

KALA TRIAL EXAMINATIONS – 2026

Kenya Certificate of Secondary Education



121/2

Paper 2

MATHEMATICS ALT A

July 2026 – 2 Hours 30 Mins

Name: Adm Number: Class:

Student's Signature: Date: School:

Instructions to candidates

- (i) Write your name, Adm number and class in the spaces provided above.
- (ii) Sign and write the date of examination in the spaces provided above.
- (iii) This paper consists of **two** sections: **Section I** and **Section II**.
- (iv) Answer **all** the questions in **Section I** and only **five** questions from **Section II**.
- (v) Show all the steps in your calculations, giving your answers at each stage in the spaces provided below each question.
- (vi) Marks may be given for correct working even if the answer is wrong.
- (vii) **Non – programmable** silent electronic calculators and KNEC Mathematical tables may be used, except where stated otherwise.
- (viii) 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.**

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

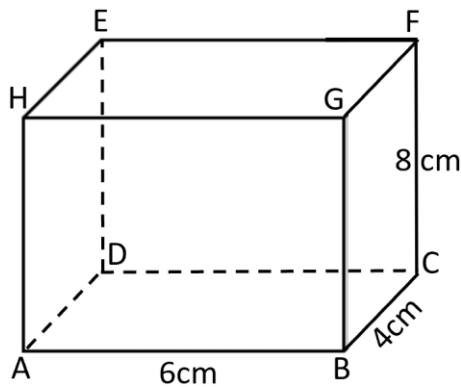
**Grand
Total**

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SECTION I (50 marks)

- Two grades of Kenyan coffee costing sh. 200 and sh. 250 per kg respectively are mixed in the ratio 3:5 by weight. The mixture is then sold at Ksh. 240 per kg. Find the percentage profit on the cost. (3 marks)
- The difference between the 4th and 8th terms of an increasing AP is 24. The first term exceeds the common difference by 2. Find the sum of the first 20 terms of the series. (4 marks)
- Find the exact standard deviation of the numbers 3, 5, 7, 9, and 11. (3 marks)

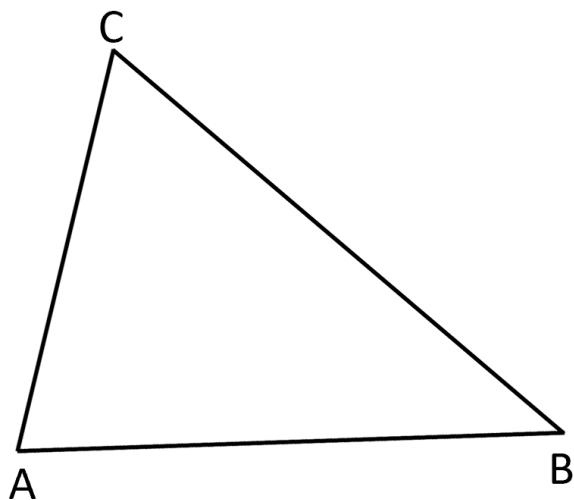
4. The figure below shows a cuboid, where $AB = 6\text{cm}$, $BC = 4\text{cm}$ and $CF = 8\text{cm}$. Calculate the angle between lines AG and DC in the cuboid below; (2 marks)



5. Make A the subject of the formula.
 $\text{Log}_{10}(A + B) - \text{Log}_{10}(3 + x) = Z$ (3 marks)

6. An object of area 4cm^2 is mapped onto an image of area 64cm^2 under the transformation by matrix $\begin{pmatrix} n & 7 \\ -1 & n \end{pmatrix}$. Find the possible values of n . (3 marks)

7. Given a scalene triangle ABC below, construct locus of a variable point P that moves such that $\angle APC + \angle ABC = 180^\circ$ (3 marks)



8. A point T divides line PQ externally in the ratio 3: 2. Given that $P = 2i - 3j + k$ and $Q = 3i - 4j - 3k$, find the coordinates of T. (3 marks)

