Each chapter is accompanied by a set of exercises. Some of these are easy, some challenging, and some, in the author's own words, "quite difficult". They should at least be read, as many indicate further areas of research, and introduce topics not covered in the text. Appendix III, Notes on Some Exercises, has hints and explanations, and references to the literature for the interested problem-solver. Appendix II, already mentioned, consists of definitions and results from functional analysis, complex variables and topology. Appendix I, Further Developments in Infinite Dimensional Holomorphy, is a survey of current research which emphasises areas not treated in the book.

At the end of each chapter is a section entitled Notes and Remarks, comprising a fascinating historical account of the subject matter of the chapter, together with many illuminating insights, suggestions for further research, and a guide to the literature. The Bibliography is enormous, containing some 725 entries in all, ranging from papers by Volterra and Von Koch in the 1880's up to the present. This is the first complete listing of papers in holomorphy and will be of great value to workers in the field, and indeed, to interested spectators.

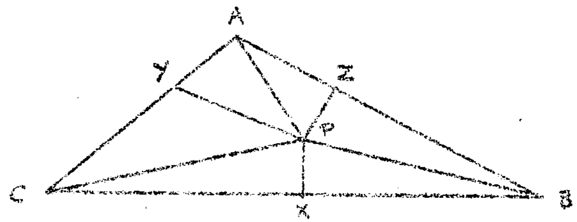
It is the reviewer's opinion that this book is a major contribution to infinite dimensional holomorphy. It succeeds admirably in its stated aims, and while giving a complete account of the theory from the topological viewpoint, is in no way closed or static — one is always led on to think of the next step, the right generalisation, the open problem. This will surely be the holomorphist's bible for many years to come. May it gain many converts!

R. Ryan

Problems Page

New or old, solved or unsolved, published or unpublished, this page will discuss any problem which has that certain something. Please send problems, solutions and references to the Editor.

1. Let P be an arbitrary point in a scalene triangle ABC, and let PX, PY, PZ be the internal bisectors of $\angle BPC$, $\angle CPA$, $\angle APB$ respectively.



Prove that

$$|PA| + |PB| + |PC| \geq 2(|PX| + |PY| + |PZ|).$$

As far as I know this is Barrow's inequality, but I have no reference. The weaker inequality, in which PX, PY, PZ are perpendicular to BC, CA, AB respectively is due to Erdos.

2. This problem came from Tom Laffey. Is

$$\inf \{|n \sin n| : n \in \mathbb{N}\} = 0?$$

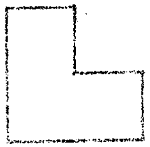
Finbarr Holland, working with his ZX81, found the approximation $\pi \approx 355/113$ which gives $355 \sin 355 \approx 0.0107$. Later Jo Manning checked (on the IBM) that this is the smallest value of $|n \sin n|$ for $1 \leq n \leq 10^6$. The problem would be answered in the affirmative if π were approximable by rationals to order $2 + \epsilon, \epsilon > 0$, and so presumably this is also open. Bill Bruce found an article by Chudnovsky (Springer Lecture Notes in Math, 751) which gives negative results on the approximation of π by rationals.

3. If $M,n \in N$ and $t = \min[m,n]$ then

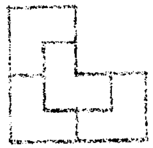
$$\sum_{d=1}^{t} 2^d \binom{m}{d}\binom{n}{d} = \sum_{d=1}^{t} \frac{(m+n-d)!}{(m-d)!\,(n-d)!}.$$

These sums arose as different people's solutions of the same problem, which was mentioned by David Singmaster.

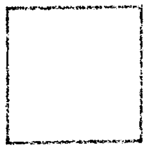
4. Some dissection problems. After getting your victim to dissect



into 4 congruent sets



follow up by asking him to dissect the square

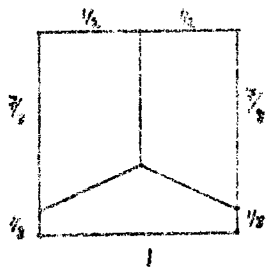


into 5. Time taken is inversely proportional to ingenuity!

A genuine problem here is to show that if p is any odd prime then there is only one dissection (apart from rotations) of the square into p congruent, connected sets.

Another hard problem is to decide whether the square can be dissected into an odd number of triangles each having the same area.

Finally, an easier one. If the unit square is dissected into 3 sets, at least one of them has diameter $\geq d = \sqrt{65/64}$. This number is the best possible.



Phil Rippon

CONFERENCE REPORTS

REPORT ON THE NASECODE II CONFERENCE

(Communicated by JJH Miller of the Numerical Analysis Group, Dublin)

The second international conference on the Numerical Analysis of Semiconductor Devices and Integrated Circuits, NASECODE II, was held in Trinity College, University of Dublin, Dublin, Ireland from June 17th to 19th, 1981, under the auspices of the Numerical Analysis Group. It was attended by over 100 delegates from 22 countries. The aim of this series of conferences is the fostering of a fruitful exchange of ideas between electronic engineers and numerical analysts.

The industrial sector was strongly represented at this conference, as was the case also at the NASECODE I Conference. Therefore, the problems of computation and numerical analysis discussed are of great practical importance as well as being intellectually challenging.

The application of numerical methods to semiconductor device modeling began about 15 years ago, and since then it has developed and broadened in scope very rapidly. To date relatively few professional numerical analysists have worked in this area, and consequently it is still a fertile source of stimulating unsolved problems of widely varying degrees of difficulty.

The models of technological importance are mainly in two space-dimensions and they may also be time dependent. Typically, two or three nonlinear differential equations have to be solved on complicated domains with a variety of boundary conditions. Computational experience indicates that the systems are often very stiff.

For the numerical analyst there is a wealth of problems. Frequently, underflow occur and special tricks have to be used to allow the computation to proceed. Convergence of the iterative method for solving the discrete nonlinear system is usually a problem. The very fine meshes generally used in certain parts of the