1. Exercise 18.2-4. (10 points)

2. For the disjoint-set problem we discussed a heuristic for the operation \textbf{find}, where we halved the path to the root by making every other node on the path point to its grandparent. This heuristic along with balancing used in the \textbf{union} ensures that $m$ operations take $O(m \lg^* n)$ time. Write a recursive as well as an iterative version of \textbf{find} with path-halving. (10 points)