**MPOMA SCHOOL-EOT 1 EXAMINATION 2018**

***Uganda Advanced Certificate Of Education***

**S.6 MATHEMATICS PAPER 1**

**P425/1**

**TIME: 3 HOURS.**

**INSTRUCTIONS TO CANDIDATES:**

* Answer **all** the **eight** questions in section A and any five from section B.
* All necessary working **must** be shown clearly.
* Begin each answer on a fresh sheet of paper.
* Mathematical tables with a list of formulae and squared paper are provided.
* Silent, non-programmable scientific calculators may be used.

**SECTION A**: **40 Marks**

1. Solve for x: 2 - = 1 (5 marks)
2. Use the substitution to solve the equation , for. (5 marks)
3. A point p(x,y) moves such that its perpendicular distance from y = x is equal to its distance from the point A(10,1). Calculate the locus of P. (5 marks)
4. The region bounded by the curve , the y-axis and x-axis from to is rotated about the x-axis . find the volume of the solid formed. (5 marks)
5. Determine , when (5 marks)
6. Given that α and β are roots of x2 – x – 6 = 0 obtain the equation whose roots are 1 , 1 (5 marks)

α2  β2

1. Find the acute angle between the lines and .

(5 marks)

1. Using the substitution t = tan (). Show that = 1n(2) (5mks)

**SECTION B 60 Marks**

1. a) When  is divided by , the remainder is , find the values of a and b. Find the quotient.

b) When a polynomial  is divided by  the remainder is 5 and when divided by **** the remainder is -3. Find the remainder when  is divided by .

1. (a) Solve for x in the equation.

tan-1 ( ) + tan-1 ( x + 1) = tan-1 ( - 1)

(b) prove that in triangle ABC, =

1. (a) Solve the differential equation: given that

( 5marks)

(b) it is observed that the rate at which the body cools is proportional to the amount by which its temperature exceeds that of its surroundings. Abody at 780C is placed in a room at 200 C and after 5 minutes the body has cooled to 650C. What will be its temperature after afuther 5 minutes

1. a) Find the equation of the normal to the ellipse  at the point .

b) Show that for the line y = mx +c to touch the ellipse in (a) above

then c2 = 4m2 +1

1. a) Use Maclaurin’s theorem or otherwise to obtain an expansion series for

up to the fourth term. (6marks)

(b )A constructor wishes to form a rectangular enclosure using an existing wall of height 2m as one of the sides. He uses iron sheets on the other three sides which have the same height as the wall. If the capacity of the enclosed space is 100m, find the dimensions of the enclosure (on the ground) required to minimize the area of the iron sheets used. (06 marks).

1. (a) form a quadratic equation having as on of the roots (5marks)

(b) given that and ,

1. Express in the form where a and b are real
2. Represent on an Argand diagram
3. Find (7marks)
4. Express y = into partial fractions hence find the value of

( 12 marks)

1. (a) Show that the lines  +  and intersect and find the coordinates of point of intersection. (08 marks)

(b) the points A and B have position vectors ***a*** and ***b***. A point C with a position vector ***c*** lies on AB such that , show that (4marks)

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**\*\*\*\*\*\*\*\*\*\*END\*\*\*\*\*\*\*\*\*\*\*\***