Review Questions 4

Your Name*:*

Please print out this form (two-sided, if you can) and write your answers *legibly* in the spaces provided. If you can't write legibly, type.

1. Draw a picture of a single fheap on nodes $a, b, ..., n$ with keys 1, 3, 7, 9, 13, 6, 14, 2, 8, 11, 4, 10, 5, 12 (in that order). Distribute the nodes across three trees with the first 6 nodes in the first tree, the next 4 in the second tree and the remainder in the third tree. Choose the trees so that no node has a rank larger than 2. Label each node with its key and its rank (you may assume all mark bits are 0).

2. Do a *decreasekey* operation on the node with key 13 (reduce its key to 5). Show the resulting fheap. Be sure to show if any of the mark bits change.

3. Perform a *deletemin* on the heap that you got at the end of problem 2. Show the intermediate structure that you get before you start combining root nodes of equal rank. Then show the final result. Be sure to label each node, including its key and rank.