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PAPER 2		

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121/2**MATHEMATICS** PAPER 2 JULY/AUGUST, 2014 TIME: 2¹/₂ HOURS

KURIA WSST SUB-COUNTY JOINT EXAMINATION - 2014

Kenya Certificate of Secondary Education **MATHEMATICS** PÁPER 2 **TIME: 21/2 HRS.**

INSTRUCTION TO CANDIDATE'S:

- 1. Write your **name**, **index number** and **school** in the spaces provided above.
- 2. Sign and write the date of examination in spaces provided.
- 3. This paper consists of two Sections; Section I and Section II.
- 4. Answer all the questions in Section I and any five questions from Section II.
- 5. All answers and working must be written on the question paper in the spaces provided below each question.
- 6. Show all the steps in your calculation, giving your answer at each stage in the spaces provided **below** each question.
- 7. Marks may be given for correct working even if the answer is wrong.
- 8. Non-programmable silent electronic calculators and KNEC Mathematical tables may be used, except where stated otherwise.
- 9. 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

40

\$°°

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)

apers.com Answer all the question in this section in the spaces provided:

Use a tables to find the value of $\chi i f^{2\chi} = 3$. Give your answer correct to 4sf. (3mks)

Make $\boldsymbol{\chi}$ the subject of the formula:

$$A = \sqrt{\frac{3+2t}{5-4t}}$$

(3mks)

3. It would take 18 men 12 days to dig a piece of land. If they work for 8 hours a day, how long will it take 24 men if they work 12 hours to cultivate three quarters of the same land. (3mks)

- com Kinyua bought soya and millet at sh.65 per kg and sh.40 per kg respectively. He then mixed 4. them and sold the mixture at sh.60 per kg making a profit of 20%. Determine the ratio of soya to millet in mixture. (3mks) . Papers Visit www.freekcser
- For Note Free Chord AB is of length 8cm and the maximum distance between chord and lower part of circle is 2cm. Determine the radius of the circle. (3mks)



6. Use the inverse matrix method rule to solve simultaneous equations. $2\chi + y = 10$ (3mks) $2\chi + 2y = 14$

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5.

For More Bree Cost Past Page Page 1 bit www.freedcaataan and a start and the second and a start and the second Construct a circle centre K and radius 2.5cm. Construct a tangent from a point Q which is 6cm from K to touch the circle at M. Measure the length QM. (3mks)

9. Given $4.6 \div 2.0$ find the absolute error in the quotient. (a)

(2mks)

(b) the percentage error in the quotient correct to four significant figures. (1mk) 10. A variable P varies jointly with the square of R and inversely with the square root of Q. If R is increased by 10% and Q decreased by 20%, what is the percentage change in the value of P.

(3mks)

11. The figure below shows a circle with segments cut off by a triangle whose longest side AB is the largest possible chord of a circle. Determine the area shaded given that AB = 14cm (3mks) and AC = BC. (3mks)



12. A bucket in the shape of a frustrum as shown in the diagram. It has diameters of 36cm and 24cm. Calculate the volume of the bucket. (4mks)



- 13. Without using a Mathematical tables or a calculator, evaluate. $\frac{2.7 \times 2.04}{300 \times 0.054}$ (2mks) 14. Find the length represented by y in the figure below. 14. Find the length represented by y in the figure below. 15. (3mks) 16. (3mks)
 - 15. (a) Expand $(1 + 2\chi)^8$ in ascending powers of χ up to and including the term χ^3 . (1mk)
 - (b) Hence evaluate $(1.02)^8$ to 3d.p.

(2mks)

16. The difference between the exterior and interior angle of a regular polygon is 100°. Determine the number of sides of the polygon. (3mks)

SECTION II: (50 MARKS)

apers.com Answer any **five** questions from this section in the spaces provided:

Fill the table below for the curves given by $y = 3 \sin (2\chi + 30^{\circ})$ and $y = \cos 2\chi$ for χ values in the range $O_{\chi} \leq 180^{\circ}$. (2r) 17. (a) (2mks)

	A *										
χ	in the second	0°	15°	30°	45°	60	75°	90°	120°	150°	180°
y = 3 Sin (2)	2 x + 30°)										
$y = \cos 2\chi$	2										
\$											

Draw the graphs of $y = 3 \operatorname{Sin} (2\chi + 30^\circ) = \operatorname{Cos} 2\chi$ on same axes. (b) (2mks) for hore free

(c) Use your graph to solve the equation $y = 3 \sin (2\chi + 30^\circ)$ and $y = \cos 2\chi$. (2mks)

(d) $2^{2^{2}}$ Determine the following from your graph: (i) Amplitude of $y = 3 Sin (2\chi + 30^{\circ})$.

