2 If we use $n/9$ group of size 9, then $(n > 5)$

if $n > 9$ then we can partition as groups as nuber of 5,
the nuber of sort as each group

we can assume that $T(n) = c^{*}n + T(n/9) + T(7n/10)$

$T(n) < cn$

~~[illegible]~~ ~~Proven~~ the class exercise,

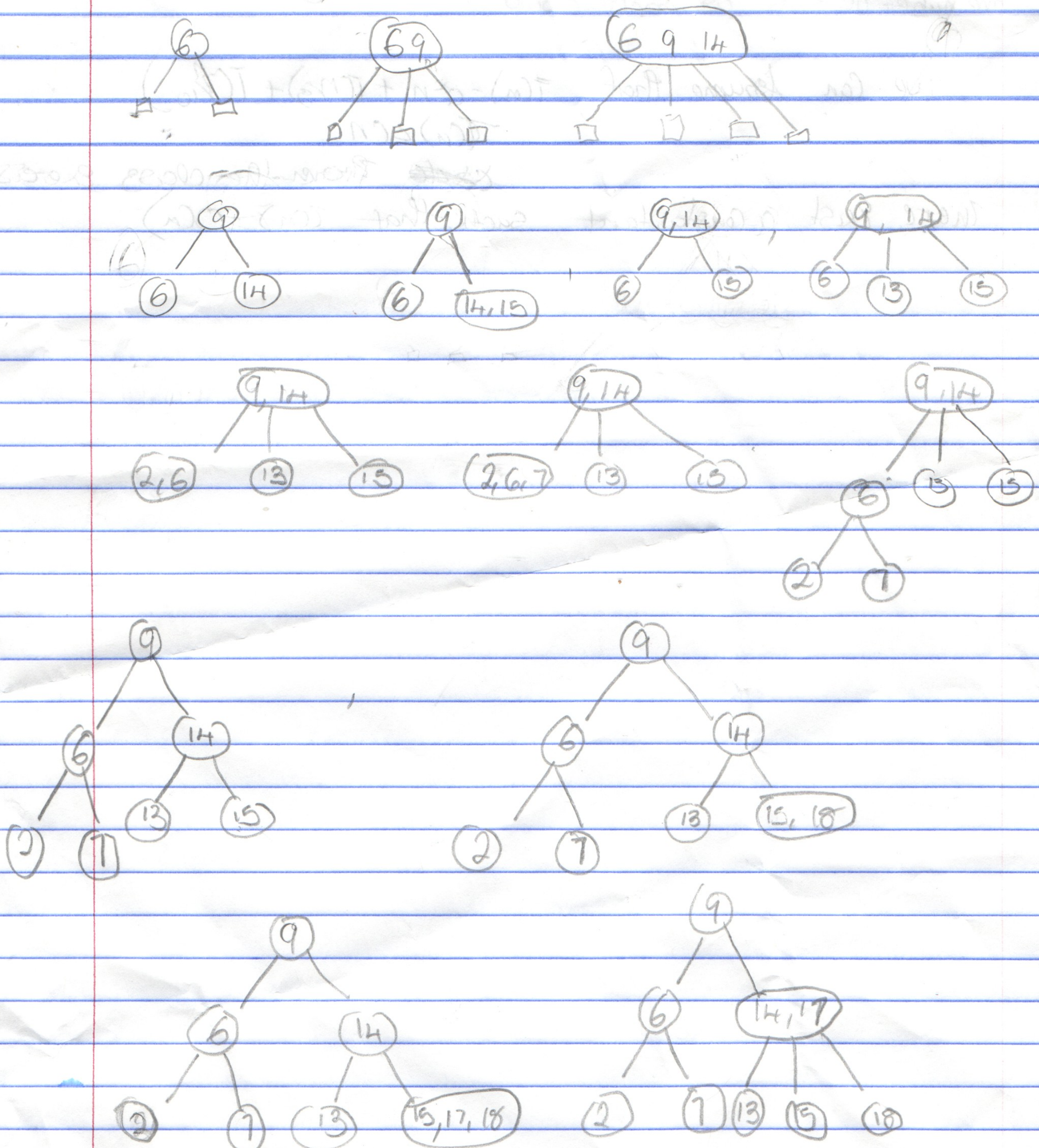
There Exist a constantant such that $T(n) = O(n)$

$O(n)$

$\Omega(n)$

Assignment

3 2-3 tree 6, 9, 14, 15, 13, 2, 7, 18, 17



80

4 Prove that $N(n) = \Omega(ck^n)$

since $N(1) = 1 \to n-1$ one side

$N(2) = 2 \to n-2$ on the other side

$N(n) = N(n-1) + 1 + N(n-2)$

$= 1 + ck^{n-1} + ck^{n-2}$

we want to prove that

$N(n) \geq ck^n$

$1 + ck^{n-1} + ck^{n-2} \geq ck^n$

we say

$ck^{n-1} + ck^{n-2} \geq ck^n$

$k+1 \geq k^2$ which is true if $k^2 - k - 1 = 0$

$k = \frac{1 + \sqrt{4+1}}{2}$

$k = \frac{1+\sqrt{5}}{2}$ $\varphi = 1.61$

Thus $N(n) \geq ck^n$ for φ^{-2} and $k = \varphi$

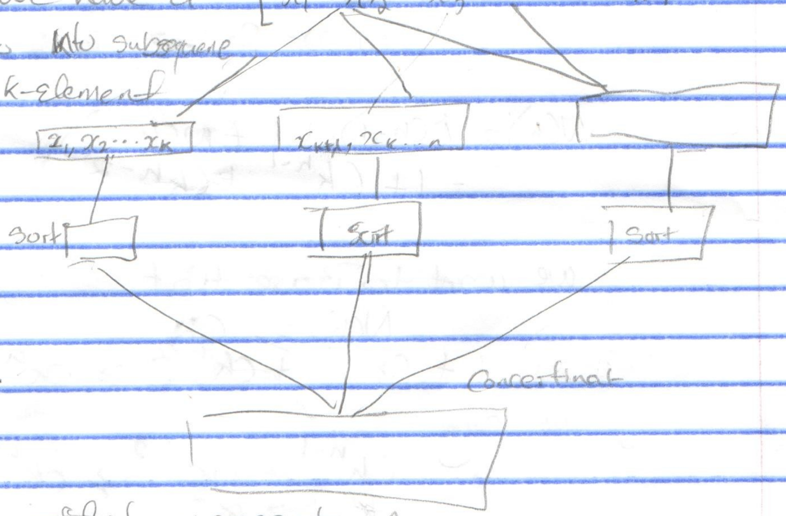
$N(n) \geq \varphi^{n-2}$

ECE 260
43, 42, 4, 24, 63, 43, 43, 5, 6, 8

(1) $n = \{x_1\ x_2 \dots x_n\}$

So we have a $[x_1\ x_2\ x_3 \dots x_n]$

we divide into subsequence which contain k-element



This a modified mergesort Algorithm, where the number of sequence to be sorted $= n/k$

Each subsequence is called $T(n/k)$ times

we have $T(n) \le n_{-1} + T(\lceil n/2 \rceil) + T(\lceil n/2 \rceil)$

The total time it takes to sort k element $= \Omega(k \log k)$

so we have $\Omega(\frac{n}{k} k \log k)$

$= \Omega(n \log k)$