



III 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

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

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: