



BRAC University

Department of Mathematics and Natural Sciences

Total Points: 15

 **Assignment-01**

Course Code: MAT215

Complex

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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

$$z^6 = 32\sqrt{3} - 32i$$

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

$$|z + 7i| + |z - 7i| = 19$$

Describe the above locus in the complex plane.


 **Solution:**

Question 3

Consider the inequality

$$|z + 6| + |z - 6| < 13$$

Describe the above locus in the complex plane.

 Solution:

Question 4

Solve the following equation for z :

$$e^{4z} = \frac{7\sqrt{3}}{2} + \frac{7i}{2}$$


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

 **Solution:**

Question 5

Prove that

$$\sinh^{-1} z = \ln \left(z + \sqrt{z^2 + 1} \right),$$

 Solution:

Question 6

Solve for z :

$$\operatorname{cosech}^{-1} z = 2 + 2i$$

 Solution:

Question 7

Solve

 Solution:

Question 8

Solve

 Solution:

Question 9

Solve


 Solution:

Question 10

Using the definition show that

$$f(z) = 7z^2 + 5z - 8$$

is differentiable at all points. Also find the derivative.


 **Solution:**

Question 11

Using the definition, find the derivative of

$$f(z) = \frac{7}{5z + 3} \quad \text{at} \quad z = z_0$$

.

 Solution: