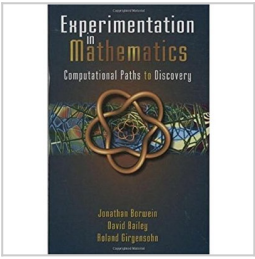

Experimentation in Mathematics: Computational Paths to Discovery

By Jonathan M. Borwein, David H. Bailey, Roland Girgensohn

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New mathematical insights and rigorous results are often gained through extensive experimentation using numerical examples or graphical images and analyzing them. Today computer experiments are an integral part of doing mathematics. This allows for a more systematic approach to conducting and replicating experiments. The authors address the role of experimental research in the statement of new hypotheses and the discovery of new results that chart the road to future developments. Following the lead of *Mathematics by Experiment: Plausible Reasoning in the 21st Century* this book gives numerous additional case studies of experimental mathematics in action, ranging from sequences, series, products, integrals, Fourier series, zeta functions, partitions, primes and polynomials. Some advanced numerical techniques are also presented. To get a taste of the material presented in both books view the condensed version.

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Editorial Review

Review
" ""The authors . . . explain experimental mathematics in a lively, surprisingly accessible fashion. ""-N/ A, *L'Enseignement Mathematique* , December 2004
How large a role will computer computations play in the mathematics of tomorrow? The books under review are about many things, but it is clear that the authors are focused on this question. Their answer: very large. Their attitude: we should embrace this change. -David P. Roberts, MAA Online Read This!, January 2005
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It is impossible to describe the content of the whole work in detail in just a few lines. -Ivan Netuka, EMS, September 2004
""Much of the material in the book has arisen from the experiences of the authors while working on a computer based approach to different topics in mathematics. The variety obtained in this way is impressive, the authors have really touched and produced a treasure trove of lovely mathematical gems."" -Fritz Beukers, *AMS MathSciNet* , May 2005
""Mathématiques expérimentales Certains mathématiciens défendent l'idée que les mathématiques sont une science expérimentale: l'ordinateur, dont la puissance de calcul engendre des conjectures, est pour eux une source d’inspiration."" -Jean-Paul Delahaye, Pour la Science--Logic et Calcul, April 2005
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