

---

**EXISTENCE OF MULTIPLE SOLUTIONS OF NONLINEAR  
BOUNDARY VALUE PROBLEMS**

**SOMKID INTHAP**

**A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF  
MASTER OF SCIENCE  
IN APPLIED MATHEMATICS**

**GRADUATE SCHOOL  
CHIANG MAI UNIVERSITY**

**APRIL 2003**

**EXISTENCE OF MULTIPLE SOLUTIONS OF NONLINEAR  
BOUNDARY VALUE PROBLEMS**

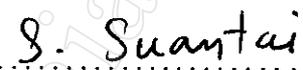
**SOMKID INTHAP**

**THIS THESIS HAS BEEN APPROVED  
TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF MASTER OF SCIENCE  
IN APPLIED MATHEMATICS**

**EXAMINING COMMITTEE**

  
..... CHAIRMAN

Prof. Amnuay Kananthai

  
..... MEMBER

Assoc. Prof. Dr. Suthep Suantai

  
..... MEMBER

Assoc. Prof. Dr. Somyot Plubtieng

**3 APRIL 2003**

© Copyright by the Graduate School, Chiang Mai University

## ACKNOWLEDGEMENT

I am deeply indebted to Prof. Amnuay Kananthai. Without his teaching talent, insightful suggestion and encouragement, this thesis would not have been possible.

I would like to express my thankfulness to Assoc.Prof.Dr. Suthep Suantai and Assoc.Prof.Dr. Somyot Plubtieng, for their constructive comment and suggestion. I also wish to thank other lecturers for their valuable lectures during my study at the department, especially Lecturer Dr. Natee Tongsirir who taught me computer programming. I also thank Khun Niphon Kittipapatsorn for his useful answers concerning all computer problems I have encountered.

I thank my beloved family for their love and support. Finally, my special thanks devotes to all of my friends in Applied and Pure Math classes who made me happy and shared all the good time together, especially Khun Wiyada Amornrattanapaichit who taught me Latex.

Somkid Inthap