

Sia  $a > 0$  Provare che

$$\lim_{n \rightarrow +\infty} n(\sqrt[n]{a} - 1) = \ln a.$$

$$\sqrt[n]{a} = e^{\log \sqrt[n]{a}} = e^{\frac{\log a}{n}} = 1 + \frac{\log a}{n} + o\left(\frac{1}{n}\right)$$

$$\begin{aligned} n(\sqrt[n]{a} - 1) &= n\left(\cancel{1} + \frac{\log a}{n} + o\left(\frac{1}{n}\right) - \cancel{1}\right) = \\ &= \log a + o(1) \rightarrow \log a \end{aligned}$$