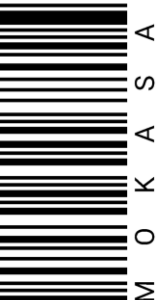




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Name:
Adm. Number:Candidate's Signature:
School:
Date: stream:

MOKASA JOINT EXAMINATION

Featuring Kenya Certificate Of Secondary Education (K.C.S.E.) 2026

121/1



MATHEMATICS

Paper 1

ALT A

FORM FOUR

MOKASA I

March. 2026–2 $\frac{1}{2}$ hours

Instructions to candidates

- Write your name and admission number in the spaces provided above.
- Sign and write the date of examination in the spaces provided.
- This paper consists of two sections: Section I and Section II.
- Answer all questions in section I and only five questions from section II.
- Show all the steps in your calculations, giving the answers at each stage in the spaces provided below each question.
- Marks may be given for correct working even if the answer is wrong.
- Non-programmable silent electronic calculators and KNEC mathematical tables may be used, except where stated otherwise.
- This paper consists of 16 printed pages.
- Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
- 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



SECTION I (50 marks)

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

1. Without using a calculator or mathematical tables, evaluate $\frac{\frac{1}{2} \text{ of } \frac{2}{5} \div \frac{3}{15} + \frac{7}{10} \times \frac{6}{7} \left(1\frac{1}{2} \times \frac{1}{3} \right)}{\frac{5}{3} \times \frac{6}{10} \div \frac{5}{4} - \frac{1}{4}}$. (3 marks)

2. Simplify the expression $\frac{4x^2 - 16y^2}{6x^2 - 8xy - 8y^2}$ (3 marks)



3. Foreign exchange on 13/02/2026 was given as follows:

Currency	Buying (Ksh.)	Selling (Ksh.)
1 Euro	147.95	158.22
1 Sterling pound	126.50	131.50

A tourist came to Kenya from London with 6000 Euros which he converted to Kenya shillings at a bank. While in Kenya he spent a total of Ksh. 300,000 then converted the balance into sterling pounds at the same bank. Calculate the amount in sterling pounds he received. (3 marks)

4. Solve the simultaneous inequalities $\frac{5-x}{2} \geq \frac{x+1}{3} \geq \frac{2x+4}{-3}$ and list all the integral values of x . (3 marks)

5. Two customer service agents in a bank work such that the first one takes an average of 5 minutes while the second takes an average of 8 minutes to serve a client. The counters are opened at 8:00 a.m when the agents begin serving clients. At what time will they complete serving 182 clients? (3 marks)



6. Solve for the values of x and y in the $36^x \times 48^y = 192$. (3 marks)

7. A two digit number is 3 more than 4 times the sum of its digits. If the digits are reversed, the new number formed exceeds the original number by 18. Find the number. (3 marks)

8. The distance between town A and B is 400 km. A bus travelling at an average speed of 70 km/hr left town A for town B at 7:30 am. 42 minutes later, a car left town B for town A and met with the bus 180 km from town B. Determine the average speed of the car. (3 marks)



9. (a) Find the inverse of the matrix $\begin{pmatrix} 4 & 3 \\ 3 & 5 \end{pmatrix}$ (1 mark)

- (b) Hence solve the simultaneous equation $\begin{matrix} 4x + 3y = 6 \\ 3x + 5y = 5 \end{matrix}$ using matrix method. (3 marks)

10. The interior angle of a polygon with $3y$ sides exceeds the interior angle of another regular polygon with y sides by 40° . Determine the value of y . (3 marks)

11. A particle is projected from the origin. Its speed was recorded as shown in the table below.

Time (sec)	0	5	10	15	20	25	30	35
Speed (m/s)	0	2.1	5.3	5.1	6.8	6.7	4.7	2.6

Use trapezoidal rule with 8 ordinates to estimate the distance covered by the particle within the 35 seconds. (3 marks)



12. The angle of elevation of the top of Mount Kenya from a point V on the horizontal ground is 22° . From a point P, 2000 m closer to the mountain and on the same horizontal ground, the angle of elevation is 40° . Calculate the length of the shortest distance from point P to the top of the mountain. (3 marks)

