

Master Theorem

TOTAL POINTS 1

1. Mark all the correct statements.

1 / 1 point

☒ If $T(n) = 8T(n/2) + O(n^2)$ then $T(n) = O(n^4)$.

✓ Correct

Yes, $T(n) = O(n^4)$; from the Master theorem, we know that $T(n)$ grows no faster than $n^{\log_2 8} = n^3$. At the same time, n^3 grows slower than n^4 and hence $T(n) = O(n^3)$ and $T(n) = O(n^4)$.

☐ If $T(n) = 3T(n/2) + O(n)$ then $T(n) = O(n)$.

☒ If $T(n) = T(n/2) + O(1)$ then $T(n) = O(\log n)$.

✓ Correct

Yes, $T(n) = O(\log n)$; this is the running time of the binary search algorithm and a recurrence relation it satisfies.

AG
CS