

Solve $T(n) = aT(n/b) + f(n)$, where $a \geq 1$ and $b > 1$.

CASE 1 $f(n) = O(n^{\log_b a - \epsilon})$
constant $\epsilon > 0$ \rightarrow $T(n) = \Theta(n^{\log_b a})$

CASE 2 $f(n) = \Theta(n^{\log_b a} \lg^k n)$
constant $k \geq 0$ \rightarrow $T(n) = \Theta(n^{\log_b a} \lg^{k+1} n)$

CASE 3 $f(n) = \Omega(n^{\log_b a + \epsilon})$
constant $\epsilon > 0$
(and regularity) \rightarrow $T(n) = \Theta(f(n))$