

Uganda Certificate of Education
MATHEMATICS
Paper 1

INSTRUCTIONS

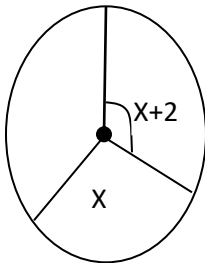
Answer ALL questions.

SECTION A

1. Make M the subject of the formula;

$$Q = \sqrt{\frac{3B}{n-M}} \quad (4 \text{ marks})$$

2. In the diagram below, the angle representing $x + 2$ is 120° . Find the value of x. (4 marks)



3. The length of a rectangular carpet is 4m more than its width. If its area is 12m^2 , find the width of the carpet. (4 marks)

4. Solve the simultaneous equation;

$$\frac{1}{2}x + y = \frac{5}{2}$$

$$x + \frac{2}{3}y = \frac{7}{2} \quad (4 \text{ marks})$$

5. The mean of x, $8x + 1$, 17 and 20 is 14. Find the:

(i) Value of x

(ii) Mode of the data. (4 marks)

6. Given that $a*b = ab - b^2$.

Find $(4*-1) * (2*1)$ (4 marks)

5. Given that $\log_{10} 2 = 0.3010$ and $\log_{10} 5 = 0.6990$, find $\log_{10} 2.5$. (4 marks)

6. Given two sets P and Q such that $n(P) = 12$, $n(Q) = 13$, $n(P \cup Q) = 20$, and $n(\epsilon) = 24$. Find;

(i) $n(P \cup Q)$

(ii) $n(P \cap Q)$ (4 marks)

7. Two points A(2, 5) and B(4, 3) are in a plane. Find the;

a) Coordinates of C, the midpoint of $\overline{AB}$. (4 marks)

b) Gradient of the line perpendicular to the line $\overline{AB}$. (4 marks)

8. A certain school is located on a stretch of land of area 45km^2 . On a map, its area is 7.2cm^2 . Determine the scale of the map. (4 marks)

SECTION B:

9. a) Given that $f(x) = 2x+8$ and $fg(x) = x - 3$. Find;

(i) $g(x)$ hence $f(15)$

(ii) $g^{-1}(x)$

(iii) $gf(x)$ (8 marks)

- b) Find the value of x when;

(i) $f(x) = g(x)$

(ii) $\frac{f(x)}{g(x)}$ is meaningless. (4 marks)

12. a) Solve for P if $81^{\frac{1}{4}} \div P^{\frac{1}{3}} = 6$. (4 marks)

- b) The force (F) for a person in Iganga bus going to Kampala is partly constant and partly varies as the square root of the passengers (n) in the bus. If the fare 12,300/= is paid when there are 100 passengers and 14,700 when there are 144 passengers. Find how much is paid when the bus takes 81 passengers. (8 marks)

13. a) Use logarithms to evaluate;

$$\sqrt[3]{\frac{0.256 \times 14.7}{0.0035}} \quad (6 \text{ marks})$$

- b) Of the 3600 students in a school, $\frac{1}{3}$ are boys. If the boys were reduced by $\frac{1}{3}$, what percentage of the total number of the remaining students would then be boys? (6 marks)

- 14.a) Draw a graph of $y = 2x^2 - x - 3$ for $-3 \leq x \leq 3$. Use scales of 2cm to represent 1 unit on Y-axis.

- b) On the same axes, draw the line $y = x + 1$.

- c) (i) Use the two graphs to solve the equation $x^2 - x - 2 = 0$

- (ii) Find the minimum value of the function $y = 2x^2 - x - 3$. (12 marks)

15. Using a ruler, a pencil and a pair of compasses only;

- a) Construct a triangle ABC in which angle $BAC = 30^\circ$, angle $ABC = 120^\circ$ and $\overline{AB} = 8\text{cm}$. (5 marks)

- b) Measure and record the lengths AC and BC. (2 marks)

- c) (i) Draw an inscribed circle in the triangle ABC.
(ii) Measure and record the radius of the circle. (5 marks)

END