$\exists\ c \in \mathbb{R}^+, c > 0 \ \wedge \ n_0 \in \mathbb{Z}^+, n_0 > 0 \ \text{tq} \ \forall\ n \geq n_0$

$f(n) = O(g(n)) \longrightarrow 0 \leq f(n) \leq c g(n)$

$f(n) = \Omega(g(n)) \longrightarrow 0 \leq c g(n) \leq f(n)$

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

$\forall\ c \in \mathbb{R}^+, c > 0 \ \ \exists\ n_0 \in \mathbb{Z}^+, n_0 > 0 \ \text{tq} \ \forall\ n \geq n_0$

$f(n) = o(g(n)) \longrightarrow 0 \leq f(n) < c g(n)$

- $f(n) = o(g(n)) \iff \lim_{n \to \infty} \frac{f(n)}{g(n)} = 0$

$f(n) = \omega(g(n)) \longrightarrow 0 \leq c g(n) < f(n)$

- $f(n) = \omega(g(n)) \iff \lim_{n \to +\infty} \frac{f(n)}{g(n)} = +\infty$

$n^2 - 10n + 2 = O(n^2)$

$\exists\ c, n_0 > 0$ tq $\forall n \geq n_0 \quad 0 \leq n^2 - 10n + 2 \leq cn^2$

Probaremos que para $c = \underline{3}$ y $n_0 = \underline{10}$ cumple

$0 \leq n^2 - 10n + 2 \leq cn^2$

$n^2 \leq n^2 \quad \forall n \geq 1$

$-10n \leq n^2 \quad \forall n \geq 1$

$2 \leq n^2 \quad \forall n \geq 1$

$n^2 - 10n + 2 \leq 3n^2 \quad \forall n \geq 1$

$0 \leq n^2 - 10n$

$0 \leq n - 10 \quad \forall n \geq 10$

$\lg n = O(\log_{10} n)$

$\exists\ c, n_0 > 0$ tq $\quad 0 \leq \lg n \leq c \log_{10} n \quad \forall n \geq n_0$

Probaremos que para $c = \_\_\_\_$ y $n_0 = \_\_\_\_$ cumple

$\lg n \leq c \log_{10} n$

$\log_2 n = \dfrac{\log_{10} n}{\log_{10} 2}$

$\dfrac{\log_2 n}{\log_{10} n} \leq c$

$\dfrac{\dfrac{\cancel{\log_{10} n}}{\log_{10} 2}}{\dfrac{\cancel{\log_{10} n}}{1}} \leq c$

$\dfrac{1}{\log_{10} 2} \leq c$

$c = \dfrac{1}{\log_{10} 2} \quad \forall n \geq n_0$