

Mathematics and Further Mathematics

Exams Offered: Edexcel AS/A2 Mathematics
Edexcel AS/A2 Further Mathematics

Teachers for sixth form

(Unit expertise)

Ms C.Mair (Head of Maths)

Pure (C1 – 4), Statistics (S1)

Mr P.Scrivens(i/c of KS 5Maths)

Pure (C1 – 4/FP1-2), Statistics (S1-2)

Ms J.Mckie

All Modules

Ms H.Mcglynn

All Modules

Mr C.Kapumpa

Core (C1 – 4), Statistics (S1)

Mr J.Donaghy

Core (C1 – 2), Statistics (S1-2)

Ms C.Burdfield

Core (C1 – 4), Statistics (S1), Mechanics (M1-2)

Mr D Kalia

Core (C1-2)

Ms N.Shaheen

Core (C1-2) , Statistics (S1)

Ms .Earley

Core (C1-2) , Statistics (S1)

Department Learning and teaching Policy and Practice

In studying Mathematics at Trinity it is expected that each student will receive the instruction, advice and practice in order to succeed in this subject. Each student will be provided with a course outline, the appropriate textbook or alternative and all practice material available.

In taking this course it is expected that each student should spend time outside of the lesson/homestudy environment on independent study which may be revision of work done or extension to work yet to be done. Through First class you will have access to past papers and other resource materials. You will also be able to contact staff and other pupils through this medium. Staff will also be able to contact you with relevant information through First class such as to set work if you miss a class or highlight a concern from your work.

In addition to the above we also subscribe to a website www.mathsnetalevel which is a valuable resource both in terms of support and enhancement. However due to the cost of this subscription we do ask for a contribution towards the cost of this resource from every student.

Further Mathematics:

To take the Further Mathematics course you must also take the Mathematics course as it is a development of that course. By taking this option you will in effect be doing 2 A levels in Mathematics.

Master Learner:

To help you as a student develop your skills in the various disciplines of this subject we encourage you to look at how you learn and develop strategies to help you best use and enhance your understanding of the topics in this subject. To develop your skills and knowledge you need to become independent, questioning and confident student. In the table that follows we have defined some statements that give an outline of the stages that we hope would aid this development to take place. We have called these steps Novice, Apprentice, Practitioner, Expert and Master. These represent the steps of your Master Learner Journey. It is expected that you will begin on one of the lower steps and that by the end of your course you will have reached one of the higher levels. These levels are designed to help you become a better student and so achieve a better grade at the end of your course as well as help you to prepare for the demands of courses and work beyond this school. There will be a Master Learner review at least twice a year.

Master Learner Learning Journey. (Mathematics & Further Mathematics)

Novice- <ul style="list-style-type: none">- Do your corrections and consolidation work as directed by your teacher.- Check first class at least once a week for feedback- spend at least two hours in self study each week
Apprentice- <ul style="list-style-type: none">- Organise your own self study to self assess and identify target areas- Complete at least two hours of self study per week- Complete all homestudy questions, seek assistance before the lesson for problems (either through First class or your teacher direct)
Practitioner- <ul style="list-style-type: none">- Plan your (minimum of)2 hours of self study to help you develop your understanding of topics – strengths and weaknesses – look at exam questions- Contribute to the first class discussion board, read and respond to questions posed by other students.- Upload any VLE resources/study ideas you have found useful to First Class
Expert- <ul style="list-style-type: none">- Organise your self study in response to appropriate self assessment – look at exam questions- Upload any VLE resources,/pod casts you have found useful to First Class and that may be useful to others- Take a lead role within the discussion forums on first class, help others to develop their skills
Master- <ul style="list-style-type: none">- Extend your self study beyond the curriculum eg: look at step papers/ OU short courses to add breadth to your studies- Independently look to study an extra module to widen your range of skills. (for example if you are studying M1 in year 13, why not look at D1 or S2 as well)- Produce your own resources for VLE to both consolidate your understanding and aid others in their understanding of topics

ASSESSMENT POLICY:

You will be assessed on a weekly, periodic and transitional basis

WEEKLY:

Every week you will be given homework which will be related to the topics you are covering at the time. These will either be collected in and marked by your teacher, or assessed by self/peers. In completing these pieces of work you will be expected to review work, do corrections, and where necessary support or extend the exercises through extra work (self-study).

SELF STUDY:

In addition to your set homework it is expected that you will do additional work to support or help you develop your understanding of the subject. This work may take the form of extra exercises from the textbook to practise skills covered, or attempting exam questions from past papers on a particular topic/skill, producing revision notes on a recent topic, or research from a website or other such source. This work will be done in an exercise book and will be monitored regularly by your teacher.

