① ⓐ $n^2 + 4n + 17 = O(n^3)$

$\exists c \forall n > n_0 \ (0 \leq n^2 + 4n + 17 \leq cn^2)$

misal $c = 1$, $n_0 = 10$

Proof by Induction

$P(n) : 0 \leq n^2 + 4n + 17 \leq n^3$

Base Case

$P(10) : 0 \leq 157 \leq 1000 = T$

Inductive Case

$P(k) : 0 \leq k^2 + 4k + 17 \leq k^3$ diasumsikan T

$P(k+1) : 0 \leq (k+1)^2 + 4(k+1) + 17 \leq (k+1)^3$

$\equiv 0 \leq k^2 + 6k + 22 \leq k^3 + 3k^2 + 3k + 1$

$\equiv 0 \leq (k^2 + 4k + 17) + 2k + 5 \leq k^3 + 3k^2 + 3k + 1$

$\equiv 0 \leq k^3 + 2k + 5 \leq k^3 + 3k^2 + 3k + 1$

memiliki penyelesaian $k \geq 1$

sehingga bernilai T   Q.E.D

ⓑ $n^3 = O(n^2 + 4n + 17)$

$\exists c \forall n > n_0 \ (0 \leq n^3 \leq c(n^2 + 4n + 17))$

untuk setiap c dan n_0 bisa diambil

$n = max(12c1, n_0 + 1)$ sehingga

$0 \leq n^3 \not\leq c(n^2 + 4n + 17)$

Proof by Contradiction, Q.E.D