This book is for experts in geometric analysis. It is a heroic achievement but requires considerable background on differential geometry, Lie groups, representation theory, distributions and special functions. Parts of it, especially the more general material in Part 1, might be of general interest to researchers in differential geometry, analysis and probability whose work wanders into symmetric spaces. It should certainly be in the library of every university where there is research in mathematics.

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How to guard an art gallery: and other discrete mathematical adventures, by T. S. Michael. Pp. 257. £13.00. 2009. ISBN: 9-780801-892998 (Johns Hopkins University Press).

When writing a review on a book, I would normally wait until the near the end before providing an overall opinion regarding its perceived merits or potential failings. However, I am so enthusiastic about this book that I will say at the outset that I found it to be absolutely delightful in every respect.

Much of the mathematical content of the book is combinatorial in nature. However, it is presented in such a manner that it appears neither daunting nor intimidating. Indeed, this book has been very well written, and the explanations and diagrams are generally extremely clear. Each chapter is devoted to a single problem and its variants and generalisations. The opening chapter, for example, is entitled 'How to count pizza pieces'. It starts with the well-known problem 'What is the largest number of pieces we can make with n straight cuts through a circular pizza?', but this idea is taken further by considering different methods of proof, the corresponding situation in three dimensions (the grapefruit cutter's formula) and related problems such as the 'pizza-envy' theorem.

I particularly enjoyed reading the eponymous chapter. The general idea here is, subject to various constraints, to minimise the number of guards required simultaneously to guard every square inch of any given art gallery with a polygonal plan. Some special cases are dealt with first in order to help set the scene and provide the reader with a gentle introduction to the problem. However, this quickly moves into more demanding territory; some of the proofs or partial proofs are ingenious. This chapter also considers the three-dimensional situation, via the octoplex and the megaplex. There were certainly a few results here that I was not previously aware of.

Other chapters cover the problem of finding the best configuration of pixels on a computer monitor to represent a particular line segment, water-measuring scenarios, Pick's formula and the consideration of whether or not a certain postage cost is attainable using particular denominations of stamps.

The font size of the text is unusually large and so one finds that the content is not quite as extensive as the thickness of the book might initially indicate. Some might find the font size a little odd at first. It certainly does not take very long to read a page, many of which are festooned with diagrams and results.

This book would make an ideal prize or gift for a sixth-form student or an undergraduate. I believe, however, that teachers and lecturers would also very much enjoy reading through it. I have used some of the ideas contained in the book as the basis for activities for both secondary-school pupils and postgraduate students training to be teachers of mathematics. These were generally received very well.

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