Assignment 2

MA06 Complex Analysis Deadline: 17:00, Monday, Dec 18, 2023

1. Evaluate the given complex function $f(z) = z^2\bar{z} - 2i$ at the indicated points.

   (a) $2i$

   (b) $1 + i$

2. Find the real and imaginary parts as functions $u(x, y)$ and $v(x, y)$ of the given complex function $f(z) = 6z - 5 + 9i$ where $z = x + iy$. (Hint: Example 2.1.2)

3. Proceed as in Example 2.2.1 in Lecture 2 to find the image S' of the set S under the given complex mapping $w = f(z) = \bar{z}$, where S is the line $x = y$.

4. Use Theorem 2.2 and the basic limits (2.6.15) and (2.6.16) to find the given complex limit $\lim_{z\to 2-i}(z^2 - z)$.

5. Show that the function f is continuous at the given point.
   $f(z) = z^2 - iz + 3 - 2i$; $z_0 = 2 - i$
   (Hint: Example 2.6.5)

   Notice:
   Please write your Email title as "A{Assignment Number}-{Your Student ID}-{Your Name}", for example, "A2-s12xxxxx-Taro Aizu",
   and submit your homework to ma06.complex.analysis@gmail.com