Exercises Serie N° 4

Exercise 1

Study the nature of the series of the general term u_n and calculate their sum.

❶ $u_n = \dfrac{1}{(n+1)(n+2)}, \quad n \geq 0.$

❷ $u_n = \sqrt{n+1} - \sqrt{n}, \quad n \geq 1.$

❸ $u_n = \dfrac{n^2 - 1}{n - 1}, \quad n \geq 1.$

Exercise 2

Study the nature of the following series:

❶ $\displaystyle\sum_{n\geq 1} \dfrac{n^2 + 1}{n^2}.$

❷ $\displaystyle\sum_{n\geq 1} \dfrac{1}{n \cos^2(n)}.$

❸ $\displaystyle\sum_{n\geq 2} \left(\dfrac{1}{\ln n}\right)^n.$

❹ $\displaystyle\sum_{n\geq 1} \dfrac{\ln(n)^n}{n^{3/2}}$

❺ $\displaystyle\sum_{n\geq 0} \dfrac{n}{2^n}$

❻ $\displaystyle\sum_{n\geq 1} \dfrac{1}{\sqrt{n}(n+1)}$