UNIVERSITÀ DEGLI STUDI ROMA TRE - MATEMATICA

ESERCIZI DI AM120

A.A. 2024/2025 - ESERCITAZIONE IV

Esercizio 1. Discutere il comportamento delle seguenti serie numeriche:

(1) $\displaystyle\sum_{n=0}^{+\infty} \frac{x+n}{1+n^3x^2} \quad (x \in \mathbb{R})$;

(2) $\displaystyle\sum_{n=1}^{+\infty} \frac{n^n}{2^n(n!)^\alpha} \quad (\alpha \in \mathbb{R})$;

(3) $\displaystyle\sum_{n=1}^{+\infty} \frac{n^2}{(1+n^3)(\ln(1+\frac{1}{n^2}))^\beta} \quad (\beta \in \mathbb{R})$;

(4) $\displaystyle\sum_{n=1}^{+\infty} \frac{n^2\ln(1+2^n)}{(1+n^3)^\beta} \quad (\beta \in \mathbb{R})$;

(5) $\displaystyle\sum_{n=1}^{+\infty} \left(1-\frac{x}{n}\right)^{n^2} \quad (x \in \mathbb{R})$;

(6) $\displaystyle\sum_{n=1}^{+\infty} \frac{n^{x-2}+n^{4-x^2}}{n^2} \quad (x \in \mathbb{R})$;

(7) $\displaystyle\sum_{n=1}^{+\infty} \left(1-n^2\sin^2\frac{1}{n}\right)$;

(8) $\displaystyle\sum_{n=1}^{+\infty} \left(e^{\frac{1}{n}}+e^{-\frac{1}{n}}-2\right)$;