# CSEC Additional Mathematics Exam Breakdown

Matthew Williams • Add Math • May 16, 2026

## CSEC Additional Mathematics Exam Breakdown

### Format

The CSEC Additional Mathematics examination assesses three cognitive profiles:

- Conceptual Knowledge (CK)
- Algorithmic Knowledge (AK)
- Reasoning (R)

These profiles determine how your marks are distributed across the exam.

| Profile | Percentage |
|---|---|
| Conceptual Knowledge | 20% |
| Algorithmic Knowledge | 50% |
| Reasoning | 30% |

Total marks: **200**

The exam consists of **three papers**.

### Paper 01 – Multiple Choice

**Duration:** 1 hour 30 minutes

**Questions:** 45

Paper 01 is a knowledge and procedure test. It rewards fast, accurate recall of formulas, rules, and standard techniques.

Content is drawn from all four sections:

- Section 1 (Algebra, Sequences and Series) — 15 items
- Section 2 (Coordinate Geometry, Vectors, Trigonometry) — 15 items

- Section 3 (Introductory Calculus) — 10 items
- Section 4 (Probability and Statistics) — 5 items

Trigonometry alone accounts for 9 of the 45 items. Calculus accounts for 10. Together they represent nearly half of Paper 01.

**Paper 01 Tips**

- There are no part marks. A wrong answer scores zero, so eliminate clearly wrong options first.
- Never leave an item blank — a guess is better than nothing.
- Move at roughly 2 minutes per item. If an item is taking too long, mark it and return.
- Exact values, index laws, and differentiation rules appear as single-step items — these should be instant.

## Paper 02 – Structured Questions

**Duration:** 2 hours 40 minutes

This is the most important paper. All six questions are compulsory.

Structure:

- 2 questions from Section 1 (Algebra and Series) — 30 marks
- 1 question from Section 2 (Geometry, Vectors, Trigonometry) — 20 marks
- 2 questions from Section 3 (Calculus) — 30 marks
- 1 question from Section 4 (Statistics and Probability) — 20 marks

Each question is broken into labelled parts: (a), (b), (c). Later parts are typically harder and worth more marks. Earlier parts often feed into later ones.

**Paper 02 Tips**

- Read all parts of a question before starting. Part (a) almost always sets up part (b).
- Show all working. A correct answer with no method shown may lose marks. A wrong answer backed by correct working can earn most of them.
- Allow roughly 1.6 minutes per mark. A 5-mark part should take about 8 minutes.
- Attempt every part of every question. Method marks are available even when the final answer is wrong.

## Paper 03 – School-Based Assessment (SBA)

This paper assesses your ability to apply mathematics to a real-world context and contributes **20%** of the final grade.

There are two project types:

- **Project A — Theory-based.** No data collection required. Uses mathematical concepts to model or describe a real-world phenomenon.
- **Project B — Experiment-based.** Involves data collection, presentation, and mathematical analysis.

> **SBA Tips**
> - Choose a topic where the mathematics is clearly central, not decorative.
> - Present all calculations neatly with full working.
> - Include a proper conclusion that interprets your results in context.
> - A well-structured, focused project scores better than an ambitious one that is incomplete.

## Paper 032 – Alternative to SBA (Private Candidates)

**Duration:** 1 hour 30 minutes

This paper replaces the SBA for private candidates.

It tests:

- Mathematical modelling
- Interpretation of results
- Application of concepts to unfamiliar situations

## Syllabus Structure

The Additional Mathematics syllabus is divided into four sections:

### Section 1 – Algebra, Sequences and Series

Topics include:

**Algebra and Polynomials**

- Polynomial operations and long division
- Remainder Theorem and Factor Theorem

- Finding unknown coefficients

**Quadratics**

- Completing the square and vertex form
- Discriminant and nature of roots
- Root relationships and forming quadratic equations

**Inequalities**

- Linear and quadratic inequalities
- Rational inequalities using sign diagrams

**Surds, Indices, and Logarithms**

- Simplifying surds and rationalising denominators
- Laws of indices and solving exponential equations
- Logarithm laws and solving logarithmic equations
- Linearising non-linear data

