NAME:……………………………………………… INDEX NO:…………………………

SCHOOL:…………………………………………….. DATE:………………………………

SIGN:……………………………..

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

MANGA DISTRICT JOINT EVALUATION EXAM– 2012
Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS TO CANDIDATES
1.   Write your name and index number in the spaces provided on top of this page.
2.   The paper contains TWO sections, section I and section II .
3.   Answer ALL the questions in section I and any FIVE(5) questions from
       section II.
4.   ALL answers and working must be written on the question paper in the spaces provided
       below each question.
5.   Marks may be given for correct working even if the answer is wrong.
6.   Negligence and slovenly work will be penalized
7.   Non-programmable silent electronic calculators and KNEC mathematical tables may be
       used.

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   GRAND TOTAL

17	18	19	20	21	22	23	24	TOTAL

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

SECTION I (50 MARKS)

1. Without using mathematical tables or calculators, evaluate the following leaving your answer as a fraction in its simplest form. (3mks)

$$3\sqrt{\frac{0.119 \times 0.256}{0.068 \times 7}}$$

2. Two boys and a girl shared some money .The elder boy got $\frac{4}{9}$ of it, the younger boy got $\frac{2}{5}$ of the reminder and the girl got the rest. Find the percentage share of the younger boy to the girl's share. (4mks)

3. From a point A, the angle of elevation of top of a watch tower is 20^0.From another point which is 25m from the base of the tower, the angle of elevation of the top of the tower is 26^0.Giving your answer to three decimal places, determine the height of the tower and hence calculate the distance between the points A and B if they are both on the same side of the tower and lie on a straight line with the base of the tower. (3mks)

4. If X is a positive integer, find all possible values of x given that $1 < \frac{2}{5}x^2 < 7$. (3mks)

5. A train whose length is 60 metres is travelling at 40km/h in the same direction as a bus whose length is 20m. If the speed of bus is 80km/h and moving parallel to the train, calculate the time it takes the truck to overtake the train completely in seconds. (3mks)

6. A positive two digit number is such that the product of the digits is 20. When the digits are reversed, the number so formed is greater than the original number by 9. Find the number.

7.   The diagram below shows a circle with centre P(5,5) and radius 5 units
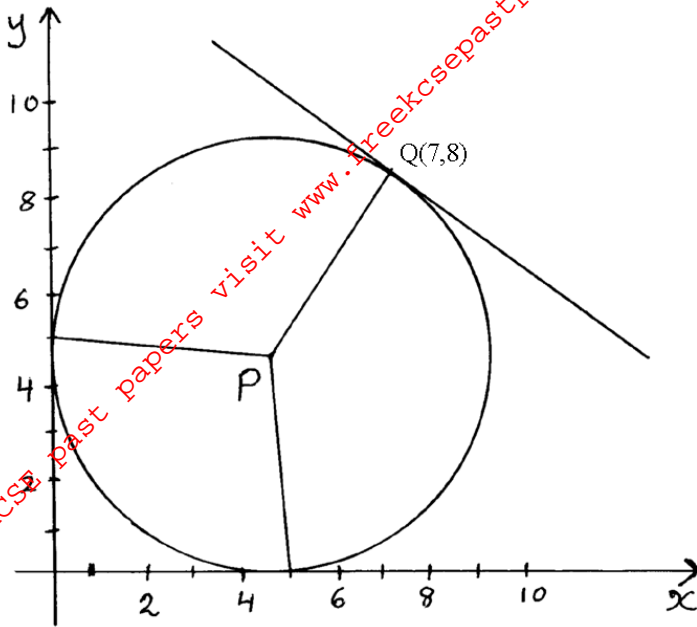
(a)   Write down in terms of x and y the equation of the circle in the form $ax^2+by^2+cx+dy+e=0$ where a,b,c,d and e are constants.   (1mk)

(b)   Determine the gradient of PQ   (1mk)

(c)   Find the equation of the tangent at Q in the form ax+by=c.   (2mks)

