



# **BRAC University**

Department of Mathematics and Natural Sciences

**Total Points: 15**

 **Assignment-01**

**Course Code: MAT215**

Complex

 **Name: MD. ISHTIAQ MOZUMDER**


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 **Section: 12**

 **Semester: FALL 2025**

 **Submission Date: \_\_\_\_\_**

*Assigned by*


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### Question 1

Find all possible values of  $z$  such that

$$z^{10} - 32\sqrt{2}(1+i) = 0$$

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: