

Name: Index No.

School: Date: Candidate's Sign

121/2
MATHEMATICS
FORM FOUR
PAPER 2
MARCH/APRIL - 2013
TIME: 2 1/2 HRS

BARINGO NORTH TRIAL EXAMINATIONS -2013

Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS

1. Write your name, admission number, name of your school and date in the spaces provided above
3. All working must be clearly shown in the spaces provided
4. Marks may be given for correct working even if the answer is wrong.
5. KNEC Mathematical tables may be used.
6. This paper consists of Two sections I and II
7. Answer **all the questions in section I** and **any five questions from section II.**

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	
----------------	--

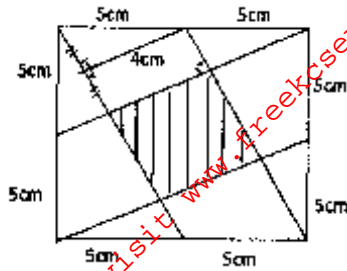
*This paper consists of 16 printed pages.
Candidates should check the question paper and ensure that all the pages are
printed as indicated and no questions are missing.*

SECTION A:

(Answer ALL questions in this section)

1. Find the area of the shaded region.

(3marks)



2. Use logarithm tables to evaluate to 2 decimal places.

(3marks)

$$4 \sqrt{\frac{16.3 \cos 35}{2712 + 1147}}$$

3. Mr. Kiplenge needs to import a car from Japan whose cost is US\$5000 outside Kenya. He intends to buy the car through an agent who deals in Japanese yen. The agent will charge him 20% commission on the price of the car and a further 80325 Japanese yen for shipment of the car. How many Kenya shillings will he need to send to the agent to obtain the car given that:

(3marks)

$$1\text{US\$} = 105.00 \text{ yen}$$

$$1\text{US\$} = \text{in sh.}63.00$$

4. Arrange the following fractions in descending order of magnitude. (2marks)

$$\frac{3}{5}, \frac{2}{5}, \frac{5}{7}, \frac{1}{2}$$

5. The Kenya power originally charged the domestic consumer in the following way. A standing charge of S per month plus t cents for each unit of electricity consumed in a month. A consumer noted from his October bill that he used 320 units and was charged Kshs.154.40. In February, he used 260 units and was charged shs.129.20.

a) Find the equation from the set of facts above. (2marks)

b) Solve for the value of S and t. (3marks)

6. Find all the integers satisfying the inequalities simultaneously. (3marks)

$$\begin{aligned} 4x - 6 &< x - 12 \\ 8 - 3x &> 2x - 7 \end{aligned}$$

7. Find the inverse of $\begin{pmatrix} 1 & 2 \\ 3 & -1 \end{pmatrix}$ hence solve

$$x + 2y = 4$$

$$3x - y = 5$$

(3marks)

8. A varies partly as B and partly as the square root of B. When B=4, A = 22 and when B =9, A = 42. Find A when B = 25.

(4marks)

9. Solve for Q in $-4 \sin Q = 3$ for $0^\circ < Q < 360^\circ$

(2marks)

10. Given that $P = 4 + \sqrt{2}$ and $Q = 2 + \sqrt{2}$ and that $\frac{P}{Q} = a + b\sqrt{c}$ where a,b and c are constants, find the value of a,b and c. (3marks)

11. Mr. Koech bought a car for Shs.1.2million which depreciated at constant rate of $9\frac{1}{2}\%$ per annum. After awhile he sold it to a second car dealer at shs.900,000. How long did he stay with the vehicle? (Give answer to 1 d.p). (3marks)

12. Kiptum, Jebet and Kimosop contributed money to start a business. Kiptum contributed a quarter of the amount while Jebet contributed two fifths of the remainder. Kimosop contributed one and half times that of Kiptum. They borrowed the rest of the money from Baringo Sacco which was Kshs. 120,000.
Find: a) The total amount required to start the business. (3marks)

b) The amount contributed by Kimosop.

