

# MOI GIRLS' HIGH SCHOOL-ELDORET

121/1



MATHEMATICS

ALT A

FORM THREE

TERM 1 MID TERM EXAM.

February. 2026 -  $2\frac{1}{2}$  hours.

Paper 1

Date: 24/02/2026

0800 - 1030 hrs

**Instructions to candidates**

- (a) Write your name and admission number in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided.
- (c) This paper consists of two sections: Section I and Section II.
- (d) Answer all questions in section I and all questions in section II.
- (e) Show all the steps in your calculations, giving the 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 18 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	Total

Grand Total



## SECTION I (50 marks)

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

1. The expression  $ax^2 - 16x + 16$  is a perfect square, where  $a$  is a constant. Find the value of  $a$ . (2 marks)
2. Five students sat for a mathematics test and had a mean score of 68%. When the score of the sixth student is included, the mean rises to 70%. Find the score of the sixth student. (3 marks)
3. Simplify completely ;  $\frac{4x^2 + 13xy + 3y^2}{16x^2 - y^2}$  (3 marks)

4. (a) Town X is 20km on a bearing of  $060^{\circ}$  from Y, and Z is 30km in the direction  $150^{\circ}$  from Y.  
Using the scale of 1cm represents 5km, draw a diagram to show the position of the three towns.  
(3 marks)

- (b) By scale drawing, find the bearing of Y from Z. (1 mark)

5. A Kenyan company received US Dollars 60 000. The money was converted into Kenyan Shillings in a bank which buys and sells foreign currencies as follows:

	Buying (Kenyan Shillings)	Selling (Kenyan Shillings)
1 US Dollars	129.31	129.56
1 Sterling Pound	171.47	171.86

- (a) Calculate the amount of money, in Kenya Shillings the company received (1 mark)

- (b) The company exchanged the Kenya Shillings calculated in (a) above into Sterling Pounds to buy a car from Britain. Calculate the cost of the car to the nearest Sterling Pounds. (2 marks)

6. Solve the inequality  $x - 5 < 3x + 2 \leq 2(x + 3)$  hence represent your solution on a number line. (3 marks)

7. The surface area of a solid hemisphere of radius  $r$  cm is  $300\pi$  cm<sup>2</sup>. If the mass of the solid is 4 kg, find its density leaving your answer in terms of  $\pi$ . (4 marks)

8. The length and width of a rectangular piece of paper were measured as 70cm and 25cm respectively. Determine the percentage error in the calculation of its area. (4 marks)

9. Given that  $\sin(x + 70) = \cos 3x$ , find  $\tan(x + 70)$  correct to 4 significant figures. (3 marks)

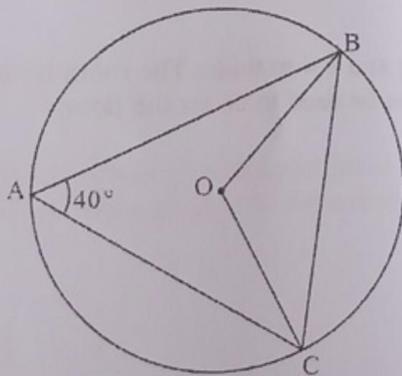
10. Given that  $5^{3n-4} = 15625$ , find the exact value of  $n$ . (3 marks)

11. A rectangular floor of a room measures 10.8 m long and 8.4 m wide. The room is covered by square tiles. Calculate the minimum number of tiles that can be used to cover the floor. (4 marks)

12. A point A (2, 6) is mapped onto A' (8, 12) under a reflection. Find the equation of the mirror line that maps A onto A'. (3 marks)

13. In a school, routine starts at 0800hours and ends at 1600hours. Morning break is 20 minutes and ends at 1000hours. Lunch starts at 1310hours and ends at 1400hours. If the rest of the time is left for lessons, how long do they spend in class? (2 marks)

14. In the figure below, O is the center of the circle and OB bisects angle ABC. Angle BAC =  $40^\circ$ .



Determine the size of;

- (i) Angle BOC.

(1 mark)

- (ii) Angle ABO.

