



MARANDA HIGH SCHOOL

Kenya Certificate of Secondary Education

THE MOCK EXAMINATIONS, 2026

121/1

MATHEMATICS

PAPER 1

May, 2026

TIME: 2½ Hrs

Name:

Admission No:

Stream: Signature: Sunday 31st May, 2026; 10:30am-1:30pm

Instructions to candidates:

- (a) Write your name, admission number and stream in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) This paper consists of **two** sections: **Section I** and **Section II**.
- (d) Answer **all** the questions in **Section I** and only **five** questions from **Section II**.
- (e) **Show all the steps in your calculations, giving your answers at each stage in the spaces provided below each question.**
- (f) Marks may be given for correct working even if the answer is wrong.
- (g) **Non-programmable** silent electronic calculators **and** KNEC Mathematical tables may be used, except where stated otherwise.
- (h) **This paper consists of 17 printed pages.**
- (i) **Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**
- (j) Candidates should answer the questions in **English**

For Examiner's Use Only

Section I

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total

Section II

17	18	19	20	21	22	23	24	Total

Grand Total

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SECTION I (50 marks)

Answer **all** the questions in this section in the spaces provided

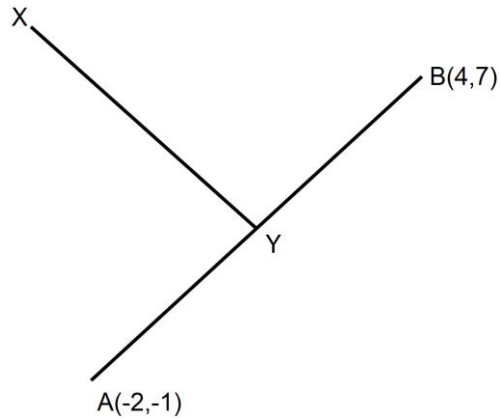
1. Without using mathematical tables or calculators, evaluate $\frac{-4(8+^{-}3)-^{-}18\div 6+5}{-7\times^{-}2+^{-}3\times 1}$. (3 marks)

2. Without using a calculator or Mathematical Tables solve for T in the equation (3 marks)

$$2T = \sqrt{6\left(\frac{4}{5} + \frac{7}{10}\right)}$$

3. After selling a bag of potatoes at Kshs.4,200 Paul made some profit. If he could have sold it Kshs. 3,200 he could have made a loss. Given that the profit is thrice the loss, calculate the amount of money he paid for the bag of potatoes. (3 marks)