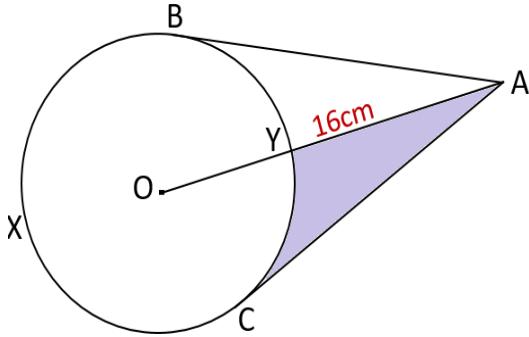
9. The cash price of a TV set is Ksh. 140,000. A customer acquired the TV on hire-purchase by paying a deposit of Ksh. 35,000 and settled the debt in equal monthly instalments for $2\frac{1}{2}$ years at 18% rate per annum. Calculate the value of each instalment to the nearest shilling. (3 marks)

10.(a) Expand $(1 + x)^9$ up to the 4th term. (2 marks)

b) Use your expansion to find the approximate value of $(0.99)^9$ correct to 4 s.f (2 marks)

11. The sides of the base of a cuboid were measured to 1dp as 6.4cm, 7.32cm and height of 8.2cm. Calculate the percentage error of calculating its volume, correct to 3 significant figures. (3marks)

12. In the figure below, BA and CA are tangents to the circle at B and C respectively. AY = 16cm and the radius of the circle is 10cm. Calculate the area of the shaded part correct to 2 decimal places. (Take $\pi = 3.142$) (4 marks)



13. The equation of a curve is given as $y = x^2 - 4x + 5$. Find the co-ordinates of the turning point of the curve. (3 marks)

14. Simplify the fraction. (3 marks)

$$\frac{(2\sqrt{3} - \sqrt{6})^2}{3 - 2\sqrt{2}}$$

15. Given two fixed points $P(-2, 2)$ and $R(-2, 6)$, and another variable point Q that moves such that angle $PQR = 90^\circ$, determine the equation of the locus of Q . (3 marks)

16. Find the values of θ between 0° and 360° that satisfy the equation. (3 marks)
- $$2 \tan^2 \theta = \frac{1}{\cos^2 \theta}$$

SECTION II. 50 Marks

17.(a) A quantity Z varies directly as the square of x and inversely as the square root of y .

i. Write the equation of Z in terms of x and y . (1 mark)

ii. If x increases by 20% and y decreases by 19%, find the percentage change in Z . (3 marks)

iii. If $Z = 3$ when $x = 6$ and $y = 18$, find the constant of proportionality. (2 marks)

b) In Wavumbuzi Robotics College, the fees charged in a week is partly proportional to the number of lessons (L) given, and partly inversely proportional to the number of students (N) in the class. The fee for 3 lessons with a class of 45 students is Ksh. 3100, and that of 8 lessons with a class of 65 students is Ksh. 5700. Find the fee for one lesson with a class of one student. (4 marks)

18. An employee earns a basic salary of Ksh **P** and he is entitled to a house allowance of Ksh. 10,480 per month. The employee is entitled to a personal relief of Ksh. 1162. He found that his employer deducts Ksh. 6075.75 as pay as you earn (PAYE) each month. The table below shows income tax rate applied.

Monthly Tax Pay (Kshs)	Rate of tax in each Shilling
1 – 10165	10%
10166 – 19740	15%
19741 – 29316	20%
29317 – 38892	25%
Over 38892	30%

- a) Calculate his monthly gross income.

(8 marks)

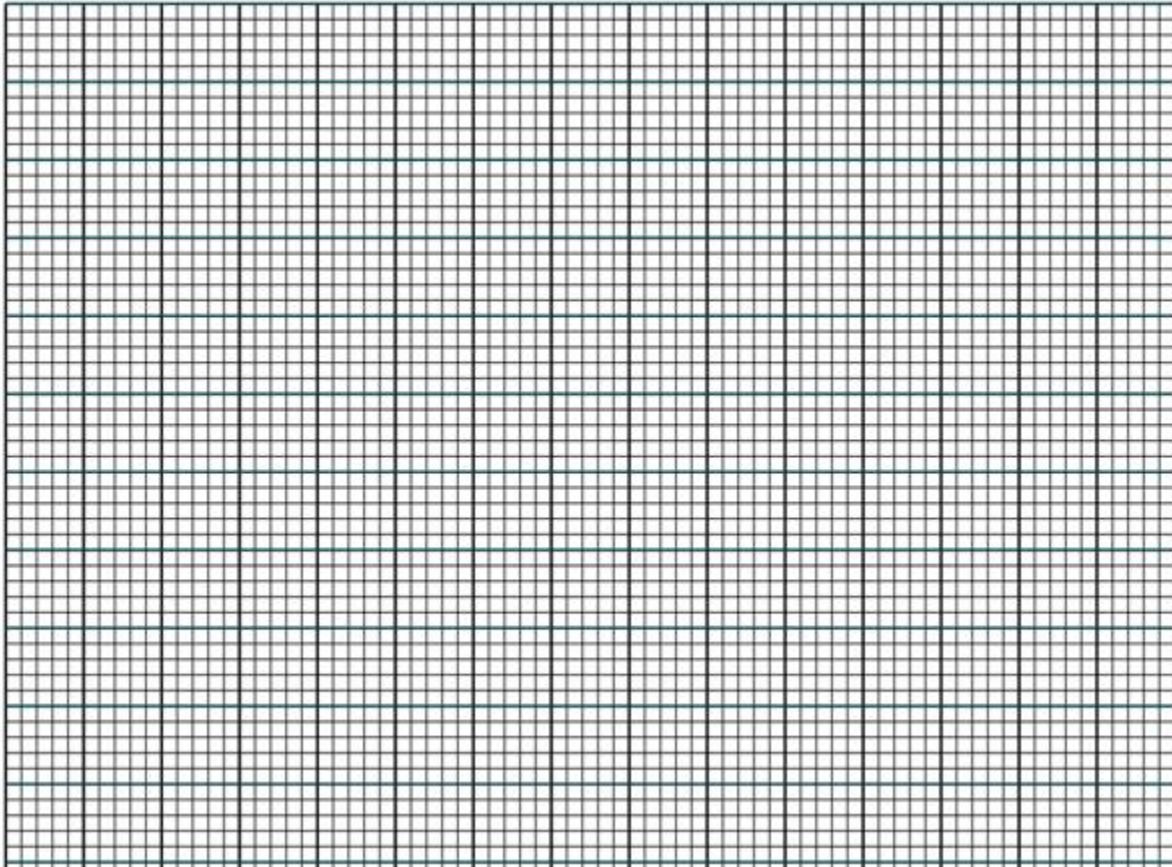
- b) Calculate his basic monthly salary

(2 marks)

19. The following is a frequency distribution of marks obtained by candidates in an examination.

Marks	1–10	11–20	21–30	31–40	41–50	51–60	61–70	71–80	81–90
Candidates	4	8	10	13	19	22	18	12	6

- a) Draw an Ogive (cumulative frequency curve) (3 marks)



- b) Use the ogive to determine;
- The semi interquartile range . (2 marks)
 - The percentage of candidates who failed the examination if the pass mark was 38 (2 marks)
 - The percentage of candidates who scored between 38 and 74 marks inclusive. (3 marks)

20. Two towns A and B are on the same circle of latitude South of the equator. The longitude of A being 75°W and that of B 120°W , the distance between the two towns is 3810km measured along the circle of latitude.