(1mk)

(ii) Period of $y = 3 \sin (2\chi + 30^{\circ})$. (2mks)

(iii) Phase difference for $y = 3 \sin (2\chi + 30^{\circ})$. (1mk)

- com OAB is a triangle in which $O_{\alpha}^{A} = a$ and $O_{\alpha}^{B} \neq b$. M is a point on OA such that OM: MA = 2:3 18. and N is another point on AB such that AN: NB = 1: 2. Lines ON and MB intercept at X.
 - Express the following vectors in terms of \underline{a} and \underline{b} . (a) excsep (i) (1mk) AB

If $O_{X} = KO_{N}$ and $B_{X} = hB_{M}$ express O_{X} in two different ways. Hence or otherwise find the values of h and K. (6mks)

Determine the ratio OX: XN. (c)

(1mk)

- 19. (a) Using only a ruler and a pair of comparises draw a line AB of length 8cm long. Hence draw the locus of all points a such that angle APB = 52.5°.
 - (b) If the region above represents a map of an estate drawn to a scale of 1cm representing 1km. Show the region to be fenced if $AMB \le 90^\circ$ by shading the unwanted region. (3mks)

(c) Find the area of this region.

(2mks)

(5mks)

20. The data **below** is a daily record of sugar sold in one of the supermarkets in Kerugoya town which sells any proportion in kg of sugar.

Kg of sugar	Number of seople
0.5 - 0.9	22
1.0 - 1.4	e 38
1.5 - 1.9	. 14
2.0 - 2.4	xxxx 12
2.5 - 2.9	× 10
3.0-3.4	4

- (a) How than people bought sugar from this supermarket on that day. (1mk)
 - (b) Calculate mean of sugar bought that day. Calculate also the standard deviation from this data. (4mks)



- com A plane take of f from airport P at (0°, 40°W) and flies 1800 nautical rules due East to Q then 21. 1800 nautical rules due South to R and finally 1800 nautical rules due West before landing at S.
 - Find to the nearest degree the latitudes and longitudes of Q, R and S. (4mks)

If the total flight time is 16 hours, find the average speed in knots for the whole journey. (3mks)

> (c) Find the time taken to fly from R to S, given that this was two hours shorter than the time taken from P to Q to R. (2mks)

The 2^{nd} and 5^{th} terms of an arithmetic progression are 8 and 17 respectively. The 2^{nd} , 10^{th} and 42^{nd} terms of the A.P. form the first three terms of a geometric progression. Find (a) the 1^{st} term and the common difference. 22. (3mks)

the first three terms of the G.P and the 10th term of the G.P.

(4mks)

(c) The sum of the first 10 terms of the G.P. (3mks)

23. (a) The acceleration of a particle t seconds after passing a fixed point P is given by a = 3t - 3. Given that the velocity of the particle when t = 2 is 5m/s, find (i) its velocity when t = 4 seconds. (3mks)

(b) Find the exact area bounded by the graph $\chi = 9y - y^3$ and the Y-axis. (4mks)

con A girl's school has a store a far off distance for food. It has 20 sacks of rice and 35 sacks of maize. 24. The weight, volume and number of meal rations for each sack are as follows.

Sack of	Weight in kg	Volume (m ³)	No of meals
Rice	25	0.05	800
Maize	10 et	0.05	160

A delivery van is to carry the largest possible total number of meals. It can carry up to 600kg in weight and 2m³ in volume.

If a load is made up of χ sacks of rice and y sacks of maize, write four inequalities other (a) than $\chi \ge 0$, $\tilde{y} \ge 0$ which satisfy these conditions. (3mks)

	Papers	2		
CESE P	18 ⁵			
¢ree (b)	Illustrated these i	nequalities graphical	ly by shading unwanted region	. (4mks)
FOTNOT				

Write down an expression for the number of meals that can be provided from χ sacks of (b) rice and y-sacks of maize. Use your graph to find best values to take for χ and y. (3mks)