

KABRAS WEST JET
121/1 Mathematics Alt A Paper 1
Kenya Certificate of Secondary Education
June 2026 - 2 ½ Hours

Name:.....Adm No

.....SIGNATURE.....STREAM.....

SchoolDATE.....

INSTRUCTIONS TO CANDIDATES

- (a) Write your name and Admission number in the spaces provided at the top of this page.
- (b) This paper consists of two sections: Section I and Section II.
- (c) Answer ALL questions in section 1 and ONLY FIVE questions from section II
- (d) All answers and workings must be written on the question paper in the spaces provided below each question.
- (e) Show all the steps in your calculation, giving your answer at each stage in the spaces below each question.
- (f) Non – Programmable silent electronic calculators and KNEC mathematical tables may be used, except where stated otherwise.

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

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This paper consists of 14 pages. Ensure all the pages are printed

SECTION I (50MKS)

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

1. Without using tables or a calculator, evaluate (3mks)

$$\frac{0.08 \times 0.54 \times 20.25}{0.81 \times 0.012}$$

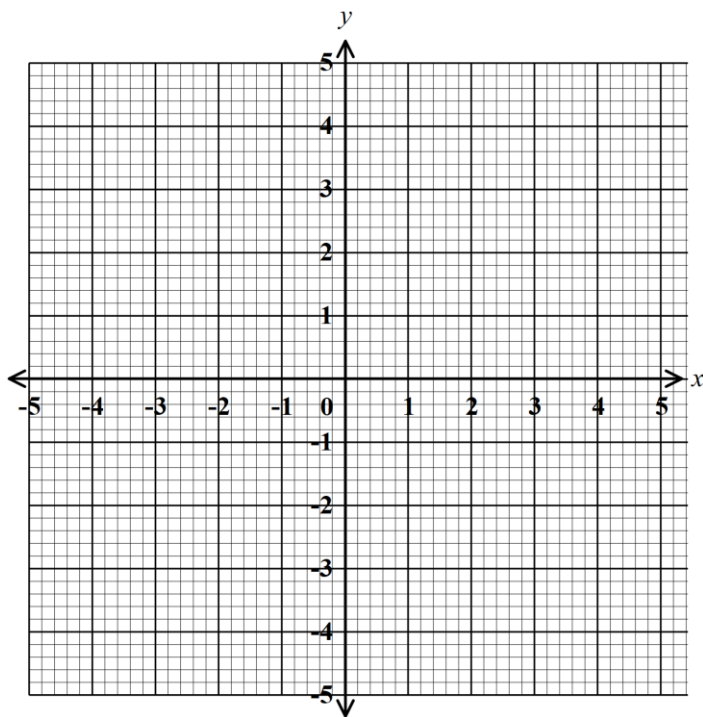
2. Three bank tellers serve clients in 2 minutes, 3 minutes and 4 minutes respectively. If they start serving at 8.00am, calculate the earliest time when they will have 182 clients served. (4mks)

3. Thirty two men working at the rate of 9 hours a day can complete a piece of work in 7 days. How many more men working at the rate of 8 hours a day would complete the same work in 6 days. (3marks)

4. Using the grid provided below, solve the simultaneous equation (3 marks)

$$3x - 4y = 10$$

$$5x + 7y = 3$$



5. A regular polygon is such that its exterior angle is one eighth the size of interior angle. Find the number of triangles the polygon can be subdivided into. (3mks)

6. Find the reciprocal of 0.324 correct to 4 significant figures, hence evaluate. (3 marks)

$$\frac{\sqrt[3]{0.512}}{0.324}$$

7. A salesman earns a basic salary of Ksh.12,400 per month, in addition, he gets a 2% commission on the first Ksh.80,000 worth of goods and a further 3% commission on goods worth over Ksh.80,000. In a certain month he earned a total of Ksh.20,000. Calculate the value of goods sold that month. (3mks)

8. Solve for x in the following equation.

(3marks)

$$4^x (8^{x-1}) = \frac{\sin 45^\circ}{\cos 45^\circ}$$

9. The points A(-2,4) and B(3,-6) lie on a straight line AB, find the equation of a perpendicular bisector of line AB. (3mks)

10. Given that $p = 5a - 2b$ where $a = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$ and $b = \begin{pmatrix} 4 \\ 1 \end{pmatrix}$, find :

a) Column vector p.

(2mks)

b) P' the image of p under a translation vector $\begin{pmatrix} -6 \\ 4 \end{pmatrix}$

(1mk)

11. If $\begin{pmatrix} K + 7 & 4 \\ -3 & K \end{pmatrix}$ is a singular matrix, find the values of K hence write down the possible matrices. (3mks)

12. A measuring cylinder of base radius 5cm contains water whose level reads 6cm high. A spherical object is immersed in the water and the new level reads 10cm. Calculate the radius of the spherical object (3 Marks)

13.Simplify:

(3 Marks)

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

14. Which of the following numbers are divisible by both 3 and 4. (3mks)

120, 744, 306, 9564, 1504, 192, 86 and 36.

15. The data below represents the ages of 15 grade 10 learners in Ikoli sec

14, 13, 15, 13, 14, 15, 15, 13, 16, 16, 17, 15, 16, 14, 18,

a) state the modal age (1mark)

b) Find the difference between the mean and the median of the data (3marks)

16. Solve for K in the equation (3 marks)

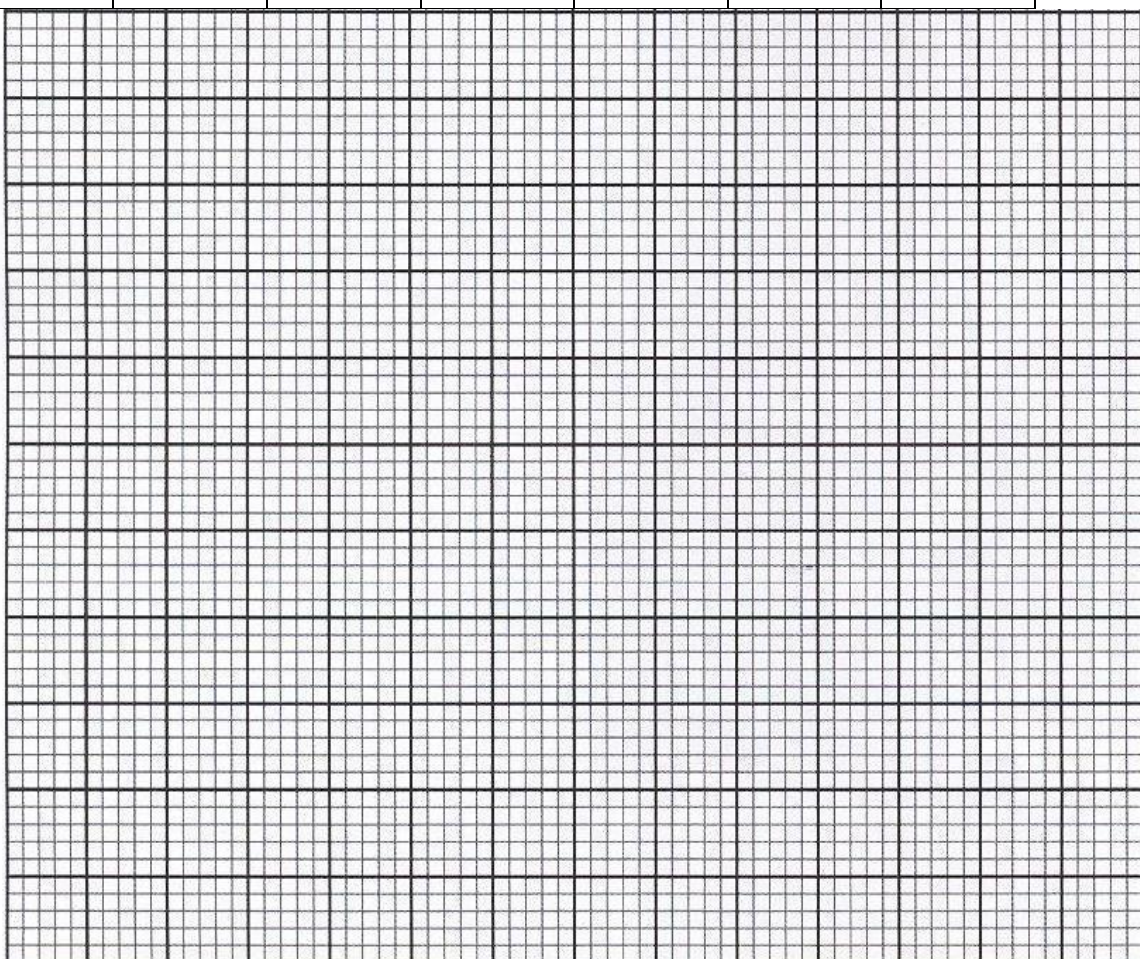
$$\left(\frac{20}{12} \right)^{7k-5} = \left(\frac{36}{100} \right)^{k-1}$$

SECTION TWO (ANSWER ONLY FIVE QUESTIONS)

17.a) Complete the table below for the function $y = 2x^2 - 3x - 4$ for $-4 \leq x \leq 2$

(2 marks)

x	-2	-1	0	1	2	3
$2x^2$		2	0	2	8	
$-3x - 4$	2		-4			-13
y			-4			5

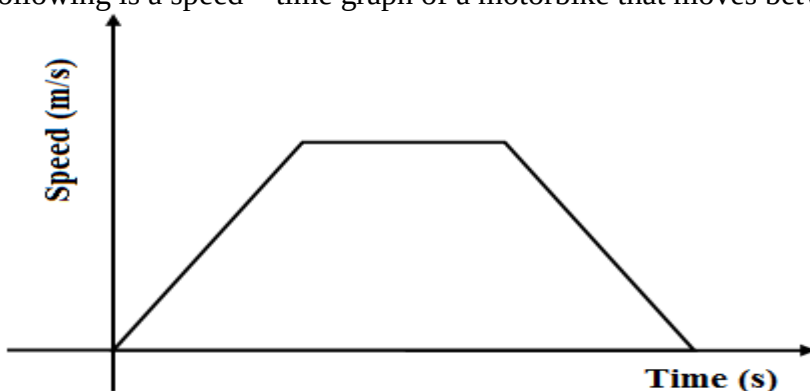


(b) On the grid below, draw the graph of $y = 2x^2 - 3x - 4 = 0$ for $-2 \leq x \leq 3$ (3 marks)

(c) Use your graph to estimate the roots of $y = 2x^2 - 3x - 4 = 0$ (2 marks)

(d) Use your graph to solve $4x^2 - 7x = 12$ (3 marks)

18. The following is a speed – time graph of a motorbike that moves between two points



The motorbike starts from rest and accelerates uniformly for 75 seconds. It thereafter travels at a constant speed for 32 seconds before decelerating uniformly for 20 seconds. If it covered a distance of 2385m between the two points:

(a) Find the maximum speed in kilometers per hour at which the motorbike travelled between the points.

