Algorithms   Homework #0

You do not need to submit this homework.

Let $T(n) = 4T(\frac{n}{2}) + n$ for all $n > 1$. $T(1) = 1$. Prove by induction that $T(n) = 2n^2 - n$ for all n that are powers of two.

Prove that

$$\ln n \ \leq \ \sum_{i=1}^{n} \frac{1}{i} \ \leq \ \ln n + 1$$