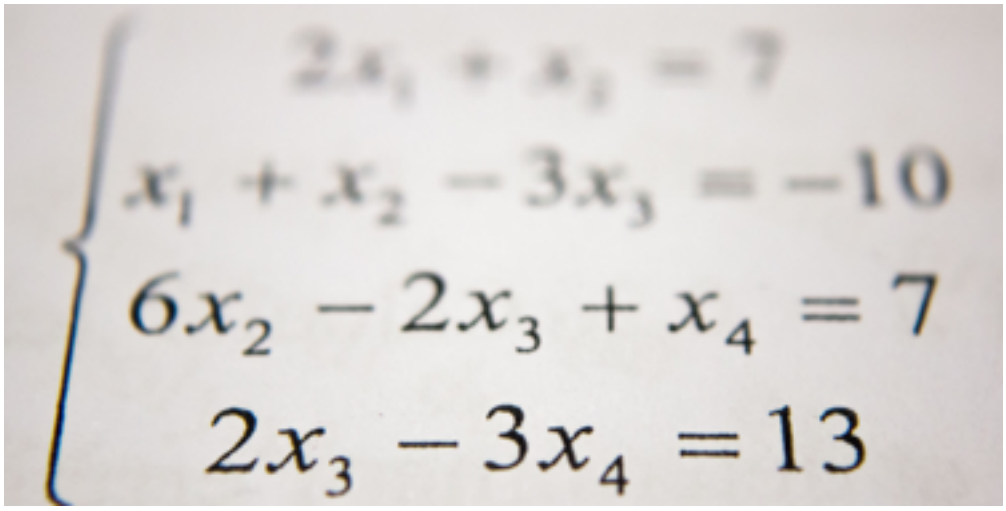
AS Level Mathematics

Transition Booklet

A guide to help you prepare for studying

AS Level Mathematics



This booklet is designed to support learners currently in Year 11 who have opted to study AS level Mathematics in the next academic year. As your studies this year have been cut short, you may be feeling anxious about returning to your studies. Please be reassured that your school or college will be doing everything they can to support you when you return; however, there are a few things you should do to ensure that you are prepared.

It is particularly important that you practice your Mathematical skills regularly throughout the summer term, so that you remain fluent in your existing Maths skills and also that you work to close any gaps in your understanding in order to ensure that you are in the best possible position to resume your studies when schools reopen.

We suggest that you focus your study time working your way through the resources in this booklet, using the videos to support and guide you.

We have split the booklet into two sections – first that which is essential for further study, and second that which is not essential for the course, but you may find interesting and exciting!

Part 1: Essential Skills for Further Study

It is important that you thoroughly understand the A and A* grade work from GCSE as it will be expected that you know how to confidently and competently complete questions of this level from GCSE during the AS level course.

Flipped Exam Support		
Grade	**Topic**	**Link**
A/A*	3D Trig and Pythagoras	https://drive.google.com/open?id=1siwQy1PVw1D5L3dT_-vQ7-P48_M1ajF5
A/A*	Algebraic Fractions	https://drive.google.com/open?id=1CSiO3CgPcrNnybbr2S2w3EqqiSQ4MKmw
A/A*	Arc length and sector area	https://drive.google.com/open?id=12z53xUQPklQunXjbGPJRu07dVExfwK5E
A/A*	Direct and indirect proportion	https://drive.google.com/open?id=1ZjsrtqZZJpWLF8rUyl6_wduJjj-P6-7Y
A/A*	Enlargements with NEGATIVE scale factor	https://drive.google.com/open?id=114gOxT81bvt_yl9cn-Pc4vDjb0SVMBCM
A/A*	Histograms	https://drive.google.com/open?id=1Bz5VBSTU055Ho0qwMhh2LXCu_iiRsrZJ
A/A*	Probability without replacement	https://drive.google.com/open?id=15rT1j5BTZT44ckt_YJWPKqmx4iEp8Xh6
A/A*	Quadratic Formula	https://drive.google.com/open?id=1eUMRyRoyb0F2X0GxKhEuxY8QccCZdlol
A/A*	Recurring decimals	https://drive.google.com/open?id=181Lpn6Je4GIPufK_xlrHvrQoa_h-VRXg
A/A*	Sine and Cosine Rule	https://drive.google.com/open?id=1fYQ3KJ2eOZcO5zXvK2yh_RBiloDfCr_x
A/A*	Spheres, Cones, Pyramids	https://drive.google.com/open?id=1QEabIIpWXBDNAIJmOy4YkEYuwvJ14vvR
A/A*	Transformations of graphs	https://drive.google.com/open?id=1jwKz609K9CE8lDphLPw80fkPjEfm5KgT
A/A*	Velocity Time Graphs and Trapezium Rule	https://drive.google.com/open?id=1sfvm9kxheEpjGK4QrZJOIaidPnEV7yCO
A/A*	AER	https://drive.google.com/open?id=1tWEyodA550GMvcHAGiff7NDBMlYc1-aT
A/A*	Similar Area and Volume	https://drive.google.com/open?id=1X_LxIVufcFDwk1IrWWhwnav2XdhZTIF1

