

Name.....

Index No.

School

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

BUTERE-MUMIAS DISTRICT MOCK EXAMINATION-2007
Kenya Certificate of Secondary Education (K.C.S.E)

121/1
MATHEMATICS
PAPER 1
JULY / AUGUST
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INSTRUCTIONS TO CANDIDATES

1. Write your NAME and INDEX NUMBER in the spaces provided at the top of this page
2. Answer all questions in section I and any five questions in section II.
3. Show all the steps in your calculations giving your answer at each stage in the spaces below each question
4. Marks may be given for correct working even if the answer is wrong.
5. Non-programmable silent electronic calculators and KNEC Mathematical tables may be used.

Section I

FOR EXAMINER'S USE ONLY

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOTAL
Marks																	

Section II

Question	17	18	19	20	21	22	23	24	TOTAL
Marks									

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 1 (50 MARKS)

Answer all the questions in the spaces provided after each.

1. Evaluate

$$\frac{2/3 (1 - 2/5 + 1/4)}{7/30 + 1/3 \text{ of } 3/5}$$

(3mks)

2. a) A farmer has 3 containers of capacity 48, 36 and 27 litres. Find the capacity of the smallest container that can be filled by each one of them in an exact number of times. (2mks)

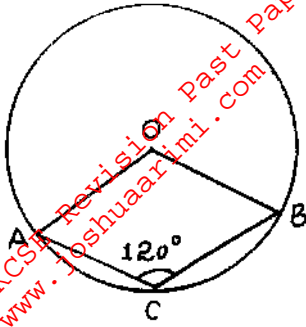
b) Find the largest capacity of the container which can be filled by each one of them in an exact number of times. (1mk)

3. Simplify

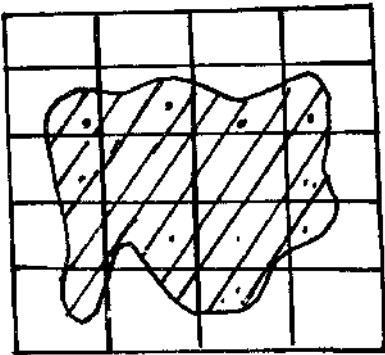
$$\frac{5(x - 2y) - 2(x - 8y)}{x^2 - 4y^2}$$

(3mks)

4. The figure below represents a wheel of diameter 28cm given $\angle ACB = 120^\circ$. Find the length of the major arc O is centre. (3mks)



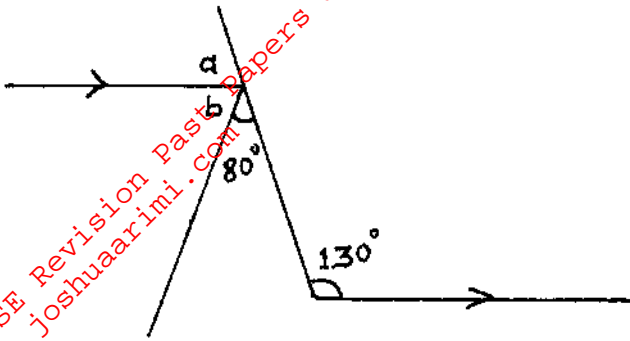
5. The shaded area represents Mumias Municipality region to 1:50,000. Estimate the area in hectares. (3mks)



6. An agent sells goods for a company and gets 10% commission on the first £1000 selling of the goods and 20% on the remainder. In one week he earned ksh.4000 as commission. What was the worth of the goods he sold. (4mks)

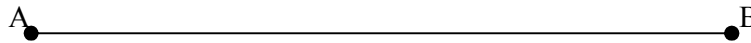
7. In the figure below, find the angles marked by a and b.

