Esercitazioni di

MATEMATICA 1

Geologia

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1. Si calcolino i seguenti limiti di successioni:

a) $\lim_{n\to\infty} \dfrac{\ln n}{n^2}$

b) $\lim_{n\to\infty} \sqrt[n]{n \ln n}$

c) $\lim_{n\to\infty} n\left(\sqrt[3]{n+2} - \sqrt[3]{n}\right)$

d) $\lim_{n\to\infty} \dfrac{1 + 2 \cdot 10^n}{5n + 3 \cdot 10^n}$

e) $\lim_{n\to\infty} \dfrac{n^{10} + 3n + 1}{n + 2e^n}$

f) $\lim_{n\to\infty} (n^2 - n \sin n)$

g) $\lim_{n\to\infty} \dfrac{\sqrt{n^3 + 9n^2} - \sqrt{n^4 + 1}}{n^2 + 2}$

h) $\lim_{n\to\infty} \left(\sqrt{\dfrac{n+1}{n+3}} - 1\right)$

i) $\lim_{n\to\infty} \dfrac{n}{2^n - 3^n}$

l) $\lim_{n\to\infty} \sqrt[n]{2^n + 3^n}$

2. Dire se convergono le serie seguenti:

a) $\sum_{n=1}^{\infty} \dfrac{1}{n3^n}$

b) $\sum_{n=1}^{\infty} \left(\dfrac{n}{n+1}\right)^n$

c) $\sum_{n=0}^{\infty} \dfrac{2^n}{n + 2^n}$

d) $\sum_{n=0}^{\infty} \left(\dfrac{3n-1}{2n+10}\right)^n$

e) $\sum_{n=0}^{\infty} \left(\dfrac{n^2 + 7n + 2}{2n^2 - 5}\right)^n$

f) $\sum_{n=1}^{\infty} \dfrac{1}{n(n+1)}$

g) $\sum_{n=2}^{\infty} \dfrac{\sqrt{n} - \sqrt{n-2}}{2^n}$

h) $\sum_{n=0}^{\infty} \dfrac{n^2}{2^n}$

i) $\sum_{n=0}^{\infty} \left(\dfrac{n+1}{n^2+1}\right)\left(\dfrac{3}{5}\right)^n$

l) $\sum_{n=2}^{\infty} \dfrac{1}{(\ln n)^{10}}$

m) $\sum_{n=1}^{\infty} \dfrac{1}{n \ln(1 + \frac{1}{n})}$

n) $\sum_{n=1}^{\infty} \dfrac{3}{\sqrt{n^2 + n - 1}}$

o) $\sum_{n=0}^{\infty} \dfrac{3 + n}{\sqrt{n^6 + 1}}$

p) $\sum_{n=0}^{\infty} \left(\dfrac{2n^3 + 3}{4n^3 + 2n^2 + 1}\right)^n$

q) $\sum_{n=0}^{\infty} \left(\dfrac{1 + n^2}{1 + n^3}\right)^2$

r) $\sum_{n=1}^{\infty} \dfrac{\ln n}{n^3}$