Flipped Exam Support		
Grade	**Topic**	**Link**
A/A*	Surds	https://drive.google.com/open?id=102bbivLznMoj1hiCz1b-OajwByh1cuq7

Make sure that you can complete the higher tier only content from GCSE past papers. Access the papers here via these links: Maths Numeracy; (you only need to focus on the second half of the papers) and use the following video tutorials to support you with completing them.

Video tutorials for Higher Tier GCSE Past Papers					
Year	Month	Tier	Maths/ Numeracy	Unit	Link:
2017	Spec	Higher	Mathematics	1	https://youtu.be/9s2i_6_LiVo
2017	Spec	Higher	Mathematics	2	https://youtu.be/ePvu9oQru2Q
2017	Spec	Higher	Numeracy	1	https://youtu.be/CaxdYTHmm8E
2017	Spec	Higher	Numeracy	2	https://youtu.be/sk9Fglsd8EI
2016	November	Higher	Numeracy	1	https://youtu.be/RzTlYB0bX5A
2016	November	Higher	Numeracy	2	https://youtu.be/ju2vD_vdsmU
2018	Summer	Higher	Mathematics	1	https://youtu.be/ry59chmwqh4
2018	Summer	Higher	Mathematics	2	https://youtu.be/Jnn0F65dsD4
2018	Summer	Higher	Numeracy	1	https://youtu.be/WYr7Veobfgw
2018	Summer	Higher	Numeracy	2	https://youtu.be/ODrljJ0iaOs
2018	November	Higher	Mathematics	1	https://youtu.be/C-amRkh8d_g
2018	November	Higher	Mathematics	2	https://youtu.be/yNXATZSkXn4
2018	November	Higher	Numeracy	1	https://youtu.be/fi8ytszU428
2018	November	Higher	Numeracy	2	https://youtu.be/NqJ4oULIvcw
2017	Summer	Higher	Mathematics	1	https://youtu.be/VZHcv7rpjrQ
2017	Summer	Higher	Mathematics	2	https://youtu.be/uAaZaPVgo1E
2017	Summer	Higher	Numeracy	1	https://youtu.be/Pb3kfKso31s

Video tutorials for Higher Tier GCSE Past Papers					
Year	Month	Tier	Maths/ Numeracy	Unit	Link:
2017	Summer	Higher	Numeracy	2	https://youtu.be/9tY7-GX5HR0

Bridging GCSE to A level Maths – The 'Jump'

Once you are confident with all of this GCSE content, you can use the following website http://m4ths.com/gcse-to-a-level-bridge.html

This comprises of 30 videos which build on skills you have already learned. They will feature heavily throughout the AS course and will get more complicated so your knowledge from the GCSE course should be as secure as possible before starting the AS course.

Hegarty Maths YouTube Live Sessions

Stay sharp for starting A-Level Maths:

- This is completely FREE and OPEN to ALL SCHOOLS, even those that are not Hegarty Maths subscribers so ask your friends and colleagues to share!
- Students can access the sessions by visiting www.youtube.com/hegartymaths/live
- Sessions will be on WEEKDAYS AT 2PM
- Content covered will support students as they transition from GCSE to A-Level maths
- Videos will be saved on the Hegarty Maths YouTube channel so students can catch up if they miss any or can't be there at the time

Part 2: Things you may find of interest!