(3marks)

13. The transformation T consist of a reflection in the X-axis followed by an enlargement centre (0, 0) and scale factor 2. Find:

a) The image of (1, 0) and (0, 1) under T.

(2marks)

b) The matrix associated with T

(2marks)

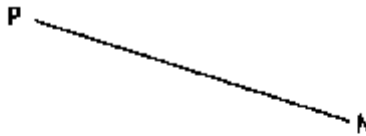
c) The image of (2, 3) under T.

(2marks)

14. A cylindrical can of diameter 20cm and height 60cm is filled with water using a cylindrical jar of diameter 12cm and height 8cm. How many jar full's will fill the can? (3marks)

15. Give all the possible pairs of last digits that make 3785__ divisible by 9. (1mark)

16. In this question use a ruler and a pair of compasses only.
In the figure below, AB and PN are straight lines.



Use the figure to find a point R on AB such that R is equidistant form P and N. (2marks)

SECTION B:

Answer any FIVE questions in this section)

17. The dimension of a rectangular plot of land is 44.4m and 26m.

a) Calculate the:-

i) Absolute error in getting the area of the rectangular plot.

(3marks)

ii) Ratio of length to breadth in simplest form.

(2marks)

b) Calculate the relative error in the perimeter.

(3marks)

c) Calculate the percentage error in the difference between length and breadth of the plot.

(2marks)

18. Caren is keen to improve her scores at darts. She always aim's to hit the bull at the centre of the darts board and her last twelve scores were:
32, 25, 56, 52, 23, 60, 19, 36, 36, 20, 56, 20
Calculate:-

a) The modal frequency. (1mark)

b) The mean of the scores (2marks)

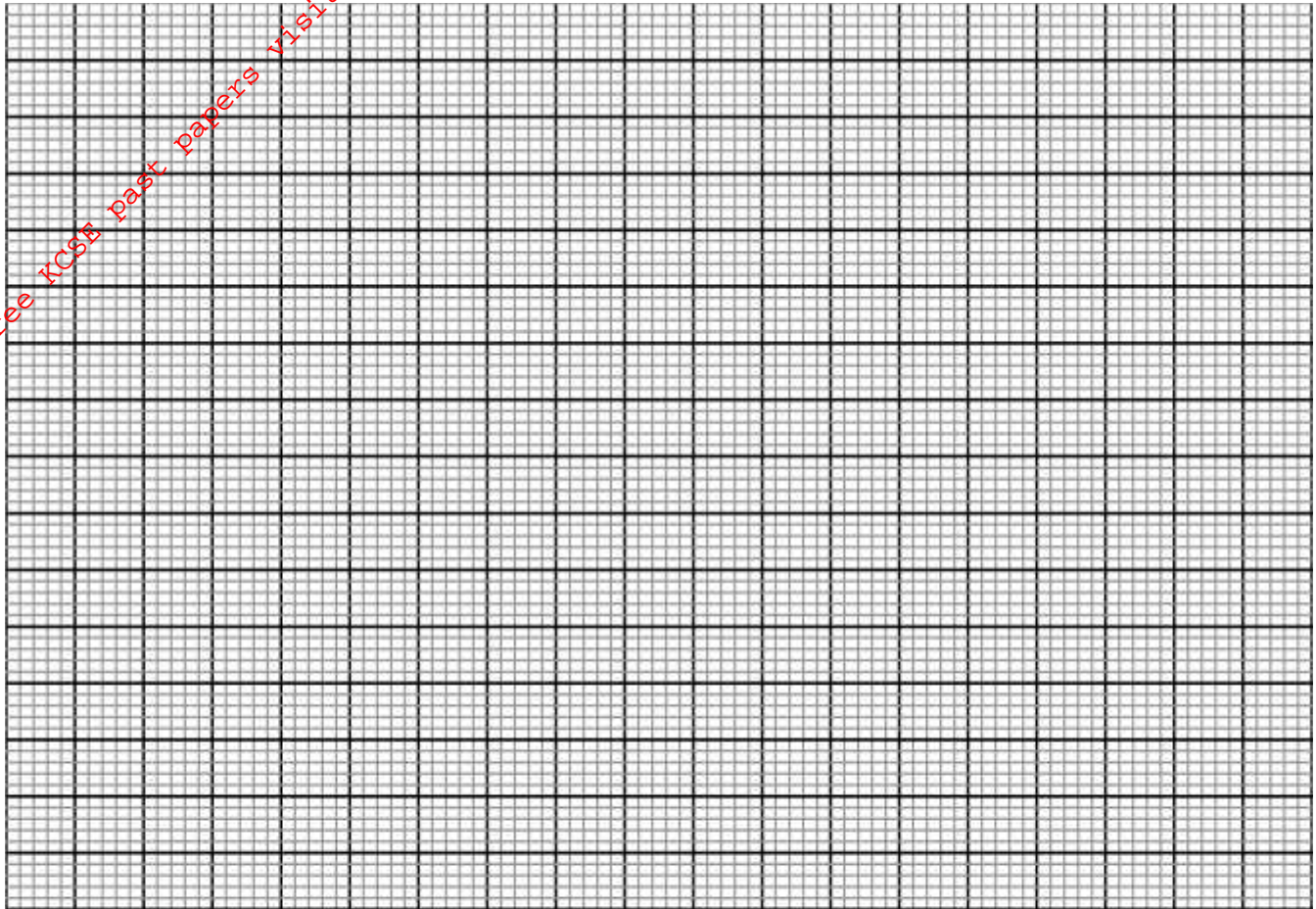
c) The quartile deviations of the scores (2marks)

d) Standard deviation of the scores (5mks)

19. The period of swing of pendulum is directly proportional to the square root of the length of the pendulum. In an experiment the square roots of the lengths and the corresponding periods were determined. The table below gives the results.

Square root of Length \sqrt{L}	0.32	0.45	0.55	0.63	0.71	0.77	0.84	0.89
Period of the Swing T (sec)	0.63	0.89	1.09	1.26	1.40	1.54	1.66	1.78

a) Draw a graph of T against the square root of L (3marks)



b) From the graph

i) Find the period of swing if \sqrt{L} is 0.52 and 0.72 (2marks)

ii) Find the square root of the length of the pendulum if the period of swing is 0.92 seconds and 1.65 seconds. (2marks)

iii) Find the length of the pendulum if the period of swing is 1 second, 1.5 second and 1.8 seconds. (3marks)

Monthly taxable income in Kshs	Tax rates per every Kshs.20
1 – 9680	2
9681 – 18800	3
18801 – 27920	4
27921 – 37040	5
37041 and above	6

c) His net earnings

(2marks)

21. Three solids, a sphere, a closed cylinder and a closed cone are such that their radii are equal and their surface areas are also equal.

a) Given that the volume of the sphere is $\frac{520\pi}{2}$ cm³, determine the radius. (2marks)

b) Calculate the:-

i) Height of the cylinder (3marks)

ii) Height of the cone (3marks)

iii) The volume of the cone. (2marks)

22. Janet and Sally both in Form 4E will sit for their final examination this year. The probability that Janet will fail is 0.1 and that Sally will fail is 0.2. Calculate the probability that:-

a) Both pass their final exam (2marks)

