**Section Two: Calculator-Allowed 50% (****25 Marks)**

This section has **four (****4)** questions. Answer **all** questions. Write your answers in the spaces provided.

Working time for this section is 25 minutes.

**Question 6 5 marks**Solve the system , clearly showing the use of matrix algebra.

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**Question 7 5 marks**

A computer company is offering short courses in the software ‘Word’, ‘Publisher’ and ‘Excel’.

* Course A comprises 4 hours on Word, 2 hours on Publisher and 1 hour on Excel.
* Course B comprises 2 hours on Word, 1 hour on Publisher and 2 hours on Excel.
* Course C comprises 4 hours on Word, 3 hours on Publisher and 1 hour on Excel.

At the end of the week the computer company found that 138 hours had been totalled on Word, 83 hours had been totalled on Publisher, and 57 hours totalled on Excel. The cost of the courses A, B and C are $65, $60 and $55 respectively.

Find the number of people who took each course and the total revenue that the company received that week.

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**Question 8 8 marks**

Consider two matrices and .

The point is mapped to the point using followed as transformation matrices.

1. Find the coordinates of 2 marks

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1. Find a single transformation matrix that will map back to . Show how you obtained your answer.

Image result for red tick png2 marks

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1. is a circle of radius 1 with centre at . C is transformed to circle by the transformation . Discuss the differences between the original circle and its image . You need to comment on the coordinates of the centre, the radius and area of the two circles. 4 marks

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**Question 9 7 marks**

1. is mapped to by the transformation represented by matrix . Determine the value of if the area of is eight times the area of . 3 marks

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* Must show 2 values of
* Must be fully simplified, no rationalisation needed.

1. By considering an anticlockwise rotation of angle A followed by a clockwise rotation B about the origin, prove using the transformation matrix  that:



4 marks

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**End of Section Two**

**Additional working space**

Question \_\_\_\_\_\_\_\_\_