



BRAC University

Department of Mathematics and Natural Sciences

Total Points: 15

 **Assignment-01**

Course Code: MAT215

Complex

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 **Section: 12**

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 **Submission Date: _____**

Assigned by


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Question 1

Find all possible values of z such that

$$z^{10} - 1 = -64\sqrt{3} - 64i$$

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

$$|z - 7i| - |z + 7i| = 8$$

Describe the above locus in the complex plane.


 Solution:

Question 3

Consider the inequality

$$\left| \frac{z + 8i}{z - 8i} \right| \leq 6$$

Describe the above locus in the complex plane.

 Solution:

Question 4

Solve the following equation for z :

$$e^{3z} = -\frac{7}{2} + \frac{7\sqrt{3}i}{2}$$

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 :

$$\tanh^{-1} z = 6 + bi$$

 Solution: