CORSO DI RECUPERO DI AM110
Lezione 3

17 marzo 2022

Esercizio 1. Verificare i seguenti limiti usando la definizione.

(A) $\displaystyle\lim_{n\to+\infty} \frac{n^2 - n\sin n}{3n^2 + \cos n} = \frac{1}{3}$

(B) $\displaystyle\lim_{n\to+\infty} \frac{2n-1}{3n+2} = \frac{2}{3}$

(C) $\displaystyle\lim_{n\to+\infty} \frac{1 + 2\cdot 10^n}{1 + 3\cdot 10^n} = \frac{2}{3}$

(D*) $\displaystyle\lim_{n\to+\infty} \log_\alpha\left(1 + \frac{1}{n}\right) = 0 \qquad (\alpha > 1)$

(E*) $\displaystyle\lim_{n\to+\infty} \sqrt{\frac{n^2+2}{2n^2-1}} = \frac{1}{\sqrt{2}}$

(F*) $\displaystyle\lim_{n\to+\infty} \frac{1}{3^{3n-1}} = 0$

Esercizio 2. Calcolare i seguenti limiti di successioni.

(A) $\displaystyle\lim_{n\to+\infty} [\log(n+1) - \log_2 n]$

(B) $\displaystyle\lim_{n\to+\infty} \frac{\sqrt{n^3 - n^2 - 1} - \sqrt{n^3 - n^2 + n}}{n - \sqrt{n^2 - n}}$

(C) $\displaystyle\lim_{n\to+\infty} \frac{1}{\log(n^4)\sin\left(-\frac{1}{n}\right)}$

(D*) $\lim_{n\to+\infty} \log(n^3)\sin\left(-\frac{1}{\sqrt{n}}\right)$

(E) $\lim_{n\to+\infty} \frac{1}{\log n\left(1-\cos\frac{1}{n}\right)}$

(F*) $\lim_{n\to+\infty} \left(\frac{n}{3}+\frac{1}{n}\right)\sin\frac{5}{n}$

(G*) $\lim_{n\to+\infty} (n^4+1)\left(1-\cos\frac{3}{n^2}\right)$

(H) $\lim_{n\to+\infty} \left(5n-\frac{1}{n^2}\right)\log\left(1-\frac{4}{n}\right)$

(I) $\lim_{n\to+\infty} \frac{1}{\sqrt[n]{2^{2^n}}}\left[n\log\left(\frac{n+3}{n}\right)^2\right]$

(J) $\lim_{n\to+\infty} \left(\frac{n!+5}{n!}\right)^{n!}$

(K) $\lim_{n\to+\infty} \left[\sin\left(\frac{1}{n}\right)\right]^{1-\cos\frac{1}{n}}$

(L) $\lim_{n\to+\infty} \frac{e^n-2^{n\log n}}{n^n}$

(M) $\lim_{n\to+\infty} \frac{\binom{n}{2}}{\binom{n}{3}}$

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