(2 marks)

(b) Find the acceleration of the motorbike before it started moving at a constant speed. (2 mark)

(c) Find the distance that the motorbike covered 15 seconds before it stopped. (3 marks)

(d) Find the time the motorbike took to cover the first three fifths of the journey. (3 marks)

19. A ship leaves port M and sails on a bearing of 050° heading towards island L. Two Navy destroyers sail from a naval base N to intercept the ship. Destroyer A sails such that it covers the shortest distance possible. Destroyer B sails on a bearing of 20° to L. The bearing of N from M is 100° and distance

NM = 300KM. Using a scale of 1cm to represent 50km, determine:-

(i) the positions of M, N and L.
(3 Marks)

(ii) the distance travelled by destroyer A
(3 Marks)

(iii) the distance travelled by destroyer B.
(2 Marks)

(iv) the bearing of N from L.
(2 Marks)

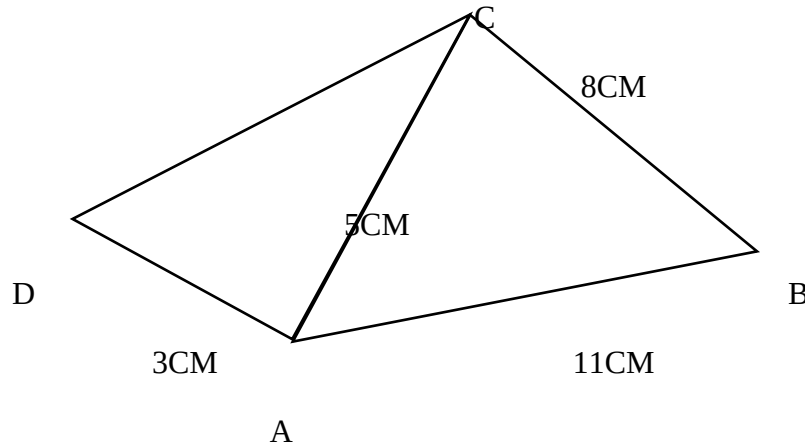
20. A flag post 20 M long is fixed on top of a tower. From a point on horizontal ground, the angles of elevation of the top and the bottom of the flag are 40° and 33° respectively. Calculate

a) the height of the tower

(6 marks)

b) the shortest distance from the point on the ground to the top of the flag post (4 marks)

17. 21. In the figure below, $AB = 11\text{cm}$, $BC = 8\text{cm}$, $AD = 3\text{cm}$, $AC = 5\text{cm}$ and $\angle DAC$ is a right angle.



Calculate, correct to one decimal place:

(a) The length DC (2 marks)

(b) The size of $\angle ADC$ (2 marks)

