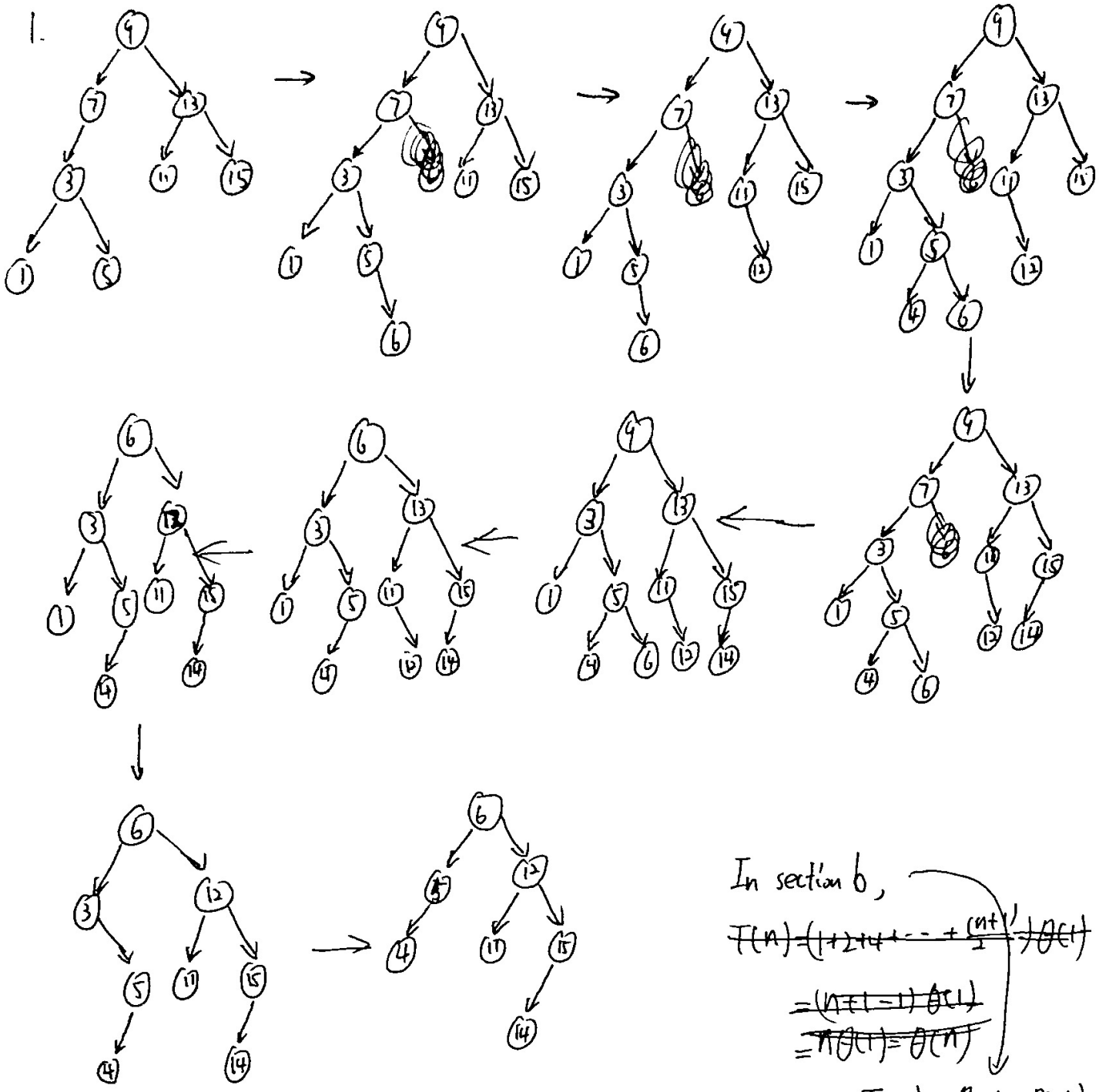
1.



In section b,

$\cancel{T(n) = (1+2+4+\cdots+\frac{(n+1)}{2})\theta(1)}$

$\cancel{= (n+1-1)\theta(1)}$

$\cancel{= n\theta(1) = \theta(n)}$

2c. In section a, $T(n) = 0+\theta(1)+1+\theta(1)+\cdots+(n-1)\theta(1)$

$= 0+1+\cdots+(n-1)+n\theta(1)$

$= \frac{(n-1)n}{2} + \theta(n)$

$= \theta(n^2)+\theta(n) = \theta(n^2)$

$T(n) = 2^0 \times (0+\theta(1))$

$+$

$2^1 \times (1+\theta(1))$

$+$

$\vdots$

$+$

$(\frac{n+1}{2}) \times (\log(\frac{n+1}{2})+\theta(1))$

$= \theta(n\log n)+\theta(n)$

$= \theta(n\log n)$