Esercitazioni di

# MATEMATICA 1

Geologia

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**1**. Si calcolino i seguenti limiti di successioni:

$a)\ \lim_{n\to\infty} \frac{n+\sin n}{n^3-n^2+1}$

$b)\ \lim_{n\to\infty} \left(1+\frac{1}{n}\right)^{\frac{3}{n}}$

$c)\ \lim_{n\to\infty} \left(1+\frac{e+1}{n}\right)^{2n}$

$d)\ \lim_{n\to\infty} \ln\left(1+\frac{1}{n}\right)$

$e)\ \lim_{n\to\infty} n\ln\left(1+\frac{1}{n}\right)$

$f)\ \lim_{n\to\infty} \frac{n^{10^3}}{3^{3n-1}}$

$g)\ \lim_{n\to\infty} \sqrt{\frac{n^2+2}{2n^2-1}}$

$h)\ \lim_{n\to\infty} \sqrt[2n]{n}$

$i)\ \lim_{n\to\infty} \left(n-\sqrt{n^2-1}\right)$

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

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

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

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

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

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

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

$s)\ \lim_{n\to\infty} \frac{n}{2^n-3^n}$

$t)\ \lim_{n\to\infty} (n-\arctan n)$

**2**. Dire se convergono le serie seguenti:

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

$b)\ \sum_{n=0}^{\infty} \left(\frac{n}{n+1}\right)^n$

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

$d)\ \sum_{n=0}^{\infty} \ln(1+e)\left(\frac{3}{1+e}\right)^{n+1}$

$e)\ \sum_{n=0}^{\infty} (2\ln 3-3\ln 2)^n$

$f)\ \sum_{n=0}^{\infty} \arctan n^2$

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

$h)\ \sum_{n=0}^{\infty} \left(\frac{n^2-1}{n^2+1}\right)\frac{3}{5^n}$

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

$l)\ \sum_{n=0}^{\infty} \left(\frac{n}{e+ne}\right)^n$