Assignment 9

MA06 Complex Analysis   Deadline: 17:00, Thursday, Jan 25, 2024

1. Write out the first five terms of the given sequence $\{5i^n\}$.

2. Determine whether the given sequence $\{\frac{3ni+2}{n+ni}\}$ converges or diverges.

3. Show that the given sequence $\{\frac{4n+3ni}{2n+i}\}$ converges to a complex number L by computing $\lim_{n\to\infty} \operatorname{Re}(z_n)$ and $\lim_{n\to\infty} \operatorname{Im}(z_n)$. (Hint: Theorem 6.1)

4. Determine whether the given geometric series is convergent or divergent. If convergent, find its sum.

   (a) $\sum_{n=0}^{\infty} (1-i)^n$
   (b) $\sum_{n=1}^{\infty} \left(\frac{i}{2}\right)^n$

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