



Longley Park

SIXTH FORM ACADEMY

Creating Excellence Together,
through a culture of care

Get Ready For...

A Level
Maths

LONGLEY PARK SIXTH FORM

What will I study?

In A level Mathematics you will study topics such as geometry, calculus and trigonometry (pure mathematics) and use these topics, and others, within the 'applied' topics, mechanics and statistics. Mechanics is linked to physics and builds on motion and forces to work out how and why objects move. Statistics allows us to analyse data and enables us to draw reliable conclusions.

What can I do next?

Mathematics complements many other subjects and prepares you for further study and employment in many areas that involve the use of Mathematics. After completing A-Level Mathematics many students go on to university to study a wide variety of courses including Mathematics, Statistics, Medicine, Dentistry, Psychology, Business, Science, Engineering, Computing, Technology. Some students follow an apprenticeship route in areas like Accounting and Engineering.

Students who studied A Level Maths in 2022 went to a variety of universities to study a range of subjects including:

University of Sheffield – Computer Science

University of Sheffield – Aerospace Engineering

University of Salford – Geography

University of Bradford – Clinical Sciences

University of Northampton – Computer Science

Sheffield Hallam University – Interior Architecture & Design

Sheffield Hallam University – Software Engineering

Sheffield Hallam University – Mechanical Engineering

Sheffield Hallam University – Accounting & Finance

What additional opportunities will I have on my course?

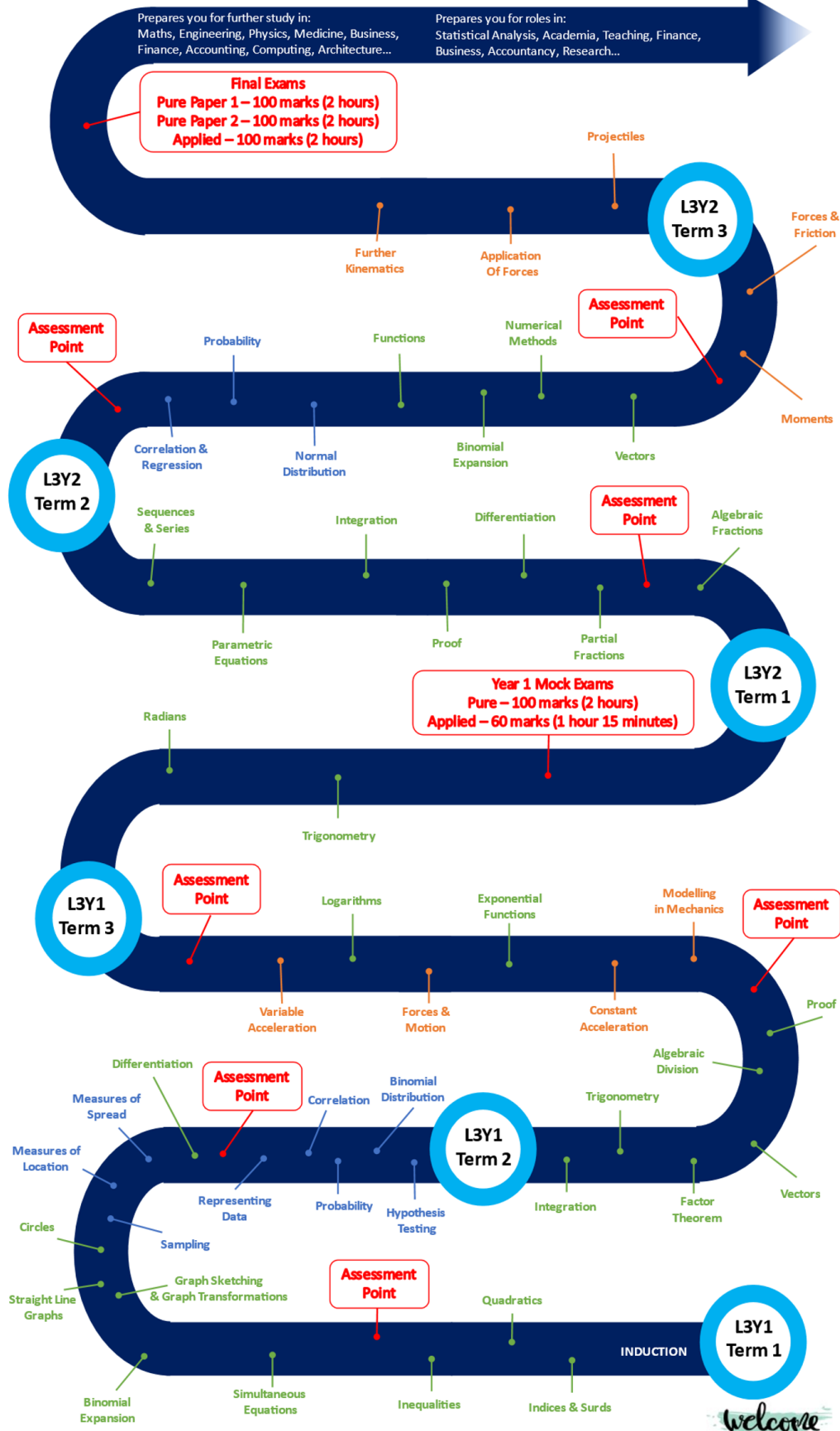
You will be entered into the Senior Maths Challenge. This is a national competition which encourages **mathematical reasoning**, **precision of thought**, and **fluency** in using basic mathematical techniques to solve interesting problems. You can find sample questions at www.ukmt.org.uk if you would like to do some practice.

