NAME:	INDEX NO:
SCHOOL	SIGNATURE
	DATE

121/1 MATHEMATICS PAPER 1 JULY/AUGUST 2015 2¹/₂ Hours

NAROK SOUTH~SUB COUNTY SECONDARY SCHOOLS JOINT EXAMINATION Kenya Certificate of Secondary Education (K.C.S.E) MATHEMATICS Paper 1 $2\frac{1}{2}$ Hours

INSTRUCTIONS TO CANDIDATE

- Write your Name and Index Number in the spaces provided at the top of this page.
- This paper contains two sections: Section I and II.
- Answer all the questions in Section I and any five questions from Section II.
- each question.
- Marks may be given for correct working even if the answer is wrong.

FOR EXAMINER'S USE ONLY

SECTION 1

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	то

This paper consists of **15** printed pages. Candidates should ensure that all pages are printed as indicated and no questions are missing. Mathematics 121/1

Show all the steps in your calculations, giving your answers at each stage in the spaces below

Non-programmable silent electronic calculators and KNEC Mathematical tables may be used.

TAL	

GRAND TOTAL



SECTION A Answer all questions in this section.

1. Evaluate without using a calculator

 $\frac{23.4 - 2(5.2 + 5.3)}{3.2 \ @ 1.2}$

(2 marks)

2. The number 5.81 contains an integral part and a recurring decimal. Convert the number into an improper fraction and hence a mixed fraction. (3marks)

3. Line L1 passes through the points A (1, -2) and B (3, -4). Find the equation of line L2 passing through the mid-point of AB and perpendicular to L1, leaving your answer in the form ax+by+c=0. (4 marks)



© Narok South Sub County Joint Exam Committee

Mathematics 121/1

3

24. The figure below shows two circles of radii 10.5 and 8.4cm and with centres A and B respectively. The common chord PQ 9cm.



$$\frac{9{\mathbb{P}}^2 - 1}{3x^2 + 2x - 1}$$

5. State all the integral values of a which satisfy the inequality. $\frac{3a+2}{4} \quad \frac{2a+3}{5} \quad \frac{4a+15}{6}$ (4 marks)

(b) Calculate angle PBQ.

(c) Calculate the area of the shaded part.

	P		
10.5m		8.4cm	
		В	
	Va.		

(a) Calculate angle PAQ.

(6 marks)

(2 marks)

(2 marks)

6. Solve the equation: $\sin \frac{5}{2} \theta = -\frac{1}{2} \text{ for } 0^0 \theta 0 \theta 180^0.$

One interior angle of a polygon is equal to 80° and each of the other interior angles are 128°. Find the number of sides of the polygon.
(3 marks)

(3 marks)

(2 marks)

© Narok South Sub County Joint Exam Committee

9.

(2 marks)

13

Height (cm)	Frequency	
140 - 144	3	
145 - 149	16	
150 - 154	20	
155 - 159	10	
160 - 164	1	
(a) State the modal class		(1mark)
(b) Calculate the median heig	;ht.	(3 marks)

The position vectors of A and B are given as $\mathbf{a} = 2\mathbf{i} - 3\mathbf{j} + 4\mathbf{k}$ and $\mathbf{b} = -2\mathbf{i} - \mathbf{j} + 2\mathbf{k}$ respectively. Find to 2 decimal places, the length of vector AB. (3 marks)

All the three fail to hit the bull's eye. (ii)

Only two fails to hit the bull's eye. (iii)

Jane or Brony hit the bull's eye.

(i)

(a)

8.	The table below shows height of 50 students
•••	

23. Three darts players Jane, Kelly and Brony are playing in a completion the probability that Jane, Kelly and Brony hit the bull's eyes is 15,75 and 310 respectively. Draw a probability tree diagram to show all the possible outcomes for the players. (4 marks)

(b) Hence or otherwise Calculate the probability that :

(2 marks)

(2 marks)

(2 marks)

© Narok South Sub County Joint Exam Committee

Mathematics 121/1

5

Determine the total distance moved by the particle. Between time t = 1 to t = 4 seconds (i) (3 marks)

(c)

During the 3rd second.

(ii)

22. The velocity V metres per second of a particle projected into space is given by the formula

 $V = 5t^2 - 2t + 9$ where t is time in seconds elapsed since projection. Determine the acceleration of the article when t = 4 seconds. (3 marks) (a)

The value of t which minimizes the acceleration. (b)

(1 mark)

(3 marks)

If the area of the shaded region is 36 cm^2 , find the area of triangle CXY.

11. Three pens and four exercise books cost Sh. 87. Two pens and five exercise books cost Sh. 93. Find the cost of one pen and one exercise book. (4 marks)

12. A farmer has enough feed to last 45 cows for 30 days. If he buys 5 more cows, how long will the feed last? (2 marks)

13. Solve for x: $\left(Log_2 x\right)^2 - Log_2 x^3 = 4$



10. In the figure below, lines AB and XY are parallel.

(3 marks)

- The marked price of a car in a dealer's shop was Kshs 450,000. Saitoti bought the car at 7% 14. discount. The dealer still made a profit of 13%. Calculate the amount of money the dealer had paid for the car. (3marks)
- 21. In the figure below, K,L,M and N are points on the circumference of the circle centre O. The points K,



The figure below is a velocity – time graph for a car. (not drawn to scale). 15.

Velocity (m/s)

(a)

(b)

16.

80

Mathematics 121/1

6

O, M and P are on a straight line. PN is tangent to the circle at N. $\angle KOL = 130^{\circ}$ and $\angle MKN = 40^{\circ}$.



(2mks)

(2mks)

(2mks)

(2mks)

(2mks)

© Narok South Sub County Joint Exam Committee

- 20. Two airports A and B are such that B is 500km due West of A. Two planes, X in port A and Y in port B, lift off from the airports at exactly the same time. Plane A flies on a bearing of 030° at 360km/h and plane B flies on a bearing of 315° at 240km/h and then they land after flying for 90 minutes.
 - Using a scale of km to represent 100km, make a scale drawing to show the planes final (a) positions. (6 marks)
- 17. (a)

b) the two trains completely pass each other.

Using the scale drawing, find the distance between the two planes after the flight. (b) (2 marks)

Determine the bearing, after the flight of (c) The plane Y from plane X. (i)

Plane X from plane Y.

(1 mark)

(1mark)

Fill the table below for the function. 18. (a) (i) $y=2x^{2}+5x-12$ for -8 x 4

Х	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4
$2x^2$	128					18				2			32
5x	-40					-15				5			20
-12	-12					-12				-12			-12
у	76					-9				-5			40

Using the table, draw the graph of the function $y = 2x^2 + 5x - 12$. Use the scale 1 cm to (ii) 1 unit on the x-axis and 1 cm for 10 units for the y-axis (4 marks)

(ii)

A bus traveling at 32km/hr passes a checkpoint at 10.00am and a matatu traveling at 99 km/hr in the same direction passes through the check point at 10.15am. If the bus and the matatu continue at their uniform speeds, find the time the matatu will overtake the bus. (6 marks)

Two passenger trains A and B which are 240m apart and travelling in opposite directions at 164km/h and 88km/h respectively approach one another on a straight railway line. Train A is 150 metres long and train B is 100m long. Determine the time in seconds that elapses before (4 marks)

(2 marks)



(ii) $3 - 7x - 3x^2 = 0$

(2 marks)

(5 marks)

(5 marks)