maths	£25,500	**Chemistry**	**£21,600**
Maths	**£25,500**	P.E.	£20,400
Physics	£25,500	**French**	**£19,900**
Computing	**£25,500**	History	£19,400
Business Studies	£25,500	**English Literature**	**£19,200**
Geography	**£25,500**	Sociology	£18,300
Biology	£25,500	**Art and Design**	**£16,800**

https://www.gov.uk/government/publications/post-16-education-earnings-outcomes-for-level-3-achievements

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.

Students applying to study a degree in a STEM subject should also consider taking Further Mathematics, to at least AS level, alongside A level Mathematics.

According to research by UCL, students with an A level in Mathematics are more likely to attend a Russell Group university **...**

A level Maths and degree courses

Degree subject category	% of accepted students with A levels who have studied A level Maths (entry 2016)
Mathematics (G1)	100%
Physics (F3)	99%
Chemical, Process and Energy Engineering (H8)	98%
Mechanical Engineering (H3)	93%
Pre-clinical medicine (A1)	75%
Economics (L1)	70%
Computer Science (I1)	57%
Chemistry (F1)	34%

A level Maths opens doors to leading universities

Taking maths at A-level is more helpful for landing a place at a Russell Group university than studying at a grammar or private school, research from University College London's Institute of Education suggests. There is even a maths premium for degree subjects that are not directly related to maths or which require a different skillset, such as languages and humanities.

Source: https://schoolsweek.co.uk/a-level-maths-is-more-useful-for-top-university-places-than-private-school

Exemplar Entry Requirements

AAA / A*AB **alternatively**

AAB / A*BB, including Further Mathematics **or**

AAB / A*BB, PLUS Grade A in AS level Further Mathematics

In all cases, the first grade quoted is the Mathematics A level.

Leeds University 2021 entry

A*A*A - Mathematics, Further Mathematics and one other subject.
Also, Grade 1 in STEP II and III.

Cambridge University 2021 entry

CCE including Mathematics (typical offer)

London Metropolitan University 2020 entry

Exemplar Entry Requirements

ABB-BBB to include Maths.

Swansea University (Chemical Engineering degree), 2021 entry

AAB including Mathematics and either Physics, Electronics, Further Mathematics or Chemistry.

Manchester University (Electrical & Electronic Engineering degree), 2021 entry

BCC including Mathematics and one other Science at grade C or above.

Northampton University (Mechanical Engineering degree), 2020 entry

Exemplar Entry Requirements

AAB - ABB to include Chemistry and one further science subject (from Biology, Human Biology, Physics, Maths, Further Maths, Psychology, Geography or Geology).

Southampton University (Chemistry degree), 2021 entry

ABB-BBB including grade B in Maths.

Reading University (Meteorology and Climate degree), 2021 entry

Exemplar Entry Requirements

ABB. One science A level required, two science A levels preferred and may lead to a lower offer. (List of sciences includes Mathematics and Further Mathematics)

Liverpool University (Psychology degree), 2021 entry

A*AA. Applicants must have achieved an A in A level Maths

University of Warwick (Economics degree), 2021 entry

My daughter/son loves maths. How can they be stretched?

Take Further Mathematics at AS or A level.

Tackle problems on the NRICH website.

Study for additional qualifications in mathematics such as STEP, TMUA or the MAT, which are required for entrance to some leading universities to study mathematics.

Other sources of information

AMSP website www.amsp.org.uk

Maths Careers website www.mathscareers.org.uk

Apprenticeship websites e.g. www.amazingapprenticeships.com

Universities and Colleges Admissions Service (UCAS) www.ucas.com

Russell Group Universities www.informedchoices.ac.uk

Tomorrow's Engineers www.tomorrowsengineers.org.uk

The Institute of Physics (IOP) www.iop.org

Nrich www.nrich.org.uk