NAME..... INDEX NO.....
CANDIDATE'S SIGNATURE.....
DATE:.....

GATUNDU SUB COUNTY FORM FOUR 2014 EVALUATION EXAM

121/1
MATHEMATICS
PAPER I
JULY/AUGUST 2014
TIME: 2 ½ HOURS

INSTRUCTIONS TO CANDIDATES

a) *Write your name and index number in the space provided above.*
b) *This paper consists of two sessions: Section I and section II.*
c) *Answer **all** the questions in the section I and **only five** questions from section II.*
d) *All answer and working **must** be done on the question paper in the space provided below each questions.*
e) *Show all the steps in your calculations, giving your answers at each stage in the spaces provided.*
f) *Non-programmable silent electronic calculators and KNEC Maths tables may be used.*
g) *Candidates should check the question paper to ascertain that all the pages are printed as indicated and 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

SECTION I

ANSWER ALL QUESTIONS IN THIS SECTION IN THE SPACES PROVIDED BELOW EACH QUESTION.

1. Using logarithms tables evaluate. (4 marks)

$$\sqrt{\frac{3.361 \times 0.054}{24.5 - 12.1}}$$

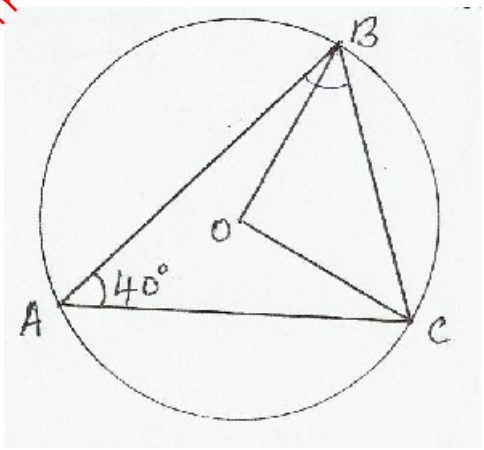
2. A sum of money is divided between three people, Tom, Mary and Lucy in the ratio 5:3:1. If Mary has sh.700 more than Lucy, calculate how much Tom has. (3 marks)

3. Evaluate 3/8 of $\left\{ 7^{3}/_{5} - {}^{1}/_{3}(1\ ¼ + 3^{1}/_{3}) \times 2^{2}/_{5} \right\}$ (3 marks)

4. Express the following as fraction. (3 marks)

$$0.\dot{9}\dot{2}$$

5. In the figure below, O is the centre of the circle and OB bisects angel ABC. Given that <BAC= 40^{o}, find <ABO (3 marks)



6. Solve for x in the equation below

$125^{(x+1)} + 5^{3x} = 630$ (3 marks)

7. Find the integral values of y of which satisfy the inequalities below.

$5 \leq 3y + 2$ and $3y - 14 \leq -2$ (3 marks)

8. Use reciprocal and cube root tables to evaluate. (3 marks)

$$\frac{1}{0.0375} - \sqrt[3]{\frac{1}{37.5}}$$

9. The position vector of points A and B relative to the origin O are a and b respectively. Given that $a = 4\mathbf{i} + 3\mathbf{j}$ and $b = \mathbf{i} + 2\mathbf{j}$, find the modulus of the vector a + b (3 marks)

9. Tap A takes one hour to fill a tank with water. If tap B takes y hours to remove the same water and both taps takes 1 ½ hours to fill the tank, find the value of y. (3 marks)

11. Obenda weighed 120kg before he was taken ill of HIV/AIDs. After sometimes his weight decreased by 10% every week for 5 weeks. He was put on ARVs and his weight increased by 5% every week for 3 weeks. What is his weight at the end of eighth week? (4 marks)

12. The mean age of 4 girls is 15 yeas. The first and second are aged 13 years and 18 years respectively. The third girl is 3 years older than the first girl. Find the modal age. (2 marks)

13. Solve the following simultaneous equations. (4 marks)

$\text{Log}_2(4y + x) = 3$
$\text{Log}_3(4x + y) = 2$

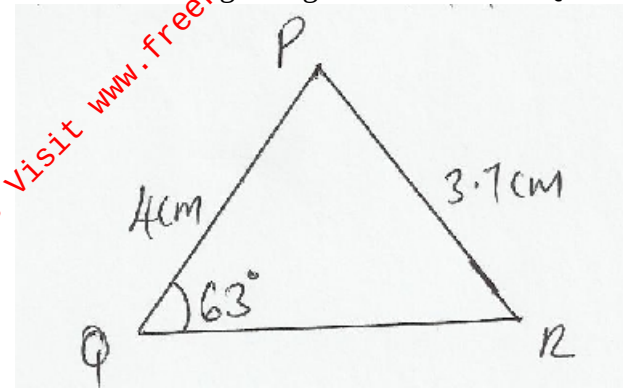
14. The L.C.M of 15, 18 and a third number is 1260. Find the square of third number. (2 marks)