Media Recommendations: Thanks to @MrACrampton		
Name	**Length**	**Link**
Gapminder Don't Panic, end poverty	59:18	https://www.gapminder.org/videos/dont-panic-end-poverty/
Gapminder Don't panic, the facts about population	58:50	https://www.gapminder.org/videos/dont-panic-the-facts-about-population/
Gapminder How not to be ignorant about the world	19:05	https://www.gapminder.org/videos/how-not-to-be-ignorant-about-the-world/
Gapminder The Joy of Stats	59:13	https://www.gapminder.org/videos/the-joy-of-stats/
Gapminder Population growth explained with IKEA boxes	9:56	https://www.gapminder.org/videos/population-growth-explained-with-ikea-boxes/
BBC Tails you Win: The Science of Chance	59:04	https://www.youtube.com/watch?v=pldHp4qayrU
BBC The Story of Maths	57:55	https://www.youtube.com/watch?v=mJbChZrXDJE
BBC Magic Numbers Mysterious World of Maths - Hannah Fry	58:45 58:38 59:02	**Part 1** https://www.youtube.com/watch?v=cyvDG8qjt-M **Part 2** https://www.youtube.com/watch?v=R6Qty8tAnVI **Part 3** https://www.youtube.com/watch?v=TKKUZoqSTxw
BBC Horizon: Fermat's Last Theorem	49:14	https://www.bbc.co.uk/iplayer/episode/b0074rxx/horizon-19951996-fermats-last-theorem
BBC The Secret Rules of Modern Living Algorithms	58:33	https://www.youtube.com/watch?v=kiFfp-HAu64&app=desktop
The Story of One by Terry Jones	54:35	https://www.youtube.com/watch?v=Z5dky0oEDo8
Numberphile	A collection of short videos	https://www.youtube.com/user/numberphile
Donald Duck, Mathmagic Land	27:34	https://www.youtube.com/watch?v=U_ZHsk0-eF0&app=desktop

Media Recommendations: Thanks to @MrACrampton		
Name	**Length**	**Link**
PBS The Origami Revolution	53:31	https://www.youtube.com/watch?v=dH2bjZ6V_04&feature=youtu.be
Modelling Surveys introduced by Stewart Gartside	23:44	https://www.youtube.com/watch?v=dKA1VvFQ6Y0
RI Lectures 2019: How to get lucky - Hannah Fry	59:02	https://www.youtube.com/watch?v=_q4DrUHKC0Q
RI Lectures 2019: How to bend the rules - Hannah Fry	59:15	https://www.youtube.com/watch?v=TtisQ9yZ2zo
RI Lectures 2019: How can we all win? - Hannah Fry	59:20	https://www.youtube.com/watch?v=u5mNa6KE0lA
What happens when Maths goes wrong? - Matt Parker	1:07:33	https://www.youtube.com/watch?v=6JwEYamjXpA
Four-Dimensional Maths: Things to see and hear in the fourth dimension	1:01:40	https://www.youtube.com/watch?v=1wAaI_6b9JE

AS Level Flipped Learning

In order to give yourself a real head start, you could also have a look at the resources below:

AS Maths - https://www.examsolutions.net/

These are educational videos available on YouTube through exam solutions – although these are focused at the Edexcel (English) examining board, a lot of the content is the same and will provide a solid foundation to undertaking the WJEC course.

AS Maths from Exam Solutions	
Description	**Link**
Prior Knowledge Algebra Basics Polynomials Pythagoras' Theorem Trigonometry	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#prior

AS Maths from Exam Solutions	
Description	**Link**
Algebra and Functions 1 Indices Surds Functions Factorising Completing the Square Quadratic Equations Roots and Discriminant Quadratic Graphs Simultaneous Equations Inequalities Algebraic Long Division Factor Theorem	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#alg_1
Coordinate Geometry Gradient of Straight Lines Straight Lines Intersection of Graphs Exam Questions – Straight lines Circles	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#Coordinate_Geometry
Algebra and Functions 2 Sketching Cubic and Reciprocal Curves Graph Transformations Asymptotes	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#alg_func_2
Sequences and Series Binomial Expansion	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#sequences_series

AS Maths from Exam Solutions	
Description	**Link**
Trigonometry Trigonometric Ratios Graphs and Transformations Applications of Trigonometry Trigonometric Equations Trigonometric Identities	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#Trigonometry
Logarithmic and Exponential Functions Exponential Functions and Logarithms The Exponential Function and Natural Log Functions Modelling Curves	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#log_exponential
Differentiation Introduction Tangents and Normals Stationary Points Increasing and Decreasing Functions	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#Differentiation
Integration Introduction Equations of Curves Definite Integration	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#integration
Vectors Vectors	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#vectors
Proof Proof	https://www.examsolutions.net/as-maths/edexcel/pure-maths-as-tutorials/#proof