1. Do example of X \{ - union-find
- heaps
- splay trees
\}

2. Short answer

3. Coding - Tree traversing → Given tree with
   \[ \text{parent links threads} \]

4. Proof/Analysis: Induction and/or counting
   + node u
   \text{find}
   \text{inorder (predecessor)}
   \text{preorder (successor)}
   \text{postorder}

5. ??
   Amortized analysis
   → How many nodes?
   → What is max min height
- Union - Find
  - Leftist Heaps

AVL

\[
\begin{align*}
\text{Leftist Heaps} & \quad \text{Union - Find} \\
\text{How expensive?} & \quad \text{How many?}
\end{align*}
\]
AA skew/split delete: skew skew split split

Traps/Skiplists - Randomized

Splay

Amortization
5(a): Full binary tree structure is uniquely determined by:
- preorder traversal
- node labeling: leaf/internal