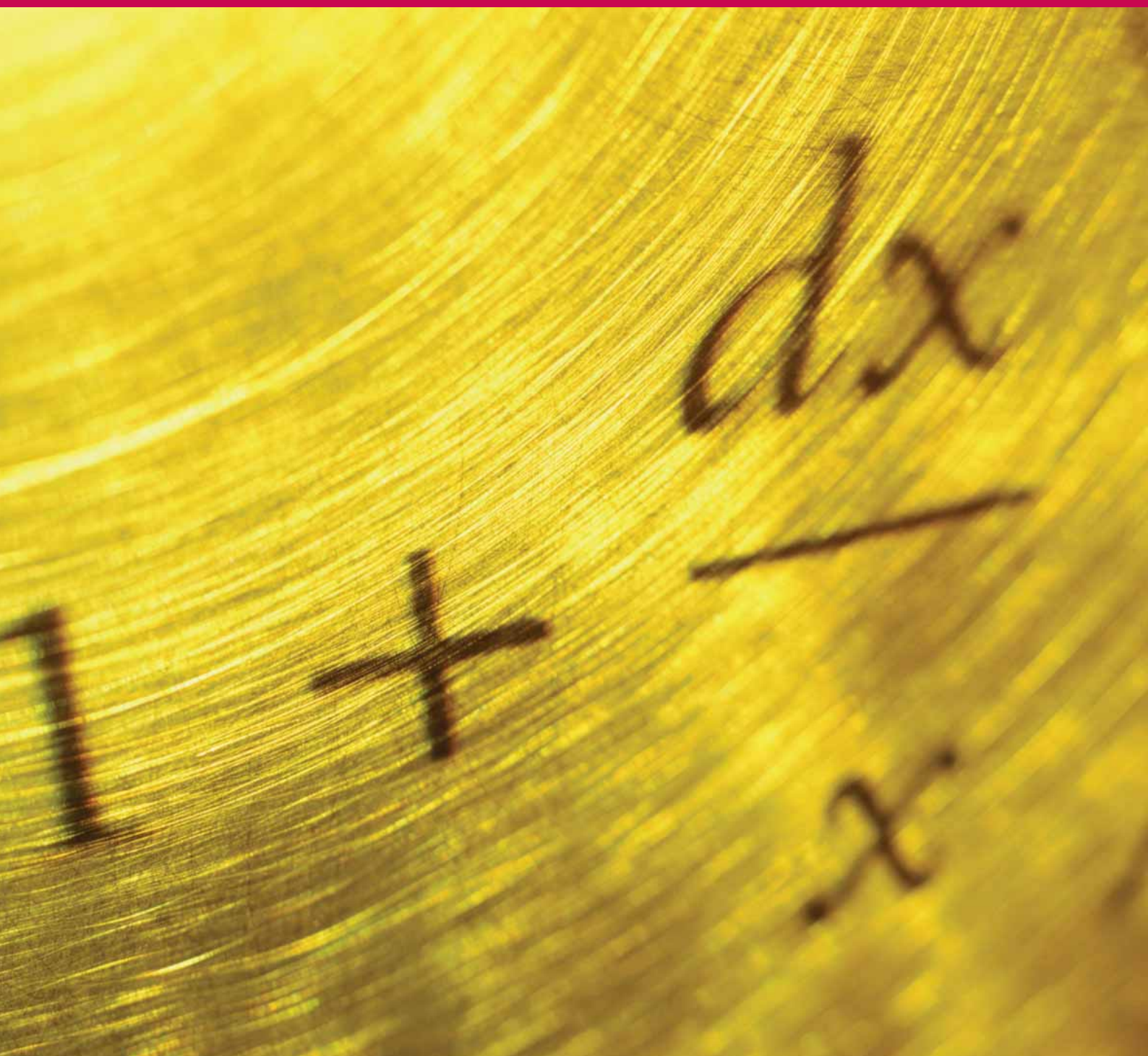


Syllabus Outline

Cambridge Pre-U  
**MATHEMATICS**  
**FURTHER MATHEMATICS**

Cambridge  
**Pre-U**

For examination in 2010



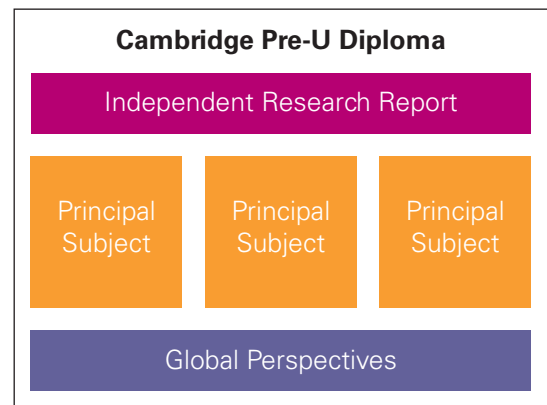
## Cambridge Pre-U Overview

Cambridge Pre-U equips students with the skills they need to make a success of their studies at university:

- a solid and coherent grounding in specialist subjects at an appropriate level;
- the ability to undertake independent and self-directed learning;
- the ability to think laterally, critically and creatively.

