VD 10: $T(n) = \begin{cases} 3T(n-1) & , \text{if } n > 0 \\ 1 \end{cases}$

$T(0) = 1.$

$T(1) = 3T(0) = 3$

$T(2) = 9.$

$T(n) = 3^n.$

$\Rightarrow T(k+1) = 3T(k)$

$\Rightarrow 3T(k+1) = 3^{k+1}. \Rightarrow T(n) = 3^n$

$\Rightarrow$ ~~$\Theta(3^n)$~~ $\cdot O(n)$.

Độ phức tạp

VD 11:

1. $T(n) = 2T\left(\frac{n}{2}\right) + 6n - 1$

$\begin{cases} a = 2 \\ b = 2 \\ f(n) = 6n - 1 \rightarrow O(n) \end{cases}$

+) $n^{\log_2 2} = n^1 = n$

$\Rightarrow f(n)$ $T(n) = \Theta(n \log n)$

2. $T(n) = 4T\left(\frac{n}{3}\right) + 3n - 5.$

$\begin{cases} a = 4 \\ b = 3 \\ f(n) = \Theta(n) \end{cases}$, $n^{\log_b a} = n^{\log_3 4} \rightarrow n^1.$

$\Rightarrow T(n) > n^{\log_3 4}.$

3. $T(n) = 3T\left(\frac{n}{2}\right) + n^2 - n$. $\begin{cases} a = 3 \\ b = 2 \\ f(n) = O(n^2) \end{cases}$

$n^{\log_2 3} < n^2 \Rightarrow T(n) = O(n^2).$