You will be encouraged to experience Maths within other fields. This could include areas such as data science, meteorology and insurance.

If you are planning to study Mathematics beyond A Level, you could study Further Maths alongside Maths. This can be done as a 1 year AS course as well as a full A Level. Universities may ask you to study additional qualifications such as STEP, MAT or TMUA; we can offer support in preparing for these additional exams if required.

Your Learning Journey

A Level Mathematics Learning Journey



"The only way to learn Mathematics is to do Mathematics" Paul Halmos

Complete the following questions and bring your solutions to your first Maths lesson in September. It doesn't matter if you print the questions or not, but please make sure that you show all your working out.

Fractions

Write as a single fraction in its simplest form:

1. $\frac{m}{2n} + \frac{1}{n}$

2. $y + \frac{3y}{7}$

3. $\frac{5y}{4} + \frac{4-3y}{3}$

Indices

Simplify, leaving the answer in index form:

1. $5p^2q \times 2pq^2$

2. $(3c^3d^4)^3$

3. $(3y^2)^3 \div 9y^3$

Find the value of n:

1. $6^n \times 6^3 = 6^6$

2. $(2^n)^5 = 2^{15}$

3. $\frac{(x^3)^5}{x^n} = x^2$

Write the following in the form ax^n :

1. $\frac{3}{x^2}$

2. $5\sqrt[3]{x}$

3. $\frac{1}{7\sqrt{x}}$

Solving linear equations

Solve the following:

1. $\frac{3x}{4} + 7 = 3$

2. $2(x+3)=16$

3. $12x+7=2x+27$

Inequalities

Solve the following inequalities:

1. $4x-5 \leq 11$

2. $2x+3 \geq x+8$

3. $-3x \leq 12$

Factorising

Factorise completely the following:

1. $pq^3 + p^2q$

2. $25x^2 - y^2$

3. $x^4 + 12x^3 + 35x^2$

Problem solving

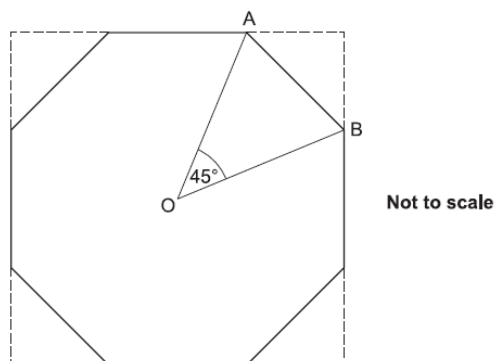
1. The sum of three consecutive integers is 42. Find the three numbers.

2. The width of a rectangle is one third of the length. If the perimeter is 96 cm, find the width.

3. Simon cuts the corners off a square piece of card to leave the regular octagon shown.
O is the centre of the octagon. A and B are vertices of the octagon.

$OA = OB = 5\text{cm}$. Angle $AOB = 45^\circ$.

- a) Work out the area of the octagon.
- b) Work out the area of the original square piece of card.



How can I go the extra mile to prepare for my course?

Useful Websites:

<https://alevelmathsrevision.com/bridging-the-gap/#>

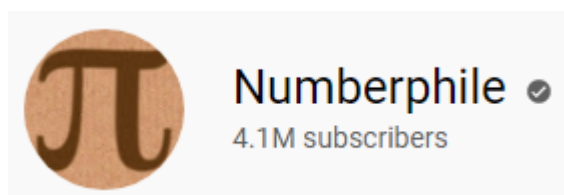
This website has some questions on key topics from GCSE with solutions and tutorial videos to help you revise topics that will be important at A Level.

https://my.integralmaths.org/integral/self_reg/self_reg_students.php

You can register to do an A Level Maths preparation course. This is designed for you to work through at your own pace and focuses on applying algebra topics to more complicated situations than you will have seen at GCSE.

Additional Reading For Your Interest

There are some really interesting videos on the Numberphile channel on YouTube.



Make a start with:

Problems with zero <https://www.youtube.com/watch?v=BRRoIKTIF6Q&feature=youtu.be>

Calculating by hand <https://www.youtube.com/watch?v=HrRMnzANHHS&feature=youtu.be>

Recommended Books

The Parrot's Theorem – Denis Guedj

The Numbers Game – Chris Anderson & David Sally

What else can I do to prepare for starting Sixth Form? What our students say

“Get ready emotionally, it is different from school!”

“Be confident. Put yourself out of your comfort zone and meet new people; you will meet lots of new people when you get here”

“Start looking at Universities/ Careers now! It will give you a focus when you start at Sixth Form”

“You will need to be more independent and be able to manage your time differently to school. Start building those skills now!”



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Additional Opportunities

We offer a variety of different opportunities to enrich your time with us and support your next steps:

- ~A variety of Clubs and Societies through Project You
- ~Employer immersion visits & Trips to employers
- ~Work Experience & Placement
- ~Trips to Universities
- ~Guest Speakers
- ~Leadership through the Student Ambassador Programme
- ~ Independent Learning Centre with IT, books and journals, quiet and group study + Seminar Rooms
- ~Health and Fitness Activities in our onsite gym
- ~Duke of Edinburgh
- ~Career Ready internship Programme
- ~ Access to wellbeing, academic tutorial, and careers support