(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2020/2021 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER

SPECIAL/SUPPLIMENTARY EXAMINATION

FOR THE DIPLOMA IN EDUCATION

MATHEMATICS

COURSE CODE: EDM 109

COURSE TITLE: GRAPHS OF BASIC CURVES AND POLAR COORDINATES

DATE: 24/9/2021 **TIME:** 2:00 PM – 4:00 PM

INSTRUCTIONS TO CANDIDATES

Answer Question One and Any other TWO Questions

TIME: 2 Hours

This Paper Consists of 2 Printed Pages. Please Turn Over.

Question One (20 Marks)

a) Draw the graph of the function $y=x^2+4x-5$ for $-7\leq x\leq 3$. Use the graph to solve the equation $x^2+4x-5=0$. (6 marks)

b) Find the center of the hyperbola $3y^2-4x^2-16-8x=0$. (5 marks)

c) Convert P(4,9) to polar coordinates. (5 marks)

d) Complete the table below on conic sections and eccentricity (e). (4 marks)

Eccentricity	Conic section
e=0	
0<e<1	
e=1	
	hyperbola

Question Two (20 Marks)

a) Draw the graph of $y = 2x^3+x^2-5x+2$ for the interval $-3\leq x\leq 3$. By drawing a suitable straight line using the same axes, solve $2x^3+x^2-5x+2=6x+12$ (10 marks)

b) Draw the graph of $y= (3x+1)(2x-5)$ for the domain $-1\leq x\leq 4$. Use your graph to solve $6x^2-19x-9=0$ (10 marks)

Question Three (20 Marks)

a) Graph $r = \frac{2}{4-cos\theta}$ (10 marks)

b) Prove that the equation $4x^2+y^2-8x+2y+1+0$ represents an ellipse. Find its eccentricity and foci. (10 marks)

Question Four (20 Marks)

Graph the following standard polar curves

a) $r= 3cos\theta$ (5 marks)

b) $r=2+2sin\theta$ (5 marks)

c) $r=cos3\theta$ (5 marks)

d) $r=sin2\theta$ (5 marks)

Question Five (20 Marks)

a) Calculate the coordinates of foci of the hyperbola $(x+3)^2/16-(y-2)^2/9 = 1$ (10 marks)

b) Express $4x^2-y^2-24x-4y+28=0$ in standard form hence compute the coordinates of foci of the parabola (10 marks)