Dimostrazione limite

Se $\lim_{n\to\infty} \frac{f(n)}{g(n)} = k > 0$, $\forall \varepsilon > 0 \ \exists n_0 \ \forall n \geq n_0$

$$\left|\frac{f(n)}{g(n)} - k\right| \leq \varepsilon$$

$$\Downarrow$$

$$-\varepsilon \leq \frac{f(n)}{g(n)} - k \leq \varepsilon$$

$$\Downarrow$$

$$k - \varepsilon \leq \frac{f(n)}{g(n)} \leq k + \varepsilon$$

$$\Downarrow$$

$$(k-\varepsilon)(g(n)) \leq f(n) \leq (k+\varepsilon)(g(n))$$

Il che vuol dire, dato $k-\varepsilon = c_1$, $k+\varepsilon = c_2$

$$c_1 g(n) \leq f(n) \leq g(n) c_2 \iff f(n) = \Theta(g(n))$$