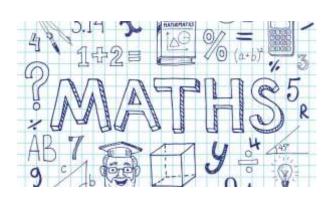


Year 12

Maths A Level Year 1



External Examinations - A Level

This is a breakdown of the content that is examined at the end of the two year course

Paper 1: Pure Mathematics 1 (*Paper code: 9MAO/01)

Paper 2: Pure Mathematics 2 (*Paper code: 9MA0/02)

Each paper is:

2-hour written examination

33.33% of the qualification

100 marks

Content overview

- Topic 1 Proof
- Topic 2 Algebra and functions
- Topic 3 Coordinate geometry in the (x, y) plane
- Topic 4 Sequences and series
- Topic 5 Trigonometry
- Topic 6 Exponentials and logarithms
- Topic 7 Differentiation
- Topic 8 Integration
- Topic 9 Numerical methods
- Topic 10 Vectors

Assessment overview

- Paper 1 and Paper 2 may contain questions on any topics from the Pure Mathematics content.
- · Students must answer all questions.
- Calculators can be used in the assessment.

Paper 3: Statistics and Mechanics (*Paper code: 9MA0/03)

2-hour written examination

33.33% of the qualification

100 marks

Content overview

Section A: Statistics

- Topic 1 Statistical sampling
- . Topic 2 Data presentation and interpretation
- Topic 3 Probability
- Topic 4 Statistical distributions
- · Topic 5 Statistical hypothesis testing

Section B: Mechanics

- Topic 6 Quantities and units in mechanics
- Topic 7 Kinematics
- . Topic 8 Forces and Newton's laws
- Topic 9 Moments

Assessment overview

- Paper 3 will contain questions on topics from the Statistics content in Section A and Mechanics content in Section B.
- · Students must answer all questions.
- Calculators can be used in the assessment.

This content is only suitable if your child is not continuing with the full A Level

External Examinations - AS Level



Paper 1: Pure Mathematics (*Paper code: 8MA0/01)

Written examination: 2 hours

62.5% of the qualification

100 marks

Content overview

- Topic 1 Proof
- Topic 2 Algebra and functions
- Topic 3 Coordinate geometry in the (x, y) plane
- Topic 4 Sequences and series
- Topic 5 Trigonometry
- Topic 6 Exponentials and logarithms
- Topic 7 Differentiation
- Topic 8 Integration
- Topic 9 Vectors

Assessment overview

- Students must answer all questions.
- Calculators can be used in the assessment.

Paper 2: Statistics and Mechanics (*Paper code: 8MA0/02)

Written examination: 1 hour 15 minutes

37.5% of the qualification

60 marks

Content overview

Section A: Statistics

- Topic 1 Statistical sampling
- Topic 2 Data presentation and interpretation
- Topic 3 Probability
- Topic 4 Statistical distributions
- · Topic 5 Statistical hypothesis testing

Section B: Mechanics

- Topic 6 Quantities and units in mechanics
- Topic 7 Kinematics
- Topic 8 Forces and Newton's laws

Assessment overview

- The assessment comprises two sections: Section A Statistics and Section B – Mechanics.
- · Students must answer all questions.
- Calculators can be used in the assessment.



Personal Learning Checklist - Pure

Unit	Topic	Class Notes	R	Α	G
Algebraic Expressions	Indices				
	Surds				
	Expanding and factorising polynomials				
	Solving quadratics				
Quadratics	Completing the square				
	Using the discriminant				
	Quadratic functions and their graphs				
Equations and	Simultaneous equations				
Inequalities	Inequalities				
	Graphs and finding regions				
Graphs and Transformations	Sketching cubics and quartics				
	Reciprocal graphs				
	Points of intersection				
	Transformations of graphs				
Straight Line	Equation of a straight line				
Graphs	Parallel, Perpendicular and Length				
	Modelling with straight lines				
Circles	Midpoints and perpendicular bisectors				
	Equation of a circle				
	Tangents and chords				
	Triangles in circles				

Algebraic Methods	Algebraic long division and factor theorem		
	Proof		
Binomial Expansion	Binomial Expansion		
Trigonometric Ratios	Sine rule, Cosine rule and area of a triangle		
	Graphs of Sin/Cos/Tan and transformations		
Trig Identities and	Trigonometry of all angles including exact values		
Equations	Solving trigonometry for the angle within a range		
	Basic trigonometric identities		
Vectors	Solving geometric problems and modelling		
	Basic differentiation		
	Derivative or differentiation		
Differentiation	Tangents and normals		
	Stationary points		
	Sketching gradient functions		
	Modelling with differentiation		
	Increasing and decreasing functions		
Integration	Basic integration		
	Definite integrals and area		
	Area between a curve and a line		
Exponentials and	Exponentials, sketching and modelling		
Logarithms	Logs laws and solving equations		
	Using logs on non-linear data		

PLCs are provided to all students to ensure they...

