

Math 4213 - Complex Analysis

Quiz #8 - 2012.02.01

Solutions

1. What is the best way to view complex valued sequences and series so that the standard theorems and properties are applicable?

Simple break up any complex valued sequence or series into real and imaginary parts.

2. Compute the following limit:

$$\lim_{z \rightarrow -i} \frac{z^6 + 1}{z^2 + 1}$$

Since the numerator and denominator are both 0 when $z = -i$, we can apply L'Hôpital's rule:

$$\begin{aligned} \lim_{z \rightarrow -i} \frac{z^6 + 1}{z^2 + 1} &= \lim_{z \rightarrow -i} \frac{6z^5}{2z} \\ &= \frac{6i^5}{2i} \\ &= \frac{6i^4}{2} \\ &= 3 \end{aligned}$$