(2mks)



8. Construct a line AC such that $\angle BAC = 30^\circ$ and use AC to divide AB into six equal parts.

(3mks)



9. Use reciprocal and cuberoot tables to evaluate

(3mks)

$$\frac{1}{0.0375} - \sqrt[3]{\frac{1}{37.5}}$$

10. Find the value of x in the following equation.

$$25^{x-1} + 5^{2x} = 130$$

(4mks)

11. Two perpendicular lines intersect at (3,5). If one of the lines passes through (2,3), find the equation of the other line in the form $ax + by = c$. (3mks)

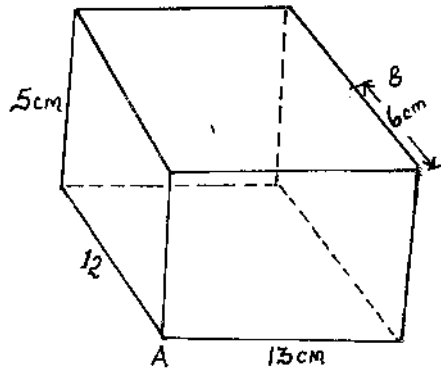
12. The image of the point A(4,-7) under the enlargement of scale factor -2 is A'(1,2). Determine the coordinate of the centre of enlargement.

13. The number of people who attended an agricultural show in one day was 510 men, 1080 women and some children. When the information is represented on the pie chart the combined angle for men and children was 216° . Find the angle representing the children. (4mks)

14. A car traveling at 90km/hr starts off at 11:15a.m due east and overtakes a truck traveling at 65km/hr due east at 11:27a.m. How far apart were the vehicles at 11:15a.m, if they both started traveling at the same time. (3mks)

15. Given that $\mathbf{a} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} -2 \\ 7 \end{pmatrix}$. Evaluate $|\frac{1}{2}\mathbf{a} + 2\mathbf{b}|$ (4mks)

16. Find the distance between points A and B on the surface of the solid drawn below. Correct to 3d.p (3mks)

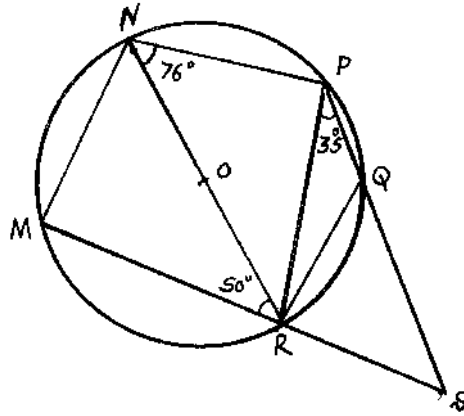


SECTION II (50 MARKS)

Answer all the questions in the spaces provided after each.

17. On the upper part of line RQ construct locus of points (10mks)
- a) T_1 such that angle $RTQ = 45^\circ$
 - b) M on RQ which is equidistant from R and Q.
 - c) S which is equidistant from R and Q and lies on T.
 - d) Calculate area bounded by loci T_1 and line RQ.

18. In the figure below NO is a diameter of a circle centre O . Given that $\angle PNR = 76^\circ$
 $\angle MRN = 50^\circ$ $\angle QPR = 35^\circ$.



Calculate giving reasons

a) angle PQR (1mk)

b) angle QSR (4mks)

c) obtuse angle POR (2mks)

d) angle MQR (1mk)

e) angle QPN (2mks)

19. The probabilities of Mary, Esther and John coming to school late on Monday are $\frac{1}{4}$, $\frac{2}{5}$ and $\frac{1}{3}$ respectively.

a) Draw a tree diagram to represent the information. (2mks)

b) Calculate the probability that (8mks)

- (i) All the three girls are late
- (ii) All except Esther are late
- (iii) At least one is late
- (iv) At most two girls are late.

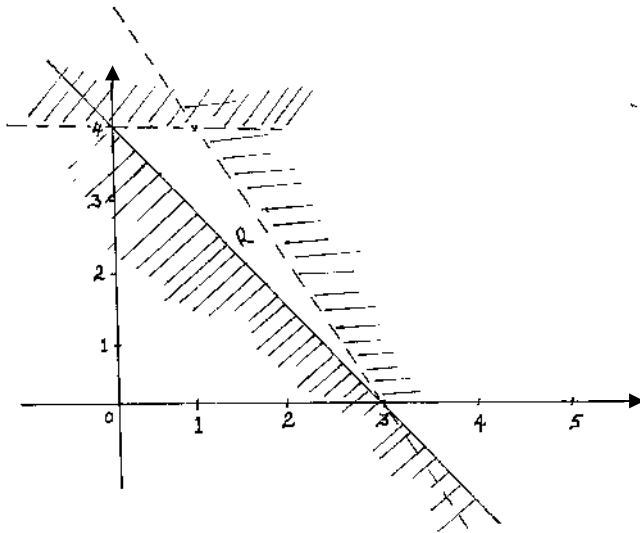
20. a) Solve the inequality and write your answer as a single statement and represent on a number line

$$2x - 4 \leq 4 > -3x - 5$$

(4mks)

- b) Write the inequalities satisfying the region below.

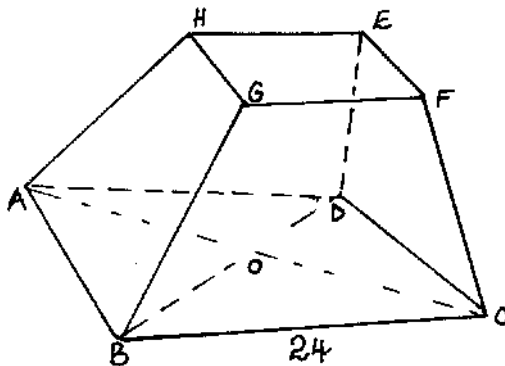
(5mks)



- c) Find the area of the required region.

(2mks)

21. The diagram below is a frustrum of a right pyramid of rectangular base ABCD measuring 24cm by 18cm. The frustrum was made by cutting off a small pyramid along the plane EFGH which is parallel to ABCD and exactly two thirds way up the vertical height of the original pyramid. EFGH is a rectangle measuring 8cm by 6cm.



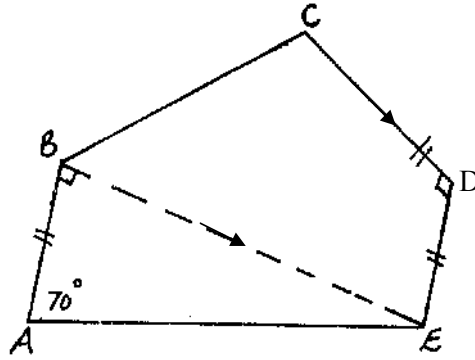
The slant height of the original pyramid is 36cm. Calculate

- a) Vertical height of the original pyramid to 1 decimal place. (3mks)

- b) The volume of the frustrum to the nearest whole number. (4mks)

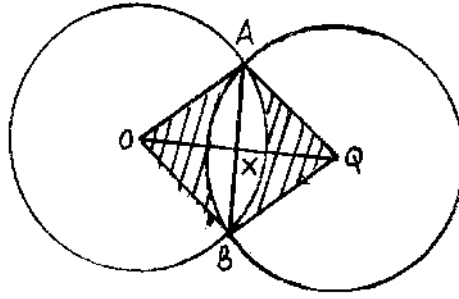
- c) The surface area of the original pyramid to the nearest whole number. (3mks)

22. Find the area of the pentagon ABCDE in which $AE=5.5\text{cm}$, $\angle A=70^\circ$ and BE is parallel to CD as shown below. $CD=DE=AB$. (10mks)



23. Three towns X, Y and Z are such that X is on bearing of 120° and 20km from Y. Town Z is on a bearing of 220° and 12km from X
- a) Using a suitable scale draw the position of x,y and z. (3mks)
- b) Find :-
- (i) the distance between Y and Z in km (1mk)
- (ii) The bearing of x from z. (1mk)
- (iii) The bearing of z from y
- (iv) The area of the figure bounded by XYZ. (4mks)

24. Two equal circles with centres O and Q and radius 8cm intersect at point A and B as shown below.



Given that the distances between O and Q is 12cm and that line AB meets OQ at X.

Find:-

- a) the length of the chord AB. (2mks)
- b) the area of the shaded region. (6mks)
- c) the reflex angle AOB. (2mks)

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