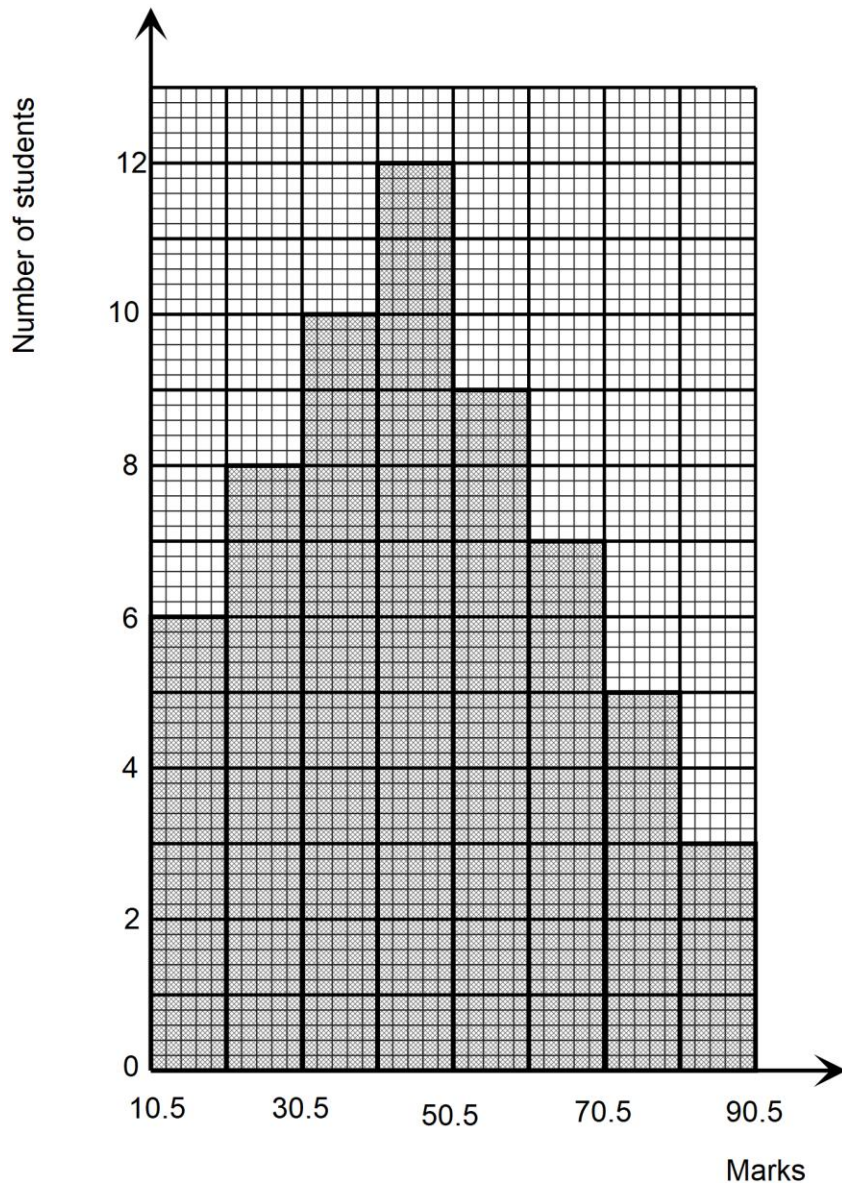
4. The diagram below shows line XY meeting AB at Y forming right angles XYA and XYB.



Given that $AY = YB$ and the coordinates of A and B are $(-2, -1)$ and $B(4, 7)$ respectively determine the equation of line XY in the form $y = mx + c$. (3 marks)

5. Given that $4\mathbf{p} - 3\mathbf{q} = \begin{pmatrix} 10 \\ 5 \end{pmatrix}$ and $\mathbf{p} + 2\mathbf{q} = \begin{pmatrix} -14 \\ 15 \end{pmatrix}$, determine the modulus, to two decimal places, of $\mathbf{p} - 2\mathbf{q}$. (4 marks)

6. The histogram below represents marks distribution of Form 4 Indigo performance in a Mathematics Test.



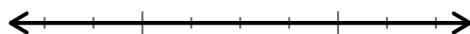
Estimate, to two decimal places, the median mark of the Test using the histogram above.

(4 marks)

7. Complete the figure below to show a rotational symmetry of order three about O. (3 marks)



8. Solve the linear inequality $\left(\frac{1}{2}\right)^{x+2} \leq 2^{2x+1} \leq 4^{-2x+2}$ hence illustrate your solution on the number line below. (4 marks)



9. Solve for t in the equation $2 \log_{\sqrt{t}} 3 = 1$. (2 marks)

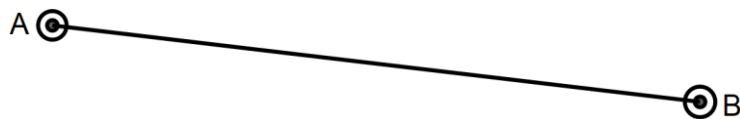
10. Triangle ABC whose vertices are: $A(-4,3)$, $B(3,2)$ and $C(1,-2)$ was first transformed by a translation $T = \begin{pmatrix} -2 \\ 2 \end{pmatrix}$ to form $A^I B^I C^I$ before being reflected onto the line $y = 0$ to form $A^{II} B^{II} C^{II}$. Determine the coordinates of both $A^I B^I C^I$ and $A^{II} B^{II} C^{II}$. (3 marks)

