



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

$$z^6 = \frac{729\sqrt{2}(-1-i)}{2}$$

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

$$\left| \frac{z + 4i}{z - 4i} \right| = 3$$

Describe the above locus in the complex plane.


 **Solution:**

Question 3

Consider the inequality

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

Describe the above locus in the complex plane.

 Solution:

Question 4

Solve the following equation for z :

$$e^{5z} = -\frac{5}{2} + \frac{5\sqrt{3}i}{2}$$


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

 **Solution:**

Question 5

Prove that

$$\sin^{-1} z = \frac{1}{i} \ln \left(iz + \sqrt{1 - z^2} \right),$$

 Solution:

Question 6

Solve for z :

$$\tanh^{-1} z = 5 - bi$$

 Solution: