Year 13

Maths A Level
Year 2

External Examinations – A Level

Paper 1: Pure Mathematics 1 (*Paper code: 9MA0/01)

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.

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	A	G
Algebraic Methods	Proof by contradiction				
	Partial fractions				
	Algebraic division				
Functions and Graphs	Mappings				
	Modulus functions				
	Composite & inverse functions				
	Solving modulus problems				
	Combined transformations				
Sequences and Series	Arithmetic Sequences				
	Geometric Sequences				
	Sigma notation				
	Recurrence relations				
Binomial Expansion	Negative & fractional powers				
	Partial fractions				
Radians	Areas & Arc Length				
	Solving Trig equations				
	Small angle approximation				
Trigonometric Functions	Reciprocal trig				
	Identities using Reciprocal Trig				
	Inverse Trig				

Unit	Topic				
Trig and Modelling	Addition & double angle formulae				
	Simplifying sin +/- cos functions				
	Proving identities				
Parametric Equations	Converting between parametric & cartesian				
	Sketching parametrics				
	Points of intersection				
	Modelling Parametrics				
Differentiation	Sine & Cosine				
	Exponentials and logs				
	Chain rule				
	Product rule				
	Quotient rule				
	Harder Trig Functions				
	Parametrics				
	Implicit				
	Using 2nd derivatives				
	Rates of change				
Numerical Methods	Locating Roots				
	Iteration				
	Newton-Raphson				
	Standard functions				
	By Substitution				
	By Parts				

PLCs are provided for all students to ensure they...
- Understand the order of teaching
- Can choose to look ahead and research topics in their own time
- Can keep their subject files organised

Personal Learning Checklist - Applied

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

Unit	Topic	Class Notes	R	A	G
Statistics					
Regression, Correlation and Hypothesis Testing	Using exponentials with linear regression				
	Finding the PMCC				
	Hypothesis testing with PMCC				
Conditional Probability	Set notation				
	Conditional probability				
	Probability formulae				
	Tree diagrams				
Normal Distribution	Finding probabilities from the normal distribution				
	Inverse normal				
	The standardised distribution				
	Finding the mean and standard deviation				
	Approximating the Binomial distribution				
	Hypothesis testing the Normal distribution				

Unit	Topic	Class Notes	R	A	G
Mechanics					
Moments	Calculating moments and resultant moments				
	Equilibrium				
	Tilting				
Forces and Friction	Resolving forces				
	Inclined planes				
	Friction				
Projectiles	SUVAT with resolution of forces				
	Derivation of general formulae				
Application of Forces	Static particles				
	Statics with friction				
	Static rigid bodies (using moments)				
	Dynamics on an inclined plane				
	Connected particles on an inclined plane				
Further Kinematics	Vectors in Kinematics				
	Projectiles with vectors				
	Variable acceleration in 1D				
	Variable acceleration in 2D				

Algebraic methods

Proof by contradiction
Algebraic fractions
Partial fractions
Repeated factors
Algebraic division

Functions and graphs

The modulus function
Functions and mappings
Composite functions
Inverse functions
$y = |f(x)|$ and $y = f(|x|)$
Combining transformations
Solving modulus problems

Module 1 - Pure

Binomial expansion

Expanding $(1 + x)^n$
Expanding $(a + bx)^n$
Using partial fractions

Radians

Radian measure
Arc length
Areas of sectors and segments
Solving trigonometric equations
Small angle approximations

Trigonometric functions

Secant, cosecant and cotangent
Graphs of $\sec x$, $\csc x$ and $\cot x$
Using $\sec x$, $\csc x$ and $\cot x$
Trigonometric identities
Inverse trigonometric functions

Trigonometry and modelling

Addition formulae
Using the angle addition formulae
Double-angle formulae
Solving trigonometric equations
Simplifying $a \cos x \pm b \sin x$
Proving trigonometric identities
Modelling with trigonometric functions

Differentiation

Differentiating $\sin x$ and $\cos x$

Differentiating exponentials and logarithms

The chain rule
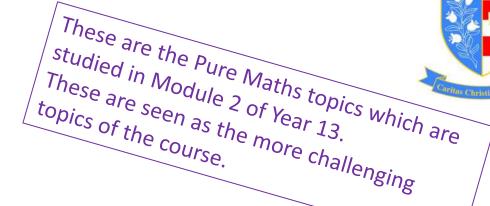
The product rule

The quotient rule

Differentiating trigonometric functions

Parametric differentiation

Implicit differentiation

Using second derivatives

Rates of change

Module 2 - Pure

Integration

Integrating standard functions

Integrating $f(ax + b)$

Using trigonometric identities

Reverse chain rule

Integration by substitution

Integration by parts

Partial fractions

Finding areas

The trapezium rule

Solving differential equations

Modelling with differential equations

Integration as the limit of a sum

Numerical methods

Locating roots

Iteration

The Newton–Raphson method

Applications to modelling

Parametric equations

Parametric equations

Using trigonometric identities

Curve sketching

Points of intersection

Modelling with parametric equations

Arithmetic sequences
Arithmetic series
Geometric sequences
Geometric series
Sum to infinity
Sigma notation
Recurrence relations
Modelling with series

