1ª) A) $T(n) = T(n-1) + 1$

$T(1) = 1$

$T(n) = T(n-1) + 1$

$T(n-1) = T(n-2) + 1$

$\vdots$

$T(2) = T(1) + 1$

$T(1) = 1$

$T(n) = n$

$T(n) \in \Theta(n)$

B) $T(n) = 2T(n-1) + n$

$T(1) = 1$

$T(n) = 2T(n-1) + n$

$2T(n-1) = 4T(n-2) + 2(n-1)$

$4T(n-2) = 8T(n-3) + 4(n-2)$

$\vdots$

$2^{n-2}T(2) = 2^{n-1}T(1) + 2^{n-2}(2)$

$2^{n-1}T(1) = 2^{n-1}(1)$

$T(n) = 2^0 n + 2^1(n-1) + 2^2(n-2) + \dots + 2^{n-2}(2) + 2^{n-1}(1)$

$T(n) = 2^0 + 2^1 + 2^2 + \dots + 2^{n-1} = 2^{n} - 1$

$2^0 + 2^1 + 2^2 + \dots + 2^{n-2} = 2^{n-1} - 1$

$2^0 + 2^1 + 2^2 + \dots + 2^{n-3} = 2^{n-2} - 1$

$\vdots$

$2^0 + 2^1 = 2^2 - 1$

$2^0 = 2^1 - 1$

$2^{n+1} - 1 - 2^0 - n$

$T(n) = 2^{n+1} - n - 2$;

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

C) $\begin{cases} T(n) = T(n/2) + n \\ T(1) = 1 \end{cases}$

Somente é válido para números pares.

$T(n) = T(n/2) + n$

$T(n/2) = T(n/4) + n/2$

$T(n/4) = T(n/8) + n/4$

$\vdots$

$T(n/2^{k-1}) = T(n/2^k) + n/2^{k-1}$

$T(n/2^k) = 1$

$T(n) = 1 + (k-1)n$

$T(n) = 1 + ((\log_2 n) - 1)n$

$T(n) = 1 + n\log_2 n - n$

$T(n) = 1 - n + n\log_2 n$

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