

REFLECTIONS ON RESOURCES

kled throughout the book, for the most part the impression given to its readers is that mathematics education in the age of the graphics calculator is pretty much the same as it was in previous ages. This would be a very difficult proposition to defend.

Barry Kissane

EXPLORING MATHS PROBLEMS WITH THE CASIO fx-9700GH

**Ian Lowe and Chris
Barling
Addison Wesley
Longman, 1996
48 pp, \$14.95**

EXPLORING MATHS PROBLEMS WITH THE TI-82 AND THE TI-83

**Ian Lowe and Chris
Barling
Addison Wesley
Longman, 1996
52 pp, \$14.95**

The primary purpose of this companion pair of books is to help students to use the relevant graphics calculator efficiently for various mathematical purposes. The back covers of the publications highlight that the starting point is the mathematics itself, rather than features of the calculators.

Each of the activity pages is A4 size and self-contained. Each begins with some mathematical exercises, very many of which might have been found in most high school curricula before graphics calculators were invented. The rest of each page provides the reader with detailed advice on how to use the relevant calculator to deal with these exemplars. The title of the publications, suggesting that problems (rather than exercises) are explored (rather than

demonstrated), seems to miss the flavour of the publication, more accurately described on the back covers with the observation that the books "... demonstrate how the (calculator) can be applied to mathematics topics".

The choice of topics places strong emphasis on graphing, clearly one of the advantages of having access to graphics calculators such as these from Casio and Texas Instruments, both of which handle many aspects of graphing well. About half of the pages are devoted explicitly to graphing (nine of them to linear graphing), while many of the others include elements of graphing, such as the graphical representation of data and the interpretation of graphs in a calculus context. Other aspects treated include calculation itself (since a graphics calculator is especially useful for numerical work too), variation and sequences and series, the latter restricted to arithmetic and geometric.

Given the capabilities of the calculators, including those not involving graphing, the omissions from the publications are perhaps a little surprising. For example, there is no mention of graphing with polar coordinates, matrix arithmetic, recursively defined sequences other than arithmetic and geometric, or complex numbers. Presumably, the books have been produced with an eye to particular mathematics curricula which do not include these elements, or the desire to restrict the size of the publications has meant that tough decisions like this have needed to be made: I notice that a flyer accompanying the review copies suggest that the publications were originally intended to be each 56

pages long. Although the line must be drawn somewhere, omissions of these kinds will restrict the usefulness of the publications for those using them with mathematics curricula that do include these other kinds of elements.

Each of the pages contains detailed, step-by-step keystrokes so that readers with a calculator will see how the relevant examples can be tackled using the calculator. The examples are generally identical in the two publications, although the precise details of how they are handled by the calculators are of course different. The Texas Instruments publication usually includes small differences between the TI-82 and TI-83 calculators, although there are places where the capabilities are sufficiently different to require extra pages. The keystrokes on each page are related to a few well-chosen screen dumps for each topic, which will allow readers to check that they have correctly followed the steps. It is disappointing that the calculator screen dumps for the TI book have been printed by a printer that has "smoothed" the images, and consequently both made them more difficult to interpret and not faithful reproductions of the actual screens concerned. A commentary on both mathematical aspects and calculator use accompanies the instructions. It is clear that the authors are competent users of these calculators, and have identified many of the useful features for their readers. The style of the publications (more likely to be dipped into rather than read serially) means that the level of detailed instructions is fairly constant from beginning to end, rather than assuming readers are becoming more sophisti-

cated. A consequence of this is that the level of detail, originally helpful, may eventually become irritating, but this seems unavoidable in publications of this kind. In general terms, I found the page design somewhat cluttered, with an assortment of fonts, print styles and symbols, and very little white space.

I confess to being a little wary of the apparent assumption that walking readers through the appropriate keystrokes will empower them to tackle new situations by themselves, and it is unfortunate that neither book contains an introduction by the authors to help the readers (whether students or teachers) get maximum benefit from the work, and share with the readers their intentions for how the publications might be used. It is not clear, for example, to what extent the books are intended for beginners or experienced users of the calculators, or even whether they are intended mainly as reference books. I would have expected that beginners need more help than provided in places (such as a description of the idiosyncratic menu system of the Casio calculator, for example) while experienced users may have been happy with much less.

