NAME…………………………………………….......   INDEX NO………………………..

SCHOOL……………………………………………..   SIGN..……………………………

DATE…………………………..

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

MARAKWET WEST DISTRICT JOINT EVALUATION TEST– 2012(MAWESSE)
Kenya National Examination Council (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)   This paper consists of TWO sections: Section **I** and **II**.
(d)   Answer **ALL** the questions in section **I** and only **FIVE** questions from section II.
(e)   All answers 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.

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1

SECTION I (50 MARKS)
Answer ALL the questions in this section in the spaces provided.

1.   Use tables of square ,cubes roots and reciprocals to find the value of x if   (3mks)

$$x = \sqrt[3]{\frac{1}{0.2365} + \frac{2}{(2.6228)^2}}$$

2.   In Barsumbat mixed secondary school, there are 120 more boys than girls. Half of the boys are $\frac{2}{3}$ of the girls are boarders. If there are 480 boarders, find the total number of students in the school.   (3mks)

3.   Solve for x in the equation   (3mks)

$$\left(\frac{1}{16}\right)^{x-\frac{3}{4}} = 32$$

4. Given that $-\dfrac{3}{5}x + 3y - 6 = 0$ is an equation of a straight line. Find:

    (i)   The gradient of the line   (1mk)

    (ii)   Equation of a line passing through point (2,3) and parallel to the given line   (2mks)

5. Simplify $\dfrac{2x^2 + x - 6}{x^2 - 4} + \dfrac{1}{x - 2}$ (3mks)

6. Two containers have base area of 750cm^2 and 120cm^3 respectively. Calculate the volume of the larger container in litres given that the volume of the smaller container is 400cm^3.   (3mks)

7. Solve for x given that:
    Log (x-4)+2=log 5+log(2x+10)   (3mks)

8. The sum of the interior angles of a polygon is 1980^0. How many triangles can this polygon be divided into.   (3mks)

9. The number 5. $\overset{\bullet\bullet}{81}$ contains integral part and a recurring decimal. Convert the number into an improper fraction and hence a mixed fraction.   (3mks)

10.   In the figure below, ABCD is a parallelogram. AD is produced to E and BE and CD meet at F.
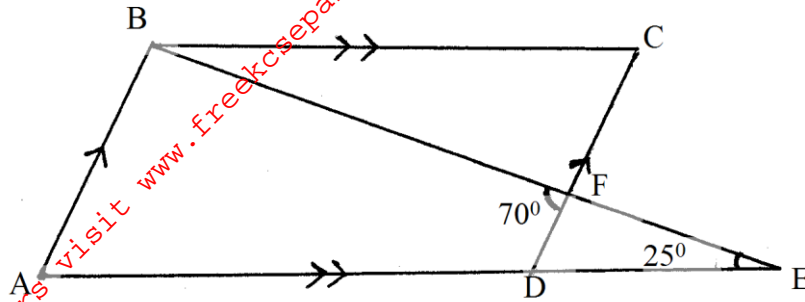
If angle DEF=250 and angle BFD=700, find the size of angle ABF.   (3mks)

11.   Mr.Waweru needs to import a car from Japan where cost is US$ 50000 outside Kenya. He intends to buy the car through an agent who deals in Japanese Yen, The agent will charge him 205 commission on the price of the car and further 80,325 Japanese Yen for shipment of the car. How many Kenya shillings will he need to send to the agent to obtain the car given that?   (3mks)
   1 US$=105.00 Yen
        1U$=Ksh.63.00

