LENANA SCHOOL

End of Term I 2024

MATHEMATICS

Form 2

Time: 2 hours 30 minutes

FILL IN YOUR PERSONAL DETAILS HERE

Student Name: _____ **Class:** 2 _____

Admission Number: _____ **Teacher:** _____

Instructions to Candidates:

(a) Write your name, admission number and class in the spaces provided above.
*(b) This paper consists of **TWO** Sections: I and II.*
*(c) Answer **ALL** the questions in section I and II in the spaces provided.*
*(d) All working **MUST** be clearly shown.*
(e) KNEC mathematical tables and silent non-programmable electronic calculators may be used.
(f) This paper consists of 15 printed pages. Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

For Examiners 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 _____

SECTION I (50 marks)

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

1. Evaluate, without using calculator, (3 marks)

$$\frac{37 + 8 \times -4 - 15 \div -3}{9 \times -3 - 8(6 - 2)}$$

2. A carpenter has three pieces of timber measuring 2.94 m. 3.36 m and 4.62 m. He cuts the timber into pieces of equal lengths. Find the least number of pieces obtained. (3 marks)

3. Use logarithms to evaluate: $\sqrt[3]{\frac{27.25 \times 0.01471}{1.938}}$ (3 marks)

4. Simplify (3 marks)

$$\frac{4x^2 - y^2}{2x^2 - 7xy + 3y^2}$$

5. A tourist arrived in Kenya with x US dollars. The money was converted into Kenya shillings in a bank which buys and sells foreign currencies as shown.

Currency	Buying (Ksh)	Selling (Ksh)
1 Sterling Pound	125.78	126.64
1 US Dollar	75.66	75.80

The tourist used Ksh. 5 000 000 while in Kenya then converted the rest into sterling pound. Given that he received 5 200 sterling pounds, find x. (4 marks)

6. Use the prime factors of 1 080 and 1 000 to evaluate $\frac{1080}{\sqrt[3]{1000}}$ (3 marks)

7. A watch which loses a half minute every hour was set to read the correct time at 5.45 am on Monday. Determine the time in 24-hour system, the watch will show on the following Thursday at 7.45 pm. (3 marks)

8. Zawadi paid rent which was $\frac{1}{10}$ of her net salary. She used $\frac{1}{2}$ of the remaining amount to make a down payment for the plot. She gave her mother Ksh. 2 500 and did shopping worth Ksh. 7 500 for herself. She saved the remaining which was Ksh. 12 500. How much was the down payment that she made. (3 marks)

9. Solve for x in the equation. (3 marks)
$125^{x+1} + 5^{3x} = 630$

10. Three interior angles of irregular polygon are 130°, 60° and 80° and all the remaining interior angles are 150° each. Calculate the number of sides of the polygon. (3 marks)

11. Next year Juma will be twice as old as Mark. Five years ago, Juma was eight times as old as Mark. Find their ages now. (3 marks)

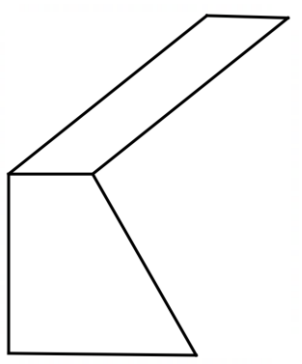
12. Express as a single fraction in its simplest form $\frac{4x-5}{2} - \frac{2x-1}{6}$ (3 marks)

13. A given volume of ethanol whose density is 0.79 g/cm^3 is mixed with 1 500 cm^3 of sea water of density 1.03 g/cm^3 to give a mixture of density 0.88 g/cm^3. Calculate the volume of ethanol in the mixture. (3 marks)

