



BRAC University

Department of Mathematics and Natural Sciences

Total Points: 15

 **Assignment-01**

Course Code: MAT215

Complex

 **Name: MD. ISHTIAQ MOZUMDER**

 **Student ID: 24301219**

 **Section: 12**

 **Semester: FALL 2025**

 **Submission Date: _____**

Assigned by


 **Partho Sutra Dhor**
Lecturer, Department of MNS
BRAC University

Question 1

Find all possible values of z such that

$$z^6 = 32\sqrt{2}(1 + i)$$

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

$$|z - 8i| - |z + 8i| = 13$$

Describe the above locus in the complex plane.


 **Solution:**

Question 3

Consider the inequality

$$|z - 8i| - |z + 8i| \geq 10$$

Describe the above locus in the complex plane.

 Solution:

Question 4

Solve the following equation for z :

$$e^{5z} = \frac{3\sqrt{2}(-1+i)}{2}$$

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

 **Solution:**

Question 5

Prove that

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

 Solution:

Question 6

Solve for z :

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

 Solution: