Special Functions and Orthogonal Polynomials (Cambridge Studies in Advanced Mathematics)

By Richard Beals, Roderick Wong

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The subject of special functions is often presented as a collection of disparate results, rarely organized in a coherent way. This book emphasizes general principles that unify and demarcate the subjects of study. The authors' main goals are to provide clear motivation, efficient proofs, and original references for all of the principal results. The book covers standard material, but also much more. It shows how much of the subject can be traced back to two equations - the hypergeometric equation and confluent hypergeometric equation - and it details the ways in which these equations are canonical and special. There is extended coverage of orthogonal polynomials, including connections to approximation theory, continued fractions, and the moment problem, as well as an introduction to new asymptotic methods. There are also chapters on Meijer G-functions and elliptic functions. The final chapter introduces Painlevé transcendents, which have been termed the 'special functions of the twenty-first century'.

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Editorial Review

About the Author
Richard Beals is a former Professor of Mathematics at the University of Chicago and Yale University. He is the author or co-author of books on mathematical analysis, linear operators and inverse scattering theory, and has authored more than 100 research papers in areas including partial differential equations, mathematical economics and mathematical psychology.

Roderick Wong is Chair Professor of Mathematics at the City University of Hong Kong. He is the author of books on asymptotic approximations of integrals and applied analysis. He has published over 140 research papers in areas such as asymptotic analysis, singular perturbation theory and special functions.

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