14. Use square roots and reciprocal tables to evaluate the expression below correct to 3 significant figures. (3 marks)

$(0.05367)^{\frac{1}{2}} + \left(\frac{2}{0.5238}\right)$

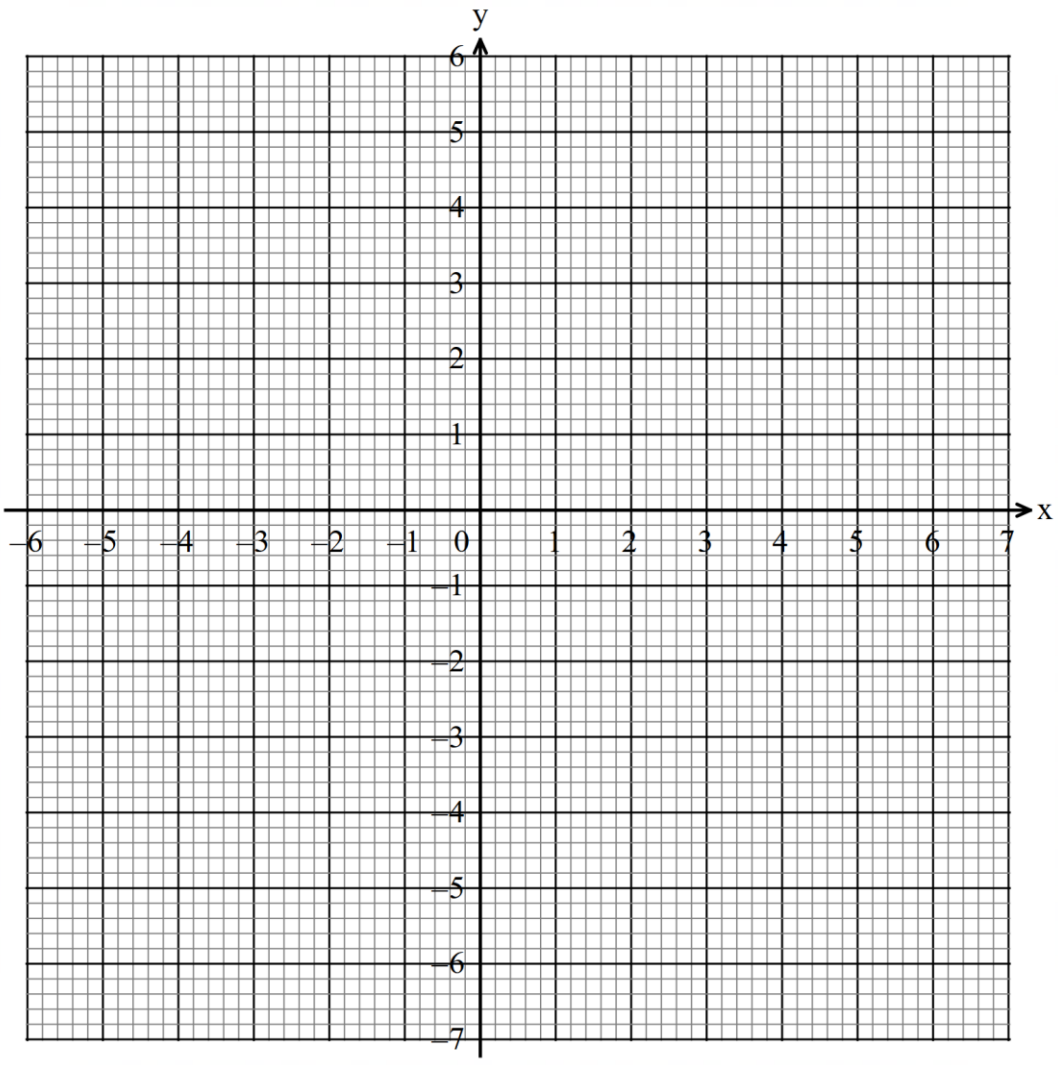
15. The figure below shows a sketch of a prism whose cross-section is in the shape of trapezium. Complete the sketch showing the hidden edges using broken lines. (3 marks)



16. On the following cartesian plane provided below, solve the simultaneous equations.(3 marks)

$x + y = -2$

$2x - y = 5$



SECTION II (50 marks)

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

17. A straight line L_1 whose equation is $3y - 2x = -2$ meets the x – axis at R.

a) Determine the coordinates of R. (2 marks)

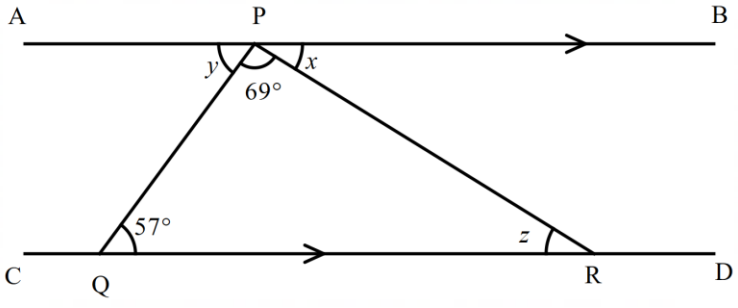
b) A second line L_2 is perpendicular to L_1 at R. Find the equation of L_2 in the form $y = mx + c$, where m and c are constants. (3 marks)

c) A third line L_3 passes through (-4,1) and is parallel to L_1, find

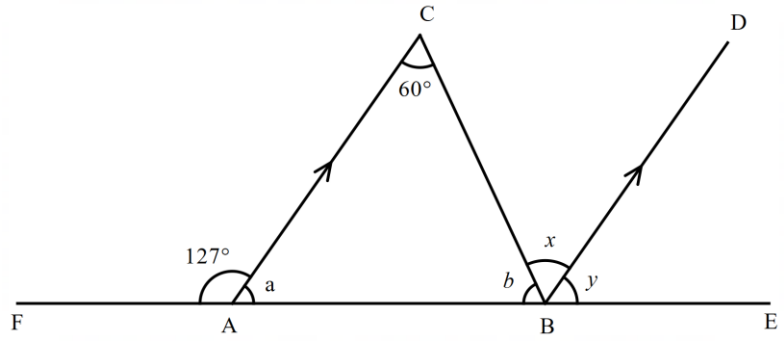
i. The equation of L_3 in the form $y = mx + c$, where m and c are constants.(2 marks)

ii. The coordinates of point S at which L_3 intersect L_2 (3 marks)

