

NAME..... INDEX NO.....  
 SCHOOL..... SIGN.....  
 DATE.....

121/1  
 MATHEMATICS  
 PAPER 1  
 JULY/AUGUST 2012  
 TIME 2 ½ HOURS

**KWANZA DISTRICT JOINT EVALUATION TEST 2012**  
*Kenya Certificate of Secondary Education (K.C.S.E)*

**INSTRUCTIONS TO THE CANDIDATES**

- (a) Write your name and the index number in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided.
- (c) The paper contains **TWO** sections: Section **I** and **II**.
- (d) Answer **ALL** the questions in section **I** and **FIVE** questions in section **II** in the spaces provided below each question.
- (e) All answer and working must be written on the question paper in the spaces provided below each question.
- (f) Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.
- (g) Marks may be given for correct working even if the answer is wrong.
- (h) Non-programmable silent electronic calculators and KNEC mathematical tables may be used, except where stated otherwise.

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 to ensure that all  
 pages are printed as indicated and no questions are missing*

**SECTION I 50 MARKS**

**ANSWER ALL THE QUESTIONS IN THIS SECTION.**

1. Evaluate without using mathematical tables

$$\frac{1.9 \times 0.032}{20 \times 0.0038}$$

(3mks)

2. Use tables of reciprocals only to find the value of

$$\frac{5}{0.0829} - \frac{14}{0.581}$$

(3mks)

3. You are given that  $\cos \theta = \frac{8}{10}$ . Without using mathematical tables express in fraction form the value of

(a)  $\sin \theta$

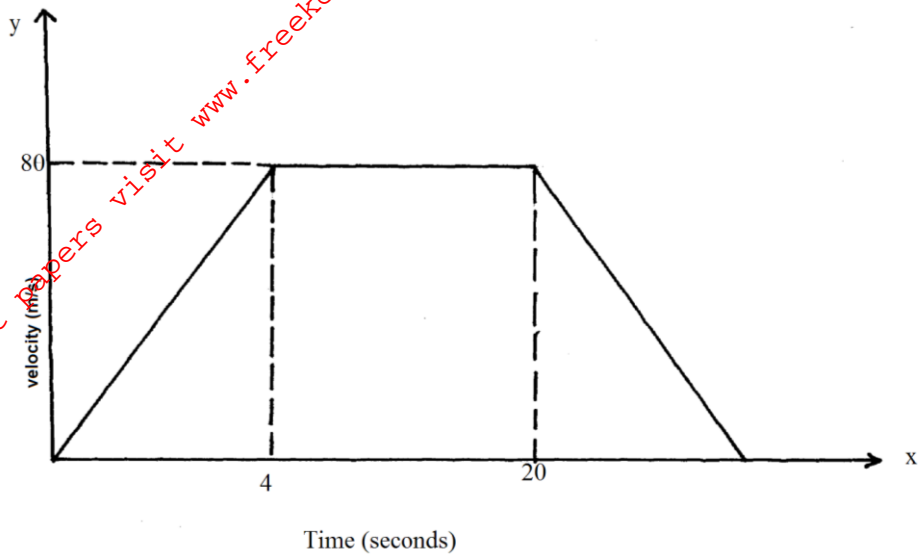
(b)  $\tan (90 - \theta)$

(3mks)

4. An open right circular cone has radius of 5cm and a perpendicular height of 12cm .Calculate the surface area of the cone.(Take  $\pi$  to be 3.14) (3mks)

5. Nyongesa spends a total of sh.970 on buying 3 text books and 5 pens. If he had bought 2 text books and 5 pens he would have saved sh.90. Find the cost of one text book. (3mks)

6. The figure below is a velocity –time graph for a car



(a) Find the total distance traveled by the car? (2mks)

(b) Calculate the deceleration of the car. (2mks)

7. Three towns are situated in such a way that town B is 40km due south of town A and town C is 30 km due East of town B.

