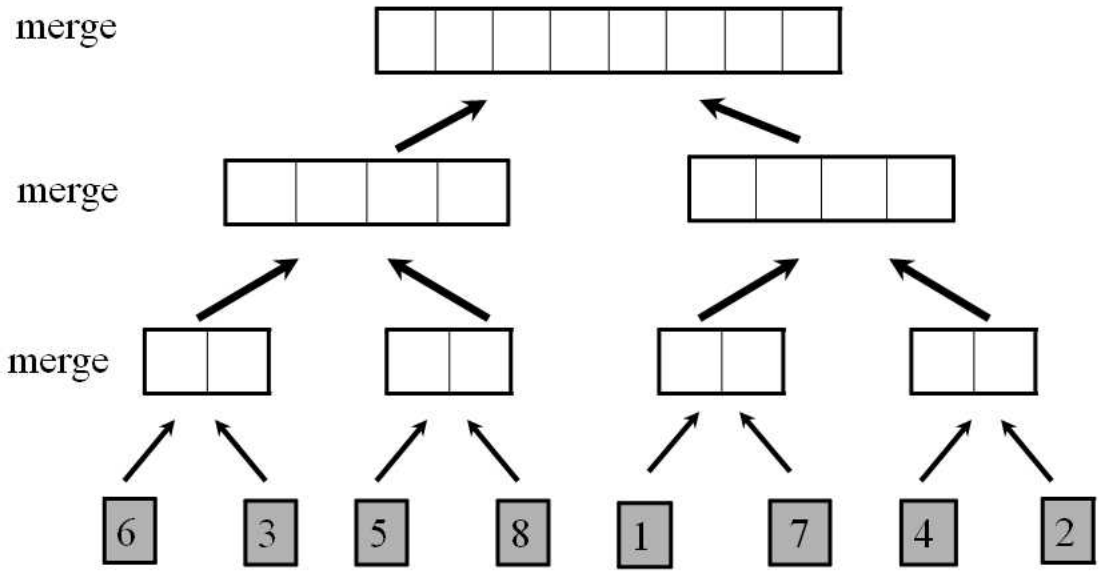
Review 2

1. Fill in the blanks when the numbers are sorted by merge sort in non-decreasing order.



2. Fill in the blanks with proper asymptotic running times. Assume that $p = 1$, $r = n$.

MERGE-SORT(*A*, *p*, *r*)	*running time*
if $p < r$	
then $q = \lfloor (p+r)/2 \rfloor$	
MERGE-SORT(A, p, q)	
MERGE-SORT(A, $q+1$, r)	
MERGE(A, p, q, r)	

3. Solve the recurrence of merge sort by using a recursion tree.

$$T(n) = \begin{cases} \theta(1) & \text{if } n = 1 \\ 2\,T(n/2) + \theta(n) & \text{if } n > 1 \end{cases}$$

4. What is the number of multiplications to evaluate the following cubic polynomial $f(x)$ when $x = 3$ if the Horner's rule is used?

$$f(x) = 4x^3 + 2x^2 + 5x + 2$$

5. Fill in the blank entries when the numbers are sorted by selection sort in non-decreasing order.

7	4	3	6	8	1	2
1	4	3	6	8	7	2
1	2	3	6	8	7	4