Abdelhafid Boussouf University Center - Mila
Institute of Nature and life Sciences
Module: Mathematics Statistics
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Department of NLS
Graduation(year one) NLS, Semester I

Series of exercises N 4

Exercise 1

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

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

❷ $u_n = \ln(1 + \frac{1}{n}), \quad n \geq 1.$

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

❹ $u_n = \dfrac{n^2 - 1}{n - 1}, \quad n > 1.$

Exercise 2

Study the nature of the following numerical series

❶ $\displaystyle\sum_{n\geq 1} \frac{a^n}{\sqrt{n}}, \quad a \geq 0.$

❷ $\displaystyle\sum_{n\geq 1} \frac{n}{2^n}.$

❸ $\displaystyle\sum_{n\geq 1} \left(a + \frac{1}{n}\right)^n, \quad a > 0.$

❹ $\displaystyle\sum_{n\geq 1} \frac{1}{\sqrt{n}(n+1)}.$

❺ $\displaystyle\sum_{n\geq 0} \frac{\cos^2(n)}{2^n}.$