Assignment 4

MA06 Complex Analysis   Deadline: 17:00, Thursday, Jan 4, 2024

1. The function $u(x, y) = x^2 - y^2$ is known to be harmonic in an appropriate domain D.

   Find $v(x, y)$, which is the harmonic conjugate of $u(x, y)$.

   Form the corresponding analytic function $f(z) = u + iv$.

2. Find the derivative of the given function $f(z) = e^{iz} - e^{-iz}$.

3. Find all complex values of the given logarithm.

   (a) $\ln(-5)$.

   (b) $\ln(-2 + 2i)$.

4. Find the principal value of the logarithm $\text{Ln}(6 - 6i)$. (No need to further calculate $\log_e t$.)

   Notice:

   Please write your Email title as "A{Assignment Number}-{Your Student ID}-{Your Name}".