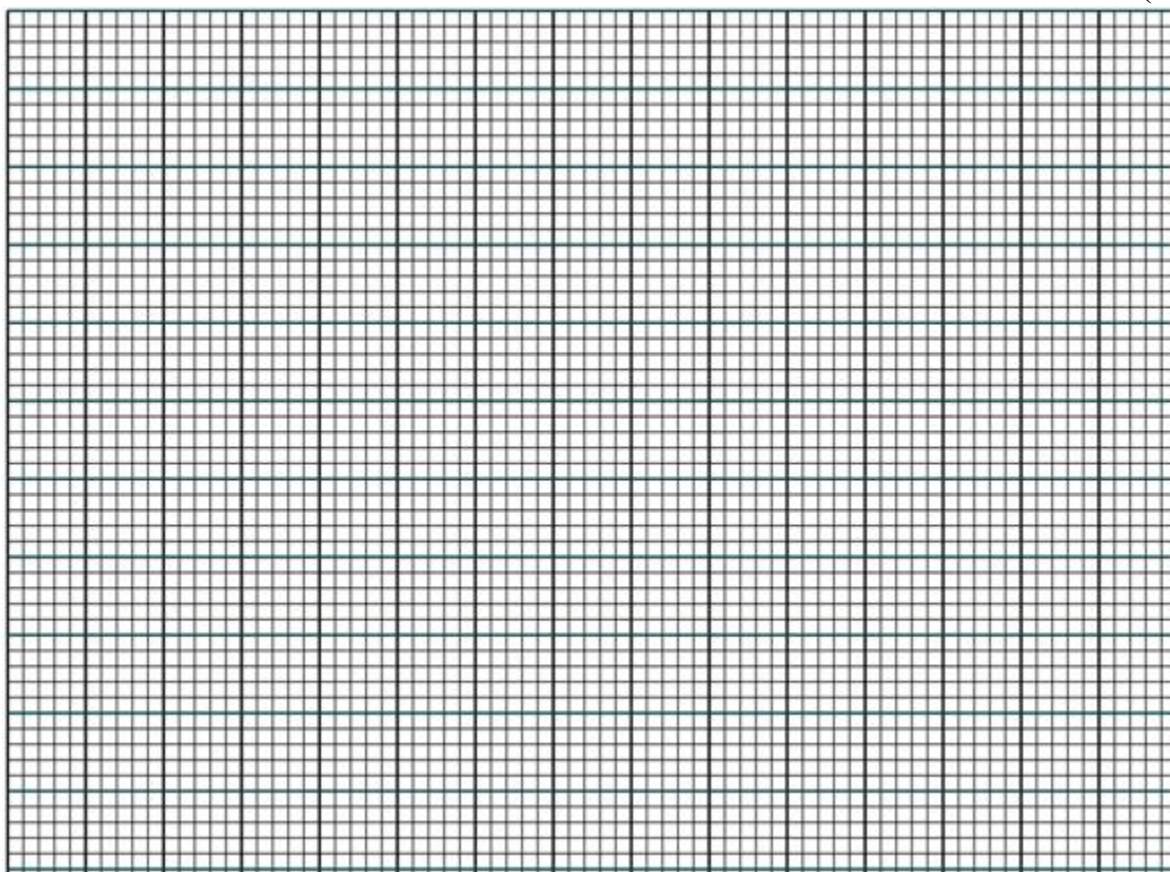
a) Find this latitude given that the length of the equator is 40040km. (5 marks)

b) An aircraft leaves town A on a Friday at 4.00p.m, and flies towards B. In which day and time does it arrive at town B if it is moving at a speed of 200km/hr? (5 marks)

21. Mwangangi operates transport service. He has two types of vehicles. The smaller one fuel consumption is 18km for 1 litre while the bigger one fuel consumption is 30km for 1 litre of petrol. The distance available for their operation is 1800 km. The company is allowed 80 litres per week to keep the transport service operational. The bigger vehicle consumes x litres per week while the smaller vehicle consumes y litres per week. Each vehicle operates for 12 hours each day.

a) Write down all the inequalities representing the above information. (3 marks)

b) On the grid provided draw all the inequalities in (a) above by shading the unwanted regions. (4 marks)



c) The profit on the smaller vehicle is sh.400 per hour while that on the bigger one is Sh. 600 per hour. Use the graph drawn in (b) above to determine the maximum profit that the company would make per week. (3 marks)

22. Two boys from a boys' high school and three girls from a girls' high school play darts. Those of the same sex have an equal probability of winning a game while each girl is thrice as likely to win as any boy. Let the probability that a boy wins be x . Find the probability in terms of x that;

a) A girl wins the game. (2 marks)

b) Find x . (2 marks)

c) If four games are played one after the other, determine the probability that
(i) Girls lose exactly three games. (2 marks)

(ii) Girls lose at most three games (2 marks)

(iii) Boys win the first and the last game. (2 marks)

23. The velocity of a particle $V\text{m/s}$ moving in a straight line after t seconds is given by;

$$V = 6t^2 - 3t - 3.$$

Find:

a) The acceleration of the particle at 3 seconds. (2 marks)

b) The distance covered by the particle between $t = 1$ and $t = 3$. (3 marks)

