



# III 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

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

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: