

University of M'sila	 Interrogation Third semester	Faculty : Mathematics-Computer Sc
L2 Mathematics		Academic year : 2024/2025
Module : Analysis 3		Duration : 1 hour

Scale	Exercise : 1 4pts
1.5 1.5 1	Study the nature of the following numerical series : 1 $\sum_{n \geq 0} \left(\frac{1}{n+1} - \frac{1}{n+2} \right).$ 2 $\sum_{n \geq 1} \frac{n!}{n^n}.$ 3 $\sum_{n \geq 1} \frac{1}{n \sqrt[3]{n}}.$ Indication : $\forall n \in \mathbb{N}^* : \frac{n+1}{n} = 1 + \frac{1}{n}.$
Scale	Exercise : 2 4pts
2 2	Let the sequence of functions $(f_n)_{n \geq 0}$ be defined on $\mathbb{R}_+$ such that : $f_n(x) = e^{-nx}.$ 1 Show that the sequence $(f_n)_{n \geq 0}$ is simply converges on $[0, +\infty[.$ 2 Study the uniform convergence of the sequence $(f_n)_{n \geq 0}$ on $[0, +\infty[.$
End	11 janvier 2025 Dr : D. Bouafia