11. The average score attained by Marvin in three subjects: English, Kiswahili and Mathematics Tests is 86%. Calculate his score in Mathematics given that he had same score in both Kiswahili and English but 6% more in Mathematics than the other two subjects. (3 marks)

12. Determine the inverse of matrix $K = \begin{bmatrix} -3 & 2 \\ 4 & h \end{bmatrix}$ whose determinant is -3 . (3 marks)

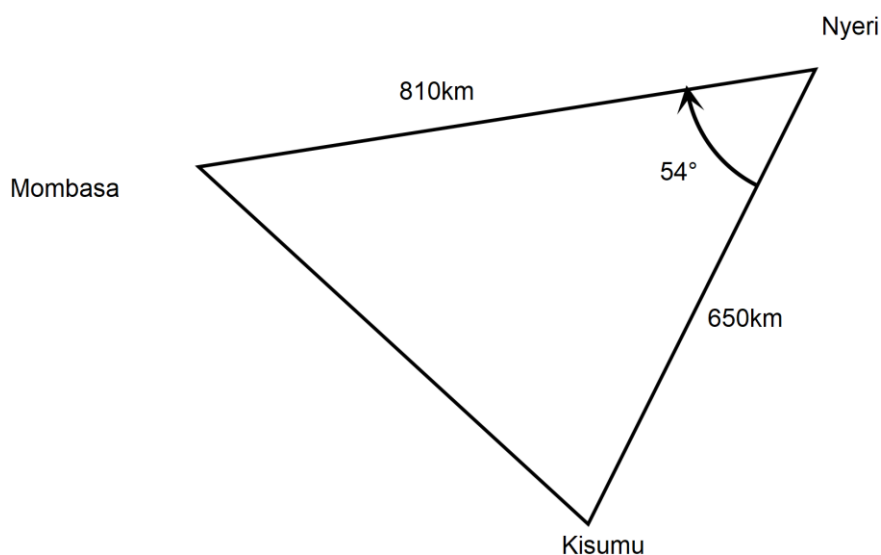
13. Petronella threw a stone vertically upwards and its height, h metres, from the ground after time, t seconds, is given by $h = 40 - 10t^2$. Calculate the velocity of the stone after 1 second. (2 marks)

14. The figure below shows line AB which is part of trapezium $ABCD$ in which line $BC = 7.2\text{cm}$ and angles ABC and BAD are $112\frac{1}{2}^\circ$ and 120° respectively. Using a ruler and a pair of compasses only complete the figure given that line DC is parallel to AB hence measure the length of line DC . (4 marks)



15. Dahiraaq Bus traveling from Nakuru to Mandera at an average speed of 70km/hr takes four hours longer on the return journey if its average speed is 20km/hr slower than the journey from Nakuru to Mandera. Calculate the distance between Nakuru and Mandera. (3 marks)

16. Three towns: Kisumu, Nyeri and Mombasa are all linked with straight SGR lines to form a triangle shown in the figure below.



Given that, the angle formed by the Mombasa-Nyeri line and Kisumu-Nyeri line at Nyeri Station is 54° and the lengths of Mombasa-Nyeri and Kisumu-Nyeri lines are 810km and 650km respectively calculate, to the nearest Kshs. 1,000, the cost of building a direct SGR line joining Mombasa to Kisumu if each Kilometre costs Kshs. 1,780,000. (3 marks)

SECTION II (50 marks)

Answer **only five** questions in this section in the spaces provided.

17. Ms. Linda filled a cuboid wooden box of length 45cm, width 15cm and height 27cm with 675 spherical plastic containers without deforming them so that no more containers could fit.

