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Index No .....

Candidate's Signature .....

Date: .....

121/1  
MATHEMATICS  
Paper 1  
JULY/AUGUST -2014  
Time: 2½ Hours

# MIGORI SUB-COUNTY JOINT EVALUATION EXAM

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

MATHEMATICS

Paper 1

## INSTRUCTIONS TO THE CANDIDATES

- Write **your name** and **index number** in the spaces provided above
- This paper contains two sections; **Section 1** and **Section 11**.
- Answer all the questions in **section 1** and only **five** questions from **Section 11**
- All workings and answers must be written on the question paper in the spaces provided below each question.
- Marks may be given for correct working **even if** the answer is wrong.
- Calculations and KNEC Mathematical tables may be used **EXCEPT** where stated otherwise.
- Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.

## FOR EXAMINERS'S USE ONLY

### Section 1

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Marks																	

### Section 11

Question	17	18	19	20	21	22	13	24	<b>Total</b>
Marks									

### **GRAND TOTAL**

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

1. Evaluate  $\frac{\frac{3}{5} \text{ of } 60 - 2\frac{2}{3} \times 1\frac{1}{2}}{5\frac{5}{8} \times 1\frac{7}{9} - \frac{5}{4} \text{ of } 4\frac{4}{5} + 2\frac{4}{5} - \frac{7}{10}}$  (3mks)

2. Simplify the expression (3mks)

$$\frac{18x^2 - 8}{6x^2 - x - 2}$$

3. A line passing through the points A (-1,3x) and B (x,3) is parallel to the line whose equation is  $2y = 9 - 3x$ . write down the co-ordinates of A and B (3mks)

4. A British tourist left UK for Kenya with UK £ 4000. He converted the whole amount into Kenya shillings. While in Kenya, he spent Sh. 250,000. After one week, he left Kenya for Belgium and converted the money he had to Euros. Using the conversion table below, calculate the amount he got to the nearest Euro. (4mks)

	Euros	UK £
Buying (Kshs)	107.91	132.50
Selling (kshs)	108.54	132.77

5. A man who has crossing a bridge 80m long had covered 30m on it. At that point, he saw an approaching truck 150M a head and he decided to run back at a speed of 3m/s. The man and the truck arrived at the end point of the bridge at the same time. Calculate the speed of the truck in km/h (3mks)

6. Solve for x in the equation  $\left(\frac{1}{2}\right)^x \times \left(\frac{1}{8}\right)^{1-x} = 32$  (3mks)

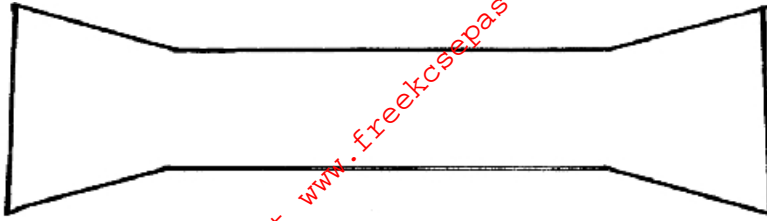
7. Determine the inverse of the matrix  $t = \begin{pmatrix} 1 & 2 \\ 1 & -2 \end{pmatrix}$ , hence find the co-ordinates of the point at which the two lines  $x + 2y = 7$  and  $x - 2y = 1$  intersect (4mks)

8. Using a pair of compasses and a ruler only, construct trapezium ABCD in which AB= 8cm, BC = 5cm, CD = 4.1cm and angle ABC =  $60^\circ$  and AB is parallel to DC. Determine through construction, the height of the trapezium. (3mks)

9. A piece of wood whose volume is  $90\text{cm}^3$  weighs 81 grams. Calculate the mass in kilograms of one cubic meter of the same wood. (3mks)

10. Find the calculation the sum of the interior angles if figure below

(2mks)



11. Find the value of x that satisfy the equation  $\log (5x - 4) = \log (x+1) + 1$

(3mks)

12. Given that  $\tan \theta = 0.75$ , find without using mathematical table or calculators.

( 3mks)

$$2 \sin \theta + \cos \theta$$

13. The frequency distribution table below represents the number of kilogram of meat sold in a butchery.

Mass in Kg	1- 15	6-10	11-15	16 – 20	21-25	26-30	31-35
Frequency	1- 2	3	6	Y	3	2	1

(a) Find the value of y if the mean K was 16.4

2mks)

(b) Calculate the median Mass

(2mks)

14. Two numbers are in the ratio 5: 7. When 15 is added to each number, the ratio changes to 5: 6. Find the two numbers. (3mks)

15. In a triangle ABC, AB=6cm, BC = 5cm and AC = 7cm. find the are of the triangle. (2mks)

16. Two boys and a girls shared some money. The younger boy  $\frac{5}{8}$  of it. The elder boy got  $\frac{7}{12}$  of the remainder and the girl got the rest. Find the percentage share of the younger boy to the girl's share (2mks)

**SECTION II**

*Answer only five questions from this section*

17. A slaughter house bought a number of sheep at sh. 1,200 each and a number of oxen at sh. 15,000 each. They paid a total amount of sh. 135,000. If they had bought twice as many as many sheep and three oxen less, they would have saved sh. 15,000

(a) Find the number of each type of animals they bought. (6mks)

(b) The slaughter house sold all the animals at a profit of 30% per sheets and 35% per oxen. Determine the total profit they made. (4mks)

18. IN a map, the location of church, mosque, borehole, cattle d.p and a village polytechnic are given as follows. The mosque is 52km from the church on a bearing of  $200^\circ$ . the borehole is 75km on a bearing of  $075^\circ$  from the mosque. The cattle dip is 86km due west of the borehole and the village polytechnic is due North of the cattle dip a distance of 90km

