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**MATHEMATICS**

**Specialist Units 3 & 4**

**Test 2 – Functions and Sketching Graphs**

**Semester 1 2019**

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**Section Two – Calculator Assumed**

Time allowed for this section

Working time for this section: 26 minutes

Marks available: 26 marks

## Material required/recommended for this section

##### To be provided by the supervisor

This Question/Answer booklet

Formula sheet

##### To be provided by the student

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

Special items: drawing instruments, templates, notes on one unfolded sheet of A4 paper, and up to three calculators satisfying the conditions set by the Curriculum Council for this course.

## 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. (5 marks)

The graph of , where a and b are coefficients and c is a constant, is shown below.

A close up of a map

Description automatically generated

The point lies on the graph, and the equations of its vertical and horizontal asymptotes are and respectively.

Find the values of *a*, *b* and *c*.

1. (9 marks: 4, 3, 2)  
   The graph of is shown below.

A picture containing sky, indoor

Description automatically generated

* 1. On the axes below, sketch the graph of .

A close up of text on a white background

Description automatically generated

* 1. On the axes below, sketch the graph of .

A picture containing text

Description automatically generated

* 1. Solve the equation

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1. (7 marks: 2, 3, 2)

The graph of the function , , is shown below.

A close up of text on a white background

Description automatically generated

* 1. Sketch the graph of on the axes with above.
  2. Determine the defining rule for and state its domain.
  3. Solve:

1. (5 marks)  
   The graph of is shown below. It has asymptotes at . On the next set of axes draw the graph of , clearly showing any roots and asymptotes.





**End of Section Two**

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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.