456/1
Mathematics
Paper 1
June/July 2019
2½ hours

BUGANDA EXAMINATIONS COUNCIL MOCKS

Uganda Certificate of Education

MATHEMATICS

PAPER 1

2 HOURS 30 MINUTES

INSTRUCTIONS TO CANDIDATES:

- Attempt **ALL** questions in section **A** and not more than **FIVE** questions from section **B**.
- All necessary calculations **MUST** be shown on the same page as the rest of the answers.
- Mathematical tables and graph papers will be provided
- Silent, non-programmable scientific calculators may be used.

SECTION A (40 Marks)

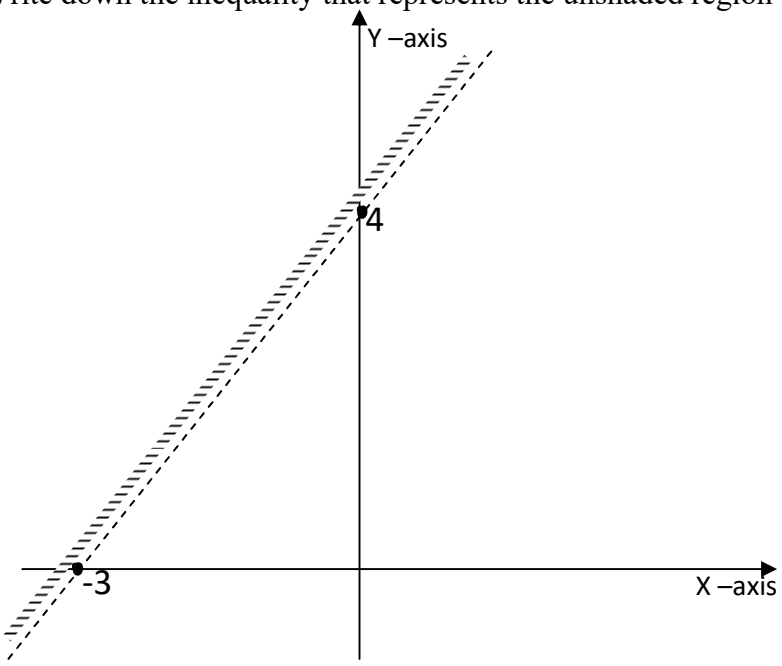
Attempt all questions in this section

1. Given that $p * q = 5 - p^q$, evaluate $\left(64 * {}^{1}/_{3}\right) * 100$ (4marks)

2. Simplify the expression; $\dfrac{2x+4}{x^2+3x+2}$ (4marks)

3. The means of the numbers: f, f, - 4, f – 1, f + 2, and 2f + 3 is 2.4. Find the value of f. (4marks)

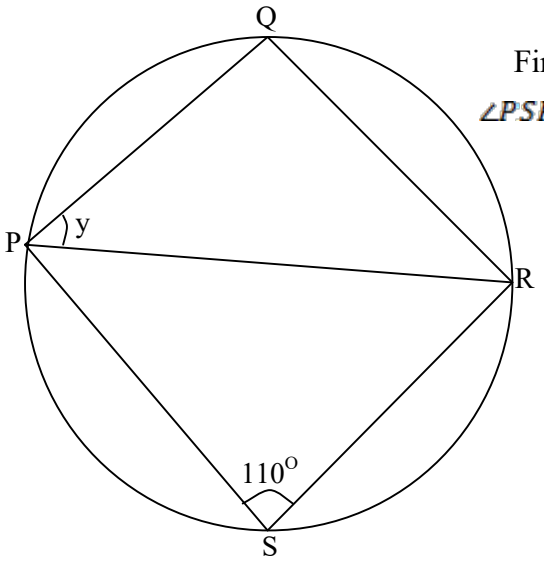
4. Write down the inequality that represents the unshaded region shown in the figure below:



(4marks)

5. Given that 15 tan Θ + 8 = 0 and Θ is a reflex angle, evaluate without using tables or a calculator the value of cosΘ + 4sinΘ. (4marks)

6. The coordinates of P (8,0) after an enlargement with linear scale factor – 2 about the centre of enlargement (2, -5) are $P^1(x, y)$. Find the value of x and y. (4marks)

7. 

Find the value of y given that $\overline{PQ} = \overline{QR}$ and that $\angle PSR = 110^{o}$ (4marks)

8. Solve the inequality: $\frac{3p-1}{2} - \frac{2p-1}{3} \leq \frac{5-p}{4}$ (4marks)

9. Given that $A^{-1} = \begin{pmatrix} -1 & 4 \\ -1 & 2 \end{pmatrix}$, determine the matrix A. (4marks)

10. A bag contains 4 green marbles, 6 red marbles and some yellow marbles. If the probability of picking a yellow marble from the bag is $^{1}/_{6}$, find the total number of marbles in the bag. (4marks)

SECTION B: (60 marks)

Attempt any ***FIVE*** questions in this section.

11(a) Simon uses one third of his farm for bananas, one quarter for coffee and two fifth of the remainder for mixed farming. She still has some six acres of unused land. Find the size of his farm. (5marks)

(b) Buddo S.S has a student population of 1200 students. On a particular day, $^{1}/_{5}$ of the boys and $^{1}/_{4}$ of the girls went to WAKISHA resource centre for a sports meeting. If 936 students were left behind, find how many more boys than girls attended the meeting. (7marks)

12. The table below shows the marks obtained in a mathematics examination by the S. 4's with their respective cumulative frequencies.

Marks	Cumulative frequency (c.f)
20 – 29	2
30 – 39	10
40 – 49	24
50 – 59	50
60 – 69	78
70 – 79	88
80 - 89	92

(a)(i) Draw an ogive to represent the above data.
(ii) Estimate the median mark from the ogive

(b) Using an assumed mean of 54.5, calculate the mean mark. (12marks)

13. A quadrilateral P Q R S has vertices P (1, 0), Q (3, 0), R (3, 1) and S (1, 1). It undergoes a transformation by matrix A = $\begin{pmatrix} 3 & -1 \\ 0 & 3 \end{pmatrix}$ to be mapped onto P^1, Q^1, R^1 and S^1.
The image P^1, Q^1, R^1, S^1 further undergoes a transformation represented by matrix B = $\begin{pmatrix} -3 & 1 \\ 1 & 0 \end{pmatrix}$ to be mapped onto $P^{II}\ Q^{II}\ R^{II}\ S^{II}$.

(a) Determine the coordinates of the image points
(i) P^1,Q^1,R^1, S^1

(ii) $P^{II}\ Q^{II}\ R^{II}\ S^{II}$.

(b) Determine the single matrix of transformation that would map the quadrilateral $P^{II}\ Q^{II}\ R^{II}\ S^{II}$ back onto the quadrilateral P Q R S. (12marks)

14(a) Draw a table for the curve y = $-x^2 - 8x - 12$ for values of x in the range
$-8 \leq x \leq 1$

(b) Using a scale of 2cm for 1 unit on the x-axis and 2cm for 2 units on the y-axis, draw the graph of y = $-x^2 - 8x - 12$.

(c) Using your graph, solve the equation $-x^2 - 8x - 7 = 0$ (12marks)

15. A plane leaves airport A and flies for 160km on a bearing of 140^{o} to airport B. It then changes direction to a bearing of 260^{o} and flies for 200km to airport C. Using a scale drawing with 1cm to represent 20km, find;

(a) the distance of airport C from airport A.
(b) the bearing of airport A from C.
(c) how long it would take the plane to fly directly back to airport A from C at a speed of 20km/hr. (12marks)

16. St. Janan is to transport its S. 4 students for fieldwork in Kasenyi. All the 400 students are to be transported using either coasters or buses. Each coaster can carry 40 people while each bus can carry 80 people. The transport department of the school has only 8 drivers on duty and up to four coasters. If the cost of hiring a coaster is shs. 150,000 and that of hiring a bus is shs. 300,000.

(a) Write down the five inequalities representing the above information.
(b) Represent the inequalities on a graph paper.
(c) Find the possible number of coasters and buses that can be used and hence determine the minimum cost. (12marks)

17(a) Solve the simultaneous equations:

$x^2 - 2xy + y^2 = 4$

$y - 2x = -3$

(b) Three shirts and two trousers cost shs. 105,000 at Mr. Sembatya's shop. Two shirts and five trousers cost shs. 180,000 at the same shop. Find the cost of;

(i) one shirt

(ii) one trouser (12marks)

END