13. Find the equation of the normal to the curve $y = x^2 - 3x - 4$ at the point $x = 3$. (3 marks)

14. The length of the major and minor arcs of a circle are 154 cm and 110 cm respectively. Taking $\pi = \frac{22}{7}$, find the angle subtended at the centre by the minor arc. (4 marks)

15. Five weeks after a reforestation project began, the heights of young saplings were recorded to the nearest centimeter. The frequency distribution of their heights is shown in the table below

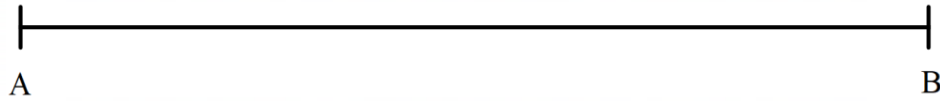


Height x in (cm)	$0 \leq x < 10$	$10 \leq x < 20$	$20 \leq x < 30$	$30 \leq x < 40$	$40 \leq x < 50$
Frequency	5	12	25	10	8
Cumulative frequency					

(a) Complete the table by entering the cumulative frequency values. (1 mark)

(b) Estimate the median height of the saplings. (2 marks)

16. A point R divides line AB internally in the ratio 2: 3, using a ruler and a pair of compasses Only locate position of R and measure RB. (3 marks)



SECTION II (50 marks)

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

17. A wildlife reserve is enclosed by four straight boundaries AB, BC, CD and DA. B is 40 km from A on a bearing of 030° . C is 50 km on a bearing of 120° from A. D is 35km on a bearing of 250° from C.
- (a) Using a scale of 1: 500 000, represent the above information on a scale drawing (4 marks)

(b) Using your scale drawing, determine:

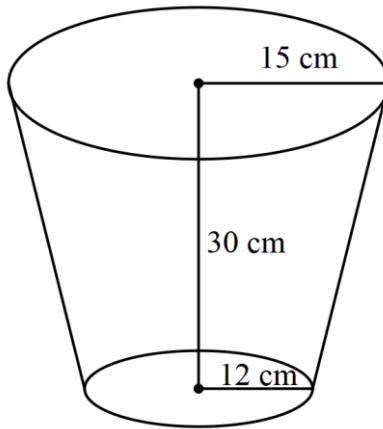
(i) the distance, in kilometres, of D from A. (2 marks)

(ii) the bearing of D from A. (1 mark)

(iii) the perimeter of the reserve. (3 marks)



18. The diagram below shows a frustum which represents a bucket with an open end diameter of 30 cm and bottom diameter 24 cm.



The bucket is 30 cm deep. ($\pi = 3.142$)

- (a) Calculate the capacity of the bucket in litres.

(5 marks)



