

Name.....

Index No .....

Candidate's Signature .....

Date: .....

121/1  
MATHEMATICS  
PAPER 1  
JULY/AUGUST 2014  
TIME: 2½ HOURS

# HOMA-BAY SUB-COUNTY JOINT EVALUATION EXAM

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

121/1  
Mathematics  
Paper 1  
2½ hours

## 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.
- Non programmable silent electronic calculators 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	23	24	<b>Total</b>
Marks									

### GRAND TOTAL

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This paper consists of 14 printed pages. Candidates should check carefully to ascertain that all the pages are printed as indicated and no questions are missing.

**SECTION I (50 MARKS)**

*Answer all questions in the spaces provided.*

1. Evaluate without using a calculator  $\frac{\left(2\frac{3}{7} - 1\frac{5}{6}\right) \div \frac{5}{6}}{\frac{2}{3} \text{ of } 2\frac{1}{4} - 1\frac{1}{7}}$  (3mks)

2. Calculate the standard deviation for the data below (3mks)  
5,8,13,12,7,10,8,15,3,14

3. A straight line  $L_1$  is perpendicular to another line  $L_2$  whose equation is  $3y+4x=12$ . If the two lines meet at point P which lies on the x-axis, find:  
(i) The co-ordinate of point P (1mk)

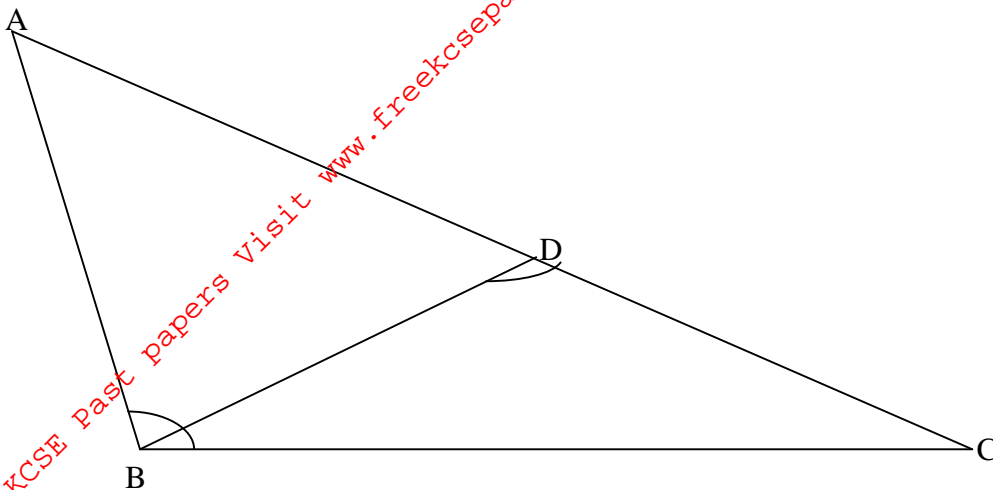
- (ii) The equation of line  $L_1$  in the form  $y=mx+c$  (3mks)

4. Mr. Ochuodho who deals in electronics sells a radio to a customer at Kshs. 1,440 after giving him a discount of 10% but finds that he still makes a 20% profit. Find the profit Mr. Ochuodho would make if he does not give a discount. (3mks)

5. A solid block in the shape of a cylinder has a height of 14cm and weighs 22kg. If it is made of material of density  $5\text{g/cm}^3$ , find the radius of the cylinder. Take  $\pi = \frac{22}{7}$  (3mks)

6. Simplify completely by factorization  $\frac{20 - 45x^2}{6x^2 - x - 2}$  (3mks)

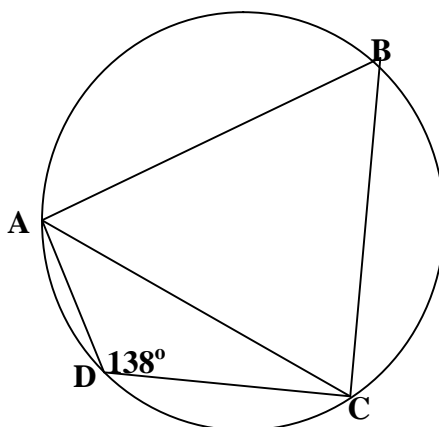
7. The figure below shows a triangle ABC not drawn to scale, D is a point on line AC. Given that  $BC=14\text{cm}$ ,  $DC=7\text{cm}$  and  $\angle ABC = \angle BDC$ . Find the length of AD (3mks)



8. Solve the simultaneous inequalities given below and list all the integral values of  $x$  (3mks)

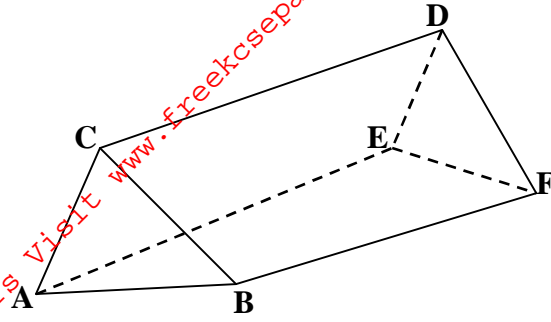
$$\frac{3-x}{2} \geq \frac{x+1}{3} \geq \frac{2x+1}{-3}$$

9. In the circle drawn to scale below A,B,C and D are points on its circumference, Chord  $BC=AC$  and angle  $ADC=138^\circ$



Giving reasons calculate the angle ACB (3mks)

10. The figure below shows a triangular prism ABCDEF.  $AF=CD=BE=18\text{cm}$ , The ends ABC and EDF are equilateral triangles of side 8cm. calculate the angle plane ABD makes with the line CD (3mks)

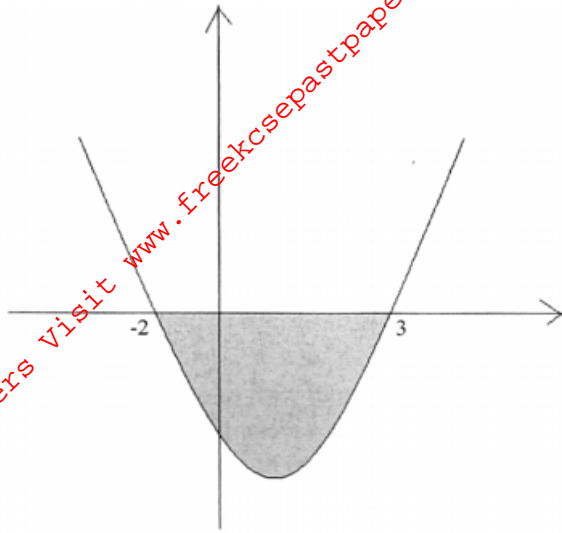


11. Patricia a student at Ongeti mixed Secondary bought 5 pens and 3 exercise books from Solving supermarket at Kshs. 135, at the same time Jane her class mate also bought 4 pens and 5 exercise books and spent Ksh. 25 more than Patricia. Find the cost of each pen and exercise book (4mks)

12. Evaluate using mathematical tables only expressing your answer to 4 significant figures

$$\frac{4}{0.2356} + (0.9873)^3 \quad (3\text{mks})$$

13. The diagram below shows the sketch of the curve  $y=x^2-x-6$



Using the mid-ordinate rule with five rectangles, calculate the area of the shaded region (4mks)

14. Given that  $\sin (3x-35)^{\circ} - \cos (x+20)^{\circ} = 0$  and  $x$  is an acute angle, find its value (2 mks)

15. A train of length 80m crosses a bridge 20 m long in 5 seconds. Calculate the average speed of the train in km/h (3mks)

16. Mr. Ombogo the principal of Chiga secondary would wish to cover the floor of the new administration block using the square tiles. The floor is a rectangle of sides 12.8m by 8.4m. Find the area of each of the largest tiles which can be used to fit exactly without breaking (3mks)

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**SECTION B (50 MARKS)**

*Answer ONLY FIVE questions in this section in the spaces provided*

17. Four schools Wiobiero, Asumbi, Nyawita and Angiro are such that Wiobiero is 15km from Asumbi on a bearing of  $158^\circ$ , Nyawita is to the west of Asumbi and 20km away while An'giro is to the South of Nyawita and on a bearing of  $240^\circ$  from Wiobiero.