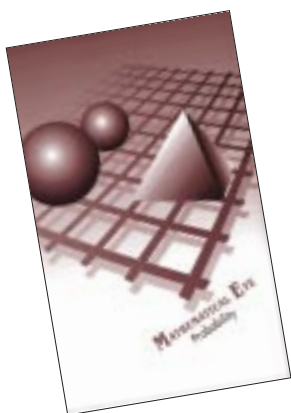
The choices of phraseology are at times unfortunate. To give three examples, the texts refer to "plotting graphs", "graphing equations" and "sketching parabolas". I would prefer to reserve the term "plotting" for hand-plotting of a graph, and the Casio calculator even refers to plotting as a process of plotting individual points, not connected to make a graph. Curiously, the texts refer to plotting terms of a sequence as "drawing a graph" of the sequence

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and also use the verb "draw" for scatterplots. Similarly, I would prefer to be more careful with the meaning of "sketch", and would certainly not want to restrict it to parabolas. I prefer the phraseology of "solve equations" and "graph functions" (or relations), rather than "graphing equations". While sophisticated users of these texts, such as mathematics teachers, will be quite untroubled by such linguistic matters, it is less clear to me that the same is true for students just starting to learn elementary algebra, presumably a major intended audience.

In all, these books will be useful companions to those using the relevant calculator for traditional mathematics curricula. While they are unlikely to excite those interested in changes to curriculum boundaries and classroom practice to take advantage of technologies like the Casio 9700 and the TI-82/83, such changes are clearly not the intention of either publication.

Barry Kissane



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This series captures the spirit of the National mathematics curriculum in the U.K. by providing a variety of illustrations and stimuli for learning concepts, undertaking investigations and problem solving, and applying mathematics at the level of the upper primary, lower secondary and middle school. Each of the ten programmes is based on a specific topic area, and is divided into approximately five minute segments, allowing the teacher to sample a particular idea or cluster of ideas for teaching episodes.

The quality of production is excellent; in fact, the series has won The Royal Television Society's Award, according to the coversheet. A range of techniques is used to present material: animation, short drama segments, voice-overs by a commentator and by children, as well as segments showing children at work in the classroom and real-life

examples of mathematics. Both the variety of images and the use of humour contribute to a style of presentation which should appeal to viewers, although as one might expect that style is distinctly British. There are indeed cultural allusions which may puzzle many Australian viewers, such as the qualities of "school custard", and beaches filled with deck chairs, while other references will be more familiar (Smarties, Star Trek and dog food).

While the settings and allusions are reflective of a multicultural England, and more particularly in the North (some of the on-screen accents are "champion"), the video segments should not be a problem for most viewers, given the amount of television watched in this country.

The series does not, and could not, attempt to cover the whole curriculum. However, except for some brief segments on truth tables and logic gates, all topics seem to fit very well into the Australian curriculum, most appropriately for about Years 6 to 9, or Bands B and C of the National Statement. The subject matter seems to have been selected to exemplify many of the core concepts of the middle school curriculum, although by no means all.

Of the individual programmes, a number such as *Symmetry* stand out as particularly appealing because of the innovative approaches taken to explore the topic. Others contain material which is clearly derivative, such as the *Ratio & Scale* segment featuring the mouse and the elephant, which is however redeemed to some extent by the explicitly graphic cartoon of both animals removing their skins to take a bath.

And the elephant is described as being ten times the height of the mouse... The overall impression is a series which has been thoughtfully assembled.

Apart from the obvious problems of translation to the Australian context, the videotapes need to be thoroughly previewed by teachers. The programme notes are not very helpful, and can be misleading. For the tapes to realise their potential, teachers should make detailed notes of the content of each programme and segment, so that they can be screened at the appropriate time in a teaching sequence. Tapes can be used as the basis for a single lesson in some cases, but more likely they will be sampled from, since the structure will require teachers to pause or stop the tape, for example after a problem has been posed. It is this flexibility in the use of the programmes which will most appeal to teachers who have used video to support their teaching. Teachers who have not used video before will take a while to uncover the possibilities, but it is worth the effort.

The tapes are available singly or as a series. For schools wishing to sample them, trial, say, the *Symmetry*, *Shapes & Angles* and the *Probability* tapes. However, it's fair to say that every programme has something to offer teachers, not only as a resource for the classroom, but also as a source of ideas for teaching. This is a series worth investing in, and given what you get, it is at a reasonable price.

Peter Brinkworth