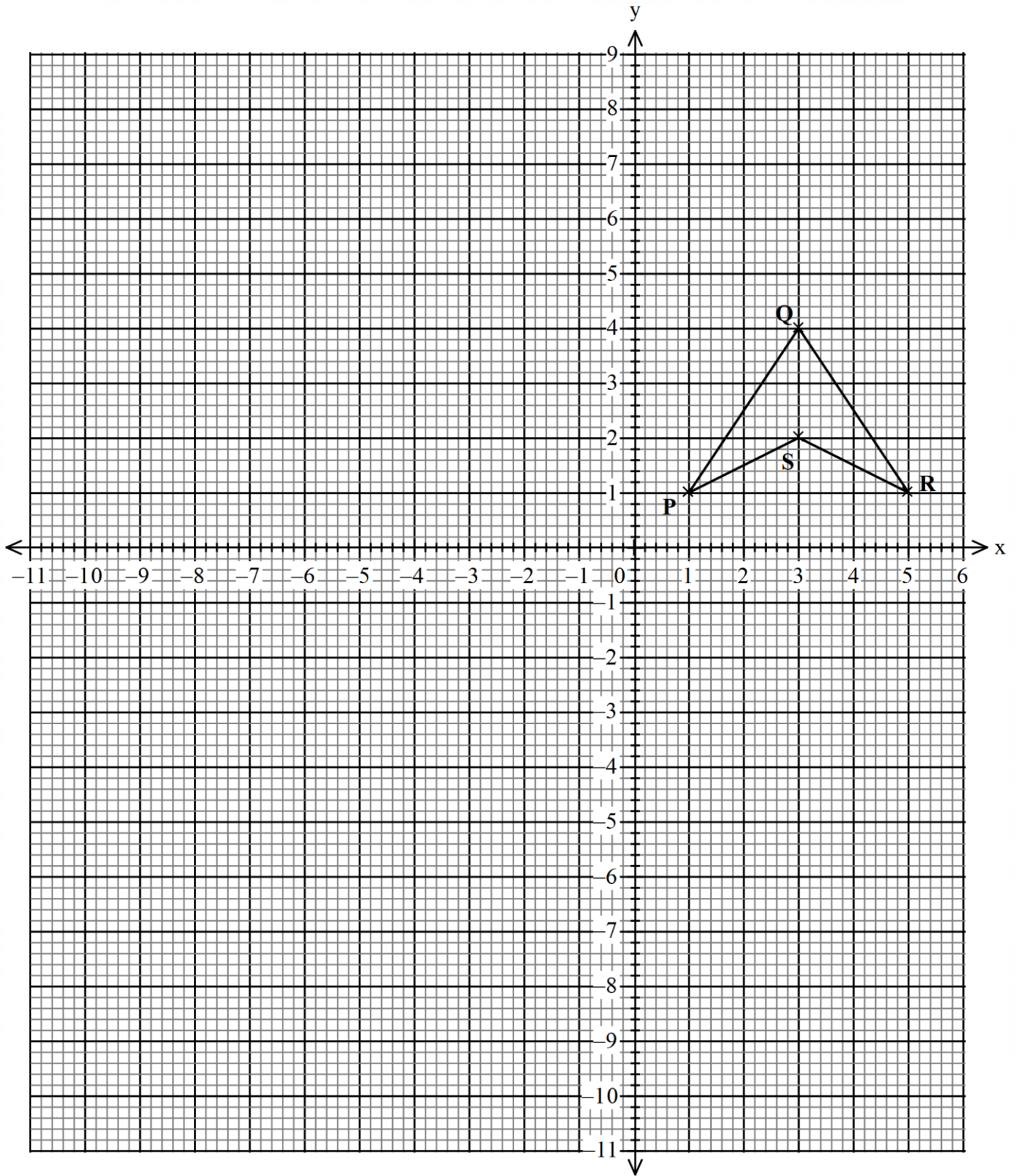
- (b) The bucket is to be used to fill an empty cylindrical tank of diameter 1.4 m and height 1.2 m.

- (i) Calculate the capacity of the tank in litres.

(3 marks)

- (ii) Determine the number of buckets that must be drawn in order to fill the tank. (2 marks)

19. On the following grid, quadrilateral PQRS is drawn.



(a) On the same grid, draw:

- (i) Quadrilateral $P^1Q^1R^1S^1$, the image of quadrilateral PQRS under a reflection in the line $y = 0$.
(2 marks)

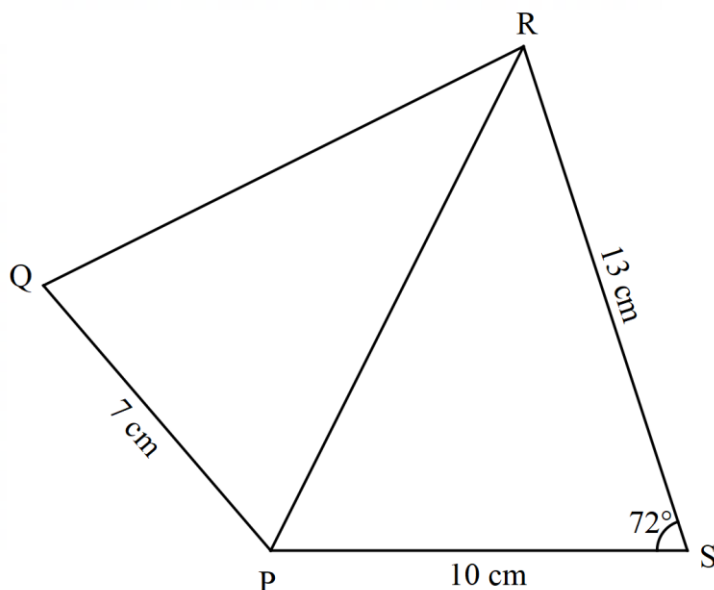
- (ii) Quadrilateral $P^{11}Q^{11}R^{11}S^{11}$, the image of quadrilateral $P^1Q^1R^1S^1$ under an enlargement scale factor -2 , centre origin.
(3 marks)