12. Calculate the area in hectares of a farm whose measurements are entered in a surveyors field book as shown below.(All measurements are in meters). (4mks)
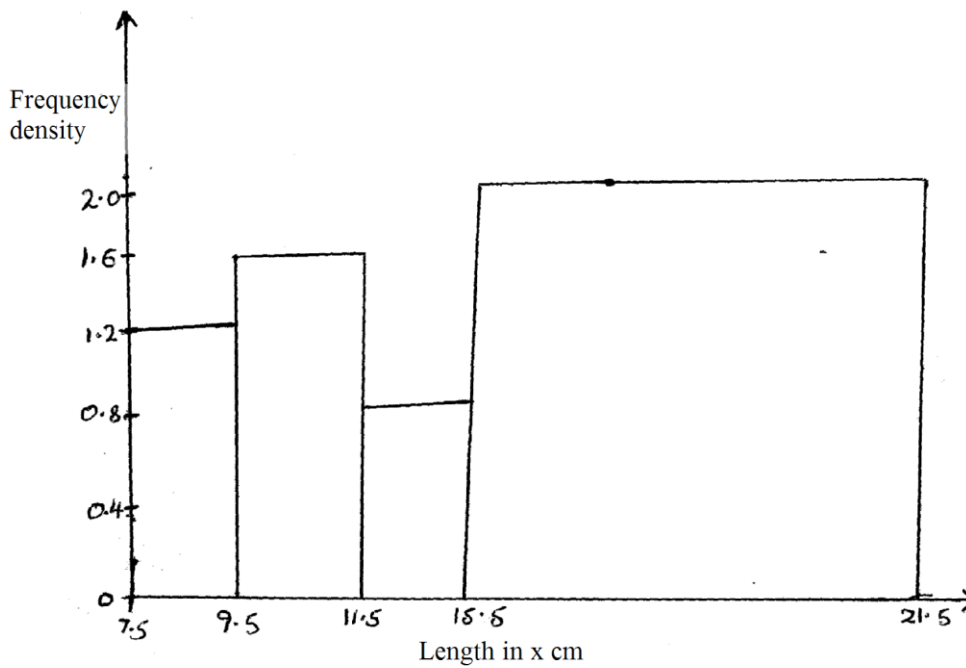
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                          │ D      │
                          │        │
                          │ 37     │
                          │        │
                          │ 27     │ 8E
                          │        │
                     C6   │ 21     │
                          │        │
                          │ 18     │ 6F
                          │        │
                     B12  │ 16     │
                          │        │
                          │ 10     │ 15G
                          │        │
                          │ A      │
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13. Vector $\overrightarrow{m}$ passes through the points (6,8) and (2,4).Vector $\overrightarrow{n}$ passes through (x,2) and (-5,0).If $\overrightarrow{m}$ is parallel to $\overrightarrow{n}$, determine the value of x. (3mks)

14. Calculate the area of the shaded segment of the circle given in the figure below. (3mks)
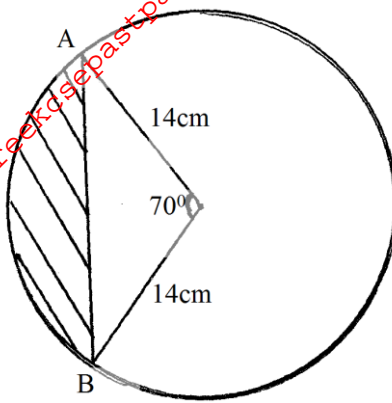
15. The figure below shows a histogram

Length in x cm

Fill in the table below the missing frequencies. (3mks)

Length in xcm	Frequency	
$7.5 \leq x \leq 9.5$	12	
$9.5 \leq x \leq 11.5$		
$11.5 \leq x \leq 15.5$		
$15.5 \leq x \leq 21.5$		

16. Object A of area 10cm^2 is mapped onto its image B of area 60cm^2 by a transformation .Whose matrix is given by $p = \begin{pmatrix} x & 4 \\ 3 & x+3 \end{pmatrix}$ find the possive values of X (3mks)

Answer any five questions in this section in the space provided.

17.   A bus travels from Nairobi to Kisumu a distance of 320 km at a speed of x km/hr. If the speed is reduced by 20km/hr the bus would take 48 minutes more.

