**Second Mid Term Exam Math 487**

**Question1**

**Prove or disprove all the following statements:**

i- 1+4 cosz is bounded in the whole complex plane.

ii-If f=u+iv is analytic in a domain D then is harmonic D

iii- has an anti derivative in C.

iv**-**If C is the ellipse traversed once in the positive direction, and G(z)=,z inside C then -2

**Question2**

i-Find the domain of analyticity of .

ii- Determine a branch of which is analytic at z=-2 and find its derivative there.

iii- Solve the equation Log.

iv- Show that where

**Question3**

i-. State the maximum modulus principle .

ii- Find on the disc

ii-If f is entire and for all sufficiently large values of ,sayProve that f must be a polynomial of degree at most 2.

iii-Evaluate the following integrals:

a- b- dz

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ii-

iii-Evaluate the following integrals:

a- b- dz

iv- Find on the disc: