BRAC University

Department of Mathematics and Natural Sciences

Total Points: 15

Assignment-01

Course Code: MAT215

Complex

Name: TAHSIN MOHAMMAD MUNIF

Student ID: 24301136

Section: 12

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Assigned by

Partho Sutra Dhor
Lecturer, Department of MNS
BRAC University

Question 1

Find all possible values of z such that

$$z^{@}Q1_{n}@ = 16\sqrt{2}\,(1+i)$$

Locate them in the complex plane. Show that they are contained in a circle and find the radius of that circle. Also find the angular distance between two adjacent roots.

Solution:

Question 2

Consider the equation

$$\left|\frac{z+9i}{z-9i}\right| = 2$$

Describe the above locus in the complex plane.

Solution:

Question 3

Consider the inequality

$$|z-6|-|z+6| \geq 8$$

Describe the above locus in the complex plane.

Solution:

Question 4

Solve the following equation for z:

$$e^{3z} = -6$$

Express z as $x + iy$ where $x, y, \in \mathbb{R}$.

Solution:

Question 5

Prove that

$$\coth^{-1} z = \frac{1}{2} \ln \left(\frac{z+1}{z-1} \right).$$

Solution:

Question 6

Solve for z:

$$\sin^{-1} z = 4 + bi$$

Solution: