4.

(a) $T(n) = 4T(\frac{n}{2}) + n^2\sqrt{n}$ $\quad \cdot n^{\log_2 4} = n^2$ $\quad n^{\frac{5}{2}} = \Omega(n^2)$

$= 4T(\frac{n}{2}) + n^{5/2}$ $\quad \cdot n^{5/2}$

Aplica M.M

$T(n) = \Theta(n^{5/2})$ $\quad d > \log_b a$

$T(n) = \Theta(n^2\sqrt{n})$

A

(b) $T(n) = 3T(\frac{n}{2}) + n$ $\quad \cdot n^{\log_2 3}$ $\quad n = O(n^{\log_2 3 - \varepsilon})$

$\cdot n$ $\quad \varepsilon \geq 0$

$\log_b a > d$

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

A

(c) $T(n) = T(\sqrt{n}) + \log(n)$ $\quad$ Hint $n = 2^m$

$n = 2^m \rightarrow m = \lg(n)$

$T(2^m) = T(2^{m/2}) + m$ $\quad T(m) = T(2^m)$

$T(m) = T(m/2) + m$ $\quad \cdot m^{\log_2 1} = 1$ $\quad m \geq \Omega(m^{0+\varepsilon})$

$\cdot m$ $\quad$ polinomicamente mayor $F(m)$

$T(m) = \Theta(m)$

volviendo a la convención inicial

$T(n) = \Theta(\lg(n))$

A