

II - 17/5/2013

$$1) \lim_{n \rightarrow +\infty} \frac{\sqrt{1 + (1 - e^{1/n})^3} - 1}{\sqrt{1 + e^{-n}} - 1}$$

$$2) \lim_{n \rightarrow +\infty} \frac{\log \left( 1 + \frac{1-n}{1-2n^2} \right)}{e^{\frac{n-1}{2n^2-1}} - 1}$$

$$3) \lim_{n \rightarrow +\infty} \left( \frac{2n}{2n-1} \right) \operatorname{tg} \frac{1}{n}$$

$$4) \text{ Date } \sum_{n=0}^{+\infty} \frac{2}{(n+1)(n+3)}$$

mostrare che converge e calcolare la somma

$$5) \text{ Date } \sum_{n=2}^{+\infty} \frac{n^2 \log^3 n + \alpha}{n^\alpha \log^\beta n} \quad \alpha, \beta \in \mathbb{R}$$

dire per quali valori di  $\alpha$  e  $\beta$  converge