

DESIGN BRIEFS

Mathematics: design briefs for stage 2 and 3 exams

WACE Examination Design Brief Specifications

Mathematics (MAT)

There will be FOUR Mathematics WACE examination papers; one for units 2A/2B, one for units 2C/2D one for units 3A/3B and one for units 3C/3D. These examinations will be scheduled at the same time and reflect the last pair of units completed within this course. The examinations will require three hours.

Each examination will consist of one calculator-free section and one calculator-assumed section. Students must complete *both* sections of the examination paper to be eligible for a WACE grade and TISC mark.

- Section A: *Calculator-free* This section of the examination is allocated 40 marks. Candidates will have a 5-minute reading time and a 50-minute working time. During the working time, candidates will not be permitted to use anything other than their pencil or biro.
- Section B: *Calculator-assumed* This section of the examination is allocated 80 marks. Candidates will have a 10-minute reading time and a 100-minute working time. During the working time, candidates will be permitted to up to two CAS calculators, scientific calculators, and two A4 sheets of notes.

Process

Section A and Section B will be printed separately with a different coloured front cover. Each will have a perforated page of formulas particular to that examination. Candidates will be given two place cards, one for each section, and will be required to write their student number on both sections.

When candidates enter the examination room, the two sections will already be on their desks. Before the examination begins, candidates will be asked to place their calculators and notes on their desk. Supervisors will check the candidate's examination equipment. At the end of instruction time, candidates will be asked to put their notes inside the section B paper and place this paper and their calculators under their chair. Supervisors will check to see that this has occurred during the reading time.

The scripts for section A will be collected at the completion of the 50-minute working time for this section. While the collection is taking place, candidates will be instructed to pick up their section B paper, calculators, and notes from under their chair. They will be then given any special instructions, if required, for this paper prior to their 10-minute reading time and 100-minute working time.

Assessment Types	Question / Item Type
Response	<ul style="list-style-type: none">• short response• item (open)• short response• item (closed)
Supporting Information	<p>Suited to the collection of evidence of student achievement of all outcomes.</p> <p>Nature of Items</p> <p>In response item assessments, students apply their mathematical understanding and skills to analyse, interpret and respond to questions and situations. Questions will require students to demonstrate knowledge of mathematical facts, conceptual understanding, use of algorithms, use and knowledge of notation and terminology and problem solving skills.</p> <p>Questions in this type of assessment can range from those that are routine and familiar to students, through to non-routine, unfamiliar questions.</p> <p>Questions could ask for the application of the concepts and relationships to unfamiliar situations for which they need to solve a problem, choosing and using mathematical models with adaptations where necessary and comparing their solutions with the situation concerned and then presenting their conclusions.</p> <p>Selected questions could require students to investigate mathematical patterns, make and test conjectures and generalise mathematical relationships.</p> <p>The questions may be closed and, so, target particular methods and results, or they may be open-ended and allow for choice in the methods and a variety of results.</p> <p>Open-ended questions typically call for high-level reasoning.</p> <p>Responses may include calculations, tables, graphs, interpretation of data, descriptive answers and conclusions.</p> <p>Nature of Stimulus Materials</p> <p>Stimulus materials may include diagrams, tables, graphs, drawings, print text and data gathered from the media.</p> <p>Materials could be expanded to include computer programs.</p> <p>Constraints/Resource Implications</p> <p>Clearance for copyright materials used as a stimulus material.</p> <p>Colour may be used.</p> <p>Interactive computer programs/ computerised delivery could be used in the future.</p>

These calculators are approved for use in examinations from 2010.

The full functions of these calculators may be used, that is, the memories do not require clearing prior to entry to the examination.

The following CAS calculators are approved by the Curriculum Council for use in:

CAS Calculators

- Mathematics Examinations
- Mathematics: Specialist Examination

Texas Instruments

TI-80, TI-81, TI-82, TI-83, TI-84 PLUS (Silver), TI-85, TI-86

Sharp

EL-9200, EL-9300, EL-9400, EL-9600, EL-9650, EL-9900

Hewlett-Packard

HP38G, HP39G, HP39G PLUS, HP39GS

SRP – 400G

SRP – 320 G II

Citizen

Instructions to candidates (for both sections)

Instructions to candidates will indicate:

- The examination will be presented in two question/answer booklets; section A: calculator-free and section B: calculator-assumed. Both sections include a provided formula sheet.