Calculate, to two decimal places, the:

a) maximum radius of each spherical plastic container in the box. (3 marks)

b) mass, in kilogrammes, of cotton required to fill the empty spaces given that the density of compacted cotton is 550kgm^{-3} . (4 marks)

c) radius of the cylindrical container of length $1\frac{1}{3}\text{m}$ which can be filled with the liquid from the 675 spherical containers packed in the wooden box above. (3 marks)

18. The gradient function of the curve $y = ax^3 + x^2 + 8x + 2$ when $x = 2$ is -3 .

a) Determine the:

i) value of a .

(3 marks)

ii) equation of the tangent to the curve at that point in the form $y = mx + c$.

(4 marks)

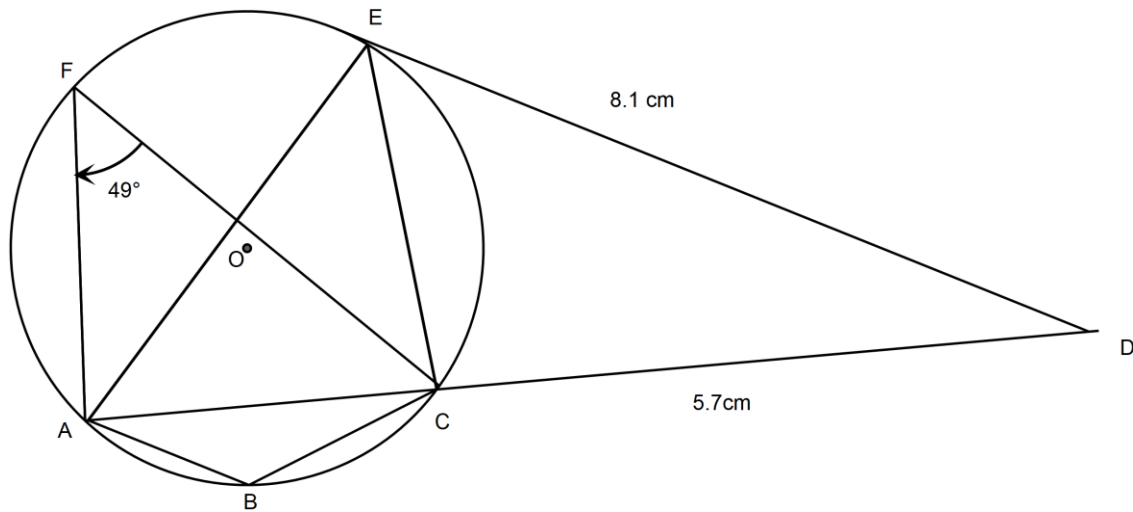
b) State the co-ordinates of the turning point on the curve $y = 2x^2 - 4x + 3$ hence determine its nature.

(3 marks)

19. James may either walk to work along a route 5km or take a bus journey of 7km. The average speed of the bus is 24km/hr faster than his average speed while walking. Taking the average walking speed as x km/hr;
- a) Write down expressions for time of the journey; (2 marks)
- i) when walking
 - ii) when using the bus
- b) Given that the journey by bus takes 36 minutes less than the journey on foot, calculate the speed of the bus. (5 marks)
- c) On a particular day, he delayed by 5 minutes before setting up for the journey to work by foot. Calculate the exact speed, in km/hr, he walked to reach the place of work at the usual time. (3 marks)

20. The ratio of goats to camels at Al Jumera Ranch at the start of the year was 3: 7. After selling 20 goats and 40 camels at the start of February, the ratio changed to 5: 12.
- a) Calculate the initial number of goats and camels in the ranch. (4 marks)
- b) From March to June, the number of goats in the Ranch increased in the ratio 8: 5 while that of camels decreased by 15% due camel disease outbreak. Calculate the new ratio of camels to goats. (3 marks)
- c) The Ranch Management decided to sell off all the livestock at the end of June to a Slaughterhouse that paid them a total of Kshs. 78,474,000 from the whole stock. Given that they sold each camel at Kshs. 315,000, calculate the amount of money that Al Jumera Ranch received from the sale of each goat. (3 marks)

21. The figure below shows a circle with centre O in which points A, B, C, E and F lies on its circumference and the chord AC intersects with tangent ED externally at D .