(a) Draw a sketch diagram showing the position of town A,B and C. (1mk)

(b) From your sketch, calculate:

(i) Distance AC (1mk)

(ii) To the nearest degree the bearing of town A from town C. (2mks)

8. A Kenyan tourist left Germany for Kenya through Switzerland. While in Switzerland he bought a watch worth 52 Deutsche marts. Find the value of the watch in;

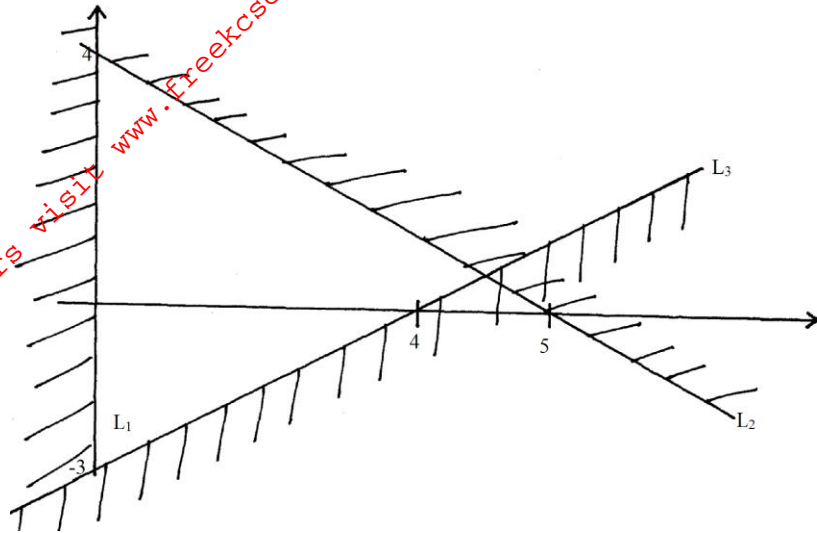
(a) Swiss Franca (2mks)

(b) Kenya shillings using the exchange rates below,

1 swiss Franc = 1.28 DM and 1 Swiss Franc = 45.21 Kenya shillings

9. Find the inequalities that defines the region R shown in the figure below

(4mks)

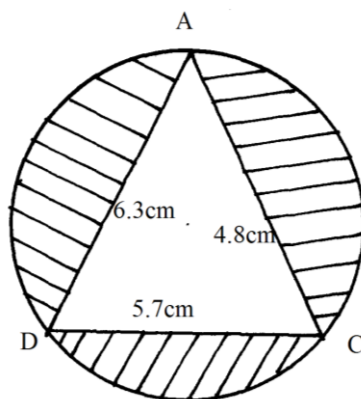


10. Form the quadratic equation whose roots are  $x = -\frac{5}{3}$  and  $x = 1$

(2mks)

11. ABCD is a circle quadrilateral and AB is a diameter. Angle  $ADC=117^\circ$ . Giving reasons for each step, calculate the value of angle BAC. (3mks)

12. The circle below whose area is  $18.05\text{cm}^2$  circumscribes a triangle ABC where  $AB=6.3\text{cm}$ ,  $BC=5.7\text{cm}$  and  $AC=4.8\text{cm}$ . Find the area of the shaded part. (3mks)



13. Solve for x in the equation

$$9^{(x-1)} \times 3^{(2x+1)} = 243$$

(3mks)

14. A form IV maths teacher originally worked out the mean mark of her 30 students to be 41. After the correction of the test, she added some marks of the test, she added some marks to Njoki, Chelimo and Nafula in the ratio 2:3:4, if the new mean mark for the class is 42.5 determine how many more marks Nafula was added than Chelimo.

(3mks)

15. The volumes of two similar solid cylinders are  $4752 \text{ cm}^3$  and  $1408 \text{ cm}^3$ . If the area of the curved surface of the smaller cylinder is  $352 \text{ cm}^2$ , find the area of the curved surface of the larger cylinder

(2mks)



16. The line which joins the point A (3, K) and B (-2, 5) is parallel to the line whose equation is  $5y+2x-7=0$ . Find the value of K. (3mks)

**SECTION II (50 MARKS)**

**Attempt only FIVE questions in this section**

17. A newly built classroom measuring 6m long 4.5m wide and 3.2 m high is to be cemented on the floor and all inside walls. The classroom has one door measuring 1.85m by 80cm by 80cm and four windows measuring 1.5m by 70cm each. Cementing materials cost 500 per square meter while labour costs 20% of the cost of cementing materials.

