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T. Kyle Petersen

Inquiry-Based
Enumerative
Combinatorics

One, Two, Skip a Few... Ninety-Nine,
One Hundred

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Inquiry-Based Enumerative Combinatorics

One, Two, Skip a Few... Ninety-Nine, One Hundred

- Equips readers with the fundamentals of enumerative combinatorics with an emphasis on generating function techniques
- Promotes an engaging learning experience by utilizing Inquiry-Based Learning (IBL)
- Offers an accessible entry-point to enumerative combinatorics that builds from minimal prerequisites to a selection of advanced topics

This textbook offers the opportunity to create a uniquely engaging combinatorics classroom by embracing Inquiry-Based Learning (IBL) techniques. Readers are provided with a carefully chosen progression of theorems to prove and problems to actively solve. Students will feel a sense of accomplishment as their collective inquiry traces a path from the basics to important generating function techniques. Beginning with an exploration of permutations and combinations that culminates in the Binomial Theorem, the text goes on to guide the study of ordinary and exponential generating functions. These tools underpin the in-depth study of Eulerian, Catalan, and Narayana numbers that follows, and a selection of advanced topics that includes applications to probability and number theory. Throughout, the theory unfolds via over 150 carefully selected problems for students to solve, many of which connect to state-of-the-art research. Inquiry-Based Enumerative Combinatorics is ideal for lower-division undergraduate students majoring in math or computer science, as there are no formal mathematics prerequisites. Because it includes many connections to recent research, students of any level who are interested in combinatorics will also find this a valuable resource.

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