

Candidate Name: _____



CENTRAL EAST EDUCATION DIVISION
2025 MSCE MOCK EXAMINATION
MATHEMATICS



Thursday, 27 March

Subject Number: M131/I
Time Allowed: 2 hours
08:00 – 10:00 am

PAPER I
(100 marks)

Instructions

1. This paper contains 15 pages. Please Check.
2. Answer all the 20 questions in this paper
3. The maximum number of marks for each answer is indicated against each question.
4. Write your answers in the spaces provided on the question paper.
5. Scientific calculators may be used.
6. All working must be clearly shown.
7. Write your name on top of each page of this paper

Question Number	Tick if answered	Do not write in these columns	
1			
2			
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Turn over



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1. Factorise completely $2x^2 - 3xy - 2y^2$ (3 marks)

2. Without using a calculator or four figure tables, simplify $\frac{5\sqrt{28} - \sqrt{63}}{5\sqrt{2}}$, giving the answer with a rational denominator. (4 marks)

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3. Make **t** the subject of the formula $P = \frac{n}{2m} \sqrt{\frac{f}{k-t}}$. (5 marks)

4. The function $g(x) = \frac{3}{3x-1}$. Given that $\{-1,0,3\}$ is the domain. Draw arrow diagram to represent the function. (5marks)

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5. **Figure 1** shows a circle KLM center O, the diameter $KM=13\text{cm}$ and chord $KL=11\text{cm}$. E is a point on LM.

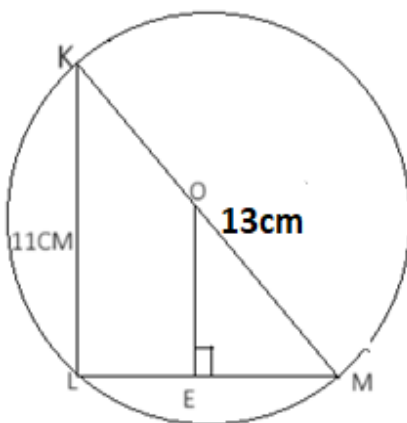


Figure 1

If OE is perpendicular to the chord LM. Calculate the length of EM. Leave your answer in three significant figures. (5 marks)

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6. If $a = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and $b = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$, calculate $|a| + |b|$ (4 marks)

7. **Figure 2** below shows a speed time graph of a motor cycle.

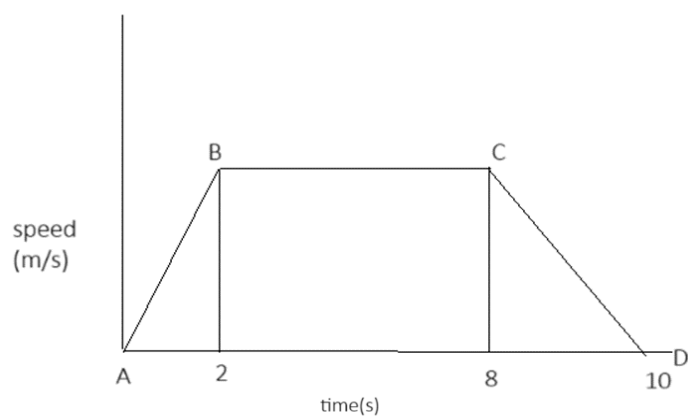


Figure 2

Given that the total distance travelled is 320m. Calculate the deceleration during the last 2 seconds. (5 marks)

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8. If $(2x + 1)^2 + (x - 1)(x - 3) = ax^2 + b$, find a and b. (5 marks)

9. P varies directly as r and inversely as the square root of x. Given that $p=8$ when $x=36$ and $r=2$. Calculate x when $r=4$ and $p=12$. (6 marks)



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10. Figure 3 below shows a straight line passing through a point B (3,5). (5 marks)