PERIODIC:

About twice a term you will have a short test on the topics covered up to that point. These will involve exam standard questions and be used to assess both progress and topics that need development. You will also have a full mock exam after the completion of each module.

TRANSITIONAL: (Mathematics)

At the end of year 12 you will sit 3 module exams (C1, C2 and S1) which form the AS part of the course. To continue to the A2 course you will be expected to pass all three exams.

For the A2 course you will sit three more exams C3 (in January), C4 and one of D1, M1 or S2 at the end of the year.

TRANSITIONAL: (Further Mathematics)

In addition to doing the above you will also have the following exams.

At the end of year 12 you will sit 3 module exams (FP1, D1 and D2) which form the AS part of the course. To continue to the A2 course you will be expected to pass all three exams.

For the A2 course you will sit three more exams M1 (in January), M2 and FP2 at the end of the year.

Course Outline (Mathematics)

• Year 12

Autumn Term	Spring Term	Summer Term
In this term the work will mostly C1 and some S1 <u>C1 Topics:</u> Algebra and Functions Quadratics	In this term the work will be C2 and finishing S1 <u>C2 Topics:</u> Exponentials and Logarithms More Coordinate Geometry	By the start of this term you should have completed or be close to completing the work for the three modules. Therefore up to half term the

Equations and Inequalities Sketching Graphs Coordinate geometry Sequences and series Differentiation Integration <u>S1 Topics:</u> Mathematical modelling Data representation Measures of location and dispersion Probability <u>C2 Topics:</u> Algebraic Division Sine and cosine law	The Binomial Expansion Use of Radians Geometric sequences & series Graphs of Trigonometric functions Use of Differentiation Simple Trigonometric identities Definite Integration <u>S1 Topics</u> Correlation Regression Discrete random variables The Normal Distribution	focus will be on Exam Practice and Revision. <u>After the exams:</u> After study leave has finished the work will start on the start of the C3 module <u>C3 Topics:</u> Algebraic Fractions Functions The Exponential and Logarithm Functions Numerical methods.
Suggested reading/resources	See Below	
Key pieces of work		
Mock C1 Exam	Mock exams	Mock exams for all modules

SUGGESTED SUPPORT BOOKS:

Before starting the Course:

<u>Title</u>	<u>IBSN</u>
CGP: Head start to As Maths	1841469939
Cambridge: Starting Advanced Mathematics	0521893569
Preparation for AS/A level Maths Workbook (Alpha)	1903406439

For the main part of the course

<u>Title</u>	<u>IBSN</u>
C1:	
Heinemann: Lets revise for C1	043551122X
Pearson Longman: Advanced Maths Essentials*	0582836631
Alpha Workbooks: C1 Revision workbook	1903406277
C2:	
Heinemann: Lets revise for C2	0435511238
Pearson Longman: Advanced Maths Essentials*	0582836661
S1:	
Heinemann: Lets revise for S1	0435511165
Pearson Longman: Advanced Maths Essentials*	058283676X
Alpha Workbooks: S1 Revision workbook	190340617X
Also for C1/C2:	
Pearson/Longman :AS Core for Edexcel	0582842379

* With these books make sure you get the book for Edexcel and not other Exam Boards – Also come with CD ROMs.

Some useful Websites:

Mymaths

www.mathsnetalevelplus

- **Year 13* In this year you have the choice of doing either D1,M1 or S2 modules (unless you are taking Further Mathematics in which case you must take S2)**

Autumn Term	Spring Term	Summer Term
In this term the focus will be on completing C3 although some work will be done on C4 and M1/D1 or S2: <u>C3 Topics:</u> Transformation of graphs Trigonometry Trigonometric Identities Further Differentiation <u>C4 Topics</u> Partial Fractions Coordinate Geometry The Binomial expansion <u>M1 Topics*</u> Mathematical models Application of Vectors Kinematics of a particle <u>D1 Topics*</u> Algorithms Graphs and networks Algorithms on graphs <u>S2 Topics*</u> Binomial Distribution Poisson Distribution Continuous Random variables	In the first few weeks of this term the C3 Exam will take place but after that the following will need to be completed. <u>C4 Topics</u> Differentiation Vectors Integration <u>M1 Topics*</u> Statics of a particle Movement in a straight line Moments <u>D1 Topics*</u> The Route inspection problem Critical path analysis Linear programming Matching Flows in Networks <u>S2 Topics*</u> Continuous distributions Approximations to Normal Hypothesis testing	In the summer term most of the time up to the exams will be spent in revision and exam practice.
Suggested reading/resources	See below	
Major pieces of work	C3 Final Exam	
C3 Mock Exam	Mock Exams	Mock exams in all Modules C4 and either D1,M1 or S2 as appropriate.

