

Discuss the convergence of $\prod_{n=1}^{\infty} (1 + c_n)$ and that of $\sum_{n=1}^{\infty} c_n$, where

$$(a) \quad c_{2n-1} = \frac{1}{\sqrt{n}}, \quad c_{2n} = \frac{-1}{\sqrt{n}};$$

$$(b) \quad c_{2n-1} = \frac{-1}{\sqrt{n}}, \quad c_{2n} = \frac{1}{\sqrt{n}} + \frac{1}{n}.$$