

## MATHEMATICS METHODS - FOUNDATION (MTM315117)

External Assessment Specifications inform the development of external assessments. The primary audience for this document is the course Setting Examiner and Exam Critics. It may also be of use to teachers and students.

These specifications must be read in conjunction with the current Course Document on the TASC website.

The external assessment for this course consists of a written exam.

### WRITTEN EXAM STRUCTURE

The written exam is THREE hours.

Students will have an additional 15-minute preparation time during which students can take notes on the note paper provided and highlight any key words in the exam booklet during the allocated time. Students will not be permitted to start their exam until advised by the Exam Supervisor.

The written exam is divided into TWO sections, each with FIVE parts.

Section A and Section B are of unequal weighting as indicated by time and mark allocations .

The sections are in two separate question-and-response booklets.

Section A is collected 80 minutes after exam commencement, from which time calculators may be used. (Section B can be commenced at any stage without calculator usage in the 80 minute period.)

The criteria to be externally assessed are:

- Criterion 4:   manipulate algebraic expressions and solve equations
- Criterion 5:   understand linear, quadratic and cubic functions
- Criterion 6:   understand logarithmic, exponential and trigonometric functions
- Criterion 7:   use differential calculus in the study of functions
- Criterion 8:   understand experimental and theoretical probabilities and of statistics

### SPECIFIC MATERIALS AND EQUIPMENT APPROVED FOR USE BY STUDENTS

- Current TASC MTM315117 Mathematics Methods - Foundation Information Sheet
- TASC approved calculators

## ASSESSMENT

All criteria are assessed numerically with marks out of 36.

A representative sample, encompassing a large proportion of the targeted course content areas, tests the standard of skills, knowledge and understanding of a student.

- The relative weighting of questions is indicated by
  - The relative allocation of marks, and
  - Space for responses
  - Items of questions (for example 1a, 1b or 1ai, 1aii) must have an individual mark allocation
  - For questions or items worth:
    - One (1) mark items, no workings are required for a correct answer
      - Correct answer with or without working = 1 mark
      - Correct answer with some incorrect working = 1 mark
      - Incorrect answer with some correct working = 0.5 mark
    - Two (2) mark items, learners are required to show relevant working
      - Correct answer with relevant working = full marks
      - Correct answer with no working = maximum 1.5 marks
      - Correct answer with some incorrect working = partial marks
      - Incorrect answer with some correct working = partial marks
      - Incorrect answer with incorrect working = no marks
    - Three (3) or more mark items, learners are required to show relevant working
      - Correct answer with relevant working = full marks
      - Correct answer with no working = maximum half marks
      - Correct answer with some incorrect working = partial works
      - Incorrect answer with some correct working = partial marks
      - Incorrect answer with incorrect working = no marks
- Approximately a mark per minute with 80 marks in Section A and 100 marks in Section B (not more questions – just more opportunity to demonstrate knowledge and understanding of relevant criteria).

A set of solutions or a marking tool will be developed by the Setting Examiner, provided to markers at the marking meeting that follows the external written exam; and will be available from TASC in the following year.

The external assessment must include questions that, separately or together, give opportunities to demonstrate the standards from rating C to rating A.

Final results will be awarded as a rating of A, B, C, t or z in the above criteria. These ratings are used in determining the final award according to the algorithm in the course document.

## Numerical Mark Allocation

Exam papers are designed so that the number of marks allocated to a section, part or question corresponds to the recommended time allocation for it. This is so that a student knows when answering a 10 mark question that the question has been designed for students to spend approximately 10 minutes reading, thinking and then answering the question. Students may find that they spend less or more time on certain questions throughout the exam.

## SECTION A

### Structure

- This section will take approximately 80 minutes and be allocated 80 marks.
- This section is divided into FIVE parts, and each part will include between THREE and SIX questions. All questions are compulsory.
- Total allocation of 16 marks per part.
- Questions may be broken into items which will each have their own mark allocation.
- Calculators are NOT allowed to be used.