SUGGESTED SUPPORT BOOKS:

Title	IBSN
C3:	
Heinemann:Lets revise for C3	0435511254
Pearson Longman: Advanced Maths Essentials*	0582836697
C4:	
Heinemann:Lets revise for C4	0435511246
Pearson Longman: Advanced Maths Essentials*	0582836727
S1:	
Heinemann:Lets revise for S2	0435511173
OUP:Statistics S2(Nicholson)	0199117871
D1:	
Heinemann:Lets revise for D1	043551119X
M1:	
Heinemann:Lets revise for M1	0435511130
Pearson Longman: Advanced Maths Essentials*	0582836751

Also for C3/C4

Pearson/Longman :AS Core for Edexcel 0582842360

* With these books make sure you get the book for Edexcel and not other Exam Boards – Also come with CD ROMs.

Some useful Websites:

Mymaths
www.mathsnetalevel plus

Course Outline (Further Mathematics)

• Year 12

Autumn Term	Spring Term	Summer Term
In this term the focus will be on D1 and the first half of FP1 <u>FP1 Topics</u> Complex numbers Numerical solution of equations Coordinate systems <u>D1 Topics:</u> Algorithms and graphs Route inspection problems Critical path analysis Linear programming Matchings	In this term the focus will be on D2 and completing FP1 <u>FP1 Topics</u> Matrix algebra Series Proof by induction <u>D2 Topics:</u> Transportation problems Allocation Travelling salesman problem Network flows Further Linear Programming Game theory Dynamic programming	In the summer term most of the time up to the exams will be spent in revision and exam practice. After the Study level period work will start on FP2 and M1 topics: <u>FP2 Topics:</u> Complex Numbers
Suggested reading/resources	See below	
Key pieces of work Mock exam for D1	 Mock exams for D1/FP1	 Mock exams for all modules

SUGGESTED SUPPORT BOOKS:

Title	IBSN
FP1 Oxford Further Pure (Gaulter&Gaulter)	0199149364

• Year 13

Autumn Term	Spring Term	Summer Term
Focus this term to complete M1 and start on M2 <u>M1 Topics</u> Vectors in mechanics Kinetics of a particle Dynamics of a particle Statics of a particle Moments Revision <u>M2 Topics</u> Kinematics of a particle moving in a straight line or plane Centres of mass Work and Energy	M1 Exam After exam work continues on M2 and FP2 <u>M2 Topics</u> Collisions Statics of rigid bodies <u>FP2 Topics</u> Inequalities Series Further complex numbers Differential equations (1 st and 2 nd order) Maclaurin and Taylor series Polar coordinates	If necessary complete final topics for FP2 and then revision and exam practice.
Suggested reading/resources	www.resources.mei.org.uk	

Major pieces of work	M1 Exam	Exam practice for M2 and FP2
M1 Mock Exam	M2/FP2 Mock exams	

Wider Learning Opportunities

(Include Extra-Curricular, Extended School, Work Related Learning and Work Experience Opportunities, Gifted and Talented, Study Support, Special Needs, Visiting Lecturers, University Relations)

In year 12 we expect all students to attend a ‘Self study’ period to give them extra time to develop their skills independently and to reinforce the work done in class. In addition to this, an extra lesson will given each week by a member of the Mathematics Department to help the weaker students. This lesson will reinforce the work done in normal lessons.

To encourage students to take a wider interest in the subject we encourage them to attend lectures, courses and revision/exam preparation days organised by outside agencies.

Wee also regularly arrange a talk for all students about University courses in Mathematics and the type of careers linked with this qualification.

Wider Reading and Study:

Books: these are suggestions for extra reading for those students interested in Mathematics at a higher level.

Liebeck MW	A concise introduction to pure mathematics	1584881933
Acheson,D	1089 and all that	0198516231
Clegg,B	A brief history of infinity	1841196509
Allenby,RBJT	Numbers and proof	0340676531
Courant,Robbins and Stewart	What is Mathematics	0195105192
Devlin,K	Mathematics:The new golden age	0140258655
Maor,E	e the story of a number	0691058547
Singh,S	Fermat’s last theorem	1857026691
Stewart,I	From here to eternity	0192832026
Hardy,GH	A mathematician’s apology	0521427061
Hodges,A	Alan Turing: The Enigma	0099116413
Hollingdale	Makers of Mathematics	0140149228
Kanigel,R	The man who knew infinity	0349104522
G.Polya	How to solve it	(penguin Mathematics)
Eastaway & Wyndhams	Why do buses come in threes	(robson books)

Websites:

www.mathsnetalevel.com plus

mymaths.co.uk (useful for some units particularly AS)

www.resources.mei.org.uk

(these are subscription set, Log in Details to be issued)