(a) Using a scale of 1:400,000 draw a scale diagram showing the relative positions of the four schools. (5mks)

(b) Using your diagram determine the distance and bearing of Ang'iro from Asumbi (2mks)

(c) A mast is to be erected so that its equidistant from Asumbi and Nyawita and 20km from Ang'iro on the same diagram show the position of the mast and find its distance from Wiobiero (3mks)



18. The table shows the marks obtained by 40 candidates in an examination

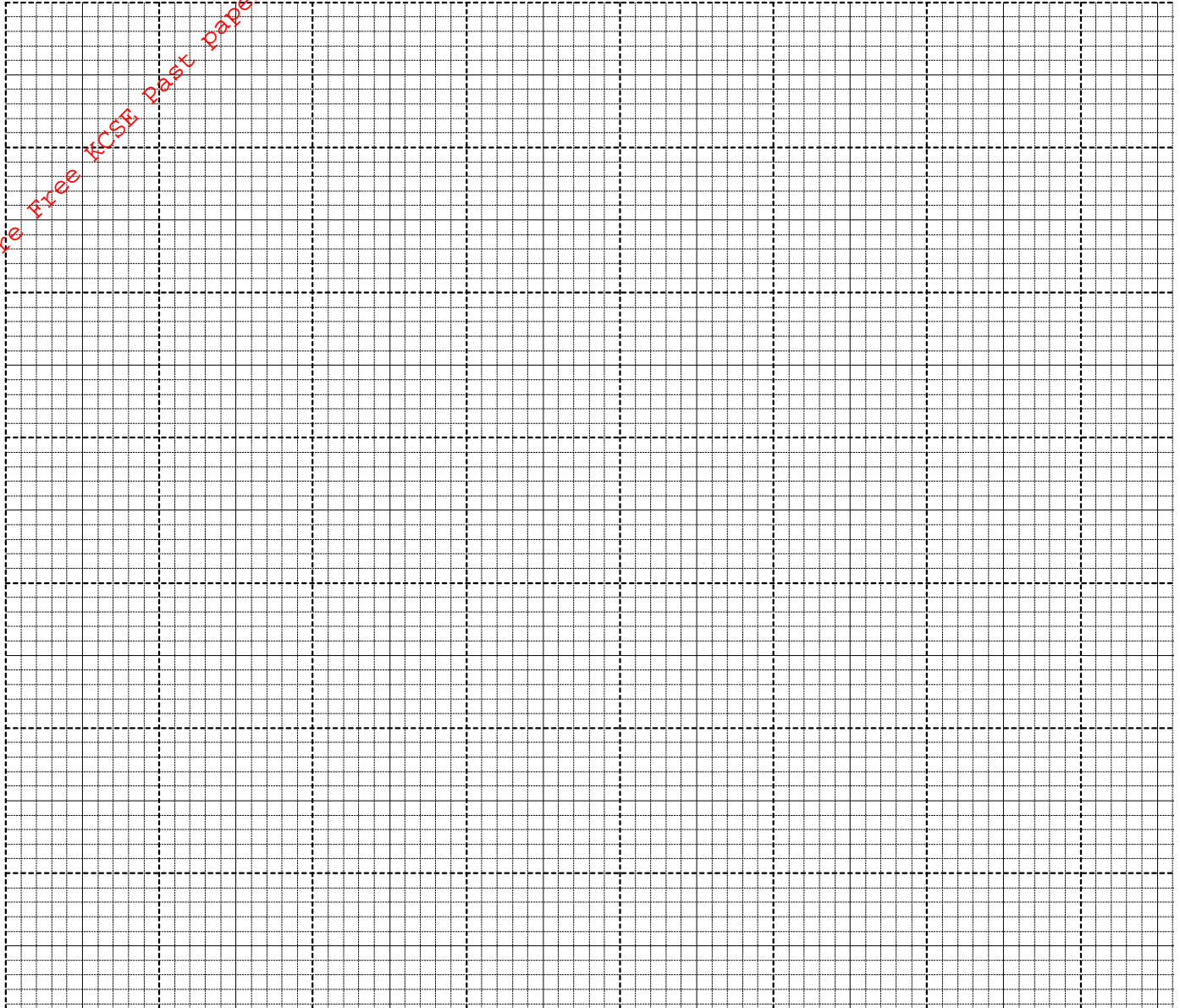
Marks	5-14	15-29	30-34	35-44	45-49
Frequency	2	12	7	15	x

(a) Find the value of x

(2mks)