Sequences and series

These are the Pure Maths topics which are studied in Module 3 of Year 13. The course is completed in this Module and the focus becomes revision for the external exams

Module 3 - Pure

Revision

Vectors

3D coordinates
Vectors in 3D
Solving geometric problems
Application to mechanics

Regression, correlation and hypothesis testing

Exponential models

Measuring correlation

Hypothesis testing for zero correlation

Module 1 - Applied

The normal distribution

Finding probabilities for normal distributions

The inverse normal distribution function

The standard normal distribution

Finding μ and σ

Approximating a binomial distribution

Hypothesis testing with the normal distribution

Conditional probability

Set notation

Conditional probability

Conditional probabilities in Venn diagrams

Probability formulae

Tree diagrams

The normal distribution

Applications of forces

Static particles
Modelling with statics
Friction and static particles
Static rigid bodies
Dynamics and inclined planes
Connected particles

These are the Applied Maths topics which are studied in Module 2 of Year 13. The focus for this Module is Mechanics.

Moments
Resultant moments
Equilibrium
Centres of mass
Tilting

Moments

Module 2 - Applied

Vectors in kinematics
Vector methods with projectiles
Variable acceleration in one dimension
Differentiating vectors
Integrating vectors

Projectiles

Horizontal projection
Horizontal and vertical components
Projection at any angle
Projectile motion formulae

Resolving forces
Inclined planes
Friction

Forces and friction

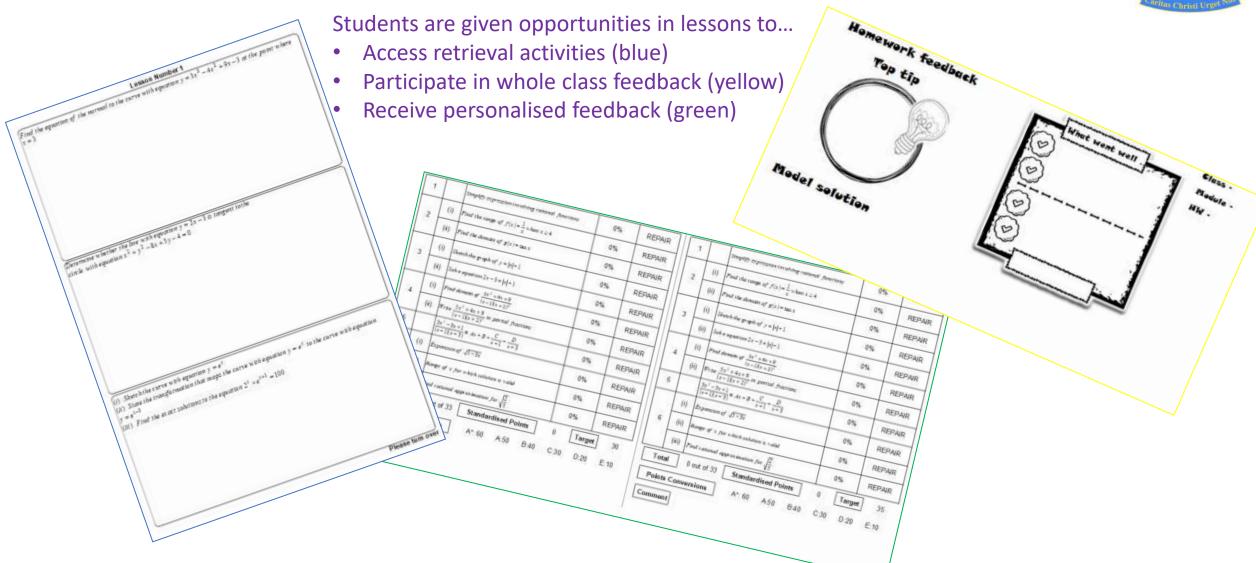# Further kinematics

Revision

Module 3 - Applied

The Applied content of the course has been completed by Module 3.
The focus becomes revision for the external exams.
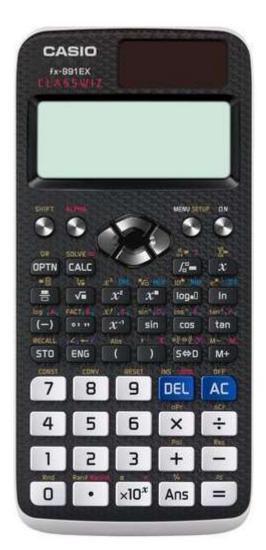
Retrieval and Feedback

Students are given opportunities in lessons to…
- Access retrieval activities (blue)
- Participate in whole class feedback (yellow)
- Receive personalised feedback (green)

Recommended Calculator

Casio fx-991EX
Scientific Calculator

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