

Muster Theorem (for subtract and conquer recurrences):

Let $T(n)$ be a function defined on positive n , and having the property

$$T(n) \leq \begin{cases} c, & \text{if } n \leq 1, \\ aT(n-b) + f(n), & n > 1, \end{cases},$$

for some constants $c, a > 0, b > 0, d \geq 0$, and function $f(n)$. If $f(n)$ is in $O(n^d)$, then

$$T(n) \text{ is in } \begin{cases} O(n^d), & \text{if } a < 1, \\ O(n^{d+1}), & \text{if } a = 1, \\ O(n^d a^{n/b}), & \text{if } a > 1. \end{cases}$$