- (iii) Quadrilateral $P^{111}Q^{111}R^{111}S^{111}$, the image of quadrilateral $P^{11}Q^{11}R^{11}S^{11}$ under a rotation of $+90^\circ$ about origin.
(2 marks)



- (b) Describe a single transformation that maps quadrilateral $P^1Q^1R^1S^1$ onto quadrilateral $P^{111}Q^{111}R^{111}S^{111}$.
(3 marks)

20. The figure below shows quadrilateral PQRS (not drawn to scale) with $PQ = 7$ cm, $PS = 10$ cm, $SR = 13$ cm and $\angle PSR = 72^\circ$



- (a) Calculate to 4 significant figures, the length PR. (3 marks)

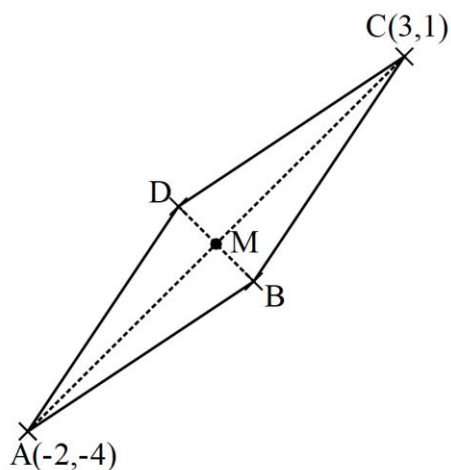


- (b) Calculate to 2 decimal places, the size of angle PRS. (2 marks)

- (c) Given that $\angle PQR = 115^\circ$, calculate to 1 decimal place
(i) the length QR. (3 marks)

- (ii) the diameter of the circle passing through P, Q and R. (2 marks)

21. Points $A(-2, -4)$, B , $C(3, 1)$ and D are vertices of a parallelogram shown below. AB has the gradient $\frac{2}{3}$ and BC has the gradient $\frac{3}{2}$.



- (a) Determine
(i) the coordinates of point B (3 marks)

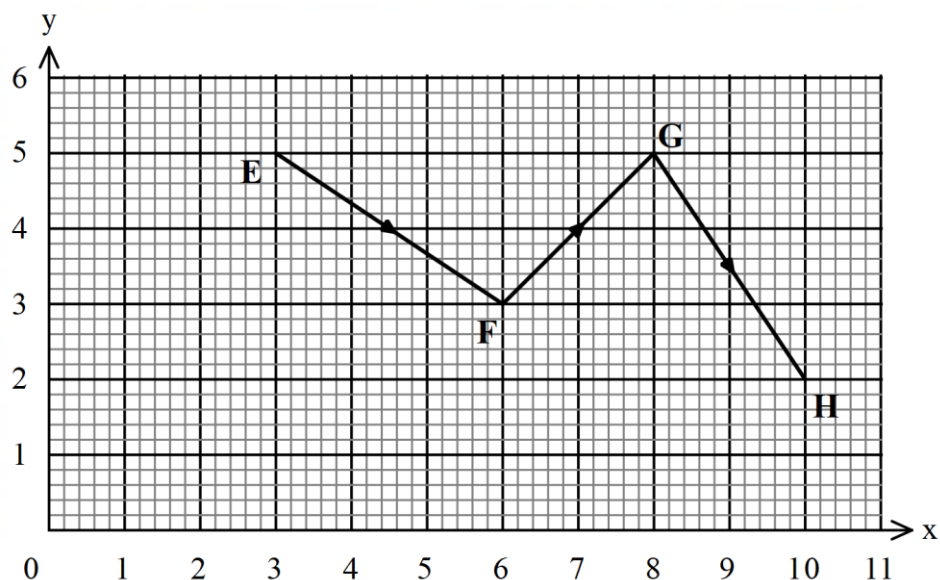
- (ii) the coordinates of point D (3 marks)



- (b) Diagonals AC and BD intersect at M . Determine the coordinates of point M . (2 marks)

- (c) Given that point F is the mid point of AD , calculate the length of FM correct to one decimal place. (2 marks)

22. The diagram shows the graph of vectors **EF**, **FG** and **GH**.



(a) Find:

(i) the column vectors **EH**

(2 marks)

(ii) $|\mathbf{EH}|$, correct to 2 decimal place

(2 marks)

(b) Two points P and Q have coordinates $(-2,3)$ and $(1,3)$ respectively. A translation maps point P to $P^1(10,10)$.

