Taller: Regla del límite

$f(n) = n^3 + an^2 \log(n)$

$g(n) = n^2 \log(n)$

Comprobar

1. $f(n) \in O(g(n))$

$$\frac{f(n)}{g(n)} = \frac{n^3 + an^2 \log(n)}{n^2 \log(n)} = \frac{n^3}{n^2 \log(n)} + \frac{an^2 \log(n)}{n^2 \log(n)}$$

$$= \frac{n}{\log(n)} + a$$

$f(n) \notin O(g(n))$

2. $f(n) \in O(n^2)$

$$\frac{f(n)}{n^2} = n + a \log(n) \to \infty \text{ cuando } n \to \infty$$

$f(n) \notin O(n^2) \to$ correcto

Comparar relaciones

$f(n) = 2^n$

$g(n) = 2^{2n} = (2^n)^2$

Ver si:

1. $f(n) \in O(g(n))$

$$\frac{f(n)}{g(n)} = \frac{2^n}{2^{2n}} = 2^{-n} \to 0 \text{ cuando } n \to \infty$$

$f(n) \in O(g(n))$

2. $g(n) \in O(f(n))$ $g(n) \notin O(f(n))$

$$\frac{g(n)}{f(n)} = \frac{2^{2n}}{2^n} = 2^n \to \infty$$