CHUKA



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EMBU CAMPUS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF

MATH 304: COMPLEX ANALYSIS I	
STREAMS: SB	TIME: 2 HOURS
DAY/DATE: TUESDAY 11/12/2018	11.30 A.M. – 1.30 P.M.

INSTRUCTIONS:

• Answer question ONE and any OTHER TWO.

Question one (30 marks)

 $z_2 = -3 + 8i$ $z_1 = 2 + 4i$ a. If and find $2z_1 - z_2$ i. (3 marks) $\overline{z}_2 z_1$ ii. (3 marks) $z_1^{-1} + \overline{z}_2$ iii. (3 marks) b. Describe the set of point $\frac{z}{z}$ in the complex plane satisfying the equation z - i = 1(4mks) c. Write the following complex numbers in polar form $\frac{\sqrt{3}}{2} + \frac{1}{2}i$ i) (3 marks) d. Show that the limit $\lim_{z \to 0} \frac{z}{\dot{z}}$ doesn't exist

marks)

$$f(z) = 2x^{2} + y + i(y^{2} - x)$$

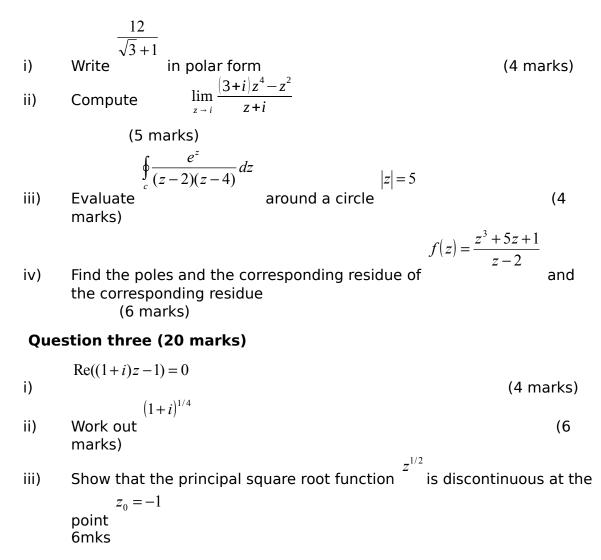
e. Show that the complex function for the comp

$$\frac{dz}{z^2+1}$$
 where ^c is the circle $|z|=4$ (5)

(5

f. Evaluate the integral marks)

Question two (20 marks)



iv) Show whether the polynomial $f(z) = z^2 + z$ is analytic for all z (4 marks)

Question four (20 marks)

z+12z + 5Find the real and the imaginary part of the complex number i) z = x + iywhere (5 marks) $\int_{(0,3)}^{(2,4)} (2y+x^2)dx + (3x-y)dy$ (0,3)along the straight lines from ii) Evaluate to (2,3) (2,4) (2,3) and then from to (10 marks) $z = x + iy \qquad z\overline{z} = \left|z\right|^2$ Given that for show that (5 iii) marks) _____