   (a)   Form an equation to represent the given information and simplify it   (4mks)

   (b)   Find the speed of the bus   (3mks)

   (c)   Determine the time taken by the bus for the whole journey   (1mk)

   (d)   Another car is moving from Kisumu to Nairobi at a speed of 80km/h. Determine their relative speed.   (2mks)

18. In a physics test student scored the following marks.
    72 50 43 58 62 49 69 60 84 62 55
    89 67 92 81 75 63 77 95 65 54 35
    45 73 41 56 50 36 49 58 61 85
    38 64 76 78 51 43 72 37 62 55

    (a)   Using a class width of 10 and 35-44 as the first class, make a frequency table of the
          grouped data.   (5mks)

    (b)   Estimate
          (i)   the mean   (2mks)

          (ii)   the median   (3mks)

19. The accerelation of a particle at a time to seconds is given by $a=3t^2-6t \text{m}/^2$. When $t=1$, the velocity of the particle is 6m/s. Find

(a) The equation representing the velocity of the particle at any time. (3mks)

(b) (i) the time when the particle attains constant velocity (2mks)

(ii) the constant velocity at that time (2mks)

(c) The distance travelled by the particle between $t=2\text{s}$ and $t=6$ sec. (3mks)

20. Matrix P is given by
$$\begin{pmatrix} 4 & 7 \\ 5 & 8 \end{pmatrix}$$
   (a) Find p^{-1} (3mks)

   (b) Two institutes regions and Alphax purchased beans at sh.B per bag and maize at sh.M per bags. Regions purchased 8 bags of beans and 14 bags of maize for sh. 47,600.Alphax purchased 10 bags of beans and 16 bags of maize for sh. 57,400.
      (i) form a matrix equation to represent the information above (2mks)

      (ii) Use the matrix p^{-1} to find the prices of one bag of each item (3mks)

   (c) The price of bean later went up by 5% and that of maize remain constant. Regions bought the same quality of beans but spent the same total amount of money as before on the two items. State the new ratio of beans and maize. (2mks)

21. Easy coach bus left Nairobi at 8.00am and traveled towards, Eldoret at an average speed of 80km/hr.8.00a.m a car left Eldoret towards Nairobi at an average speed of 120km/h.Given that the distance between Nairobi and Eldoret is 400km.Calculate

(a)   the time the car arrived in Nairobi   (2mks)

(b)   the time the two vehicles met   (4mks)

(c)   the distance from Nairobi to the meeting point   (2mks)

(d)   the distance of the bus from Eldoret when the car arrived in Nairobi   (2mks)

22. Joy is a sales executive earning a salary of Ksh.20,000 and a commission of 8% for the sales in excess of sh.100,000.
If in April she earned a total of Ksh.48,000 in salaries and commission.
   (a)   Determine the amount of sales she made in that month   (4mks)

   (b)   If the total sales in the months of May and June increased by 18% and then dropped by 30% respectively, calculate;
      (i)   Joy's commission in the month of May   (3mks)

      (ii)   Her total earnings in the month of June   (3mks)

23. Four towns P,Q,R and S are such that town Q is 120km due East of town P.Town R is 160km due north of town Q, town S is on a bearing of 330⁰ from [and on a bearing of 300^0 from R.

   (a) Use a ruler and compasses only to show the position of towns P, Q, R and S. (Take scale of 1cm=40km).

   (b) Determine
       (i) the distance SP   (2mks)
       (ii) the distance SR   (2mks)
       (iii) the bearing of town S from town Q   (1mk)

24. Two equal circles with centres O and Q and radius 8cm intersect at point A and B as shown below
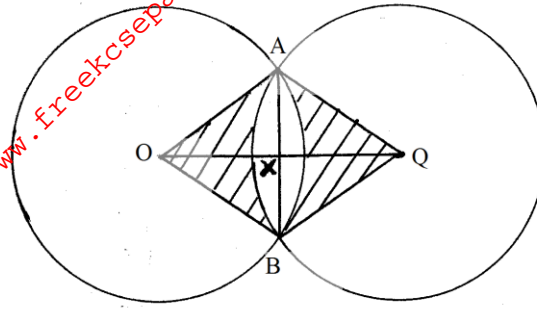
Given that the distance between O and Q is 12cm and that line AB meets OQ at X, find

(a)   the length of chord AB   (2mks)

(b)   the area of the shaded region   (6mks)

(c)   the reflex angle AOB   (2mks)

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