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8. Find the value of x in the following figure given that area A =Area B=Area C(Give your answer to 2 decimal places) (4mks)
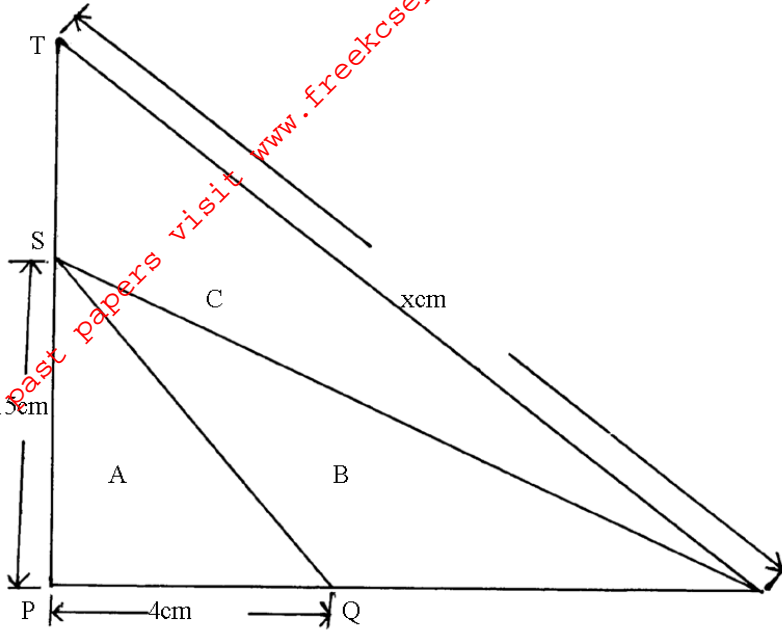
9. Odhis car Hire company hires out as follows; sh. 2500 per day and sh. 270 per kilometer covered. They offer a discount of 30km free each day of hire.Makori hires a car for 5 days and drives for 480km.Calculate the total cost. (2mks)

10. Omwando borrows sh. 90,000 for 5 years at $6\frac{1}{2}$ % simple interest p.a. What amount does he have to pay at the end of that time? (3mks)

11. Solve for t in the equation
$9^{t+1} + 3^{2t} = 30$. (3mks)

12. Given the curve $y= x^2-2x+6$, find the coordinates of the point on the curve at which the gradient is 4. (2mks)

13. Mary has some money in two denominations only. Fifty shilling notes and twenty shilling coins. She has three times as many fifty shilling notes as twenty shilling coins. If altogether she has sh. 3400, find the number of fifty shilling notes and 20 shilling coins.

14. In Ngamongo village, a piece of work can be completed by 45 workers in 10 days .They worked for 4 days after which 15 workers were laid off. How many days would it take the remaining workers to complete the work? (3mks)

15. The table below shows marks obtained by a form four class in a certain school.

Marks (x)	$8 \leq X < 9$	$9 \leq X < 11$	$11 \leq X < 13$	$13 \leq X < 16$	$16 \leq X < 20$	$20 \leq X < 21$
No. of students (y)	2	6	8	3	2	1

Use the table to represent the information on a histogram. (3mks)

16. Find the inverse of the matrix $\begin{pmatrix} 2 & 1 \\ 3 & 2 \end{pmatrix}$ and hence solve the simultaneous equations below. (4mks)

   2x+y=21

   3x+2y=34

SECTION II (50 MARKS)

## ANSWER ANY FIVE QUESTIONS.

17. A bag contains 5 red , 4 white and 3 blue beads. Two beads are selected at random.

   (a) Draw a tree diagram and list the probability space.   (3mks)

   (b) Find the probability that

      (i)   The last bead selected is red.   (2mks)

(ii)   The beads selected were of the same colour   (2mks)

(iii)   At least one of the selected beads is blue.   (3mks)

18.   In the figure below,O is the centre of the circle.PQR is a tangent to the circle at Q. Angle
       PQS=28^0,angle UTQ=54^0 and UT =TQ.
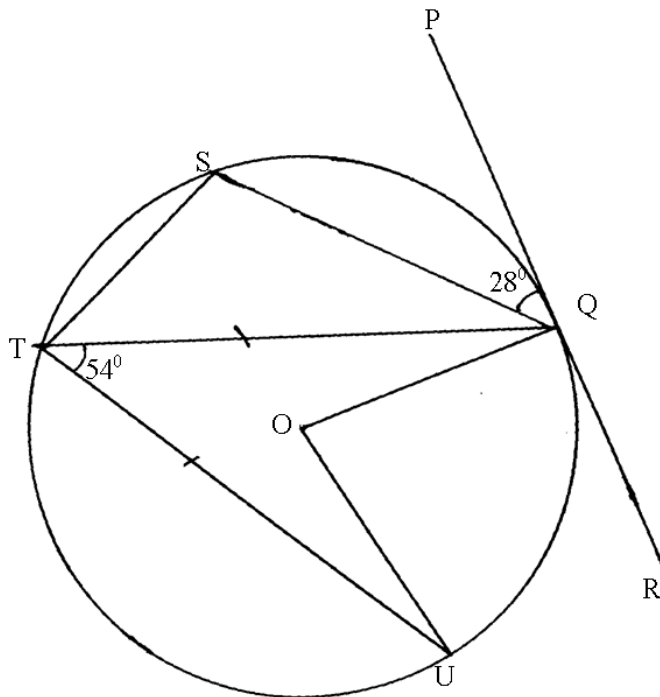
Giving reasons , determine the size of

(a)   Angle STQ.   (2mks)

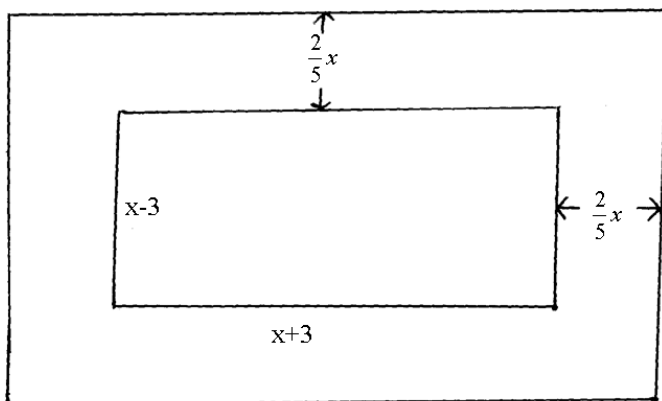(b)   Angle TQU.   (2mks)

(c)   Angle TQS   (2mks)

(d)   Reflex angle UOQ .   (2mks)

(e)   Angle TQR.   (2mks)

19.   The following figure represent a dancing floor with   a carpeted margin all around of $\frac{2}{5}x$ wide

leaving a dancing space of (x-3)m by (x+3)m

If the total area of the entire room is $315m^2$

(a)   Calculate the value of x.   (5mks)

(b)   Calculate the area of the carpeted margin.   (3mks)

(c)   If the carpet cost sh. 750 per m^2,calculate the total cost of the sealed margin.   (2mks)

20. A plane leaves an airport $P(10^0S, 62^0E)$ and flies due north at 800km/h.

(a) Find its position after 2 hrs. (3mks)

(b) The plane turns and flies at the same speed due west. It reaches Q longitude of 12^0W.

(i) Find the distance it has travelled in nautical miles (3mks)

(ii) Find the time it has taken (Take the radius of the earth to be 6370km and 1 nautical mile to be 1.853km) (2mks)

(c) If the local time at P was 1300 hrs when it reached Q, Find the local time at Q when it landed at Q . (2mks)

21. A car accelerates from rest for 10 seconds until it reaches a velocity of 12 metres per second.It then continues at this velocity for the next 40 seconds after which it brakes and comes to rest until a constant retardation of 1.5 meres per second

    (a)   Determine

        (i)   The acceleration over the first 10 seconds   (2mks)

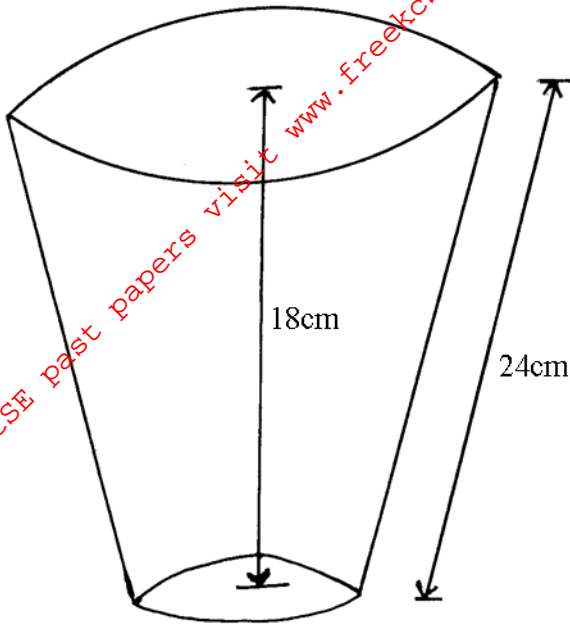   (ii)   The time taken during the retardation   (2mks)

    (b)   Draw the velocity time graph for the journey and use it to determine.

        (i)   The total distance covered by the car   (4mks)

        (ii)   The percentage of the total distance which was covered during the first 15 seconds.

                                                       (2mks)

22.   The diagram below shows a flower vase of depth 18cm. The ratio of the top and bottom diameters is 5:2 (Take Π =3.142)

Calculate

(a)   The volume of the flower vase   (7mks)

(b)   The curved surface area of the flower vase   (3mks)

23. Given that x-y=3 and 3x+y=17, find without solving for X and Y the value of

(a) $2xy-x^2-y^2$ (2mks)

(b) $6xy+y^2+9x^2$ (2mks)

(c) $3x^2-2xy+y^2$ (3mks)

(d) $\dfrac{3x^2 - 4xy + y^2}{9x^2 - y^2}$ (3mks)

24. Three Kenyan warships A,B and C are at sea such that ship B is 450km on a bearing of 030^0 from ship A. ship C is 700km from ship B on a bearing of 120^0. An enemy ship D is sighted 1000km due south of ship B.

(a) Taking a scale of 1cm to represent 100km locate the position of the ships A,B,C and D

(4mks)

(b) Find the compass bearing of :

    (i)   Ship A from ship D   (1mk)

    (ii)   Ship D from ship C   (1mk)

(c) Use the scale drawing to determine

    (i)   The distance of D from A   (1mk)

    (ii)   The distance of C from D   (1mk)

(d) Find the bearing of :

    (i)   B from C   (1mk)

    (ii)   A from C   (1mk)