Understand the order of teaching

Can choose to look ahead and research

Can keep their subject files organised





Students are provided with separate PLCs for Pure and separate PLCs for Pure and Applied due having different teachers delivering the two elements of the course

Unit	Topic	Class Notes	R	Α	G
Statistics					
Data Collection	Sampling				
	Types of data				
	The large data set				
Location and Spread	Averages & quartiles				
	Range, IQR & interpercentile range				
	Variance & standard deviation				
	Coding data				
Representations of Data	Finding outliers				
	Box plots & cumulative frequency graphs				
	Histograms				
	Comparing data				
Correlation and Linear Regression	Correlation & linear regression				
Probability	Sample space & frequency				
	Venn diagrams				
	Mutually exclusive & independent				
	Tree diagrams				
Statistical Distributions	Probability distributions				
	Binomial distribution				
Hypothesis Testing	Binomial hypothesis testing				

Unit	Topic	Class Notes	R	Α	G		
Mechanics							
Modelling in Mechanics	Models & assumptions						
	SI units & simple vectors						
Constant Acceleration	Displacement & velocity time graphs						
	Simple SUVAT						
	SUVAT using gravity						
Forces and Motion	Force diagrams & vectors						
	Force & acceleration						
	Forces in 2D						
	Connected particles & pullies						
Variable Acceleration	Acceleration as a function of time						
	Using calculus						
	Deriving the constant acceleration formulae						

Solving quadratic equations Completing the square Functions

Quadratic graphs The discriminant

Modelling with quadratics

Vectors

Vectors

Representing vectors Magnitude and direction

Position vectors

Solving geometric problems

Modelling with vectors

Graphs and

Quadratics

The binomial expansion

Pascal's triangle

Factorial notation

The binomial expansion Solving binomial problems

Binomial estimation

Midpoints and perpendicular bisectors

Equation of a circle

Intersections of straight lines and circles

Use tangent and chord properties

Circles and triangles

Circles



These are the Pure Maths topics which are / studied in Module 1 of Year 12. This builds on knowledge from GCSE

Equations and inequalities

Linear simultaneous equations Quadratic simultaneous equations Simultaneous equations on graphs

Linear inequalities

Quadratic inequalities

Inequalities on graphs

Regions

y = mx + c

Equations of straight lines

Parallel and perpendicular lines

Length and area

Modelling with straight lines

Module 1 - Pure

Straight line graphs

transformations Algebraic expressions

Algebraic methods

Cubic graphs

Quartic graphs

Reciprocal graphs

Points of intersection

Translating graphs

Stretching graphs

Transforming functions

Index laws

Expanding brackets

Factorising

Negative and fractional indices

Surds

Rationalising denominators

Algebraic fractions Dividing polynomials

The factor theorem

Mathematical proof

Methods of proof

Angles in all four quadrants Exact values of trigonometric ratios

Trigonometric identities

Simple trigonometric equations

Harder trigonometric equations

Equations and identities

Trigonometric ratios

Gradients of curves

Finding the derivative

Differentiating x^n

Differentiating quadratics

Differentiating functions with two

or more terms

Gradients, tangents and normal

Increasing and decreasing functions

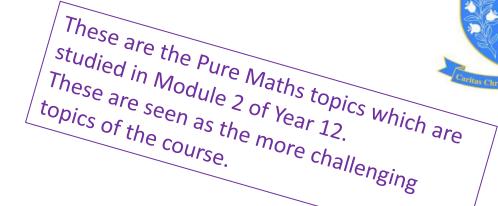
Second order derivatives

Stationary points

Sketching gradient functions

Modelling with differentiation

Differentiation



Module 2 - Pure

Integration

Integrating x^n

Indefinite integrals

Finding functions

Definite integrals

Areas under curves

Areas under the x-axis

Areas between curves and lines

Exponential functions

 $y = e^x$

Exponential modelling

Logarithms

Laws of logarithms

Solving equations using logarithms

Working with natural logarithms

Logarithms and non-linear data

Exponentials and logarithms



Revision

Module 3 - Pure

The Pure content of the course has been completed by Module 3.

