material that is often far from trivial, and even the preliminary chapters need to be read carefully, because it is here that the notation (much of it nonstandard) is established.

Errors aside, some readers may find it difficult to establish exactly what the assumptions are—even the 1-dimensional example in Chapter 6 stops short of presenting the actual quadrature formulas obtained with this approach. Instead, it refers the reader to work by Shamalov that is unavailable in the West. In the 1-dimensional setting sharper and more explicit results can be found, for example, in the survey [1] (not among the references of the original or the translation).

As noted above, a key question is: what restrictions, if any, are placed on the behavior of ϕ and ψ at the boundary of Ω? This is surprisingly hard to pin down, because the setting at the start of the cubature discussion seems to be $L_2^m(\Omega)$ but then shifts to $L_2^m(R^n)$.

Finally, our friends in numerical analysis who master this book will, we think, be inclined to question the practical value of the optimal rules produced by the methods of this book. Indeed, the author is admirably frank about the difficulties that face optimal cubature: 'Unfortunately, this choice [of function space setting] is partly dictated by the desire to obtain the problem subject to the method of investigation planned by the author, since the natural formulation itself may turn out to be too difficult.' It should also be mentioned that the optimality discussion in this book does not consider in full generality the choice of nodes: instead, guided by results for the periodic case, 'we ... restrict ourselves to the case when the system of nodes ... is a parallelepipedal lattice, and [we] will only change the parameters of this lattice.' It is generally accepted that for nonperiodic smooth functions on bounded regions the cubature points should in some way be concentrated towards the boundary, and this is recognized in Chapter 5 through the ad hoc addition of extra cubature nodes near the boundary. While this is done in such a way as to preserve the optimal order of convergence, many readers will feel that the treatment of boundary effects remains unsatisfactory.

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1. S. M. Nikolskii, *Quadrature formulas* (with an appendix by N. P. Korneichuk), 3rd ed., "Nauka", Moscow, 1979. (Russian)

33[11-02, 11Y40].—Michael E. Pohst, *Computational Algebraic Number Theory*, DMV Seminar, Band 21, Birkhäuser, Basel, 1993, x + 88 pp., 24 cm. Price: Softcover $26.50.

This 88-page booklet is based on lectures given by the author in the DMV seminar on Computational Number Theory held at Schloß Mickeln, Düsseldorf, August 1990. It contains a discussion of the fundamental computational problems of algebraic number theory: the computation of the ring of integers of a number field and the computation of the unit group and the ideal class group of this ring. All algorithms presented are based on calculations with integral lattices, in particular on the Lenstra-Lenstra-Lovász lattice reduction algorithm.

The text does not contain full proofs of the basic theorems of algebraic number theory. For these, the reader, unfortunately, is often referred to the idiosyncratic book by Pohst and Zassenhaus [1]. However, in contrast to that book, the discussion of the computational aspects of the theory is here very clear and pleasant to read. The examples presented, which are computed using the "Kant" computer algebra package, are impressive. They represent the state of the art and give the reader some feeling for the practical side of the problem.

I highly recommend this short text to anyone interested in the computational aspects of algebraic number theory.

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1. M. Pohst and H. Zassenhaus, *Algorithmic algebraic number theory*, Cambridge Univ. Press, Cambridge, 1989.