(a) Locate by scale drawing the relative position of the station. Use a scale of 1cm to represent 10km (5mks)

(b) Find the distance and bearing of the village polytechnique from the borehole (2mks)

(c) From a survey carried out, the following information was entered in a field book

	Y	
To R	240	180to N
	90	
	180	
	120	60 to M
	X	

If  $XY = 360m$ , determine the area of the field in hectares showing clearly the sketch of the map. (3mks)



19. (a) (i) Draw the quadrilateral A (-6,-1), B (-6,-4), C (-3,-7) and D (-3,-2)

On the same grid draw the image

(ii) A'B'C'D' of ABCD under an enlargement centre(-1,-1) and scale factor Y. (2mks)

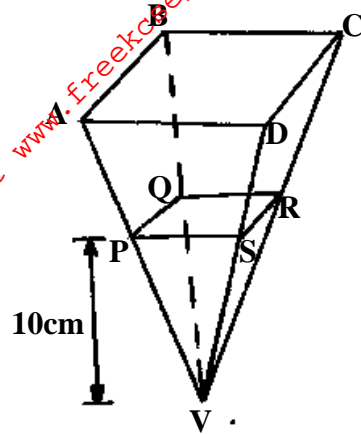
(b) A''B''C''D'' of image A'B'C'D' under a rotation centre (0,0) through  $90^\circ$  (2mks)

(c) A'''B'''C'''D''' the image of A''B''C''D'' under a reflection in the line  $y = x - 2$  (2mks)

(d) A''''B''''C''''D'''' the image of A'''B'''C'''D''' under a translation  $\begin{pmatrix} 2 \\ 8 \end{pmatrix}$  and write down the co-ordinates of the final image. (2mks)

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20. The diagram below represents squared base pyramid standing vertically.  $AB = 12\text{cm}$ ,  $PQ = 4\text{cm}$  and the height of pyramid PQSV is  $10\text{cm}$ .



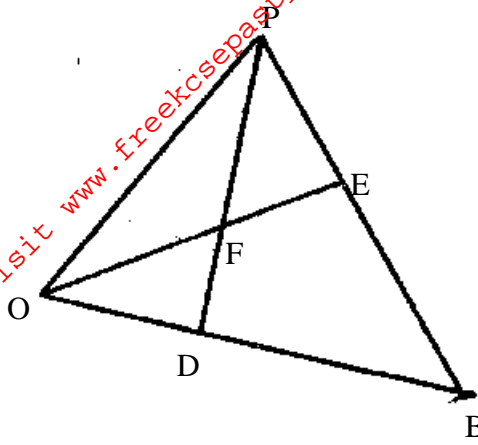
- (a) If PQRSV is a solid, find the volume of material used to make it. (2mks)

- (b) Find the (i) height of the frustrum ABCDPQRS (2mks)

- (ii) Volume of the frustrum (3mks)

- (c) The liquid from a hemisphere is poured into PQRS. Find radius of the hemisphere if the liquid from hemisphere filled the solid completely. (3mks)

21. In the figure E is the mid point of Ab,  $OD:OB = 2:3$  and F is the point of intersection of OE and AD



- (a) Given that  $\vec{OA} = \mathbf{a}$  and  $\vec{OB} = \mathbf{b}$ , express the following  $\vec{OE}$  and  $\vec{AD}$  in terms of  $\mathbf{a}$  and  $\mathbf{b}$  (2mks)

- (b) Given further that  $\vec{AF} = t \vec{AD}$  and  $\vec{OF} = s \vec{OE}$ . Find the values of  $s$  and  $t$ . (5mks)

- (c) Show that O, F and E are collinear (3mks)

22. Sketch the curve  $y = (x-3)(2x^2 - 3x + 1)$

The equation of a curve is given by  $y = 6x^2 - 12x - 18$

(a) Find the turning point of the curve.

(3mks)

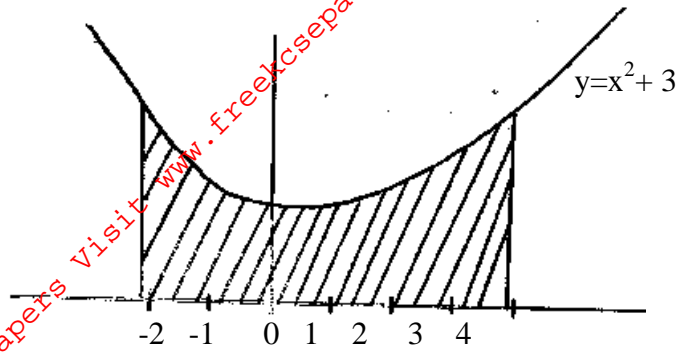
(b) Find the x-intercept and y-intercept

(5mks)

(c) Sketch the curve showing clearly the turning points and the intercepts.

(3mks)

23. Given is a sketch of area bounded by the curve  $y = x^2 + 3$  and lines  $x = -2$ ,  $x = 4$  and  $y = 0$



(a) Use the mid - ordinate rule with 6 strips to estimate the shaded area.

(3mks)

(b) Determine the exact area in (a) above.

(c) Find the percentage error in the estimated area above

24. One day, Mr. Ortone bought some oranges worth Ksh. 45. On another day of the same week. Mrs Ortone spent the same amount of money but bought the oranges at a discount of 75cents per orange.

(a) If Mr. Ortone bought an orange at Kshx, write down a simplified expression for the total number of oranges bought by the family in a week. (3mks)

(b) If Mrs. Ortone bought 2 oranges more than her husband, find how much she spent on an orange. (5mks)

(c) Find the number of oranges bought for the family in that week. (2mks)