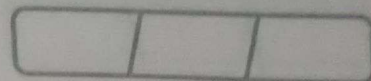


Apa - 28/03/2025

Phillipi Jesus Carlos Pires C=2



a) $n - 100 \leq C(n - 200)$

$$n - 100 \leq C$$

$$n - 200$$

$$n - 100 \leq 2$$

$$n - 200$$

$$n - 100 \leq 2(n - 100)$$

$$n - 100 \leq 2n - 200$$

$$-100 + 100 \leq 2n - n$$

$$\lim_{n \rightarrow \infty} \frac{n - 100}{n - 200} = \lim_{n \rightarrow \infty} \frac{1 - \frac{100}{n}}{1 - \frac{200}{n}} = \frac{1}{1} = 1 \leq C \quad 200 \leq n$$

$$f(n - 100) = O(g(n - 200)) \text{ com } C=2 \text{ e } n_0 = 300$$

b) $n^{\frac{1}{2}} \leq Cn^{\frac{2}{3}}$

$$n^{\frac{1}{2}} \leq C$$

$$n^{\frac{1}{2}}$$

$$n^{\frac{1}{2} - \frac{2}{3}} \leq C$$

Para $C=1$ e $n_0 = 1n^{\frac{1}{3}}$

$$O(n^{\frac{1}{3}})$$

$$n^{\frac{1}{2}} \text{ é } O(n^{\frac{2}{3}})$$

$$n^{\frac{3}{6} - \frac{4}{6}} \leq C$$

$$n^{-\frac{1}{6}} \leq C$$

$$\sqrt[6]{1}$$

$$n$$

c) $100n + \log n \leq C(n + (\log n)^2)$

$\log n$ cresce menos que $100n$ logo $100n$ é o termo dominante, já n também cresce mais que $(\log n)^2$

$$100n + \log n \leq C(n + (\log n)^2)$$

$$100n + \log n \leq C \frac{n + (\log n)^2}{n}$$

$$\lim_{n \rightarrow \infty} \left(100 + \frac{\log n}{n} \right) \leq C \left(1 + \frac{(\log n)^2}{n} \right) \lim_{n \rightarrow \infty}$$

$$100 + 0 \leq C \cdot 1 + 0$$

$$100 \leq C$$

FORONI