

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

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

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

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

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

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

$$\bullet f(n) = o(g(n)) \Leftrightarrow \lim_{n \rightarrow \infty} \frac{f(n)}{g(n)} = 0$$

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

$$\bullet f(n) = \omega(g(n)) \Leftrightarrow \lim_{n \rightarrow +\infty} \frac{f(n)}{g(n)} = +\infty$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{\cancel{\log_{10} n}}{\frac{\log_{10} 2}{\cancel{\log_{10} n}}} \leq c$$

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

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