The focus becomes revision for the end of year exams.

Data collection

Populations and samples Sampling Non-random sampling Types of data

The large data set

Correlation

Correlation

Linear regression

Measures of central tendency Other measures of location Measures of spread Variance and standard deviation Coding

Calculating probabilities

Venn diagrams

Mutually exclusive and independent

events

Tree diagrams

Probability

The Applied content is taught from Module 2 in Year 12. These are the Applied Maths topics which are studied. The focus for this Statistics.



Module 2 - Applied

Measures of location and spread

Hypothesis testing Finding critical values

One-tailed tests

Two-tailed tests

Hypothesis testing

Probability distributions

The binomial distribution

Cumulative probabilities

Statistical distributions

Outliers

Box plots

Cumulative frequency

Histograms

Comparing data

Representations of data

Constant acceleration

Displacement-time graphs

Velocity-time graphs

Constant acceleration formulae 1

Constant acceleration formulae 2

Vertical motion under gravity

The Applied content is taught from Module 2 in Year 12. These are the Applied Maths topics which are studied. The focus for this Module is Mechanics.



Module 3 - Applied

Modelling in Constructing a model mechanics Modelling assumptions **Quantities and units**

Working with vectors

Force diagrams Forces as vectors Forces and acceleration Motion in 2 dimensions Connected particles Pullevs

Forces and motion

Functions of time

Using differentiation

Maxima and minima problems

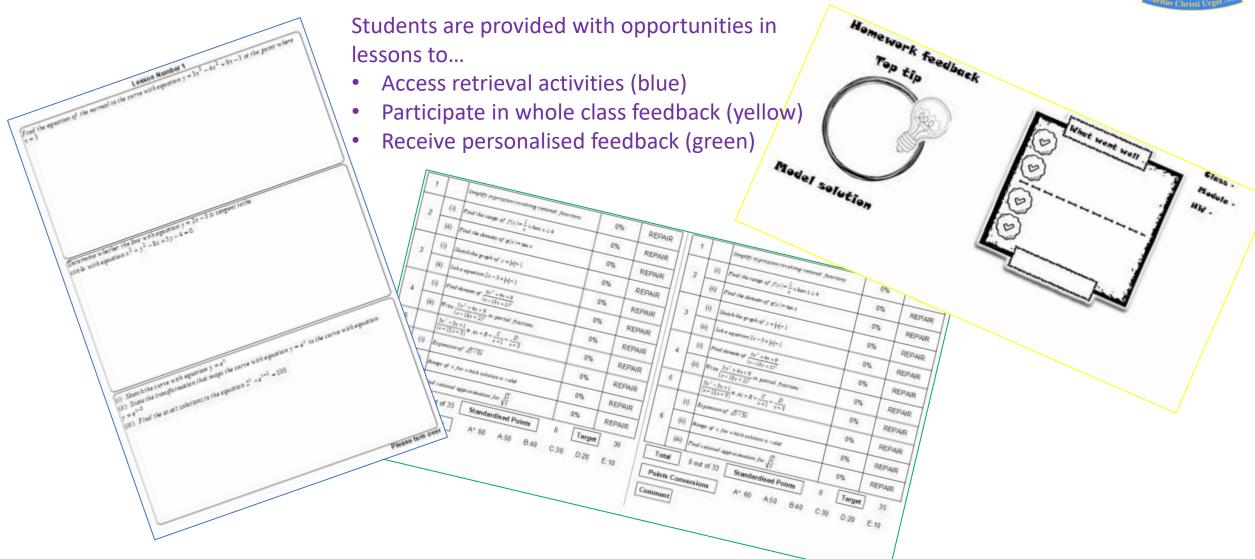
Using integration

Constant acceleration formulae

Variable acceleration

Retrieval and Feedback

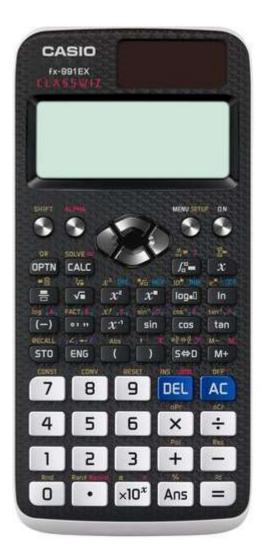




Recommended Calculator

Casio fx-991EX
Scientific Calculator

The calculator we recommend for the course is available to purchase from the school via ParentPay



Suggested Revision Material

CGP A Level Mathematics Edexcel Complete Revision and Practice

> The revision guide that we recommend for the course is available to purchase from the school via ParentPay

