$$T(n)\begin{cases} 100, & n=4 \\ T(n-1)+n+1, & n>4 \end{cases}, \forall n \geq 4 \in \mathbb{N}$$

$$P(n): T(n) \geq \frac{n^2}{2}, \forall n \geq 4$$

- Base ($n=4$)

$$T(4) = 100$$
$$P(4): T(4) \geq \frac{4^2}{2}$$
$$100 \geq 8$$

- Suponha que $\forall K \in \mathbb{N}$; $n \geq K$ tenhamos:

$$T(K) \geq \frac{K^2}{2}$$

- Passo indutivo

Prove $P(K+1): T(K+1) \geq \frac{(K+1)^2}{2}$

Hipótese indutiva: $T(K) \geq \frac{K^2}{2}$

$$T(K+1) = T((K+1)-1) + (K+1) + 1$$

Por Hi

$$T(K+1) \geq \frac{K^2}{2} + K + 2$$

$$T(K+1) \geq \frac{K^2+2K+4}{2}$$

$$T(K+1) \geq \frac{K^2+2K+1+3}{2}$$

$$T(K+1) \geq \frac{K^2+2K+1}{2} + \frac{3}{2}$$

$$T(K+1) \geq \frac{(K+1)^2}{2} + \frac{3}{2}$$

$$T(K+1) \geq T(K)$$