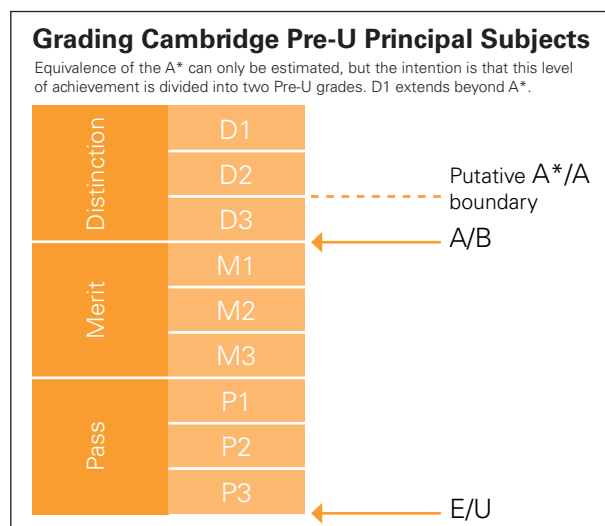
Cambridge Pre-U Certificates in Mathematics and Further Mathematics are stand-alone qualifications, certificated separately.

Students can combine it with other individual Principal Subjects and core components (Global Perspectives, Independent Research Report) to gain the Cambridge Pre-U Diploma.



## Common characteristics of Cambridge Pre-U syllabuses

- **Stretch:** built into syllabus content (challenging concepts), assessment (open-ended questions) and grading outcomes (finer differentiation at the top end).
- **Innovation:** new approaches to subjects, new topics, new methods of delivery and new forms of assessment.
- **Progression in learning:** building on prior knowledge gained at 14 – 16, where appropriate.
- **Linearity:** assessment at the end of the course makes for greater coherence in teaching and learning, by freeing up time currently used in module examinations and retakes, and by giving teachers the freedom to structure their courses in the most appropriate way for their students.



Cambridge Pre-U offers a joined-up approach to assessment, making possible a coherent approach to teaching and learning.

## Reporting of Achievement

Achievement is reported on a scale of nine grades: D1 (Distinction 1), D2, D3, M1 (Merit 1), M2, M3, P1 (Pass 1), P2, P3. The grade D1 reports achievement above the new A\* grade. The intention is to differentiate more finely and extend reporting at the top end, while keeping the grading scale accessible to the full range of ability currently achieving passes at A Level.

# Cambridge Pre-U Mathematics and Further Mathematics

## Assessment Objectives

Candidates should:

<b>A01</b>	manipulate mathematical expressions accurately, round answers to an appropriate degree of accuracy and understand the limitations of solutions obtained using calculators
<b>A02</b>	construct rigorous mathematical arguments and proofs through the use of precise statements and logical deduction, including extended arguments for problems presented in unstructured form
<b>A03</b>	recall, select and apply their knowledge of mathematical facts, concepts and techniques in a variety of contexts
<b>A04</b>	understand how mathematics can be used to model situations in the real world and solve problems in relation to both standard models and less familiar contexts, interpreting their results

## Scheme of Assessment

Candidates taking these qualifications take both papers together in the same session. All papers consist of a mixture of short, medium and long questions. Candidates answer all questions.

### Mathematics

Component	Name	Duration	Weighting (%)	Type of Assessment
<b>Paper 1</b>	Pure Mathematics and Probability	3h	50	Written paper, externally set and marked.
<b>Paper 2</b>	Pure Mathematics and Mechanics	3h	50	Written paper, externally set and marked.

### Further Mathematics

Component	Name	Duration	Weighting (%)	Type of Assessment
<b>Paper 1</b>	Further Pure Mathematics	3h	50	Written paper, externally set and marked.
<b>Paper 2</b>	Further Applications of Mathematics	3h	50	Written paper, externally set and marked.

## Curriculum content

Throughout these courses, students are expected to develop two parallel strands of Mathematics, Pure Mathematics and Applications of Mathematics. Candidates will be expected to apply their mathematical knowledge in the context of both Mechanics and Probability and will also be presented with less familiar scenarios.

<b>Mathematics Syllabus</b>		<b>Further Mathematics Syllabus</b>	
<b>Paper 1 and Paper 2</b>	<b>Pure Mathematics</b> Quadratics Algebra Functions Coordinate Geometry Circular Measure Trigonometry Sequences and Series Logarithms and Exponentials Differentiation Integration Vector Geometry Differential Equations Complex Numbers Numerical Methods	<b>Paper 1</b>	<b>Further Pure Mathematics</b> Rational Functions Roots of Polynomials Complex Numbers De Moivre's Theorem Polar Coordinates Summation of Series Mathematical Induction Calculus Hyperbolic Functions Differential Equations Vector Geometry Matrices Groups
<b>Paper 1</b>	<b>Pure Mathematics and Probability</b> Pure Mathematics (see list above) <b>Probability</b> Analysis of Data Probability Laws Permutations and Combinations Discrete Random Variables The Normal Distribution	<b>Paper 2</b>	<b>Mechanics</b> Energy, Work and Power Motion in a Circle Relative Motion Elastic Strings and Springs Simple Harmonic Motion Further Particle Dynamics Linear Motion under a Variable Force <b>Probability</b> Poisson Distribution Normal Distribution as Approximation Continuous Random Variables Linear Combinations of Random Variables Estimation Probability Generating Functions Moment Generating Functions
<b>Paper 2</b>	<b>Pure Mathematics and Mechanics</b> Pure Mathematics (see list above) <b>Mechanics</b> Kinematics of Motion in a Straight Line Force and Equilibrium Friction Newton's Laws of Motion Linear Momentum and Impulse Motion of a Projectile		

## Support and Resources

CIE offers a programme of Cambridge Pre-U INSET training for teachers accompanied by support materials on a dedicated Cambridge Pre-U website.

Full syllabus details are at [www.cie.org.uk/cambridgepreu](http://www.cie.org.uk/cambridgepreu)

Specimen assessment materials are available from: [international@cie.org.uk](mailto:international@cie.org.uk)

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