BRAC UNIVERSITY

Inspiring Excellence

MAT 215

Fall 2020

Assignment 04

SET: N

Please write your name and ID on the assignment script. The deadline for submitting the assignment is ***18th November 2020****. Solve* ***all the problems****. You will receive* 5 *bonus marks for* ***submitting your assignment in LaTeX****.* ***No Late submissions will be accepted****.*

Any information you need to solve this exam are given in the question.

Be creative, use your intuition. Answer the questions by yourself. Cheating and Copying will lead to ***50%*** *deduction from your total marks in the course and a Zero in the assignment.* ***Total marks is 50****. Each question carries 10 marks.*

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1. Find all values of z for which $e^{(2z-1)} = 1$.
2. Obtain all values of $\ln(\sqrt{3} - i)$.
3. Show that $\ln(1-i) = \frac{1}{2}\ln 2 + (2n - \frac{1}{4})\pi i$ where $n = 0, \pm 1, \pm 2, ...$
4. Show that $Exp(z + \pi i) = -e^z$.
5. Let $w^2 = z$ and suppose that, corresponding to $z = 1$, we have $w = 1$.
   (a) If we start at $z = 1$ in the z-plane and make one complete circuit counter clockwise around the origin, find the value of w on returning to $z = 1$ for the first time.
   (b) What are the values of w on returning to $z = 1$ after $2, 3, ...$ complete circuits about the origin?