15. Use the currency conversion table below to answer the questions that follow.

CURRENCY	BUYING	SELLING
1 US DOLLAR	Ksh.78.4133	Ksh.78.4744
1 EURO	Ksh.73.4226	Ksh.73.5295

An American tourist came to Kenya with US dollar 10,000. He converted all his money to Kenya shilling and used Ksh.32,000 while he was in Kenya. The tourist converted the remainder to Euros because he wanted to visit Germany. How much did he get (give the answer to 4 decimal places) (3 marks)

16. Find the length QR of the following triangle if PR=3.7cm PQ=4cm and <PQR = 63^{o}. (4 marks)



SECTION II
ANSWER ANY 5 QUESTION FROM THIS SECTION

17. Mr. Biwott operates two passenger service vehicles along Nakuru- Eldoret route. One is a 16 seater Matatu and the other is 8-seater van. Each vehicle makes one route trip per day and the charges are ksh 250 and ksh 300 per passenger respectively (one way). The matatu uses diesel which costs ksh.48 per litre and the van uses regular petrol which costs ksh.52 per litre. The fuel consumption of the two vehicles is in the ratio of 4:3 respectively.

a) If the matatu uses 80 litres for the round trip, determine the fuel consumption of the van for the round trip. (2 marks)

b) Calculate the daily collection for each vehicle. (2 marks)

c) Determine which vehicle is more profitable (on daily basis) and by how much. (3 marks)

d) If the price of both types of fuel goes up by 20% determine the percentage change in daily collection. (3 marks)

18. Two airports are such that B is 500km due East of A. Two planes P and Q take off from A and B respectively and at the same time. Place P flies at 360km/h on a bearing of 030^{o}. Plane Q flies at 240km/h on a bearing of 315^{o}. The two planes land after 90 minutes. Using a scale of 1:10,000,000:

a) Show the positions of the planes after 90 minutes. (7 marks)

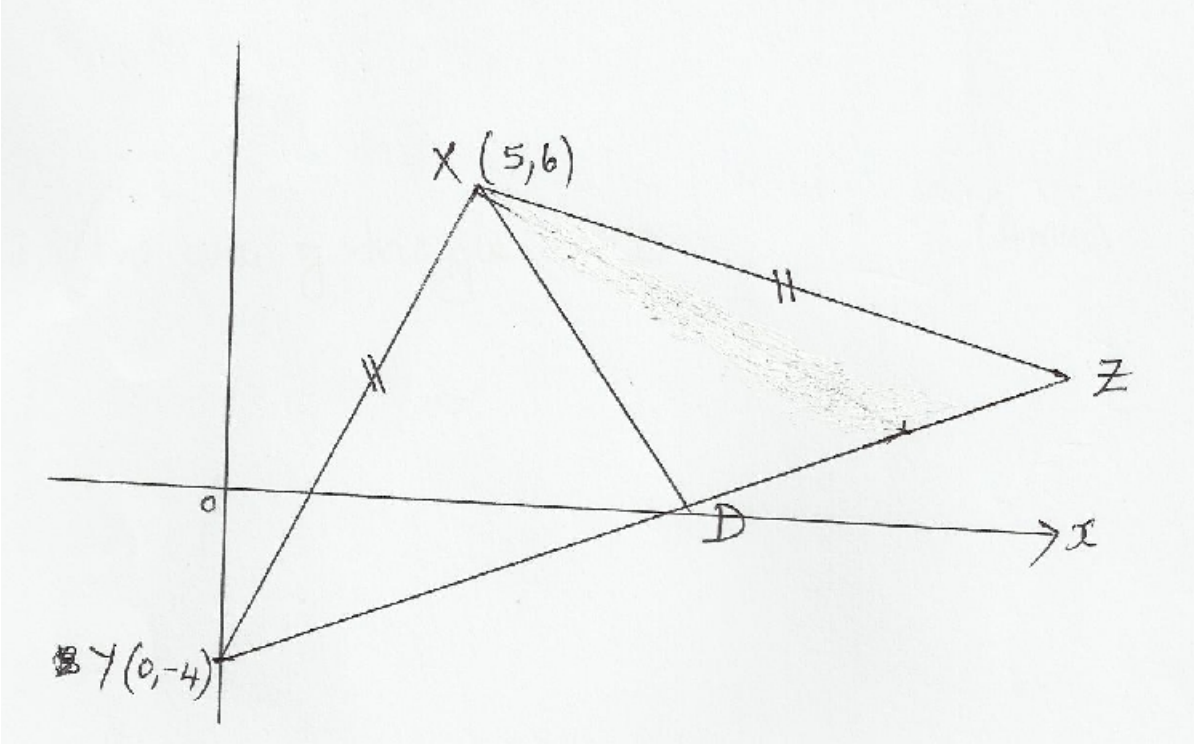
b) Find the distance between the planes after 90 minutes. (1 mark)

c) Find:

(i) The bearing of plane P from plane Q after 90 minutes. (1 mark)

(ii) The bearing of plane Q from plane P after 90 minutes

19. The diagram which is not drawn to scale, shows an isosceles triangle XYZ in which XY=YZ. The coordinates of x and y are (5,6) and (0, -4) respectively.



