EXTERNAL ASSESSMENT SPECIFICATIONS – 2020
MATHMATICS METHODS FOUNDATION
Course Code: MTM315117

The purpose of the External Assessment Specifications is to provide information about the external assessment.

The criteria to be externally assessed are: 4, 5, 6, 7 and 8

The format of the external assessment is a 3 hour written examination. The number and complexity of questions will be streamlined and will provide students with additional working time in the exam. Sample questions/exemplars will be provided.

APPROVED ASSESSMENT SPECIFIC MATERIALS AND EQUIPMENT:
A calculator approved by TASC
External examination Information Sheet for Mathematics Methods Foundation 3

WRITTEN EXAMINATION CONTENT

- A representative sample, encompassing a large proportion of the targeted course content areas, tests the standard of skills, knowledge and understanding of a candidate
- The relative weighting of items is indicated by
  - The relative allocation of marks, and
  - Space for responses
  - Sub questions (for example 1a, 1b or 1ai, 1a ii) must have an individual mark allocation
  - For items or sub 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 7080 marks in Part 1 and 80400 marks in Part 2 (not more items – just more opportunity to demonstrate knowledge and understanding of relevant criteria).
WRITTEN EXAMINATION STRUCTURE

The examination paper is divided into two parts, each with five (5) sections:

- Part 1 and Part 2 are of unequal weighting as indicated by time and mark allocations
- The parts are in two separate item-and-response booklets
- Part 1 is collected 80 minutes after examination commencement, from which time calculators may be used. (Part 2 can be commenced at any stage without calculator usage in the 80 minute period.)

The following specifications for each part are outlined in the table on the following pages:

- The distribution across the parts of:
  - Criteria
  - Course content (topics)
  - Time and mark allocations
- Number and type of items.

<table>
<thead>
<tr>
<th>Part</th>
<th>Part 1 Calculators are NOT allowed to be used. 5 sections</th>
<th>Part 2 Calculators are allowed to be used. 5 sections</th>
</tr>
</thead>
</table>
| Criterion/Criteria | Criteria 4, 5, 7, 8 includes all elements  
Criterion 6 includes all elements except 4, 5 and 9 where it specifies the use of technology | Criteria 4, 5, 6, 7, 8 includes all elements |
| Course Coverage | • Algebraic expressions and solving equations  
• Linear, quadratic and cubic functions  
• Logarithmic, exponential and trigonometric functions  
• Differential calculus  
• Statistics and probability  
One topic per section which are equally weighted. | • Algebraic expressions and solving equations  
• Linear, quadratic and cubic functions  
• Logarithmic, exponential and trigonometric functions  
• Differential calculus  
• Statistics and probability  
One topic per section which are equally weighted. |
<table>
<thead>
<tr>
<th>Number of Questions</th>
<th>From 3 to 6 per section, with a total allocation of 16 marks per section. (Each item may be broken into sub items which will each have their own mark allocation)</th>
<th>From 3 to 6 per section, with a total allocation of 20 marks per section. (Each item may be broken into sub items which will each have their own mark allocation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory/optional [questions/parts of questions]</td>
<td>Compulsory</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Question type(s)</td>
<td>A balance of items ranging from short to extended formats (no item or sub item will have more than 10 marks allocated) Extended items include a balance of routine and non-routine contexts. All closed-ended responses.</td>
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</tr>
<tr>
<td>Suggested time allocation</td>
<td>80 minutes</td>
<td>100 minutes</td>
</tr>
<tr>
<td>Mark allocation</td>
<td>7080 marks</td>
<td>80460 marks</td>
</tr>
</tbody>
</table>

A set of solutions will be provided to markers at the marking meeting and made publically available and published with the assessment report early in the following year.
CRITERIA being externally assessed:

The following criteria and their standards are assessed as follows.

- **Criterion 4:** Manipulate algebraic expressions and solve equations
  All aspects of Criterion 4 standards are examinable

- **Criterion 5:** Understand linear, quadratic and cubic functions
  All aspects of Criterion 5 standards are examinable

- **Criterion 6:** Understand logarithmic, exponential and trigonometric functions
  All aspects of Criterion 6 standards are examinable, with technology aspects of elements 4, 5 and 9 examinable only in Part 2 of the examination.

- **Criterion 7:** Use differential calculus in the study of functions
  All aspects of Criterion 7 standards are examinable

- **Criterion 8:** Understand experimental and theoretical probabilities and of statistics
  All aspects of Criterion 8 standards are examinable.

Noting that:

The external assessment must include items 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.
ATTACHMENT 1

ITEM TYPES

The form in which candidates must answer

- **Short response format**

  These items 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 item is suited to assessing the candidate’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 items 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 m².

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

  \[ \text{brick wall} \]

  \[ y \]

  \[ x \]

  (4 marks)
WRITTEN EXAMINATION CHECKLIST

PART I

SECTION A:
- assesses examinable aspects of Criterion 4
  - provides a list of all content points that have been included
- provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
- includes a representative sample of course content
- comprises three to six questions.
- marks clearly indicated for all questions and sub items
- no question or sub questions worth more than 10 marks.

SECTION B:
- assesses examinable aspects of Criterion 5
  - provides a list of all content points that have been included
- provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
- includes a representative sample of course content
- comprises three to six questions.
- marks clearly indicated for all questions and sub items
- no question or sub questions worth more than 10 marks.

SECTION C:
- assesses examinable aspects of Criterion 6 (excluding tech. aspects of elements 4, 5, 9)
  - provides a list of all content points that have been included
- provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
- includes a representative sample of course content
- comprises three to six questions.
- marks clearly indicated for all questions and sub items
- no question or sub questions worth more than 10 marks.
SECTION D:

☐ assesses examinable aspects of Criterion 7
  - provides a list of all content points that have been included
☐ provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
☐ includes a representative sample of course content

☐ comprises three to *five six* questions.

☐ marks clearly indicated for all questions and sub items

☐ no question or sub questions worth more than 10 marks.

SECTION E:

☐ assesses examinable aspects of Criterion 8
  - provides a list of all content points that have been included
☐ provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
☐ includes a representative sample of course content

☐ comprises three to *five six* questions.

☐ marks clearly indicated for all items and sub items

☐ no item or sub item worth more than 10 marks

PART 2

SECTION A:

☐ assesses examinable aspects of Criterion 4
  - provides a list of all content points that have been included
☐ provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
☐ includes a representative sample of course content

☐ comprises three to *five six* questions.

☐ marks clearly indicated for all questions and sub items

☐ no question or sub questions worth more than 10 marks.

SECTION B:

☐ assesses examinable aspects of Criterion 5
  - provides a list of all content points that have been included
☐ provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
☐ includes a representative sample of course content

☐ comprises three to *five six* questions.
SECTION C:
- assesses examinable aspects of Criterion 6
  - provides a list of all content points that have been included
- provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
- includes a representative sample of course content
- comprises three to five six questions.
- marks clearly indicated for all questions and sub items
- no question or sub questions worth more than 10 marks.

SECTION D:
- assesses examinable aspects of Criterion 7
  - provides a list of all content points that have been included
- provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
- includes a representative sample of course content
- comprises three to five six questions.
- marks clearly indicated for all questions and sub items
- no question or sub questions worth more than 10 marks.

SECTION E:
- assesses examinable aspects of Criterion 8
  - provides a list of all content points that have been included
- provides opportunities to demonstrate standards from rating C to rating A
  - provides a list of all elements from C to A that have been included
- includes a representative sample of course content
- comprises three to five six questions.
- marks clearly indicated for all items and sub items
- no item or sub item worth more than 10 marks