1.4 -1 $3n^2+2n = O(n^2)$ $a=4,\ b=3$ 일 때 모든 $n \geq 3$에 대해서

$3n^2+2n \leq 4n^2$ 이 된다

따라서 $g(n) = n^2$

1.4 -2 $n^3-10^6n^2 \leq O(n^3)$

$n^3-10^6n^2 \leq an^3$ $n \geq b$

$(1-a)n^3 \leq 10^6 n^3$

$(1-a) \leq 10^6$ $1-10^6 \leq a$

1.4 $\frac{n(n-1)}{2} = O(n^2)$ $n^2-n \leq 2an^2$ $(1-2a)n^2 \leq n$

$(1-2a)n \leq 1$

$n \leq \frac{1}{1-2a}$

ex) ① $C_N = C_{N-1} + N$, $N \geq 2$, $C_1 = 1$

② $C_N = C_{\frac{N}{2}} + 1$, $N \geq 2$, $C_1 = 0$

③ $C_N = C_{\frac{N}{2}} + N$, $N \geq 2$, $C_1 = 0$

④ $C_N = 2C_{\frac{N}{2}} + 1$, $N \geq 2$, $C_1 = 1$

⑤ $C_N = 2C_{\frac{N}{2}} + N$, $N \geq 2$, $C_1 = 0$

⑥ $C_N = 2C_{\frac{N}{2}} + N^2$, $N \geq 2$, $C_1 = 0$

⑥ $C_N = 2C_{\frac{N}{2}} + N^2$, $N \geq 2$. $C_1 = 0$

$N = 2^n$ $\quad C_{2^n} = 2C_{2^{n-1}} + 2^{2n}$

2^n 으로 나누면 $\quad \frac{C_{2^n}}{2^n} = \frac{C_{2^{n-1}}}{2^{n-1}} + 2^n$

$$= \frac{C_{2^{n-2}}}{2^{n-2}} + 2^{n-1} + 2^n$$

$$\frac{C_N}{N} = N + \frac{N}{2} + \frac{N}{4} \cdots + 1$$

$$\frac{N}{1-\frac{1}{2}} = 2N$$

$\therefore \frac{C_N}{N} = 2N \quad C_N = 2N^2$

$\therefore C_N = O(N^2)$