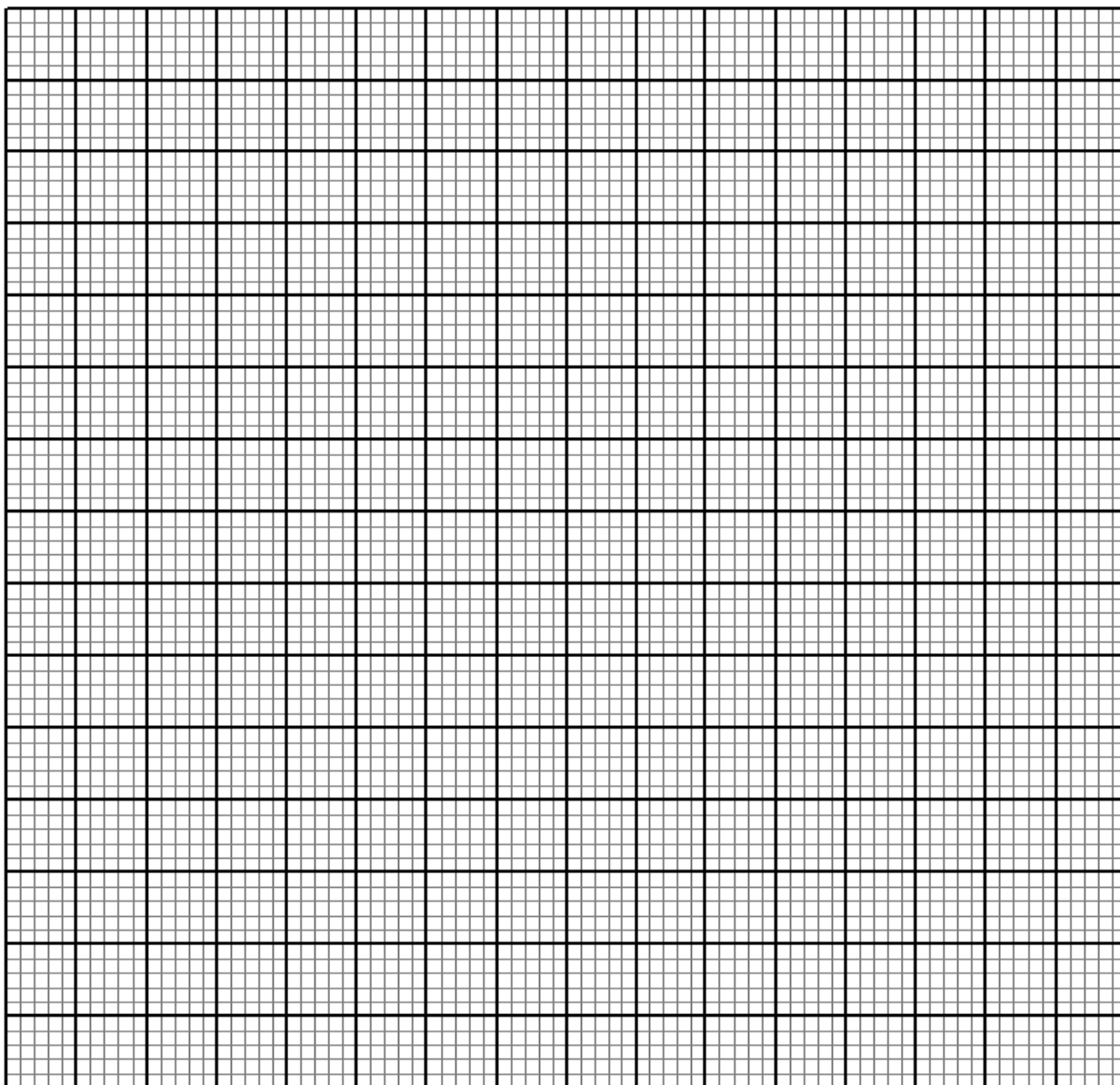
c) The time when the particle is momentarily at rest. (2 marks)

d) The maximum velocity attained by the particle (3 marks)

24. A transformation represented by the matrix $\begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$ maps A (1, 3), B (3, 3) and C (2, 1) onto A¹ B¹C¹ respectively.

- (i) On the grid provided, draw the triangle ABC and its image A¹B¹C¹ on the same axes.

(3 marks)



(ii) Hence or otherwise determine the area of triangle $A^1B^1C^1$. (2 marks)

(iii) Another transformation represented by the matrix $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ maps $A^1B^1C^1$ onto $A^{11}B^{11}C^{11}$.
Plot triangle $A^{11}B^{11}C^{11}$ on the same axes. (2 marks)

(iv) Describe the transformation represented by the matrix $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (1 mark)

(v) Determine the matrix of the single transformation which maps $A^{11}B^{11}C^{11}$ onto ABC . (2 marks)