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Ensley, Douglas E.; Crawley, J. Winston

Discrete mathematics. Mathematical reasoning and proof with puzzles, patterns, and games.

Hoboken, NJ: John Wiley & Sons (ISBN 0-471-47602-1/hbk). xii, 691 p. (2006).

This text covers all topics recommended as content and learning objectives for a one-semester course for computer science or math majors by the ACM/IEEE and MAA CUPM. The main themes are: Thinking and writing about mathematics; Sets, functions and relations; Combinatorics and probability; and Graph theory. One innovation in the presentation is the effort of the authors not to represent the topics compartmentalized, but to make the students aware of the interconnections by using so called "threads" that weave the themes together. One important content thread is the focus on puzzles, games or magic tricks. These engage the students very naturally with problems that motivate the development of specific topics. The book contains over 1000 exercises ranging through all levels of difficulty. Also in the exercises an effort is made to make connections to past topics and foreshadow future developments. Each chapter ends with an excursion into applications of the concepts of the chapter. There are electronic resources accompanying the book which contain not only on-line versions of the material and exercises, but also interactive modules. Particularly interesting is the web-based material related to mathematical proof, which prompts students to critically read proofs. Their understanding is checked by targeted example/counterexample questions. This seems a novel and fruitful use of electronics. *Herman J. Servatius (Worcester)*

Classification: N70 K20 K30 H50
Keywords: combinatorics; graph theory; Boolean algebra