

$$T(n) = 3 \cdot T\left(\frac{n}{2}\right) + n^2$$

$\left. \begin{array}{l} a = 3 \\ b = 2 \\ d = 2 \end{array} \right\}$

$a < b^d$
 $3 < 2^2$

$T(n) = \Theta(n^2)$

5.2

$$n^2 = 2 \left(n^{\log_2 3 + \varepsilon} \right)$$

$$3 \cdot \left(\frac{1}{2}\right)^2 \leq c \cdot n^2 \quad (\text{para algum } c \leq 1)$$

$\frac{3}{4} \leq c$

$T(n) = \Theta(n^c)$

$$11. T(n) = 3 \cdot T(n/2) + n \cdot \ln n$$

$$\textcircled{U.2} \quad n \cdot \ln n = O\left(n^{\log_2^3 - \epsilon}\right) \quad \text{caso 1 da TM.} \quad (\alpha < 1)$$

$$T(n) = \Theta\left(n^{\log_2^3}\right).$$

$$13. T(n) = 2 \cdot T(n/2) + n \cdot \ln n$$

$$\textcircled{U.2} \quad n \cdot \ln n = \Omega\left(n^{1+\epsilon}\right) \quad \text{caso 3 da TM}$$

Logo, caso 0 TM
não se aplica
neste caso.

$$2 \cdot \left(\frac{n}{2} \cdot \ln \frac{n}{2}\right) \leq c \cdot n \cdot \ln n \quad (\text{para algum } c < 1)$$

$$n \cdot (\ln n - \ln 2) \leq c \cdot n \cdot \ln n \quad c < 1$$
$$(1-c) \cdot n \cdot \ln n \leq n \cdot \ln 2 \Rightarrow \ln n \leq \frac{\ln 2}{1-c}$$