****

**MATHEMATICS**

**Specialist Units 3 & 4**

**Test 4 – Integration**

**Chapters 13, 14 and 15**

**Semester 2 2017**

# 

**Section One – Calculator Free**

Time allowed for this section

Working time for this section: 35 minutes

Marks available: 35 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. (10 marks)
2. Find using a suitable trigonometric formula. [2]
3. Find using a suitable substitution. [4]
4. Find using partial fractions. [4]
5. (9 marks)
6. Determine the volume of the solid formed when the area in the first quadrant and enclosed by , the line and the y-axis is rotated through one revolution about the y-axis. [4]
7. The area in the first quadrant enclosed by the curve , the lines and the x-axis is rotated about the *x*-axis. If the volume of the solid generated is determine the value of the constant k. [5]
8. (8 marks)
9. Determine using the substitution . [4]
10. Show that [4]
11. (8 marks)
12. Use the substitution to determine [4]
13. Find [4]

**End of Section One**

**This page has intentionally been left blank**

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.