ESERCIZI SUI LIMITI DI SUCCESSIONI

Calcolare $\lim_{n\to\infty} a_n$ nove

(1) $a_n = \dfrac{(n+2^{-n})^5}{(n+3\cdot 2^n)^5}$ (2) $a_n = \dfrac{(n+2^{-n})^4}{n^4+3\cdot 2^{-4n}}$ (3) $a_n = \dfrac{(n+2^n)^4}{(n+3\cdot 2^n)^4}$

(4) $a_n = \dfrac{\left(2^{n+1}(n+1)+2^n\cdot n\right)^2}{4^n\cdot n^2}$ (5) $a_n = \sqrt{n^2+n} - \sqrt{n^2+1}$ (6) $a_n = \sqrt{n^2+n+2} - \sqrt{n^2+n}$

(7) $a_n = n\cdot\left(\sqrt{n^2+1} - \sqrt{n^2-1}\right)$ (8) $a_n = \left(\dfrac{n+1}{n}\right)^{n/2}$ (9) $a_n = \dfrac{(n+1)^{\frac{n+1}{2}}}{n^{n/2}}$

(10) $a_n = \dfrac{n^{n/2}}{n!}$ (suggerimento: calcolare $\lim_{n\to\infty} \dfrac{a_{n+1}}{a_n}$)

(11) $a_n = \left(\dfrac{n^2+2}{n^2}\right)^n$ (12) $a_n = \left(\dfrac{n+2}{n}\right)^{n^2}$ (13) $a_n = \left(\dfrac{n^2+2}{n^2}\right)^{n^2}$ (14) $a_n = \left(\dfrac{n+2}{n}\right)^n$

(15) $a_n = \left(\dfrac{n+2}{n+1}\right)^n$ (16) $a_n = \left(\dfrac{n^2+2}{n^2+1}\right)^n$ (17) $a_n = \left(\dfrac{n+2}{n+1}\right)^{n^2}$

(18) $a_n = \dfrac{n^{-3}\cdot 3^{n+1} + n^2\cdot 2^{-n}}{\left(3^{n-1}+2^n\right)\cdot\left(n^{-3}-n^2\right)}$

Soluzioni:

(1) 0 (2) 1 (3) $1/3$ (4) 8 (5) $1/2$ (6) 0 (7) $1/2$

(8) $e^{1/2}$ (9) ∞ (10) 0 (11) 1 (12) ∞ (13) e^2 (14) e^2

(15) e (16) 1 (17) ∞ (18) 0