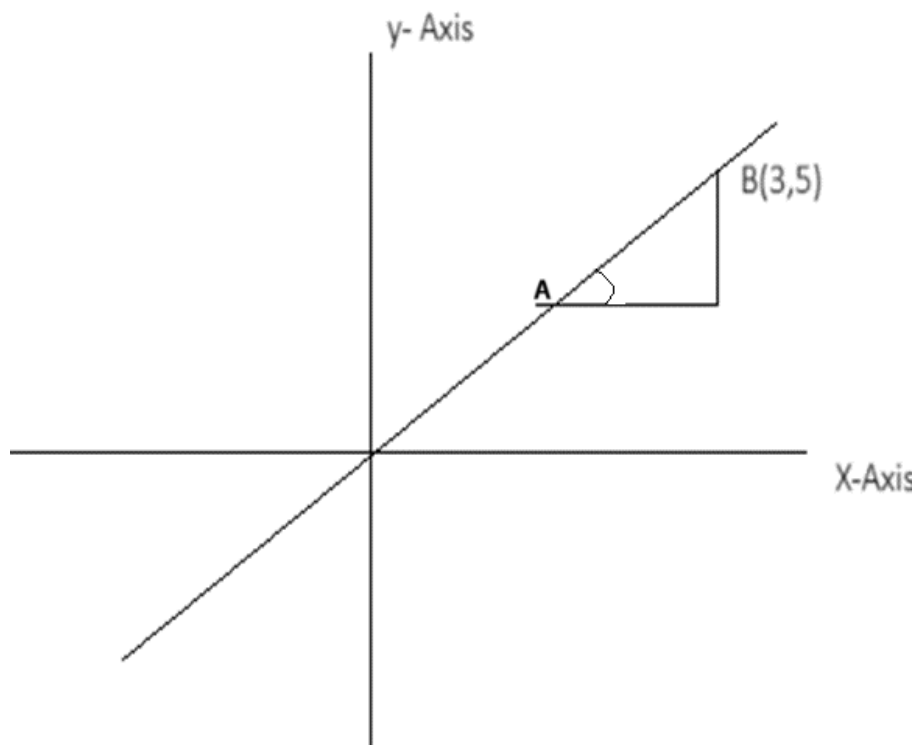


Figure 3

Given that $\tan A = \frac{1}{3}$. Find the equation of the line in the form $y = mx + c$.

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11. Solve the equation $5x^2 + 8x - 2 = 0$, giving the answer correct to two decimal places.
(6 marks)



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12. **Figure 4** below shows a tangent QTE to a circle TSRP at T. Angle $STQ = 50^\circ$ and SPE is a straight line.