Calculate:

- (a) To one decimal place, the total surface area to be cemented (5mks)

- (b) The cost of cementing materials (2mks)

(c) The total cost of cementing the classroom (3mks)

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

(a) Determine the values of

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

(ii)  $2xy$  (2mks)

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

(iv)  $x-y$

(2mks)

(b) Find the value of  $x$  and  $y$

(2mks)

19. A country bus left town A at 11.45 am and traveled towards town B at an average speed of 60km/h. A matatu left town B at 1.15 pm. On the same day and traveled towards town A along the same road at an average speed of 90km/h. the distance between the two towns is 540km.

Determine

(a) The time of day when the two vehicles met

(4mks)

(b) How far from town A they met

(2mks)

(c) How far outside town B the bus was when the matatu reached town A (4mks)

20. The table below shows the names of 200 persons measured to the nearest kg

Mass (kg)	40-49	50-59	60-69	70-79	80-89	90-99	100-109
No. of persons	9	27	70	50	26	12	6

(a) Calculate the mean mass (5mks)

(b) Calculate the median mass (5mks)

21. (a) Complete the table below by filling in the blank spaces

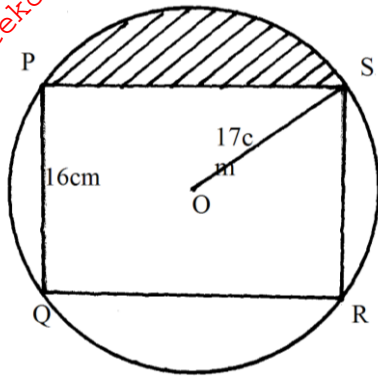
$X^\circ$	0	30	60	90	120	150	180	210	240	270	300	330	360
$\cos x$	1.00		0.5			-0.87		-0.87					
$2 \cos \frac{1}{2} x$	2.00	1.93				0.52			-1.00				-2.00

Using the scale km to represent 300 on the horizontal axis and 4cm represent 1 unit on the vertical axis, draw on the grid provided the graphs of  $y = \cos x$  and  $y = 2 \cos \frac{1}{2} x$  (4mks)

(b) Find the period and amplitude of  $y = 2 \cos \frac{1}{2} x$  (2mks)

(c) Describe the transformation that maps the graph of  $y = \cos x$  on the graph of  $y = 2 \cos \frac{1}{2} x$  (2mks)

22. The figure below represent a rectangle PQRS inscribed in a circle centre O and radius 17cm. PQ = 16cm.



Calculate

(a) The length PS of the rectangle (2mks)

(b) The angle ROS (4mks)

(c) The area of the shaded region (4mks)

23. (a) (i) Complete the table below for the function

$$Y=x^3+x^2-2x$$

(2mks)

X	-3	-2	-1	0	1	2	2.5
-2x	6	4	2	0	-2	-4	-5
X <sup>2</sup>	9	4	1	0	1	4	6.25
X <sup>3</sup>	-27	-8	-1	0	1	8	15.625
Y=x <sup>3</sup> +x <sup>2</sup> -2x							

(ii) On the grid provided, draw the graph of  $y=x^3+x^2-2x$  for the values of x in the interval  $-3 \leq x \leq 2.5$

(4mks)

(iii) State the range of negative value of x for which y is also negative

(1mk)

(b) Find the coordinates of two points on the curve other than (0,0) at which x-coordinate and y-coordinate are equal.

(3mks)

24. Use a ruler and a compass only for all constructions in this section.
- (a) Construct a triangle XYZ in which  $XY = 6\text{cm}$ ,  $YZ = 5\text{cm}$  and angle  $XYZ = 120^\circ$ . (2mks)
- (b) Measure XZ and angle YXZ. (4mks)
- (c) Construct the perpendicular bisector of XZ and let it meet XZ at M (1mk)
- (d) Locate a point W on the opposite side of XZ as Y and that  $XW = ZW$  and  $YW = 9\text{cm}$  and hence complete triangle XZW. (3mks)