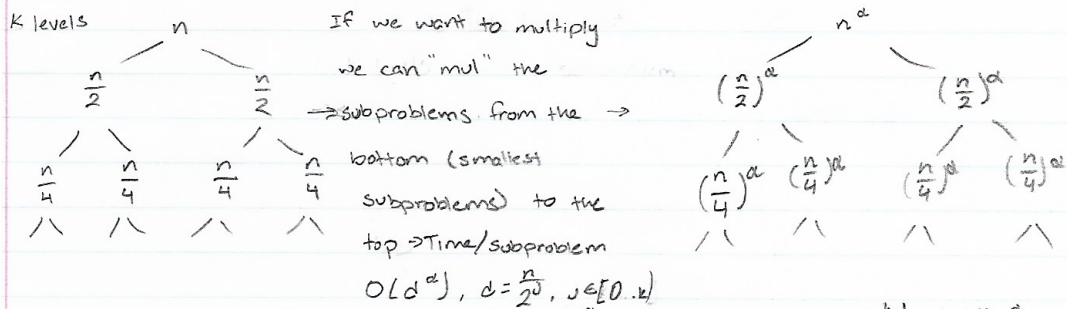


6.

To take a divide and conquer approach, we can divide the problem into subproblems. Assume n is a power of 2 for simplicity. More specifically $n = 2^k$. Therefore, we can split the binomials $(x-a,)$.



General trend in total cost per level: $2^j \cdot \left(\frac{n}{2}\right)^\alpha$, $j \in [0, k] \rightarrow$ total cost $\sum_{j=0}^{k-1} 2^j \left(\frac{n}{2}\right)^\alpha \rightarrow \sum_{j=0}^{k-1} \left(\frac{n^\alpha}{2^{j-\alpha}}\right) \rightarrow n^\alpha \sum_{j=0}^{k-1} \frac{1}{2^{j-\alpha}} \rightarrow$ This summation is a geometric power series that can be approximated by $\frac{1}{1-r} \rightarrow \frac{1}{1-\frac{1}{2}} = 2$.
a constant.

So the total cost using the "mul" function is $2n^\alpha$. We know that $1 < \alpha < 2$. Therefore, the total cost is $O(n^2)$.