(b) On the grid provided below draw a histogram to represent the data

(5mks)



(c) By drawing a straight line on the graph above determine the median mark

(3mks)

19. A matatu left Oyugis for Homabay town 51km away at an average speed of 48km/h at 7.00am. At 7.30am a Boda boda left Homabay for Oyugis travelling along the same route at an average speed of 60km/h

(a) The time when Boda boda meet the matatu (3mks)

(b) How far from Oyugis did the Boda boda meet the matatu (3mks)

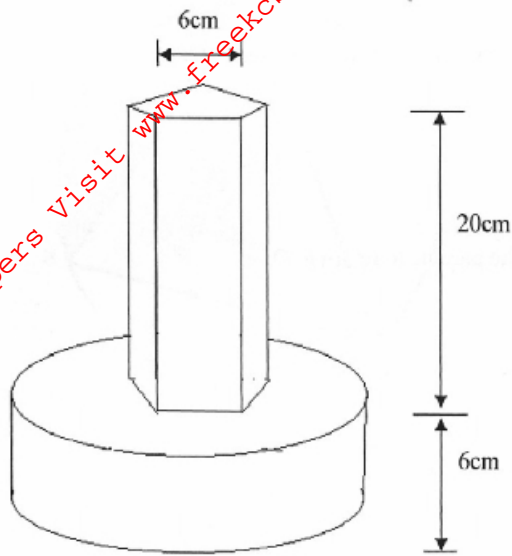
(c) After meeting the Boda boda the matatu stopped for fifteen minutes before resuming the journey. At what speed should it travel then to reach Homabay at the same time when the Boda boda reached Oyugis (4mks)

20. A group of people planned to contribute equally towards a water project which needed Ksh.2,000,000 to complete. However 40 members of the group withdrew from the project. As a result each of the remaining members were to contribute Kshs.2,500 more  
(a) Find the original number of members in the group (5mks)

(b) Forty five percent of the value of the project was funded by constituency development fund(CDF). Calculate the amount of contribution that would be made by each of the remaining members. (3mks)

(c) Members contribution were in terms of labour provided and money contributed. If the ratio of the value of labour to the money contribution was 6:9. Calculate the total amount of money contributed by the members (2mks)

21. The figure below shows a prism whose cross section is a regular pentagon of side 6cm and whose length is 20cm joined to a cylinder of radius 14cm and height 6cm to form a the model of a solid



(a) Calculate the cross section area of the pentagon (3mks)

(b) Calculate the total volume of the solid (4mks)

(c) The model represents a pillar of total height 5.2m, calculate the volume of the actual solid in  $m^3$  (3mks)

22. The displacement of a particle  $S$  metres,  $t$  seconds after passing a fixed point  $O$  is given by

$$S=3+2t-5t^2$$

Calculate:

(a) The displacement of the particle 3 seconds later (2mks)

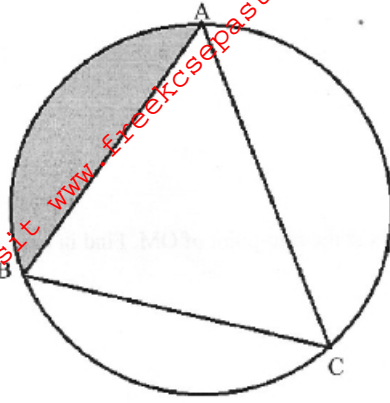
(b) The time taken for the particle to return to  $O$  (2mks)

(c) The maximum displacement of the particle (3mks)

(d) The initial velocity of the particle (2mks)

(e) The acceleration of the particle after  $t$  seconds (1mk)

23. The diagram below shows a circle ABC with  $AB=12\text{cm}$ ,  $BC=15\text{cm}$ , and  $AC=14\text{cm}$



Calculate to 4 significance figures:

(a) The angle ACB

(3mks)

(b) The radius of the circle

(3mks)

(c) The area of the shaded region

(4mks)

24. OABC is a trapezium such that the coordinates of O,A,B and C are (0,0),(2,-1) (4,3) and (0,y)  
(a) Find the value of y (2mks)

(b) M is the mid-point of AB and N is the mid point of OM. Find in column form  
(i) The vector AN (3mks)

(ii) The vector NC (2mks)

(iii) Vector AC (1mk)

(c) Hence show that A, N and C are collinear (2mks)