

Calcolare i limiti, per  $n \rightarrow +\infty$ , delle seguenti successioni:

$$1) \frac{2n^2 + 3n \cos n}{n^2 - 1}$$

[2]

$$2) n (\sin n - 2)$$

$[-\infty]$

$$3) n \sqrt{1 + n^2} - \sqrt{n^2 - 1}$$

$[+\infty]$

$$4) \sqrt{2 + n^3} - \sqrt{1 + 2n^2 + n^3}$$

$[-\infty]$

$$5) \sqrt[3]{2 + n^3} - \sqrt[3]{1 + 2n^2 + n^3}$$

$[-\frac{2}{3}]$

$$6) \frac{n^3}{n^2 + 1} - n$$

[0]

$$7) \frac{\log_2(2^n + 5)}{n + \sin n}$$

[1]

$$8) \left( \frac{\alpha n + 5}{n + 3} \right)^n \quad (\alpha \geq 0)$$

$\left[ \begin{array}{lll} +\infty & \text{se} & \alpha > 1 \\ e^2 & \text{se} & \alpha = 1 \\ 0 & \text{se} & 0 \leq \alpha < 1 \end{array} \right]$

$$9) \frac{\log(e^n + 5)}{n + \sin n}$$

[1]

$$10) \left( \frac{n - \alpha}{n + \alpha} \right)^n \quad (\alpha \in \mathbb{R})$$

$[e^{-2\alpha}]$

$$11) \left( 1 - \frac{1}{n} \right)^{n^2}$$

[0]

$$12) \left(1 - \frac{1}{n^2}\right)^n$$

[1]

$$13) \left(1 + \frac{1}{n}\right)^{\frac{1+n}{n}}$$

[1]

$$14) \left(\frac{1+n}{3n+1}\right)^{\log n}$$

[0]

In più: Esercizi 2.6.6, 2.8.1, 2.8.2 del testo consigliato  
(Bertsch-Dall'Aglia-Giacomelli)