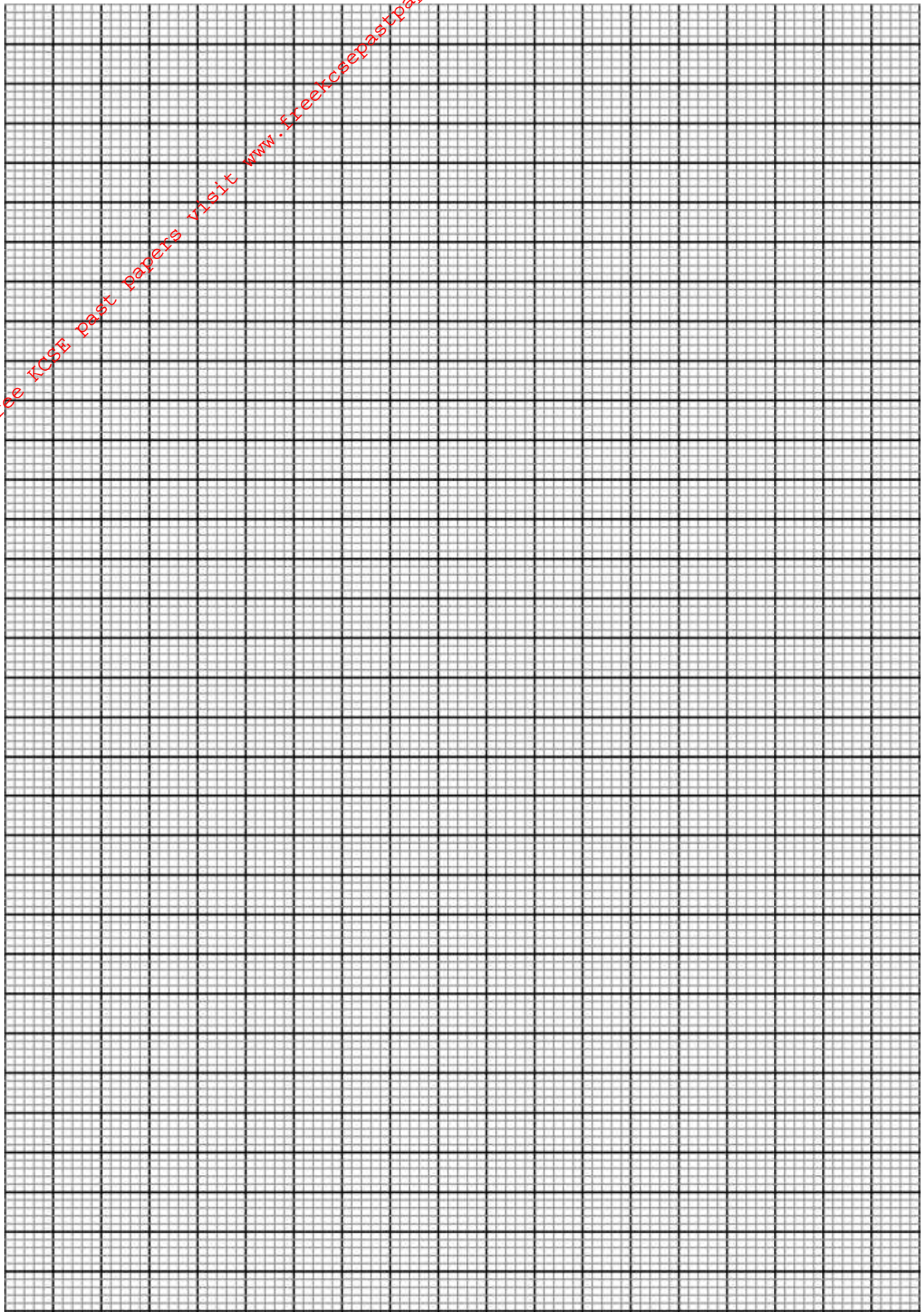
b) None pass their final exam (2marks)

c) Only one passed the final exam. (2marks)

d) Janet passes but Sally fails the exam. (2marks)

e) At least one of them passes. (2marks)

23. a) Using the grid below, plot the graph of $y = -2 + 5x - x^2$ for values of x between 0 and 7.
(5marks)



b) From the graph solve the equation $x^2 - 5x + 2 = 0$

(1mark)

c) By drawing a suitable line on the same axes, solve the equation

i) $x^2 - 7x + 6 = 0$

(2marks)

ii) $2x^2 - 3x - 1 = 0$

(2marks)

24. If $x^2 + y^2 = 29$ and $x + y = 3$

a) Determine the values of

i) $x^2 + 2xy + y^2$

(2marks)

ii) $2xy$

(2marks)

iii) $x^2 - 2xy + y^2$

(2marks)

iv) $x - y$

(2marks)

b) Find the value of x and y

(2marks)