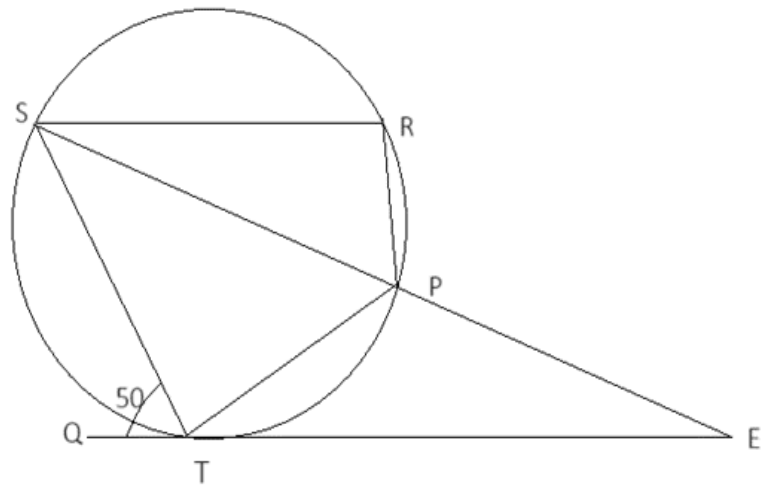


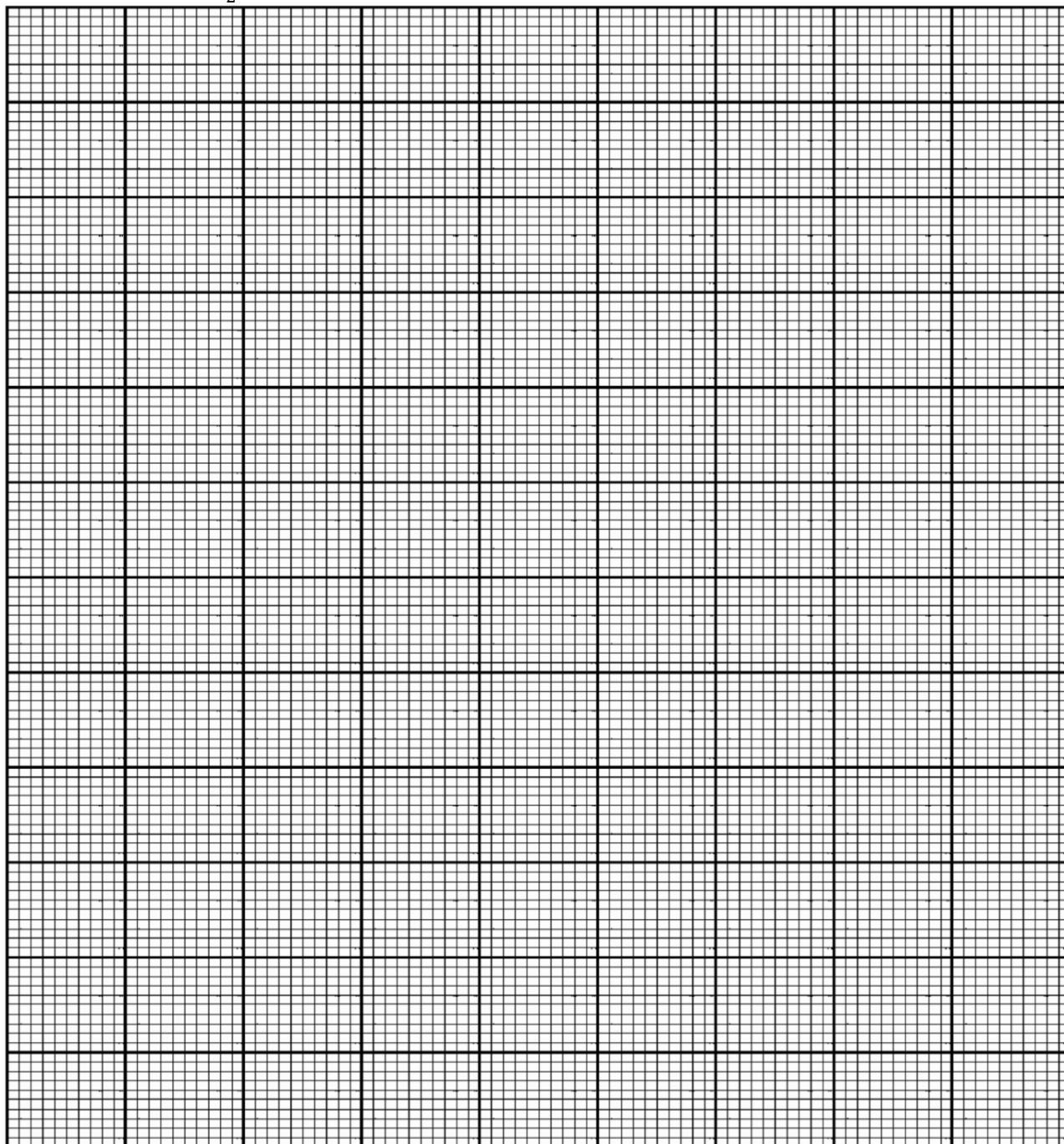
Figure 4

If $TE = TS$, calculate the value of angle SRP .

(6 marks)

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13. On a graph paper provided, using a scale of 2cm to represent 1 unit on both axes, draw triangle ABC whose vertices are A(2,2), B(3,5) and C (5,3). On the same axes draw the image of triangle ABC using $-\frac{1}{2}$ as a scale factor and (0,0) as the center of enlargement. (5 marks)



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14. Given that fifth and tenth term of a geometric progression (GP) are 4 and $\frac{1}{8}$ respectively. Find the sum of the first 6 terms. **(5 marks)**

15. Given that A and B are two matrices, such that $\mathbf{A} = \begin{bmatrix} 2 & 1 \\ -1 & 3 \end{bmatrix}$ and $\mathbf{B} = \begin{bmatrix} 0 & 3 \\ -1 & 1 \end{bmatrix}$. Find $3\mathbf{B} - \mathbf{A}^2$. **(5 marks)**

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16. The ratio of area of two circles is 4:9. Given that the radius of the bigger circle is 18cm, find the radius of the smaller circle. (4 marks)

17. Figure 5 below is a diagram of a drinking trough for chickens made by joining a cylinder and a cone and it is open at the top. The diameter of the trough is 28cm while the height of the cylinder and trough are 20 cm and 10 cm respectively.

