

Math 4213 - Complex Analysis

Quiz #4 - 2012.01.23

Solutions

1. Describe the differences in the definitions of continuity for real versus complex valued functions of a single variable.

There are many possible answers, but firstly, and perhaps most importantly, complex valued functions of a single variable require open disks for continuity definitions, and furthermore, both the real and complex portions of the function $f(x + iy) = u(x, y) + iv(x, y)$ must be continuous at the point in question.

2. Find a parametrization, $z(t)$, for the line that passes through the points $2 - i$ and $-3 + 5i$, such that at $t = 0$, the parametrization is at $2 - i$, and at $t = 2$, it is at $-3 + 5i$.

The standard process would be to parametrize for $t \in [0, 1]$ as $z(t) = (2 - i)(1 - t) + t(-3 + 5i)$. But since we want $t \in [0, 2]$, we simply modify the value of t in the previous definition of $z(t)$ to get

$$z(t) = (2 - i) \left(1 - \frac{t}{2}\right) + \frac{t}{2}(-3 + 5i)$$