**P425/1**

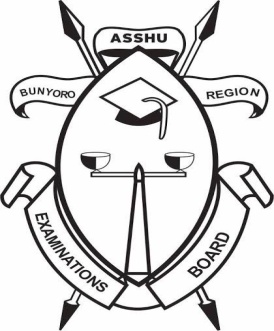
PURE MATHEMATICS

**Paper 1**

July/August, 2022

**3 hour**

**ASSHU-BUNYORO REGION MOCK EXAMINATIONS, BOARD (ABREB)**

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**Uganda Advanced Certificate of Education**

MOCK EXAMINATION, 2022

**PURE MATHEMATICS**

Paper 1

**3 hours**

**INSTRUCTIONS TO CANDIDATES:**

*Answer* **all** *questions in section* **A** *and only five questions in section* **B***.*

*All necessary calculations* **MUST** *be done on the same page as the rest of the answers.*

*Any extra question(s) attempted in section* **B** *will not be marked.*

*Begin each other question on a fresh sheet of paper.*

*All working must be shown clearly.*

*Silent, non-programmable, scientific calculators and mathematical tables with a list of formulae may be used.*

**SECTION A (40 MARKS)**

*Answer all the questions in this section.*

1. Solve the equation for 3600 (05 marks)
2. Given the complex number

Determine;

1. z in the form where a and b are constants,

(03 marks)

1. Arg (z) (02 marks)
2. The equation of a curve is Show that:-

(05 marks)

1. Find the coordinates of the point of intersection of the line.

and the plane (05 marks)

1. Evaluate giving your answer to three significant figures. (05 marks)
2. Mr. Geresom’s age and his three children are in a geometrical progression, the sum of their ages is 140 years, the sum of the ages of the last two children is 14 years, find Mr. Geresom’s age. (05 marks)
3. A straight line **AB** of length 10 units is free to move with its ends on the axes.

Find the locus of a point P on the line at a distance of 3 units from the end on the x-axis. (05 marks)

1. The rate at which a body loses temperature at any instant is proportional to the amount by which the temperature of the body at that instant, exceeds the temperature of its surroundings. A container of hot liquid is placed in a room of temperature 180C and in 6 minutes the liquid cools from 820C to 520C.

How long does it take for the liquid to cool from 260C to 200C? (05 marks)

**SECTION B: (60 MARKS)**

*Answer any* **five** *questions from this section.*

*All questions carry equal marks*

1. (a) A polynomial is exactly divisible

by () and leave remainder of 18 when divided by .

Find the values of λ and µ. (05 marks)

(b) The first, second, third and nth term of a series are 4, 3, -16 and

respectively. Find **a**, **b** and **c**. (07 marks)

1. (a) The line , where *k* is a constant, is a tangent to the curve

at the point P. Find;-

1. The value of *k*
2. The coordinates of point P. (05 marks)

(b) Show that an equation of the normal to the parabola with equation

at the point P is . This normal

meets the parabola again at the point Q.

Show that (07 marks)

1. (a) Expand up to the term in . Hence use the expression to

find correct to 3 decimal places. (05 marks)

(b) Use the substitution to solve the equation

1. (a) Find (05 marks)

O

**a**

**y**

(b) The area of the region shown in the diagram is defined by

, .

2

The region is rotated 3600 about the x-axis to form a solid of revolution. Find the value of a, if the volume of this solid of revolution is cubic units. (07 marks)

1. (a) Show that the line is parallel to

Hence find perpendicular distance between the plane and the line.

(b) (i) Find Cartesian equation of a plane which passes through the

point with position vector and perpendicular to the

vector .

(ii) find the angle between the line and the

plane

. (12 marks)

1. (a) Given that y .

Show that

(05 marks)

(b) An inverted right circular cone of vertical angle 600 is collecting water

from a tap at a steady rate of 20 cm3/min. Find:-

1. the depth of the water after 10 minutes,
2. the rate of increase of the depth at this instant. (07 marks)
3. (a) Solve 10 for

(07 marks)

(b) If and angle *A* is a cute, find the value of

(05 marks)

1. (a) The gradient of the tangent at any point of a curve is .

Given that the curve passes through the point find the equation of the curve (06 marks)

(b) Solve the equation given that and

(06 marks)

**END**