

Corso di laurea in Scienze Biologiche  
 Laurea Triennale  
 Matematica, Corso A (lettere A-M), Prof. E. Mascolo

**ESERCITAZIONE 2**

Calcolare i seguenti limiti di successioni:

- $\lim_{n \rightarrow \infty} \left(1 + \frac{1}{3n}\right)^{2n}$  ( $e^{\frac{2}{3}}$ ),  $\lim_{n \rightarrow \infty} \frac{\sqrt{n-n+n^2}}{2n^2-n^{\frac{3}{2}}+1}$  ( $\frac{1}{2}$ ),  $\lim_{n \rightarrow \infty} \frac{2^n-3^n}{1+3^n}$  ( $-1$ )
- $\lim_{n \rightarrow \infty} \frac{2^n+3^n}{3^n+n^3}$  ( $1$ ),  $\lim_{n \rightarrow \infty} \frac{n^n}{n!}$  ( $+\infty$ ),  $\lim_{n \rightarrow \infty} [(\sqrt{n})^n - 3^n]$  ( $+\infty$ )
- $\lim_{n \rightarrow \infty} \frac{1+\log n}{\sqrt{n}-\log n}$  ( $0$ ),  $\lim_{n \rightarrow \infty} \frac{n \log n}{(n+1)(n+2)}$  ( $0$ ),  $\lim_{n \rightarrow \infty} (-1)^n \frac{2n}{n^3+1}$  ( $0$ )
- $\lim_{n \rightarrow \infty} (-1)^n \frac{2n^2}{3n+1}$  ( $\nexists$ )  $\lim_{n \rightarrow \infty} \frac{n^2(3^n-3^{-n})}{5^n+n^2}$  ( $0$ ),  $\lim_{n \rightarrow \infty} \left(\frac{n+5}{n+1}\right)^n$  ( $e^4$ )
- $\lim_{n \rightarrow \infty} \frac{\log(n+1)}{\log n}$  ( $1$ ),  $\lim_{n \rightarrow \infty} (n\sqrt{n}-3^n)$  ( $-\infty$ ),  $\lim_{n \rightarrow \infty} \left(\frac{n-1}{n}\right)^{n^2}$  ( $+\infty$ )
- $\lim_{n \rightarrow \infty} \sqrt[n]{n \log n}$  ( $1$ ),  $\lim_{n \rightarrow \infty} \sqrt[n]{\frac{2n}{3n^2+1}}$  ( $1$ ),  $\lim_{n \rightarrow \infty} \sqrt[n]{2^n+5^n}$  ( $5$ )
- $\lim_{n \rightarrow \infty} \left(\frac{n+1}{n-1}\right)^{n+2}$  ( $e^2$ ),  $\lim_{n \rightarrow \infty} (\sqrt{n^2+2n} - \sqrt{n^2-n-4})$  ( $3$ )
- $\lim_{n \rightarrow \infty} \frac{\log(n^3+\sin n)}{\log(n^3+n^2)}$  ( $1$ ),  $\lim_{n \rightarrow \infty} \frac{(2n+1)^n}{2^n n^n}$  ( $e^{\frac{1}{2}}$ ),  $\lim_{n \rightarrow \infty} \frac{2^n n!}{n^n}$  ( $0$ )
- $\lim_{n \rightarrow \infty} (1 - (-1)^n) \sin\left(\frac{1}{n}\right)$  ( $0$ ),  $\lim_{n \rightarrow \infty} (\sqrt{2n+4} - \sqrt{n-2})$  ( $+\infty$ )
- $\lim_{n \rightarrow \infty} \frac{n^5-4n+2}{1-5n^4+2n^6}$  ( $0$ ),  $\lim_{n \rightarrow \infty} \left(\frac{n^2-n-8}{n^2+2n-4}\right)^{5n}$  ( $e^{-15}$ )
- $\lim_{n \rightarrow \infty} n^2 2^{-\sqrt{n}}$  ( $0$ ),  $\lim_{n \rightarrow \infty} (\log(e^n + 1) - n)$  ( $0$ )
- $\lim_{n \rightarrow \infty} (\log(e^n + n^2 + 1) - n)$  ( $0$ ),  $\lim_{n \rightarrow \infty} \frac{(n+3)!-n!}{(n+1)!}$  ( $+\infty$ )