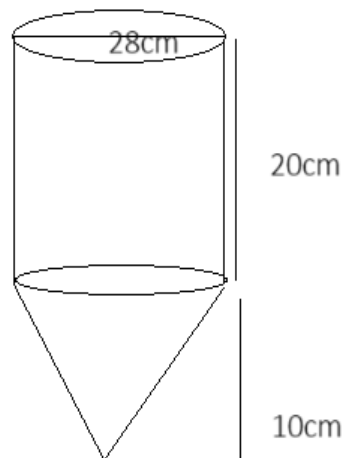


Figure 5

If the trough was painted outside only. Calculate the total surface area that was painted. (5 marks)

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18. A point P on the level ground is 15m away from the foot of the wall of a house. The angle of elevation of the bottom B of a window from P is 12° and the angle of elevation to the top T of the window from the same point P is 16° . Calculate the height of the window, giving the answer correct to the nearest metre. **(6 marks)**



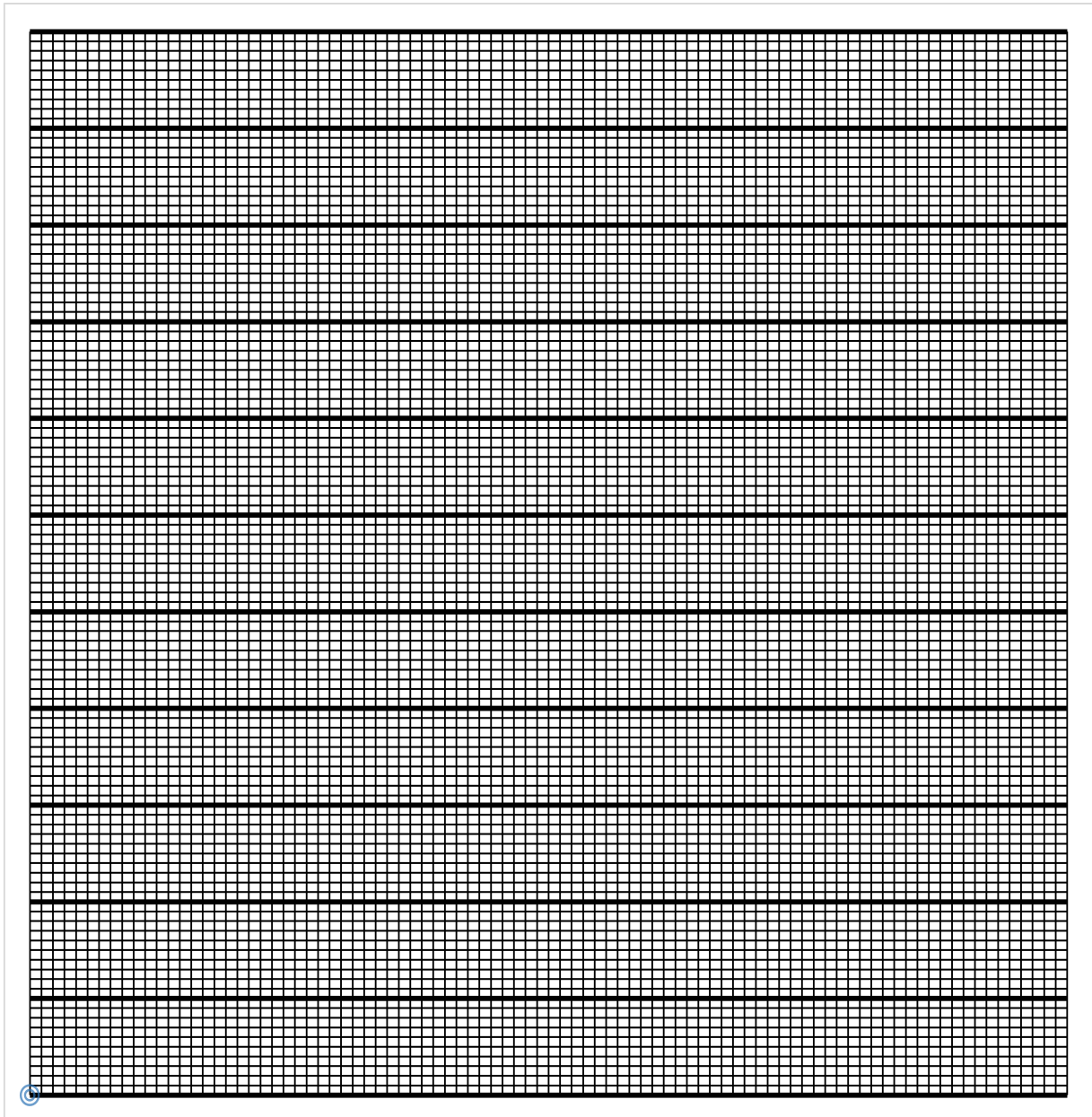
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19. The table below shows frequencies of different class intervals of people in years.

