1. Give asymptotic upper and lower bounds for T(n)

(1) $T(n) = 20T(n/9) + n^{1.5}$

(2). $T(n) = 25T(n/625) + n^{0.66}$

(3). $T(n) = 15T(n/225) + n^{0.5}$

(4). $T(n) = T(n-10) + n^{4.3}$

2. For Quicksort (from slides = leftmost for the pivot) for the sequence
26,41, 15, 11, 48, 30, 47

the last swap is _____, the first swap is _____

the number of swaps is _____, the number of comparisons is_____

3. For Insertion sort for the sequence
26,41, 15, 11, 48, 30, 47

the last swap is _____, the first swap is _____

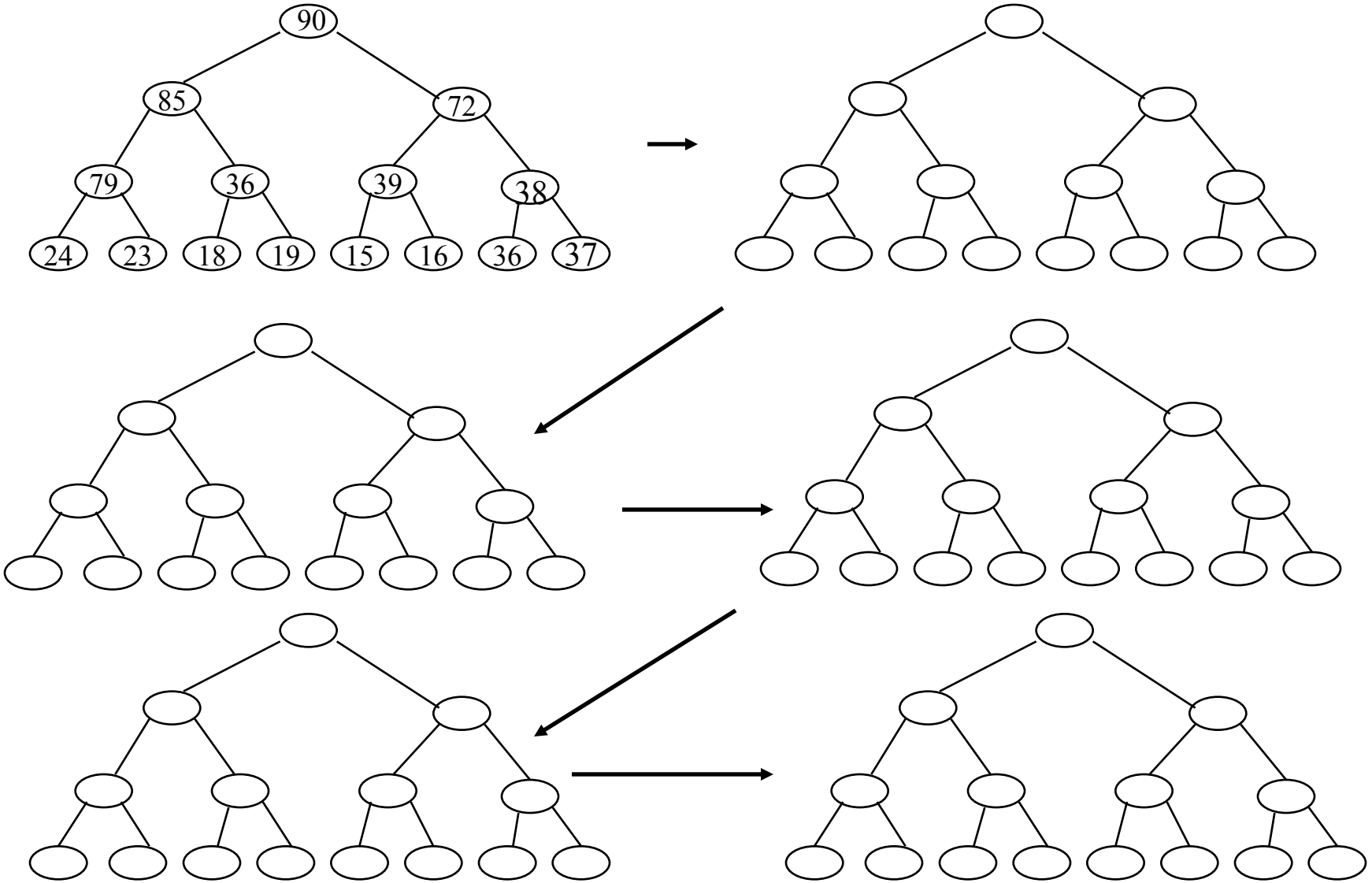
the number of swaps is _____, the number of comparisons is_____

4. Given a set of 20 coins among which there are exactly 3 false coins which are heavier than true. During each test you put any number of coins on each cup and of a lever scales and find which cup is heaver or they are equal. Using lower bound method tell what is the minimum number of tests is necessary (you cannot do better) to find all 3 false coins .

5. How many comparisons is necessary for the selection algorithm (from slides = pivot is the leftmost) to find median out of the sequence

26,41, 15, 11, 48, 30, 47

6. Show first 5 swaps of heapsort (deletions of max) with the input heap below



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