NAME……..……..……INDEX NO…..……

SCHOOL……..…….

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MATHEMATICS
PAPER 1
JULY / AUGUST 2010
2 ½ HOURS

KAKAMEGA NORTH DISTRICT JOINT EVALUATION TESTS

Kenya Certificate of Secondary Education (K.C.S.E) 2010

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MATHEMATICS
PAPER 1
JULY / AUGUST 2010

INSTRUCTIONS TO CANDIDATES

1. *Write your name and index number in the spaces provided at the top of this page.*
2. ***Sign and write the date of examination in the space provided above.***
3. *The paper consists of two sections:* ***Section I and Section II.***
4. *Answer* ***all*** *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 space provided below each question*
6. *Show all the steps in your calculation, giving your answers at each stage in the spaces below each question.*
7. *Non- programmable silent electronic calculators* ***and KNEC*** *Mathematical tables may be used, except where stated otherwise.*

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 (50 MARKS)

Answer all the questions in this section.

1. **Evaluate** without using mathematical tables or calculators, the square root of

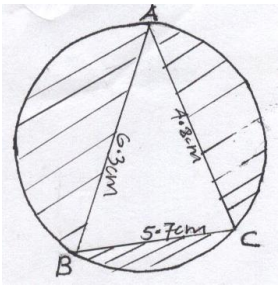
$$\frac{0.0273 \times 1.152}{1.3 \times 1.68}$$ (3mks)

2. **Find** the integral values of the following simultaneous linear inequalities.
$\frac{x+2}{2} \geq 5; \frac{x+6}{4} < 4$ (3mks)

3. A cold water tap can fill a bath in 10 minutes while a hot water tap can fill it in 8 minutes. The drainage pipe can empty it in 5 minutes. The cold water and hot water taps are left running for 4 minutes. After which all the three taps are left running. **Find** how long it takes to fill the bath. (3mks)

4. The hire purchase term of a cupboard is a deposit of Ksh. 4,400 and six monthly instalments of ksh. 900 each. The hire purchase price is 175% of the cost price while the cash price is 25% more than the cost price. **What** is the cash price of the cupboard? (3mks)

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



6. A teacher gave his form four class a quiz in mathematics which was marked out of 50 marks. The distribution of the marks was as shown in the table below.

Mark	10-14	15-19	20-24	25-29	30-34	35-39	40-44
Frequency	2	4	6	10	9	7	2

Calculate the median of this class. (2mks)

7. The actual area of an estate is 3510 hectares. The estate is represented by a rectangle measuring 2.6cm by 1.5 cm on the map whose scale is 1:n. **Find** the value of n. (3mks)

8. Wasike and Wanjala live 40km apart. Wasike starts cycling from his home at 8.00a.m toward's Wanjala's house at 16km/h. Wanjala stars cycling towards Wasike's house 30 minutes later at 8km/h. **what** time did they meet. (3mks)

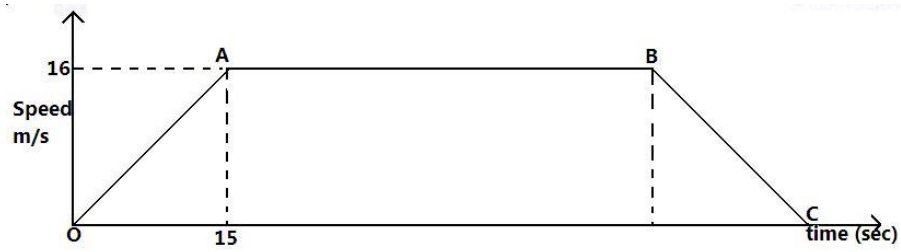
9. **Solve** for x in the equation

$Log_8\ (x+6) - Log_8(x-3) = \frac{2}{3}$ (4mks)

10. The surface area of a spherical ball is increased by 21% after pressure was pumped in.
    (a) **Find** the circumference of the original ball if the one with increased pressure has a circumference of 55cm. (2mks)

    (b) **Calculate** the percentage increase in volume of the ball. (2mks)

11. The figure below shows speed time graph of a journey. If total distance travelled in 80 second is 920m



i. **Calculate** the acceleration during the first 15 seconds. (1mk)

ii. The distance travelled in the final 40 seconds. (2mks)

12. Use table of cubes and reciprocals to **evaluate**.

$$45.7^3 - \sqrt[3]{4411} + \frac{1}{0.07897}$$ (4mks)

13. Given the simultaneous equations:

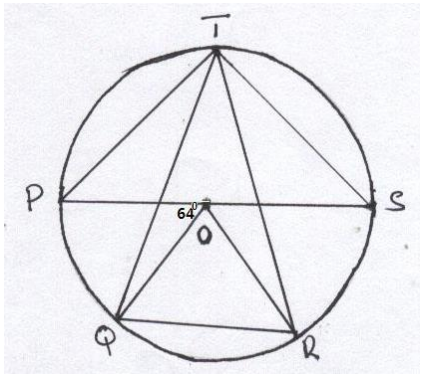
$5x + y = 19$

$-x + 3y = 9$

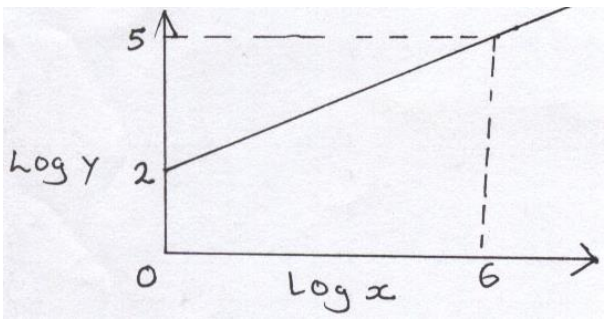
Write down the equations in matrix form hence find the values of x and y. (3mks)