(2 marks)

15. The mass of fat in two similar tins are 2000g and 500g respectively. If the area of the base of the smaller tin is  $100\text{cm}^2$ , find the area of the base of the larger tin. (3 marks)

16. The base PQRSU, of a right pyramid is a regular hexagon of side 3cm. Point V is the vertex of the pyramid and the length of the slanting edges is 3.5cm. Draw a labeled net of the pyramid. (3 marks)

## SECTION II (50 marks)

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

17. A bus left Nairobi at 9.00 a.m., and travelled towards Voi at an average speed of 80 km/hr. At 10.00 a.m, a car left Voi traveling towards Nairobi at an average speed of 120km/hr. If the distance between Voi and Nairobi is 400 km, calculate;
- (a) The time of the day the bus arrived in Voi. (2 marks)
- (b) The time of the day the two vehicles met. (4 marks)
- (c) The distance from Nairobi to where the two vehicles met. (2 marks)
- (d) The distance of the bus from Voi when the car arrived in Nairobi. (2 marks)

20. A straight line  $L_1$  has gradient of  $-0.5$  and passes through  $P(-1, 3)$ . Another line  $L_2$  passes through the points  $Q(1, -3)$  and  $R(3, 5)$ . Find;

(a) The equation of  $L_1$ . (2 marks)

(b) The equation of  $L_2$  in the form  $ax + by + c = 0$  where  $a$ ,  $b$  and  $c$  are integers. (3 marks)

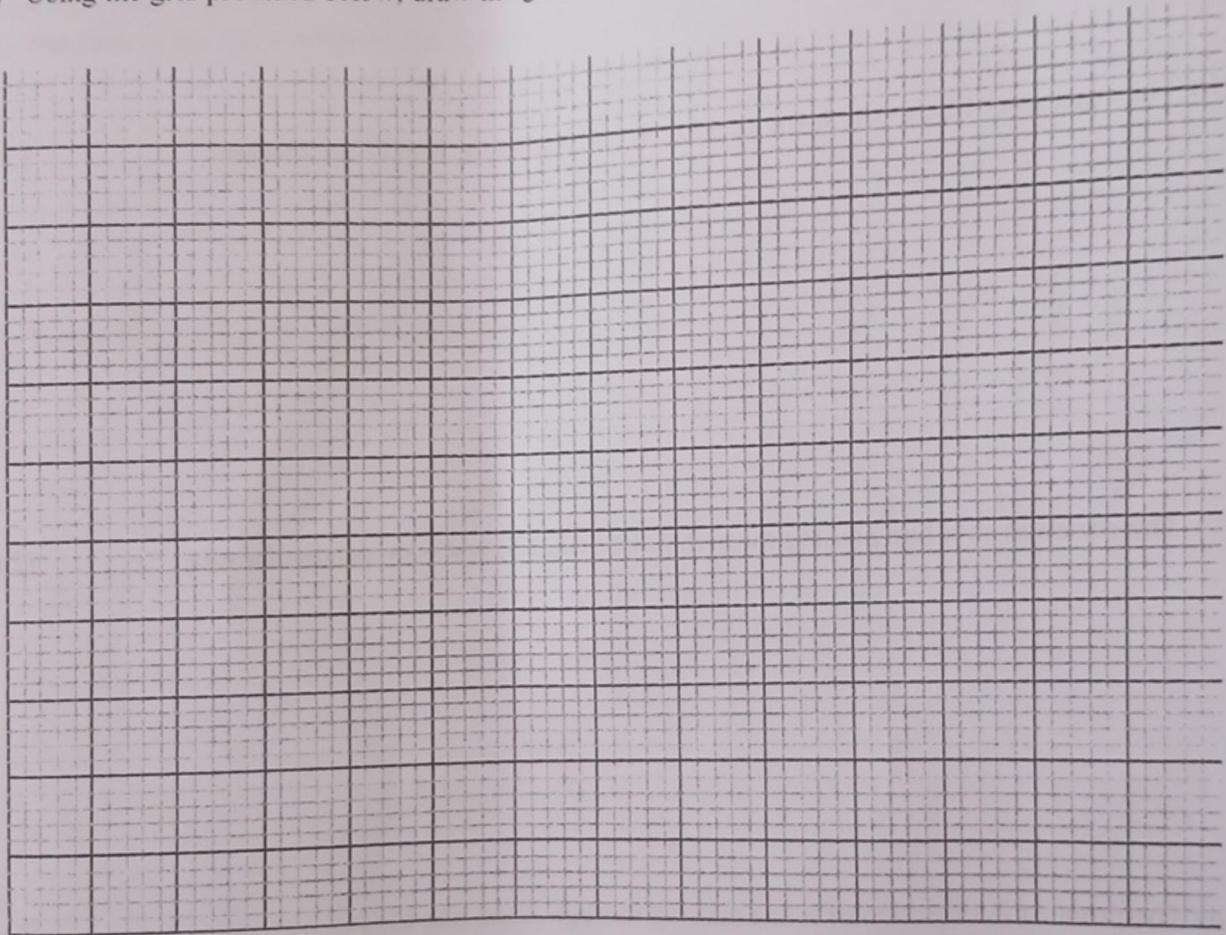
(c) The equation of a line passing through point  $S(0, 1.5)$  and is perpendicular to  $L_2$ . (2 marks)