Class interval	1-10	11-20	21-30	31-40	41-50	51-60
Frequency	10	5	17	25	20	13

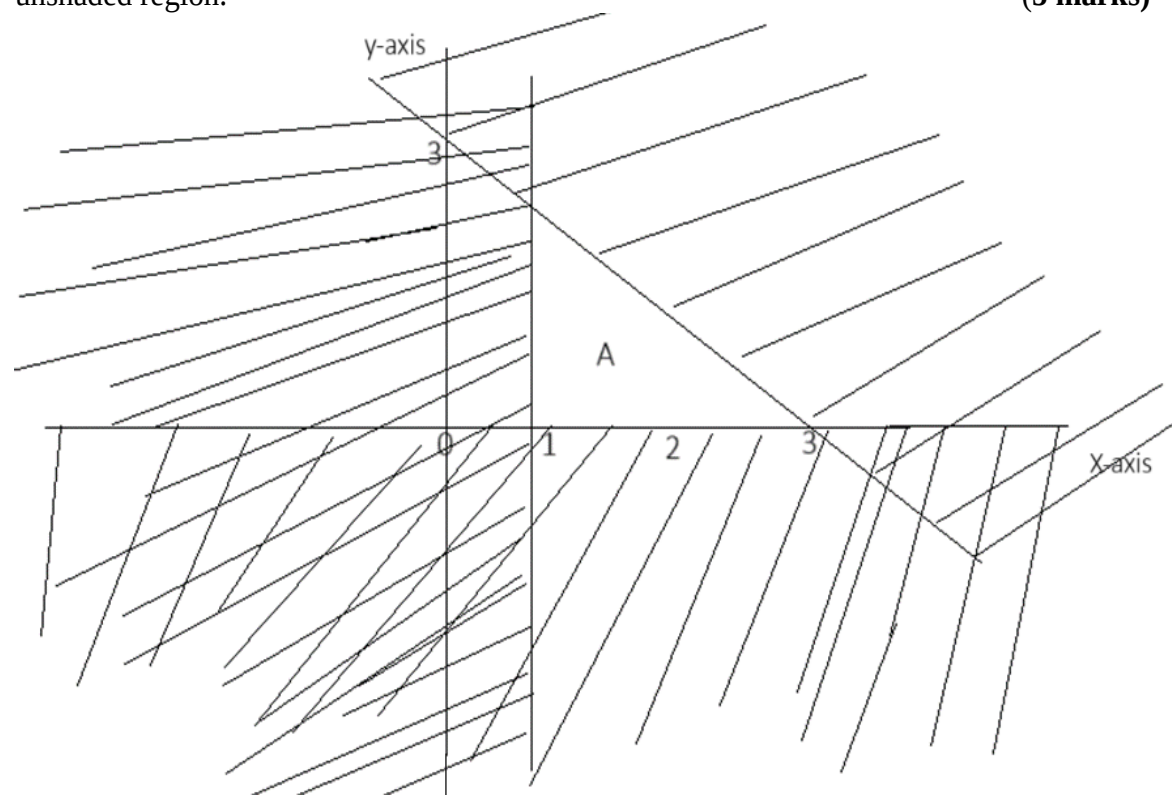
Using a scale of 2cm to represent 0.5 units on the vertical axis and 2cm to represent a class interval of 10 units on the horizontal axis, draw a frequency polygon to represent information.

(6 marks)



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20. **Figure 6** shows the unshaded region A. Write down the three inequalities that describe the unshaded region. (5 marks)



END OF QUESTION PAPER

NB: This paper contains 15 printed pages