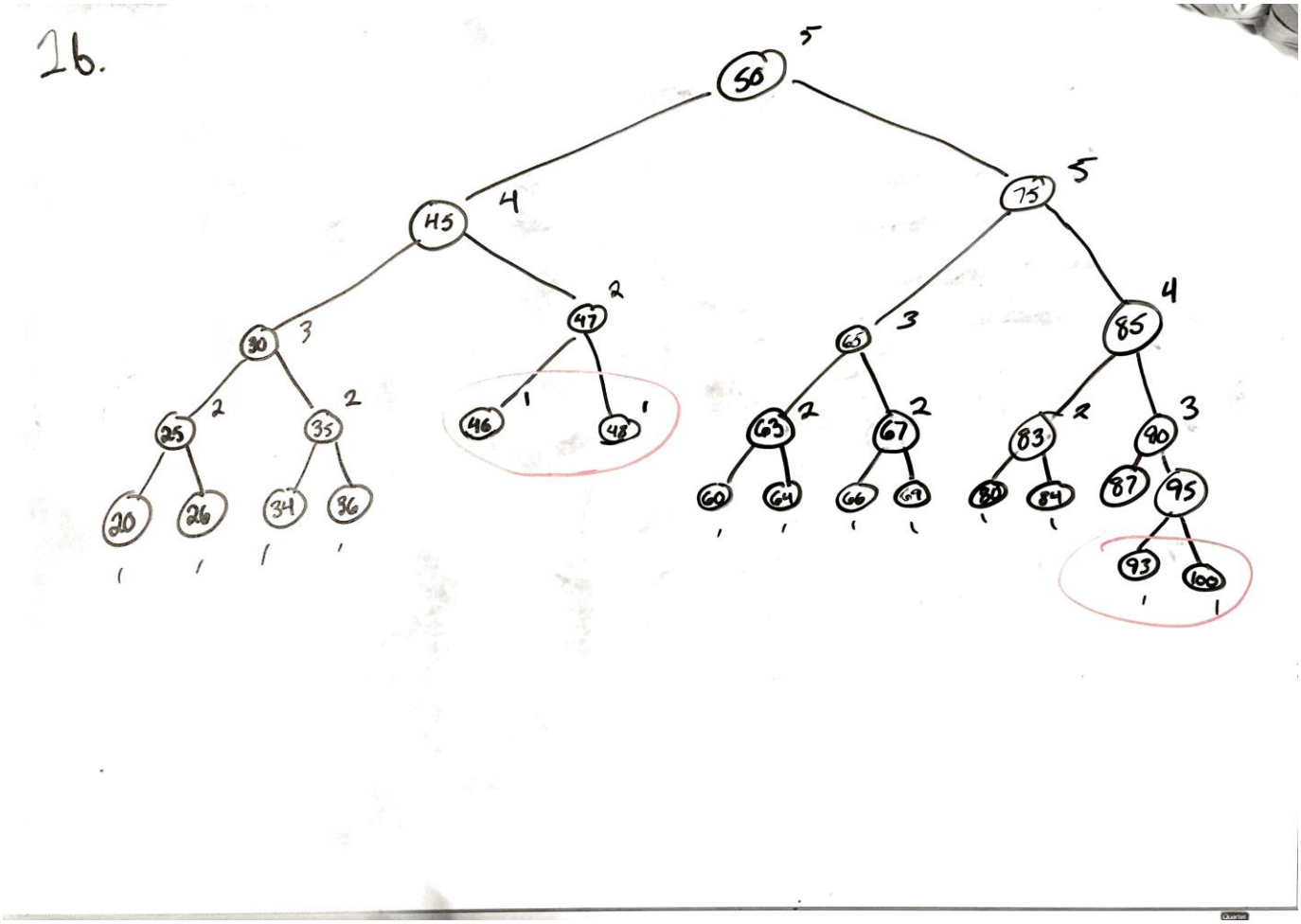
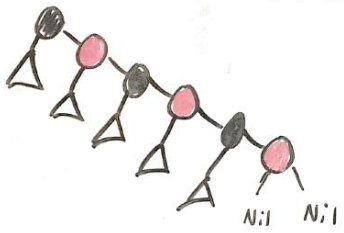
1a. the depth of the shallowest leaf can be no less than the depth of the deepest leaf minus 1 (d_{max} - 1))



2. Max tree height, both red and black nodes, w/ black-depth of 3?

# of edges

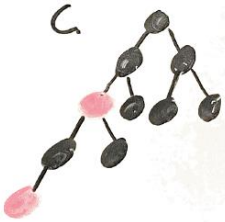
a. Max depth of 5



b. Min # of internal Nodes to produce in a.?

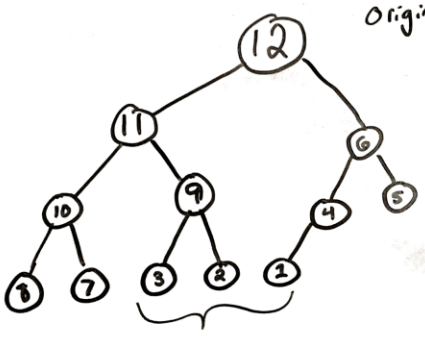
10 internal Nodes

c.



3.

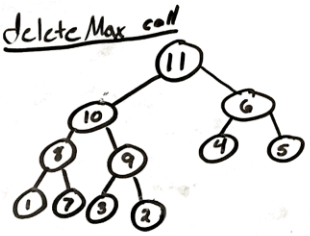
original heap



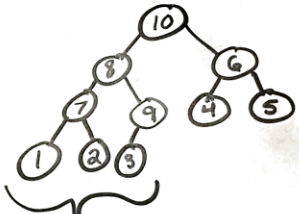
3, 2, 1 order

→

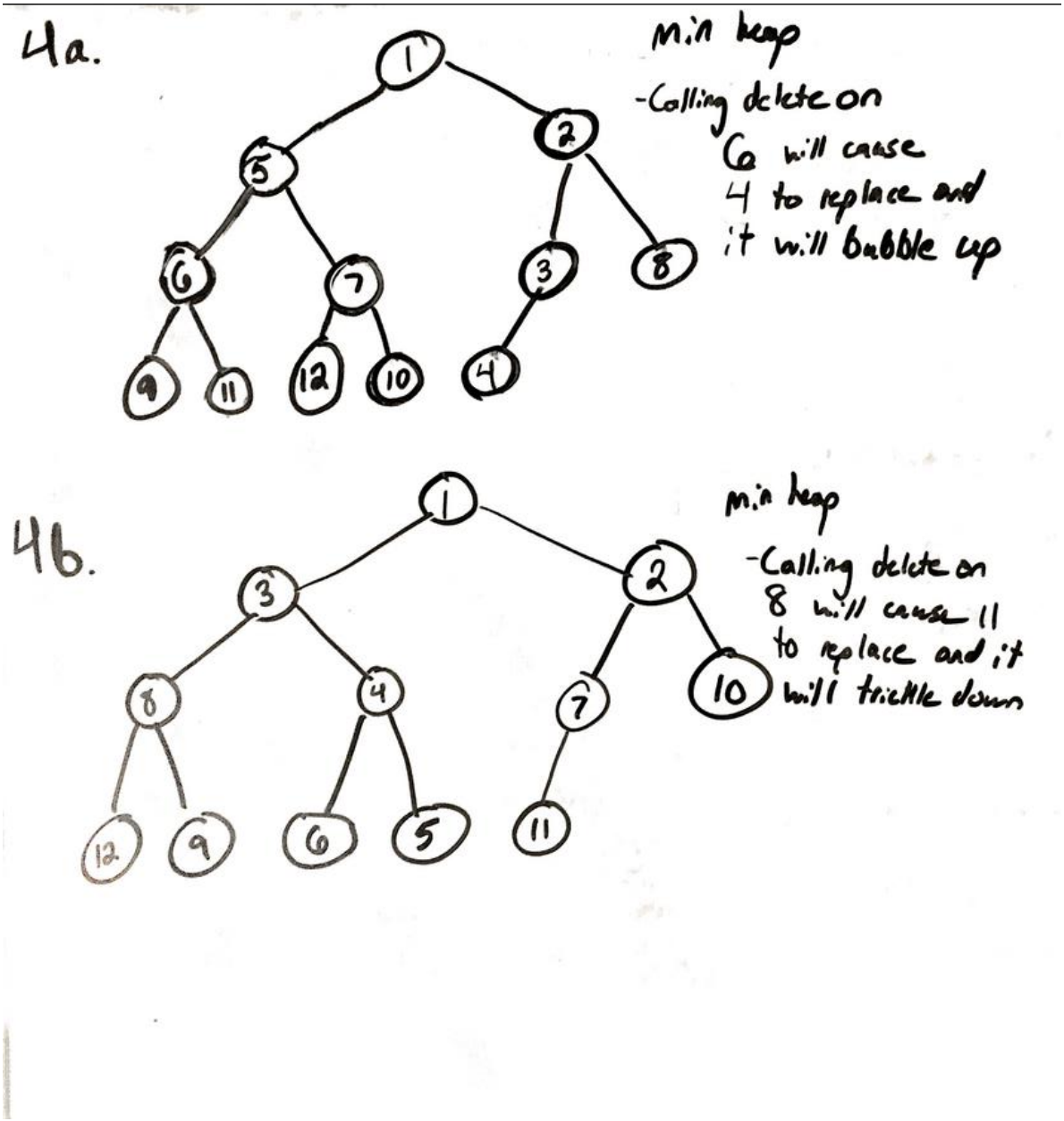
deleteMax call



deleteMax call



New 1, 2, 3 order



4c. It is not possible to construct a heap that will fit the parameters. The reason being is if we construct a heap we will have the same replacement value for both cases. In order for us to replace a value for 6 in a heap and have that value bubble up to the top, that value needs to be 5 or lower. By contrast, in order for us to replace the value 8 and have it trickle down the heap, it must be 9 or greater. Since there is no overlap for these number sets, therefore it is impossible to have the parameters met.