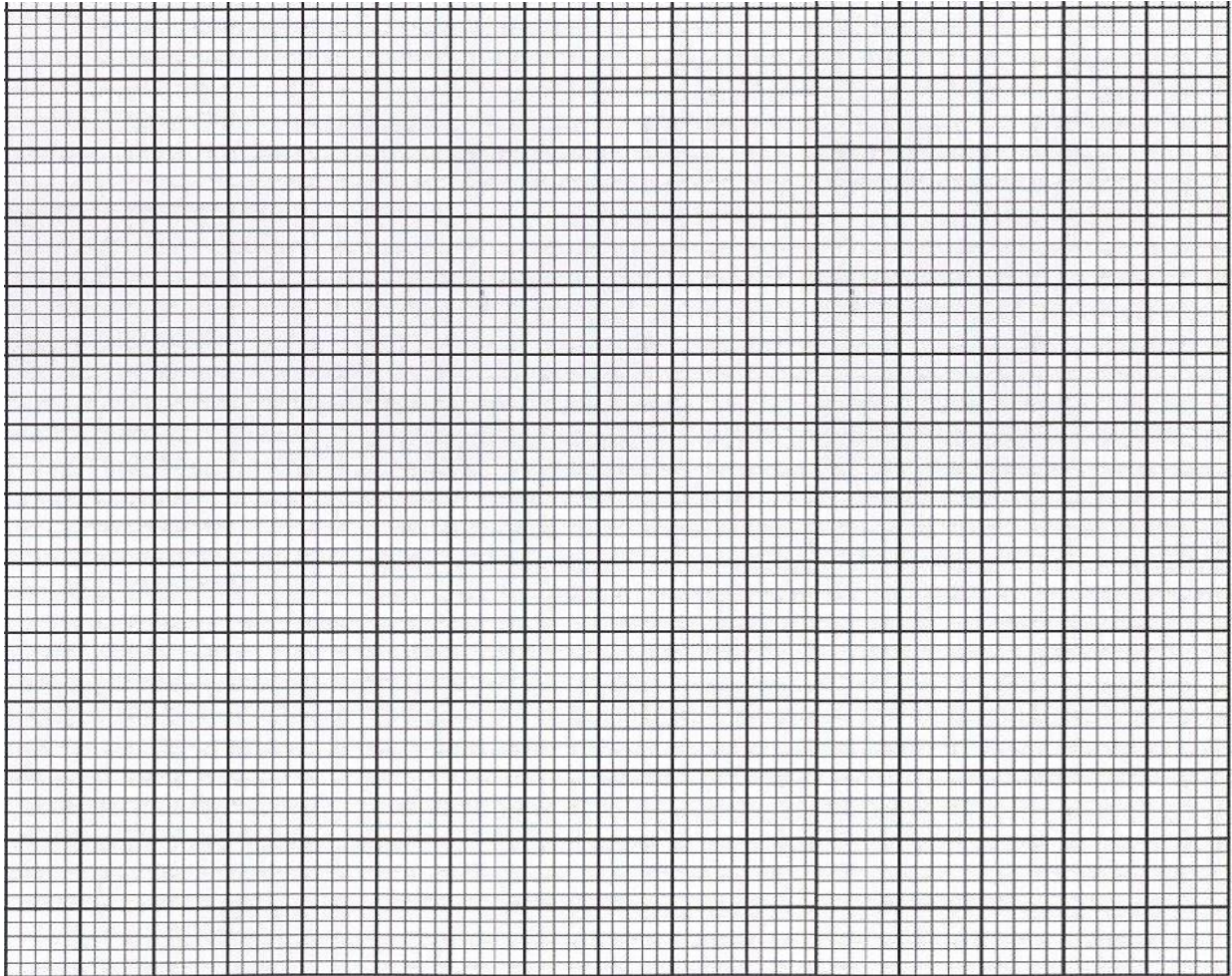
(c) The size of $\angle ACB$ (3 marks)

(d) The area of the quadrilateral ABCD (3 marks)

18. 22. Triangle ABC has vertices $A(-6,5)$, $B(0,1)$ and $C(-2,-3)$. Triangle MNP is the image of triangle ABC under an enlargement. The vertices of triangle MNP are $M(-4,6)$, $N(-1,4)$ and $P(-2,2)$. A reflection then maps triangle MNP onto triangle XYZ whose vertices are $X(7,-5)$, $Y(5,-2)$ and $Z(3,-3)$.

(a) Plot the three triangles on the grid below.

(3 marks)



(b) Determine the centre and the scale factor of enlargement that maps ABC onto MNP.

(3 marks)

(c) Find the equation of the mirror line of the reflection.

(2 marks)

Given that triangle XYZ has an area of $Q\text{cm}^2$, state the area of triangle ABC in terms of Q .

(2 marks)

23 a. Complete the table below for; $y = x^2 - 3x + 5$ in the range $2 \leq x \leq 8$. (2mks)

X	2	3	4	5	6	7	8
Y	3		9			33	

b. Use the trapezium rule with six strips to estimate the area enclosed by the curve, x-axis and the lines $x=2$ and $x=8$ (3mks)

a) Find the exact area of the region given in (b) (3mks)

b) Calculate the percentage error in the area.

24. A particle moving along a straight line passes through a fixed point P. Its displacement S metres from P after a period of t seconds is given $S=t^3-5t^2+3$.

Find;

(a) The particle's displacement from P at $t=4$ (2 marks)

(b) The particle's velocity at $t = 4$. (3 marks)

(c) The possible Value(s) of t when the particle is momentarily at rest. (3 marks)

(d) The acceleration of the particle at $t = 3$. (2 marks)