

**Analisi Matematica 1-Informatica-UniNa**  
**Foglio 2**

**ESERCIZIO:** Calcolare i seguenti limiti:

1.  $\lim_{n \rightarrow \infty} \frac{3n^3 + n^2 + 1}{5n^3 + n};$
2.  $\lim_{n \rightarrow \infty} \frac{n^2 + \sqrt{n^4} + n}{e^{2 \log(n)} + 4n};$
3.  $\lim_{n \rightarrow \infty} \frac{4^n + \left(\frac{1}{4}\right)^n + 3 \cdot 2^{2n}}{\left(\frac{1}{7}\right)^n + \left(\frac{1}{4}\right)^{\frac{n}{2}} + 16^{\frac{n}{2}}};$
4.  $\lim_{n \rightarrow \infty} \frac{\frac{1}{\sqrt{n}} + \left(\frac{1}{n}\right)^2 + n^{-3}}{3\sqrt[n]{n} + n^{-4}};$
5.  $\lim_{n \rightarrow \infty} \frac{\log(n^3) + 2n^2 + n}{e^{2 \log(n)} + \frac{3}{n^{-2}} + 1};$
6.  $\lim_{n \rightarrow \infty} \frac{n \sin\left(\frac{3}{n^3}\right)}{e^{-2 \log(n)}};$
7.  $\lim_{n \rightarrow \infty} \frac{e^{n \log(n)} + n!}{4^n + \sqrt[n]{n^{2n}} + 1};$
8.  $\lim_{n \rightarrow \infty} \frac{1}{\log(n) \sin\left(\frac{1}{n}\right)};$
9.  $\lim_{n \rightarrow \infty} \left( \sqrt{n^3 + 1} - \sqrt{n^3 - 1} \right) \sqrt{n^3};$
10.  $\lim_{n \rightarrow \infty} \left( 1 - \cos^2 \left( \frac{1}{n} \right) \right) \frac{n^3 + 1}{n};$
11.  $\lim_{n \rightarrow \infty} \frac{\log\left(\frac{n+1}{n}\right)}{\sin\left(\frac{4}{n}\right)};$
12.  $\lim_{n \rightarrow \infty} \frac{n! e^n n}{n^{n+1} \sin\left(\frac{1}{\sqrt{n}}\right)};$
13.  $\lim_{n \rightarrow \infty} \frac{\log(1 + e^n)}{\sqrt{2n^2 + n + 1}};$
14.  $\lim_{n \rightarrow \infty} \left( 1 + \sin \left( \frac{1}{n} \right) \right)^{2n};$
15.  $\lim_{n \rightarrow \infty} \left( \frac{n}{n+1} \right)^n;$
16.  $\lim_{n \rightarrow \infty} \left( \frac{n+2}{n+1} \right)^{n^2};$
17.  $\lim_{n \rightarrow \infty} \log(\sqrt{n} + 5^n) \frac{n^n}{(n+1)^{n+1}};$
18.  $\lim_{n \rightarrow \infty} \left( \frac{n^2 + n}{n^2 - 2n - 1} \right)^n;$
19.  $\lim_{n \rightarrow \infty} \frac{3(n!) - 4e^{n \log(n+3)}}{n^n};$
20.  $\lim_{n \rightarrow \infty} \sqrt{n^2 + 3n + 2} - \sqrt{n^2 + 1};$