Given that angle $AFC = 49^\circ$ and lines ED and CD are 8.1cm and 5.7cm , calculate the:

- a) sizes of angles

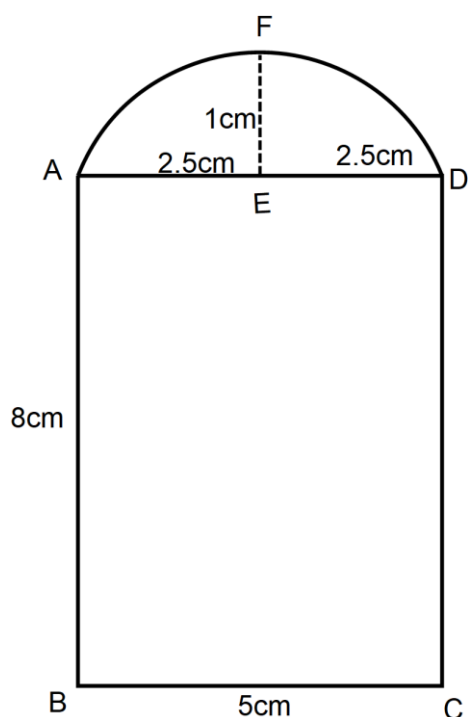
i) $\angle AEC$. (1 mark)

ii) $\angle ABC$. (3 marks)

b) length, to 1 decimal place, of chord AC . (3 marks)

c) radius of the circle in metres. (3 marks)

22. The figure below shows a schematic diagram of a cross-sectional area of a Cathedral door designed by Canaan Carpenters and Fabricators Ltd comprising of a rectangular part ABCD joined by an arc AFD (which does not form part of a semicircle) and F being its furthest point from line AD and also that E is the midpoint of AD.



- Besides the diagram calculate the area of cross-section of the diagram. (5 marks)
- Given that the length AB of the actual door is 3.2m and that the actual door is 40mm thick calculate, to the nearest cm^3 , the volume of the actual door. (3 marks)
- Calculate, to the nearest Kshs.100, the price which Canaan Carpenters should sell the door so as to make a 30% profit given that 1 m^3 of the timber used costs Kshs. 5,872,000 while labour and other costs of production is always 20% the cost of timber. (2 marks)

23. The Central Business District (A) within a city is 36km away and on a bearing of $S43^{\circ}E$ from Estate W. Estates X and Y are 45km to the West and 24km to the East of the CBD (A) respectively while Estate Z is on a bearing of 149° and 12km from Estate X.