14. A man invests Ksh. 24,000 in an account which pays 16% interest p.a. the interest is compounded quarterly. **Find** the amount in the account after 1 ½ years. (3mks)

15. The figure shows a circle centre O with line POS as a diameter. QOR is an equilateral triangle and PT =ST. given that $\angle POQ = 64^0$, **find** the sizes of $\angle SPT$ and $\angle STR$. (3mks)



16. The figure below shows the graph of logy against logX



If the law connecting x and y is of the form $y = ax^b$, where a and b are constants. **Find** the values of a and b. (3mks)

SECTION II (50 MARKS)

Answer any FIVE questions in this section.

17. Income tax for all the income earned was charged at the rates shown:

Total income p.a(K£)	Rate in Sh. Per K£
1 - 1980	2
1981 - 3960	3
3961 - 6440	5
6441 - 7920	7
7921 - 9900	9
Excess of 9900	10

a) Wanyonyi earned a salary of Sh. 10,500 per month. In addition he was given a house allowance of Sh. 6500 per month. He got family relief of Sh. 300 per month. **Find**

(i) His taxable income P.a (2mks)

(ii) Income tax he pays per month. (6mks)

b) Apart from income tax, the following deductions are made per month. NHIF of Sh. 320. Widow and pension scheme of 2% of his gross salary. **Calculate** his net monthly pay. (2mks)

18. A straight line passing through the points (8,-2) and (4,-4) has its equation in the form ax + by + c = 0, where a, b and c are integers.

a) **Determine** the numerical values of a, b and c. (3mks)

b) If the line in (a) above cuts the x-axis at point P, **determine** the coordinates of P. (2mks)

c) Another line, which is perpendicular to the line in (a) above passes through point P and cuts the y axis at Q. **determine** the coordinates of point Q. (3mks)

d) **Find** the length of QP (2mks)

19. A helicopter is stationed at an airport H on a bearing of 060^0 and 800km from another airport P. A third airport J is on a bearing of 140^0 and 1200km from H.

a) Using a scale of 1cmrep. 100km.

(i) **Show** the relative positions of P, H and J (3mks)

(ii) **Determine** the distance between P and J. (2mks)

(iii) State the bearing of P from J. (2mks)

b) A jet flying at a speed of 1.035Km/hr left J towards P. The helicopter at H also took off towards P at the same time. Find the speed at which the helicopter will fly so as to arrive at P, 12 minutes later than the jet. (3mks)

20.**Using** a ruler and a pair of compasses only construct.

a) A line PQ, 8cm long. On the line construct triangle PQR such that $\angle$ QPR = 75^0 and line PR = 7cm. measure line QR (4mks)

b) **Construct** a circum circle of triangle PQR and measure its radius. (3mks)

c) **Calculate** the difference in area between the circle and triangle PQR. (3mks)

21. A two digit number is such that its value is equal four times the sum of its digits. If the digits are interchanged, the new number formed exceeds two-thirds of the original number by 52. **Find** the original number. (5mks)

(b) The prices of admission to a concert are as follows:

Primary school children	-	Ksh. 100 each
Secondary students	-	Ksh. 200
University	-	ksh. 400

One day the money taken from the university students was twice the proceeds of the primary sales while four times as many as tickets sold to secondary as to primary. If the total collections at the ticket office were Sh. 22,000, **find** the number of tickets which were sold altogether. (5mks)

22. Four ships are at sea, such that ship B is 520km on a bearing of 210^0 from ship A. Ship C is due North of ship B and due west of ship A. The fourth ship D is 100km on a bearing of 340^0 from ship A and 240km on a bearing of 070^0 from C.

(a) **Draw** a rough sketch showing the positions of ships A, B, C and D.

(b) Use your sketch to **find** the size of

(i) angle ADC (1mk)

(ii) angle BAD (1mk)

(c) **calculate** to the nearest whole number
(i) the distance of C from A. (2mks)

(ii) the area of the quadrilateral ABCD. (4mks)

(d) determine the bearing of B from D

23. (a) Given that $y = 7 + 3x - x^2$, complete the table below.

X	-3	-2	-1	0	1	2	3	4	5	6
Y	-11			7						-11

(2mks)

(b) On the grid provided and using a suitable scale, draw the graph of
$y = 7 + 3x - x^2$ (3mks)

Graph paper

(c) On the same grid draw the straight line and use your graph to solve the equation. $x^2 - 4x - 3 = 0$ (3mks)

(d) **Determine** the coordinates of the turning point of the curve.

24. A parallelogram has the lengths of its two diagonals being $4\sqrt{5}$ cm and $8\sqrt{5}$ cm. The acute angle made by the diagonals at the point of intersection is 60^0
(do not use mathematical tables and calculators in part (a) and (b) of this question)

Calculate

a) the perimeter of the parallelogram (4mks)

b) the angles of the parallelogram. (4mks)

c) The area of the parallelogram (2mks)