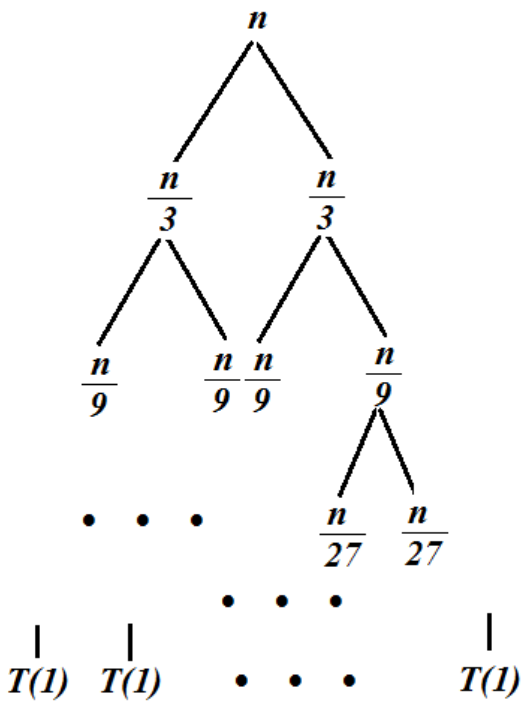
CS 3130 **Design and Analysis of Algorithms** **Fall 2018**

K E Y T O Q U I Z #6

[6 points]

Draw a recursion tree representing a recurrence $T(n) = 2T\left(\frac{n}{3}\right) + n$. Considering only the exact powers of 3 ($n = 3^k$), find the height and the number of leaves of this tree as functions of n.

Solution.



The height of this tree is $\boxed{h = k = \log_3 n}$.

The number of leaves is $\boxed{L = 2^h = 2^{\log_3 n} = n^{\log_3 2}}$