MATHEMATICS METHODS FOUNDATION 3

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.

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
  o The relative allocation of marks, and
  o Space for responses
  o Sub questions (for example 1a, 1b or 1ai, 1aii) must have an individual mark allocation
  o 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 80 marks in Part 1 and 100 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:
  o Criteria
  o Course content (topics)
  o Time and mark allocations
• Number and type of items.
<table>
<thead>
<tr>
<th>Part</th>
<th>Part 1</th>
<th>Part 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Calculators are NOT allowed to be used.</td>
<td>Calculators are allowed to be used.</td>
</tr>
<tr>
<td></td>
<td>5 sections</td>
<td>5 sections</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criteria Elements</th>
<th>Criteria 4, 5, 7, 8 includes all elements</th>
<th>Criteria 4, 5, 6, 7, 8 includes all elements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Criterion 6 includes all elements except 4, 5 and 9 where it specifies the use of technology</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Coverage</th>
<th>• Algebraic expressions and solving equations</th>
<th>• Algebraic expressions and solving equations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Linear, quadratic and cubic functions</td>
<td>• Linear, quadratic and cubic functions</td>
</tr>
<tr>
<td></td>
<td>• Logarithmic, exponential and trigonometric functions</td>
<td>• Logarithmic, exponential and trigonometric functions</td>
</tr>
<tr>
<td></td>
<td>• Differential calculus</td>
<td>• Differential calculus</td>
</tr>
<tr>
<td></td>
<td>• Statistics and probability</td>
<td>• Statistics and probability</td>
</tr>
<tr>
<td></td>
<td>One topic per section which are equally weighted.</td>
<td>One topic per section which are equally weighted.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of items</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>
</table>

<table>
<thead>
<tr>
<th>Number of compulsory items</th>
<th>All</th>
<th>All</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Item type(s)</th>
<th>A balance of items ranging from short to extended formats (no item or sub item will have more than 10 marks allocated)</th>
<th>A balance of items ranging from short to extended formats (no item or sub item will have more than 10 marks allocated)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extended items include a balance of routine and non-routine contexts. All closed-ended responses.</td>
<td>Extended items include a balance of routine and non-routine contexts. All closed-ended responses.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Suggested Time allocation</th>
<th>80 minutes</th>
<th>100 minutes</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Mark allocation</th>
<th>80 marks</th>
<th>100 marks</th>
</tr>
</thead>
</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.
EXTERNALLY ASSESSED CRITERIA:

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.

\[
\begin{align*}
\text{brick wall} \\
y \\
x
\end{align*}
\]

(4 marks)
ATTACHMENT 2
WRITTEN EXAMINATION CHECKLIST

PART 1

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
☐ 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
☐ 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
☐ 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
☐ 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 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
☐ includes a representative sample of course content
☐ comprises three to 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 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
  - 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 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 six questions.
  - marks clearly indicated for all items and sub items
  - no item or sub item worth more than 10 marks