Given that the equation of line YZ is y=3/4x – 4 and that the perpendicular from X to YZ meet YZ at D, find.

(i) The equation of XD (2 marks)

(ii) The coordinate of D (2 marks)

(iii) The coordinates of Z (2 marks)

(iv) The area of triangle XYZ (4 marks)

20. a) On the grid provided plot the points.

A(1, 5) B(3, 1) C(4, 4) and D(3, 3). Join these points to form quadrilateral ABCD. (2 marks)

b) The points $A^1(2, 10)$ $B^1(6, 2)$ $C^1(8, 8)$ and $D^1(6, 6)$ are the images of A, B, C and D under a certain enlargement. On the same grid draw the image $A^1B^1C^1D^1$

(2 marks)

c) Use the construction method to locate the centre of enlargement and state its coordinates. (2 marks)

d) What is the scale factor of this enlargement? (1 mark)

e) Determine the matrix of this enlargement. (3 marks)

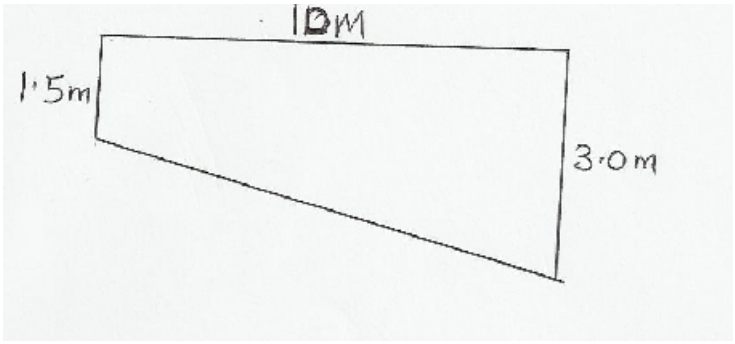
21. Draw the graph of the given function over the given range and use it to solve the given equation.
Range $-4<x<4$. $y = 2x^2 + x - 1$ hence solve (5 marks)

a) $2x^2 + 5x + 4 = 0$ (1 mark)

b) $2x^2 + 5x + 2 = 0$ (2 marks)

c) $2x^2 + 4x + 3 = 0$ (2 marks)

22. The figure below shows a uniform cross-section of a swimming pool which is 4m wide. The depth of the pool increase gently from 1.5m to 3.0m.



a) How much water in litres does it hold when full? (3 marks)

b) Calculate total internal surface area of the pool. (5 marks)

c) Find the angle at which the bottom of the pool inclines to the horizontal. (2 marks)

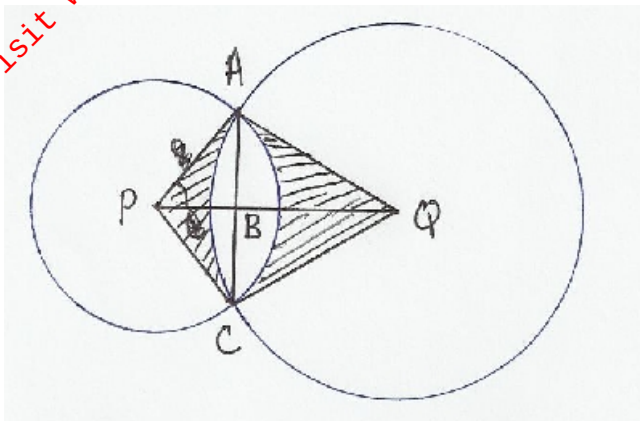
23. a) Using a ruler and a pair of compasses only construct a rhombus A B C D such that AB = 6cm and <ABC = 135°. (4 marks)

b) Drop a perpendicular from C to AB extended to meet AB at N. Measure BN and CN. (3 marks)

c) Bisect <ABC and <DAB, let the two bisectors meet at M. Measure MA. (1 mark)

d) Determine the area of triangle ABM. (2 marks)

24. Two intersecting circles have centres P and Q as shown below. The circle centre P has radius 8cm and that of centre Q has radius 9cm.



The distance between the centres PQ = 14cm and PB:BQ = 3:4. Calculate

(i) Angles APC (2 marks)

(ii) Angle AQC (2 marks)

(iii) The area of the shaded region. (6 marks)