On the front page of each booklet in the examination:

- o Write your student number in the space provided on each booklet.
- o Check that your name and student number on the label is correct and sign your name to verify this.
- o All written responses must be in English.
- o (Calculator-assumed paper ONLY) State the make and code of calculators brought into the examination. This information is required to ensure the examination is fair for all students.
- During reading time:
 - o Detach the perforated formula sheet from the booklet.
 - o Do not annotate the examination paper during the reading time.
- When answering questions in the examination:
 - o All questions in each section should be attempted.
 - o Answers should be written in the space provided in the booklet. The available space does not necessarily indicate the length of the response.
 - o Spare answer pages will be provided at the end of the booklet. If these need to be used, the new page number will need to be indicated in the original answer space.
 - o All working should be shown clearly and in sufficient detail to allow answers to be checked readily and for credit to be awarded for reasoning.
 - o Correct answers given without supporting reasoning may not be allocated full marks. Incorrect answers given without supporting reasoning cannot be allocated any marks.
 - o A blue or black ball point or ink pen should be used.
 - o It is recommended that pencil is not used, except in diagrams.

Note: Students are NOT permitted to bring mobile phones or any other unauthorised electronic devices into the examination room.

Examination Length

The examination will be 3 hours in length. Each examination comprises two written sections.

The total examination length for the calculator-free paper is 50 minutes working time and 5 minutes reading time.

This section is allocated 40 marks.

The total examination length for the calculator-assumed paper is 100 minutes working time and 10 minutes reading time. This section is allocated 80 marks.

Permissible Materials

For the calculator-free paper:

Standard Items: pens, pencils, pencil sharpener, highlighter, eraser.

For the calculator-assumed paper:

Standard Items: pens, pencils, pencil sharpener, highlighter, eraser.

Special materials:

Curriculum Council Revised Mathematical Formulae and Statistical Tables Book
drawing instruments
ruler
templates
notes on up to TWO unfolded sheets of A4 paper; and
Up to two approved CAS calculators and a graphic/scientific calculator (satisfying the conditions set by the Curriculum Council).

Note:

1. Personal copies of the Tables Book should not contain any handwritten or typewritten notes, symbols, signs, formulae or any other marks (including underlining and highlighting), except a name and address, and may be inspected prior to or during the examinations.
2. Calculator memory DOES NOT need to be cleared.

Calculator Policy

The Curriculum Council monitors developments in calculator and related technology and publishes details of approved technology for use in mathematics examinations annually.

Only Curriculum Council approved calculators or other technology may be used in these examinations. The calculators may be approved scientific calculator, graphics calculator or approved CAS calculator as applicable to the last pair of units studied in a course.

Calculators that have graphical, symbolic or programmable capabilities may be used, provided that the model is approved.

Where there are doubts about whether a particular model is approved, schools should ascertain its status by contacting the Certification and Examinations Branch of the Curriculum Council, preferably at the beginning of the course.

Conditions of use

The conditions under which calculators may be used are:

- the calculator must be silent and of the hand-held type containing its own power source (battery or solar operated)
- the calculator must not operate with paper tapes
- students will be entirely responsible for ensuring adequate power supply to their calculators and the proper working order of their calculators
- students must supply their own spare batteries – any battery failure or other fault which limits the usefulness of a calculator during an examination will not be taken into consideration by the assessors
- no student may borrow a calculator from another student after entering the examination room
- no magnetic cards may be used
- calculator instruction booklets and removable covers must not be taken into the examination room.

Programmable Calculators

Programmable calculators, other than those with features specifically excluded below, may be used in calculator assumed mathematics examinations.

A programmable calculator is one in which the user can store a sequence of operations which the calculator will then execute automatically. Students are permitted to bring programs stored on their calculator into these examinations.

A calculator is excluded if it:

- makes noise or 'talks'
- needs mains electricity.

Other Technology

Computers, mini-computers, pocket-organisers, laptops, palmtops, calculator models that can 'communicate' with other calculators, notebooks, mobile phones and the like are also excluded, except under specified circumstances for which prior approval has been given by the Curriculum Council.

Approved Calculators

For calculator assumed mathematics examinations, two CAS calculators and one scientific calculator may be used.

Graphics calculators

The following graphics calculators are approved by the Curriculum Council for use in:

- *Mathematics* Examinations
- *Mathematics: Specialist* Examinations

These calculators are approved for use in examinations from 2010.

The full functions of approved graphics calculators may be used, that is the memories do not require clearing prior to entry to the examination.

Approved Graphics Calculators

Casio

FX-7300G, FX-7400G, FX-7400G PLUS, FX-7700GH, FX-8500G, FX-9700GH, CFX-9800G, CFX-9850G, CFX-9850G PLUS, CFX-9850GB PLUS, CFX-9850GB PLUS-WE, CFX-9850GC, FX 9860G AU, CFX-9950G, FX 9860G AU