(i) Find the translation vector.

(2 marks)

(ii) Find the coordinates of Q^1 , the image of Q under the translation.

(1 mark)

(iii) Find the values of m and n if $m\mathbf{P} - n\mathbf{Q} = \begin{pmatrix} -12 \\ 9 \end{pmatrix}$.

(3 marks)

23. A frequency distribution of marks obtained by 150 students in a test is to be represented in a histogram. The table below shows the grouped marks. Frequencies for all the groups and also the area and height of the rectangle for the group 40 – 70 are given.

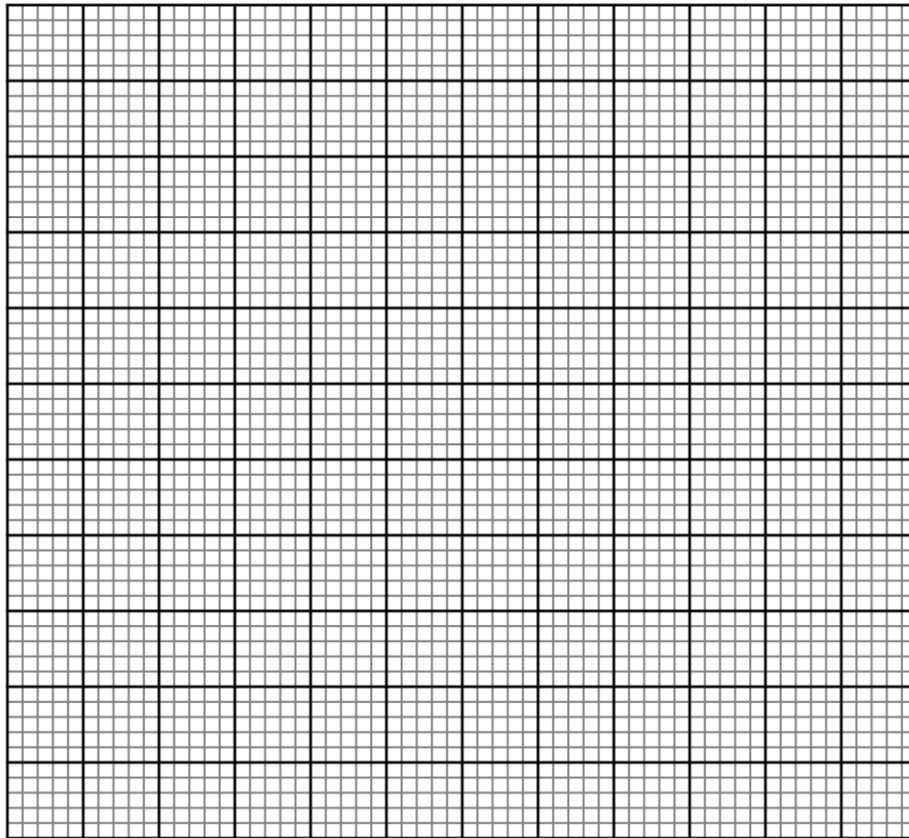
Marks	0 – 20	20 – 40	40 – 70	70 – 80	80 – 100
Frequency	18	36	45	21	30
Area of rectangle			225		
Height of rectangle			7.5		

- (a) (i) Complete the table.

(4 marks)

- (ii) On the grid provided below, draw the histogram

(2 marks)



- (b) (i) State the group in which the median mark lies

(1 mark)

- (ii) A vertical line drawn through the median mark divides the total area of the histogram into two equal parts. Using this information or otherwise, estimate the median mark (3 marks)

24. A particle moves in a straight line such that its displacement, S metres from a fixed point is given by

$$S = 3t^3 - 15t^2 + 16t - 2 \text{ where } t \text{ is time in seconds.}$$

(a) Calculate the displacement when $t = 2$ seconds. (2 marks)

(b) Determine the velocity when $t = 2$ seconds. (3 marks)



(c) Find the time (s) when the particle is momentarily at rest. (3 marks)

(d) Find the acceleration when $t = 3$ seconds. (2 marks)