Undergraduate Texts in Mathematics

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continued after Index

Gabriel Klambauer

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With 82 Illustrations

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To Agnes Catherine

Preface

This book is intended for students familiar with a beginner's version of differential and integral calculus stressing only manipulation of formulas and who are now looking for a closer study of basic concepts combined with a more creative use of information. The work is primarily aimed at students in mathematics, engineering, and science who find themselves in transition from elementary calculus to rigorous courses in analysis. In addition, this book may also be of interest to those preparing to teach a course in calculus.

Instead of exposing the reader to an excess of premature abstractions that so easily can degenerate into pedantry, I felt it more useful to stress instructive and stimulating examples. The book contains numerous worked out examples and many of the exercises are provided with helpful hints or a solution in outline. For further exercises the interested reader may want to consult a problem book by the author entitled *Problems and Propositions in Analysis* (New York: Marcel Dekker, 1979). For the history of calculus I recommend the book by C. B. Boyer, *The Concepts of the Calculus* (New York: Dover, 1949).

This book is made up of seven chapters and the Contents gives detailed information concerning the topics covered. The book begins with a study of the logarithmic and exponential functions. The treatment of these functions is geometric rather than arithmetic in nature and quickly leads to the evaluation of certain limits that are of crucial importance; the approach, which depends on a specific relation between hyperbolic segment and logarithmic function, goes back to A. A. de Sarasa (1618–1667). In the Bibliography at the end of the book the reader will find suitable references for further study.

I thank Professor P. R. Halmos, Indiana University, for the kind interest he has shown in my work, my son Peter who prepared the illustrations for this book, and my friends Dr. E. L. Cohen, University of Ottawa, and Dr.

G. K. R. Rao, University of Kenya, for valuable help and steadfast encouragement. I also wish to express my gratitude to the Board of Governors of the University of Ottawa for the benefit of a sabbatical leave during a portion of the writing of this book, and to the staff of Springer-Verlag for their fine cooperation.

Gabriel Klambauer

Contents