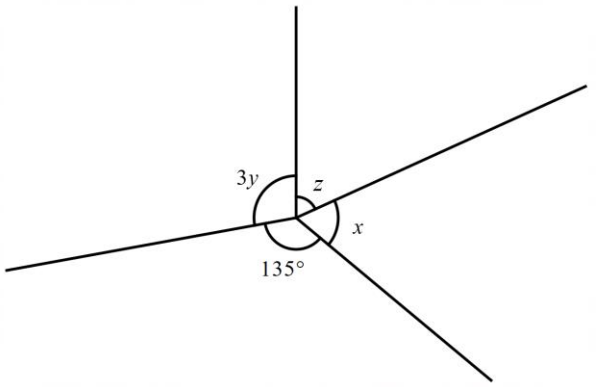
18. (a) The figure below shows two parallel line AB and CD. Angle QPR = 69° and angle RQP is 57°. Determine the size of angle x, y and z. (3 marks)



(b) In the figure below line AC and BD are parallel lines. Line FE is a straight line. Angle FAC is 127° and angle ACB is 60°. Find the size of angle a, b, x and y. (4 marks)



(c) In the figure below $x = 3y$ and $z = y$. Calculate the value of unknown angles. (3 marks)



19. Halima wishes to carpet her sitting room at a cost of sh. 19 600. The carpet costs sh. 700 per square.

a) Find the area of the sitting room. (2 marks)

b) To reduce the cost of carpeting, Halima decides to buy a smaller carpet by leaving a margin of $\frac{1}{2}$ m all-round the carpet. After buying the smaller carpet, she saves sh. 7000.

(i) The area of the carpet bought. (3 marks)

(ii) The dimension of the sitting room. (5marks)

20. Four points P, Q, R and S are on a flat ground. Point Q is 100 m on a bearing of N70°E from P while S is 130 m on a bearing of S50°E from P. Point R is on a bearing 150° from Q and 040° from S.

(a) Using a scale of 1 cm to represent 20, make a scale drawing to show the positions of the points P, Q, R and S. (4 marks)

(b) From the scale drawing, determine;

(i) The distance between P and R. (1 mark)

(ii) The true bearing of P from R. (2 marks)

(iii) The perimeter of the region bounded by the straight lines joining P, Q, R and S (3 marks)

21. A sales woman is paid a basic salary of Ksh. 18 500 per month for selling laptops marked at Ksh. 42 000 each. In addition, she is paid commission as follows;

	Commission
For sales up to Ksh. 500 000	0%
For sales above Ksh. 500 000	
For the first Ksh. 250 000	3%
For the next Ksh. 250 000	5%
For any amount above Ksh. 1 000 000	8%

(a) During one month, she sold 24 laptops at 6% discount. Calculate;

(i) The amount of commission she earned in that month. (3 marks)

(ii) The amount of her total earnings in that month. (2 marks)

(b) The following month, the sales woman's monthly salary was increased by 10%. Her monthly total earnings that month were Ksh. 40 990. Calculate;

(i) The total amount of sales of laptops that month. (3 marks)

(ii) The percentage discount she allowed that month per laptop if 25 pieces were sold. (2 marks)

22. A minibus had 23 passengers at the beginning of a journey. Twelve passengers alighted at the second stop while 9 boarded. Six of those who boarded at the first stop alighted at the second stop and 12 got in. The minibus should not stop again up to the final destination. The charges from the starting point were sh. 50 up to the first stop, sh. 70 up to the second stop and sh. 85 up to the final destination.

(a) How many passengers alighted at the final destination. (3 marks)

(b) How many passengers were ferried by the bus through the journey. (3 marks)

(c) How much money was collected during the trip. (4 marks)

23. Using a ruler and pair of compasses only.

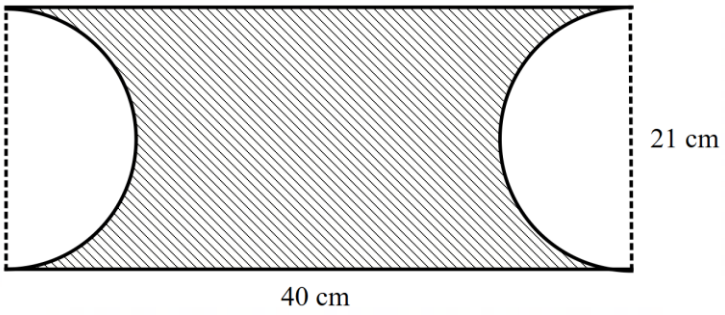
(a) Construct a triangle ABC in which angle BAC = 60°, AB = 6 cm and BC = 7 cm. (3 marks)

(b) Measure AC. (1 mark)

(c) Construct a circle that passes through the vertices of triangle ABC and measure its circle. (3 marks)

(d) Determine the area of the circle. (3 marks)

24. The diagram below shows a steel grinder used in construction work, the cross section consists of a rectangle measuring 40 cm by 21 cm from which similar semi circles have been removed. The grinder is 5 m long and is made of steel whose density is 10 g/cm^3



(a) Determine the perimeter of the shaded region. (3 marks)

(b) Find the area of the area of the shaded region. (3 marks)

(c) Find the mass of the steel grinder in kilogram. (4 marks)

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