This section addresses the following course content:

- Part 1 - Algebra
- Part 2 - Linear, Quadratic and Cubic Functions
- Part 3 - Logarithmic, Exponential and Trigonometric Functions
- Part 4 - Differential Calculus
- Part 5 - Statistics and Probability

One topic per section which are equally weighted.

### Assessed Criteria

- Criterion 4     manipulate algebraic expressions and solve equations.
- Criterion 5     understand linear, quadratic and cubic functions.
- Criterion 6     understand logarithmic, exponential and trigonometric functions.
- Criterion 7     use differential calculus in the study of functions.
- Criterion 8     understand experimental and theoretical probabilities and of statistics.

(All Elements, except C6 Elements 4, 5 and 9 where it specifies the use of technology)

### Nature of Questions

See Appendix A

### Nature of Responses

- Responses will be assessed numerically.
- All closed-ended responses.

## SECTION B

### Structure

- This section will take approximately 100 minutes and be allocated 100 marks.
- This section is divided into FIVE parts, and each part will include between THREE and SIX questions. All questions are compulsory.
- Total allocation of 20 marks per part.
- Questions may be broken into items which will each have their own mark allocation.
- Calculators are allowed to be used.

This section addresses the following course content:

- Part 1 - Algebra
- Part 2 - Linear, Quadratic and Cubic Functions
- Part 3 - Logarithmic, Exponential and Trigonometric Functions
- Part 4 - Differential Calculus
- Part 5 - Statistics and Probability

One topic per section which are equally weighted.

### Assessed Criteria

- Criterion 4     manipulate algebraic expressions and solve equations.
- Criterion 5     understand linear, quadratic and cubic functions.
- Criterion 6     understand logarithmic, exponential and trigonometric functions.
- Criterion 7     use differential calculus in the study of functions.
- Criterion 8     understand experimental and theoretical probabilities and of statistics.

(All Elements)

### Nature of Questions

See Appendix A

### Nature of Responses

- Responses will be assessed numerically.
- All closed-ended responses.

## Appendix A - TYPES of Questions (All SECTIONS)

A balance of questions ranging from short to extended formats (no question or item will have more than 10 marks allocated)

Extended questions include a balance of routine and non-routine contexts.

### Short response format

These questions are composed of a brief prompt that demands a response to some stimulus material that varies from a single response to a few written points. This sort of question is suited to assessing the student's ability:

- To recall specific information and methods related to key content
- To apply rehearsed methods to familiar situations
- To demonstrate understanding of key concepts in unseen stimulus material.

#### Exemplars:

Solve the following for  $x$

(a)  $4x - 3 = 7x - 20$  (1 mark)

(b)  $\frac{x+1}{2} - \frac{x-2}{5} = 7$  (2 marks)

### Extended response format

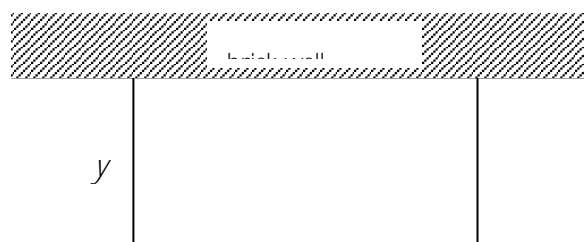
These questions involve multi-stage responses of increasing complexity. Greater complexity may be due to one or more of the following:

- A greater cognitive demand of mathematical concepts
- The necessity to select appropriate data and/or formulae
- Justification of a response via a logical line of reasoning.

#### Exemplar:

Three sides of a rectangular garden bed are formed by 31 metres of wooden border. The fourth side is a brick wall. The area of the garden is  $114 \text{ m}^2$ .

Use simultaneous equations with  $x$  metres being the length and  $y$  metres being the width garden bed, determine the possible **dimensions** of the garden bed.



(4 marks)