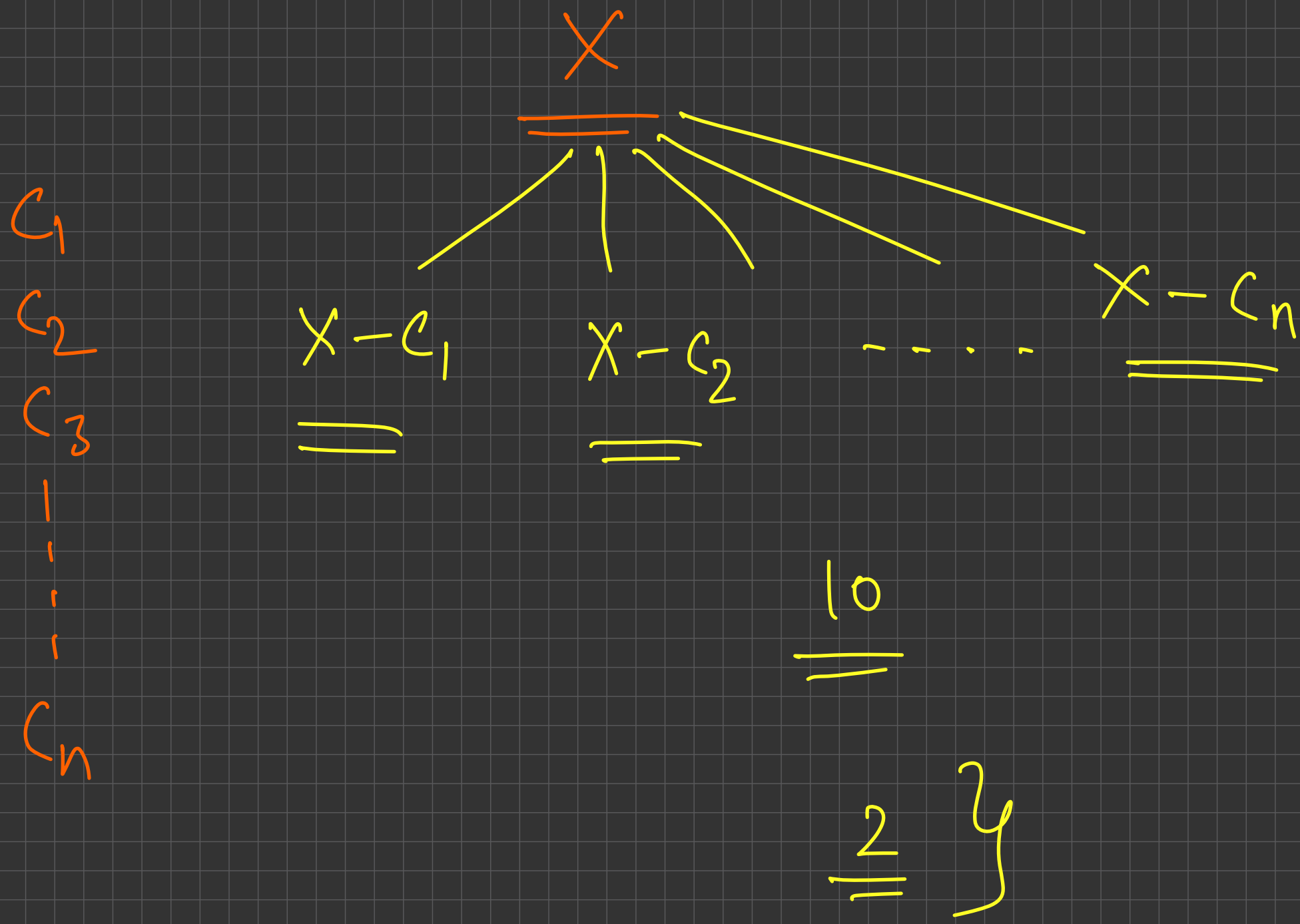
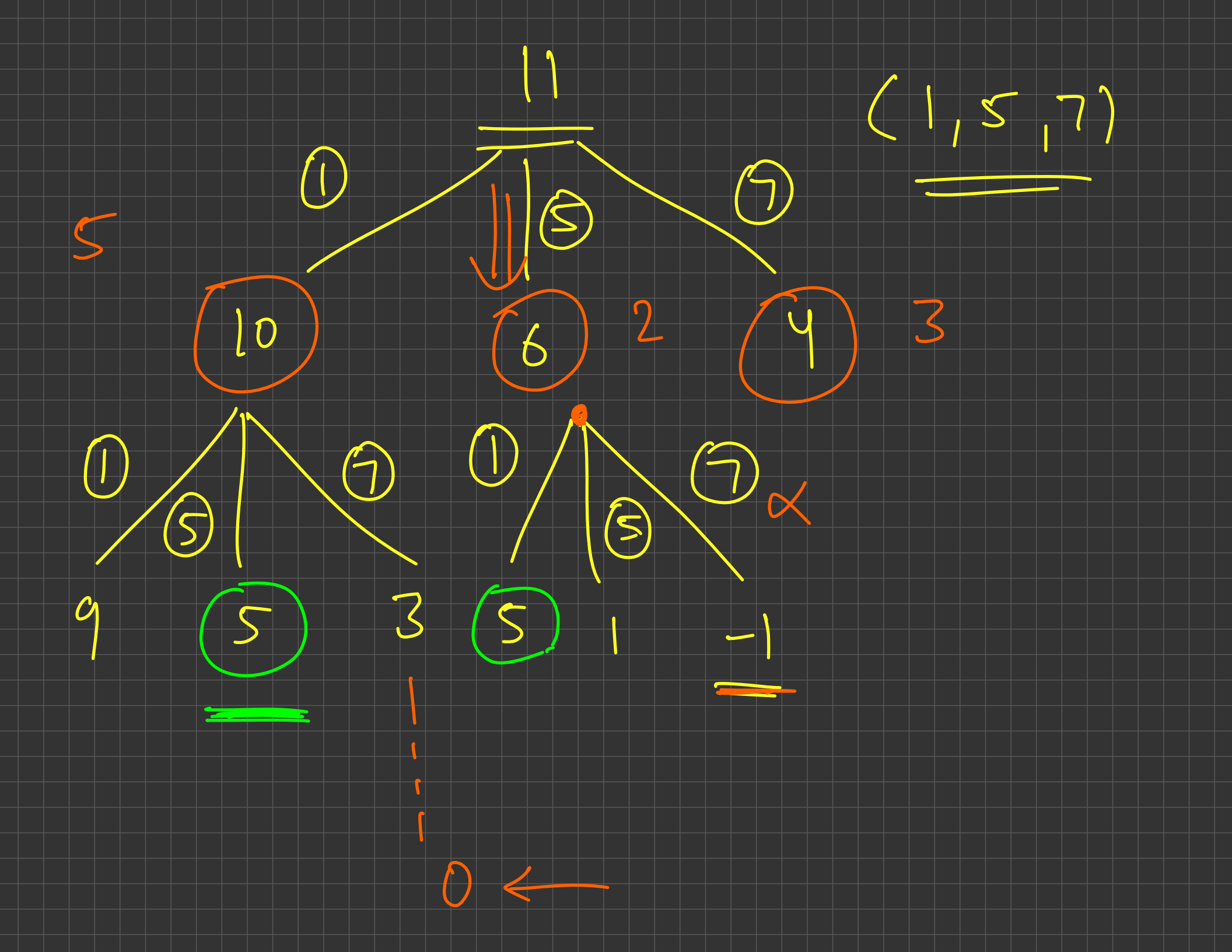
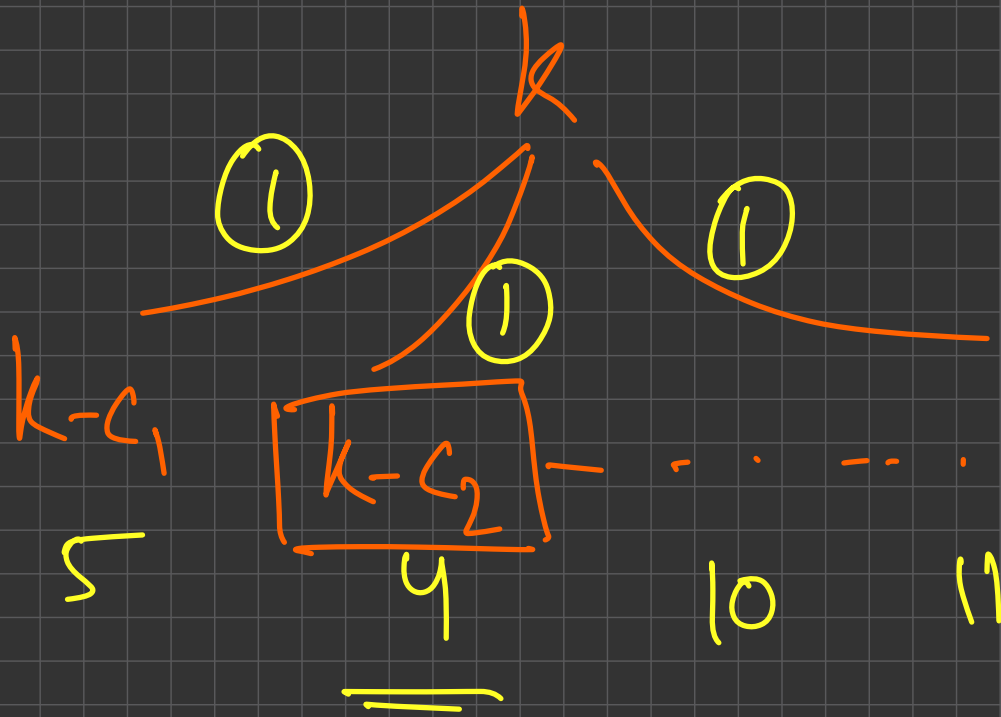

X
c_1
c_2
c_3
c_n
$x-c_1$
$x-c_2$
$x-c_n$
10
2
y


11
(1, 5, 7)
1
5
7
5
10
6
2
4
3
1
5
7
1
5
7
α
9
5
3
5
1
-1
0

$dp[k]$ = minimum no. of coins required to construct a sum of k

State



transition

$$dp[k] = \min\left(dp[k-c_i]\right) + 1$$

i goes from 1 to n

$dp(0) = 0$ coin $\neq$ Base case

final subproblem $\rightarrow$ $dp[x]$

Time Complexity :

states × avg transition time per state

↓

$O(x) \times O(n)$

$O(n \cdot x)$

Space Complexity :

state = $O(n)$