

# Preface

This book is for anyone acquainted with the rudiments of analytic geometry who wishes to learn the fundamental ideas of calculus and a few of their applications. It aims to present the elements clearly and fully enough that they may be understood. To this end concepts are everywhere emphasized, and physical interpretations of mathematical ideas are given a prominent role; but no prior study of physical science is expected of a reader. A feature of the exposition (which I note here for experts) is that infinitesimals are cautiously introduced and employed in parallel with limits, so that the lucid symbols of calculus can be read as they were meant to be, and as most scientists and engineers have always read them. The plan of the book is sketched at the beginning of the first chapter.

The “questions” (exercises, problems) accompanying the text supplement it and provide the practice in calculation and problem-solving that is needed to test one’s understanding. In the interest of active reading, many questions call for arguments and details omitted from the discussion. There are answers in the back, most of them including solutions full enough to be of service to the learner studying alone.

The Reader’s Guide which follows this preface explains the reference system and provides other information and advice. For translations of the epigraphs that precede Chapter 1 see Appendix 2.

In both matter and form the book owes much to the classic lectures *Differential and Integral Calculus* of R. Courant (who would have condemned the unregenerate infinitesimals). Its writing was partially supported by St. John’s College and the Beneficial-Hodson Trust. I thank Christopher Colby, Thomas Slakey, and Stewart Umphrey for their generous help, and I remember with gratitude George Comenetz, my father, whose reading of the original manuscript led to many improvements. My wife Sandy and sons Joshua and Aaron gave me heart for the work.

MICHAEL COMENETZ