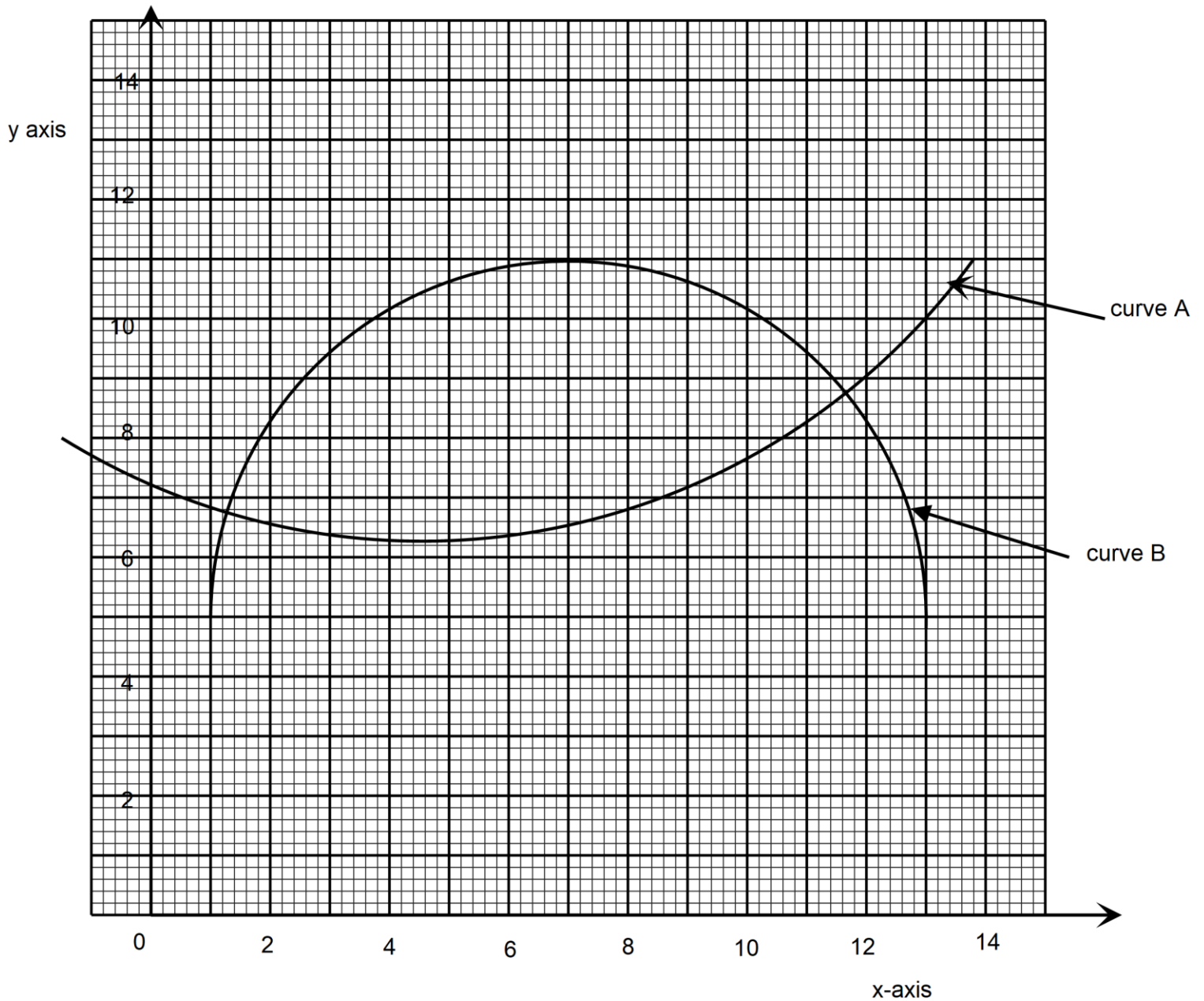
a) Using a scale of 1:500,000 draw a scale diagram representing the information above. (4 marks)

b) State the compass bearing of Estate W from Estate Z. (1 mark)

c) This City County's borders are defined by straight roads joining Estates W to X to Y to Z and then to W. Calculate the area, to the nearest hectare, of the City County. (3 marks)

d) Estimate the population of this City County given that approximately 260 persons occupy 1 hectare. (2 marks)

24. The figure below shows the graphs of Curves A and B.



- a) Fill in the values of y ordinates corresponding to the given x-ordinates for curves A and B in the Table below. (2 marks)

x	2	3	4	5	6	7	8	9	10	11
Curve A	6.6		6.3	6.3		6.5	6.8		7.7	
Curve B	8.1	9.4			10.9			10.6	10.2	9.4

- b) Using the Trapezium rule with 4 strips, estimate the area bounded by the curves A and B between $x = 2$ and $x = 10$ in the graph above. (4 marks)

- c) Using the Mid-ordinate rule with 4 strips, estimate the area bounded by the curves A and B between $x = 3$ and $x = 11$ in the graph above. (4 marks)

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