(d) The point of intersection of a line passing through  $S$  and line  $L_2$ . (3 marks)

21. (a) Complete the table given below for the function  $y = x^2 - x - 6$

$x$	-3	-2	-1	0	1	2	3	4
$y$				-6		-4		6

(b) Using the grid provided below, draw the graph of  $y = x^2 - x - 6$  for  $-3 \leq x \leq 4$ . (3 marks)



(c) From the graph drawn in (b) above, find the roots of  $x^2 - x - 6 = 0$  (1 mark)

(d) Draw a suitable straight line on the grid in (b) above to solve the equation  $x^2 - 4x - 12 = 0$  (3 marks)

(e) Find the equation of the line of symmetry of the curve drawn in (b) above. (1 mark)

18. The position vectors of **S** and **T** are  $\begin{pmatrix} -8 \\ 12 \end{pmatrix}$  and  $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$  respectively. Point **A** is the midpoint of **ST** and point **B** is the midpoint of **OA**.

Find:

(a) (i) Column vector **ST**

(2 marks)

(ii) The coordinates of point **A** and **B**.

(2 marks)

(iii)  $|\mathbf{AB}|$  correct to three decimal places.

(3 marks)

(b) A translation vector **R** maps point **S** onto **T**. Determine the coordinates of the object **P** whose image is  $P'(-3, -5)$  under the same translation.

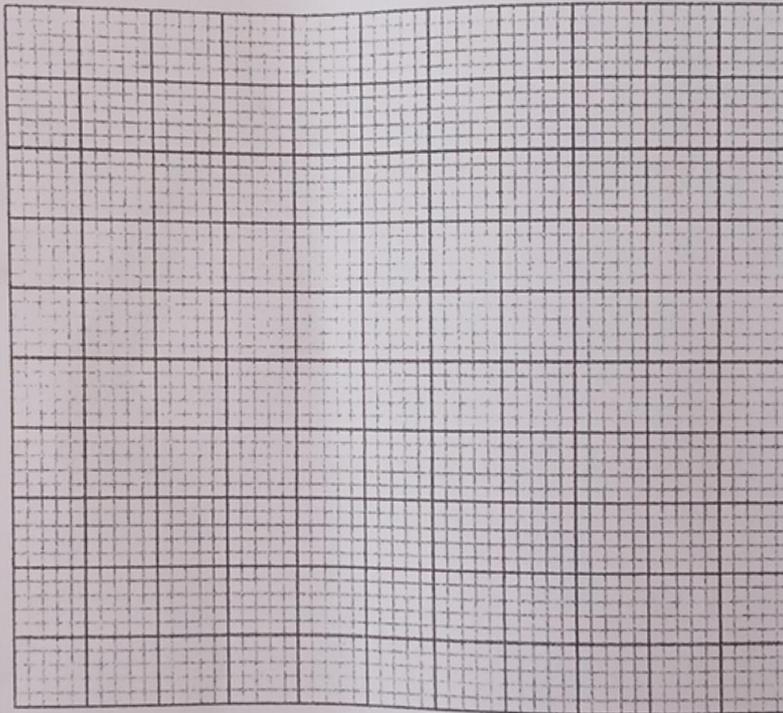
(3 marks)

19. The masses to the nearest kilogram of some students were recorded in the table below.

Mass(kg)	41 – 50	51 – 55	56 – 65	66 – 70	71 – 85
Frequency(f)	8	12	16	10	6
Frequency density(fd)					

(a) Complete the table drawn above. (2 marks)

(b) On the grid provided below, draw a histogram to represent the above information. (4 marks)



(c) State the class in which the median mass lies. (1 mark)

(d) Determine the median mass using the histogram drawn in (b) above. (3 marks)