A $d$-ary heap is like a binary heap, but nodes potentially have $d$ children instead of 2.

1. In a binary heap, the parent of $i$ is at index $\lfloor i/2 \rfloor$. What is the formula in terms of $i$ and $d$ for a $d$-ary heap?

2. In a binary heap, the children of node $i$ are at index $2i$ and $2i + 1$. What is the formula in terms of $i$, $d$, and $k$ for the index of the $k$th child of node at index $i$?

3. What is the time complexity (asymptotic notation) of inserting an element in the $d$-ary heap in terms of $d$ and $n$?

4. What is the time complexity (asymptotic notation) of extracting the max in a $d$-ary max-heap in terms of $d$ and $n$?