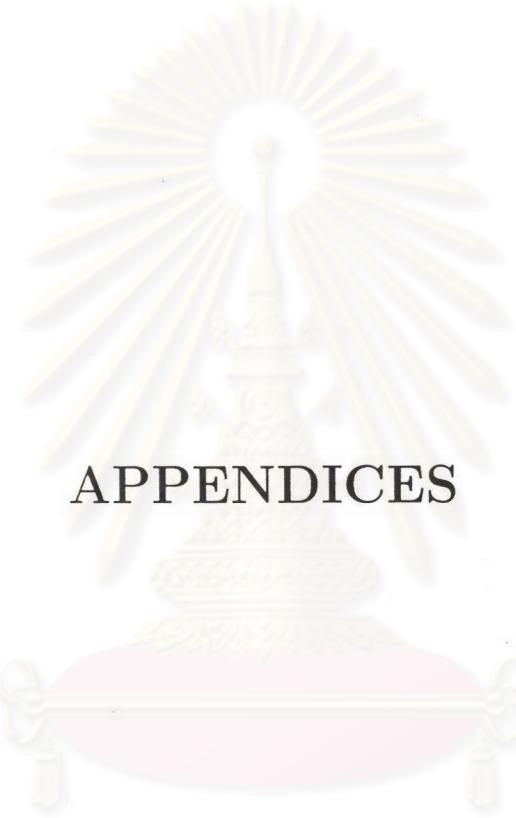


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APPENDICES

ศูนย์วิทยทรัพยากร
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APPENDIX 1

For $a_1, a_2, a_3, a_4 \geq 0$, we have

$$(a_1 + a_2 + a_3 + a_4)^3 \leq 16(a_1^3 + a_2^3 + a_3^3 + a_4^3).$$

Proof.

First we note that for $0 \leq b \leq a$,

$$(a - b)(a^2 - b^2) \geq 0$$

which implies

$$a^3 + b^3 \geq ab^2 + a^2b, \quad (\text{A1})$$

so

$$\begin{aligned} (a + b)^3 &= (a + b)^2(a + b) \\ &\leq 2(a^2 + b^2)(a + b) \\ &= 2(a^3 + b^3 + a^2b + ab^2) \\ &\leq 4(a^3 + b^3), \end{aligned}$$

where the last inequality come from (A1). Hence

$$\begin{aligned} (a_1 + a_2 + a_3 + a_4)^3 &\leq 4(a_1 + a_2)^3 + 4(a_3 + a_4)^3 \\ &\leq 16(a_1^3 + a_2^3 + a_3^3 + a_4^3). \end{aligned}$$

□

APPENDIX 2

For $a, b > 0$ we have

$$\min(a, b) \geq b - \frac{b^2}{4a}.$$

Proof. Let $a, b > 0$.

$$\text{If } a > b, \text{ then } \min(a, b) = b \geq b - \frac{b^2}{4a}.$$

Assume that $b > a$, so $\min(a, b) = a$.

Note that

$$(2a - b)^2 \geq 0$$

$$4a^2 - 4ab + b^2 \geq 0$$

$$4a^2 \geq 4ab - b^2$$

$$\begin{aligned} a &\geq \frac{4ab - b^2}{4a} \\ &= b - \frac{b^2}{4a}. \end{aligned}$$

Hence $\min(a, b) \geq b - \frac{b^2}{4a}$.

□

VITA

Miss Jiraphan Suntornchost was born on May 20, 1980 in Chachoengsao, Thailand. She graduated with a Bachelor Degree of Science in Mathematics with second class honor from Chulalongkorn University in 2002. For her Master degree, she has studied Mathematics at the Department of Mathematics, Faculty of Science, Chulalongkorn University. According to the scholarship requirement,