

Analisi Matematica 1 - Esercizi del 18 Gennaio 2019

Esercizio 1. Studiare la convergenza delle seguenti serie numeriche:

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| 1. $\sum_{n=1}^{\infty} \frac{1}{\log n + \sqrt[n]{n!}}$ | 8. $\sum_{n=2}^{\infty} \frac{\log^3 \log n}{n \log^2 n}$ |
| 2. $\sum_{n=2}^{\infty} \frac{1}{(\log n)^{\log n}}$ | 9. $\sum_{n=2}^{\infty} \frac{(-1)^n}{\log n}$ |
| 3. $\sum_{n=1}^{\infty} \frac{\sin n \log n + n^{3/2}}{\log^2 n! - n}$ | 10. $\sum_{n=1}^{\infty} \frac{(-1)^n \log n}{n}$ |
| 4. $\sum_{n=1}^{\infty} \frac{1}{(2 + (-1)^n)^n}$ | 11. $\sum_{n=1}^{\infty} \frac{3^n + (-4)^n}{n! + 2^n}$ |
| 5. $\sum_{n=1}^{\infty} \left(n \sin \frac{1}{n} \right)^{n^3}$ | 12. $\sum_{n=1}^{\infty} \frac{(-1)^n \cos(2\pi\sqrt{1+n^4})}{n}$ |
| 6. $\sum_{n=1}^{\infty} n^2 \left(\sqrt[3]{\frac{n+2}{n^4 - n^3 + 1}} - \frac{1}{\sqrt{n^2 + 1}} \right)$ | 13. $\sum_{n=1}^{\infty} \frac{(-1)^n n \sin n}{(\log n! + 2)^{\frac{\log(n^2+1)}{\cos n + \log n}}}$ |
| 7. $\sum_{n=2}^{\infty} n^2 (\arctan n^2 - \arctan(n^2 - \sqrt[3]{n}))$ | 14. $\sum_{n=2}^{\infty} \sqrt{\log(n^2 + n)} \left(\sin \left(\frac{1}{\log n!} \right) - \frac{1}{n \log n} \right)$ |

Esercizio 2. Studiare la convergenza delle seguenti serie numeriche, al variare del parametro $x \in \mathbb{R}$.

1. $\sum_{n=1}^{\infty} \frac{\left(\frac{1}{2} - \frac{3}{2} e^{n(x^2-x)} \right)^n}{n+1}$
2. $\sum_{n=1}^{\infty} \sqrt{\left| \cos^3 \left(\frac{1}{n} \right) - e^{\frac{x}{2n^2}} \right|}$