**Sequences and Series**

- Arithmetic and geometric sequences
- Sum formulas and sum to infinity
- Convergence condition for geometric series

## Section 2 – Coordinate Geometry, Vectors, and Trigonometry

Topics include:

**Coordinate Geometry**

- Gradient, midpoint, and distance formulas
- Equations of lines (parallel and perpendicular)
- Circle equations — standard form and general form
- Tangents, normals, and line-circle intersection

**Vectors**

- Column vectors, magnitude, and unit vectors
- Displacement vectors and parallel/collinear conditions
- Scalar (dot) product and angle between vectors
- Perpendicular vectors

**Trigonometry**

- Radians, arc length, and sector area
- Exact values and the CAST diagram

- Pythagorean identity and compound-angle formulas
- Double-angle formulas
- Proving identities and solving equations in $[0, 2\pi]$

## Section 3 – Introductory Calculus

Topics include:

### Differentiation

- Power rule, chain rule, product rule, quotient rule
- Derivatives of $\sin ax$ and $\cos ax$
- Tangents, normals, and stationary points
- Kinematics and connected rates of change

### Integration

- Power rule and integration of $\sin ax$, $\cos ax$
- Finding curves from gradient functions
- Definite integrals and area under a curve
- Volume of revolution about the x-axis
- Kinematics using integration

## Section 4 – Probability and Statistics

Topics include:

### Statistics

- Data types, measures of central tendency
- Quartiles, IQR, variance, and standard deviation
- Stem-and-leaf diagrams and box-and-whisker plots

### Probability

- Addition rule and conditional probability
- Independent and mutually exclusive events
- Tree diagrams, Venn diagrams, and possibility spaces

## How You Are Actually Tested

Additional Mathematics tests three levels of thinking:

### Conceptual Knowledge

- Recalling definitions and properties
- Identifying the correct theorem or rule to apply
- Stating formulas from memory

### Algorithmic Knowledge

- Carrying out multi-step procedures accurately
- Manipulating algebraic expressions
- Differentiating, integrating, and solving equations without error

This is 50% of all marks. The exam rewards fluency in procedures above everything else.

### Reasoning

- Modelling real-world problems mathematically
- Interpreting results in context
- Evaluating whether a solution makes sense



## Common Mistakes

- Forgetting the constant of integration in indefinite integrals
- Applying the chain rule incorrectly (not multiplying by the inner derivative)
- Using the wrong form of $\cos 2A$ when proving identities
- Confusing mutually exclusive with independent events
- Not converting degrees to radians before using arc length or sector area formulas
- Leaving Paper 02 parts blank instead of attempting a method

# Study Strategy

## Master the Procedures First

AK makes up 50% of marks. You must be fluent in:

- Differentiating composite, product, and quotient functions
- Integrating and evaluating definite integrals
- Completing the square
- Solving exponential and logarithmic equations

These should be automatic before the exam.

## Prioritise High-Yield Areas

Trigonometry (9 Paper 01 items) and Calculus (10 Paper 01 items plus two Paper 02 questions) together carry the most marks. Treat them as non-negotiable priorities.

## Practise Showing Working

Paper 02 awards method marks. A student who shows clear steps and makes one arithmetic error still earns most of the marks. A student who writes only a final answer earns nothing if it is wrong.

## Use Past Papers

Past papers reveal:

- How questions are phrased
- What mark schemes reward
- Where marks are typically lost

Work through papers under timed conditions.

## Understand, Don't Memorise

You will not be asked to reproduce a proof from memory. You will be asked to apply concepts to unfamiliar setups. Understanding why a rule works lets you adapt it. Memorising it without understanding leaves you stuck when the question looks slightly different.

## Final Insight

Additional Mathematics is not hard because of its content. It is hard because **half the marks test accuracy under time pressure**.

Students lose marks by:

- Making algebraic errors in routines they know
- Rushing and skipping steps
- Leaving parts blank because they are unsure

Slow down in Paper 02. Show every step. Attempt every part.