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**MATHEMATICS**

**Specialist Units 3 & 4**

**Test 1 – Complex Numbers**

**Chapters 13, 14 and 15**

**Semester 1 2019**

# 

**Section One – Calculator Free**

Time allowed for this section

Working time for this section: 22 minutes

Marks available: 22 marks

## Material required/recommended for this section

##### To be provided by the supervisor

This Question/Answer booklet

Formula sheet

##### To be provided by the candidate

Standard items: pens, pencils, pencil sharpener, eraser, correction fluid, ruler, highlighters

Special items: Nil

## Important note to candidates

No other items may be used in this section of the examination. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

1. (6 marks)

Determine exact expressions in the form for each of the following:

1. [3]
2. [3]
3. (5 marks)

The polynomial , where m is a real constant. The equation has a solution of . Determine the value of and the remaining solutions of .

1. (5 marks)  
   Two of the solutions to the equation , , are and .
2. State one other solution to the equation. [2]
3. Determine the minimum value of and the exact value of in this circumstance. [3]
4. (6 marks)  
   Given the polynomial
5. Rewrite in the form for a polynomial of degree 2 and a real number. [3]
6. Hence, or otherwise, find in the form . [3]

**End of Section One**

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You may use this space to extend or re-attempt an answer to a question or questions and should you do so then number the question(s) attempted and cross out any previous unwanted working.