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Titles: *Calculator Statistics* and *Calculator Calculus*
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(The books are not available in bookshops but can be obtained from: A + B Books, 15 Top Lodge, Fineshade, Near Corby, NN17 3BB)

These two books, whose authors have considerable experience of designing courses for students using graphics calculators, are aimed at students aged 16 or over who are using Texas Instruments TI-83 or TI-83 Plus calculators. Graphics calculators are available in many schools and there is a demand among teachers for supporting materials. The overall approach of the books is to provide instructions that encourage students to take part in activities using their calculators and to check their progress against very well-written solutions at the end of each book. The solutions are illustrated by screen dumps and are written in a friendly, encouraging tone. The books prompt students to think about concepts while doing practical calculator work. Each short unit ends with a useful *So finally?* section that either checks a student's understanding of the main points of the unit or poses a more challenging question that could be used to start a class discussion.

In my opinion the *Calculator Statistics* book is an excellent resource book. It contains 16 units that aim to demonstrate some of the 'big ideas' of Statistics and it would add interest to a Statistics course. Teachers can easily identify and use the units that are relevant to any particular course. This book has enough background explanation to make situations clear and contains many varied activities to reinforce students' learning. In some activities program listings are given and the programs have been deliberately kept short enough to fit one screen.

The book's contents cover summarising data, regression, correlation, probability distributions and finally statistical tests as well as work on sampling in units called *The Central Limit Theorem*, *Are estimators biased?* and *Correcting bias*.

Some units of the *Calculator Calculus* book could provide extra interest for students but I feel that other parts of the

book might distract students from what they actually need to learn in order to differentiate functions. There are a few *Brain Stretchers* in this book to encourage students to think hard – these are a good idea. Drawing line segments on a set of axes and calculating their gradients is a good introductory unit and this leads on to zooming in at different points on curves until the curve resembles a straight line. However my worry is that it takes until the end of Unit 8 before the derivative of ax^n is given as nax^{n-1} . This seems too long to wait if the reader has not been taught differentiation before. The other earlier units are filled with different ways of estimating or calculating numerical values of derivatives. Here the authors seem to concentrate on explaining how the calculator arrives at an answer rather than on suggesting how students can enhance their learning of Calculus.

In Unit 9 the second derivative is introduced and used as a way of finding points of inflexion. The authors state that if the second derivative equals zero at a point then

it is a point of inflexion. This is confusing for two reasons. Firstly, points of inflexion are often met as one type of stationary point rather than the more general definition the authors are using and secondly if the second derivative equals zero there may not be a point of inflexion. For example the curve $y = x^4$ has a minimum turning point when $x = 0$. Rather than devoting a unit to points of inflexion, I think it would have been more useful to have a unit on stationary points in general and including the second derivative test for determining the nature of a stationary point.

I approve of the later units, firstly one on rates of change, for example marginal cost, velocity and acceleration and then units that concentrate on the evaluation of definite integrals and some of their applications.

The authors recognise that readers will find these books more useful if they are familiar with the basic features

and menus of the calculator and they occasionally refer readers to an earlier book *Calculator Mathematics: Foundations Plus*. I think it may be rather off-putting to readers to be advised on the first page of unit 1 of *Calculator Calculus* to look at the earlier book to find out how to switch off statplots or deselect functions in the Y= screen. Since it is so important to do this at the outset it would have been better if the authors had included a short instruction here.

Overall I am impressed by the care that the authors have put into planning a series of activities which could be used by students as homework or, in class, as groupwork or individual tasks. The books provide a fresh approach to topics that students often find less than exciting and encourage them to become actively involved in the learning process. I recommend the *Calculator Statistics* book but as I have explained earlier I have some reservations about some units of *Calculator Calculus*.