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Gallier, Jean. **Discrete mathematics**. Springer, 2011. 465p bibl indexes afp
ISBN 9781441980465 pbk, $74.95

This well-written, highly illustrated book will be very useful and interesting to students in both mathematics and computer science. Gallier (computer and information science, Univ. of Pennsylvania) begins the six-chapter work by introducing the rules of mathematical reasoning and the tools used to construct formal proofs or check their accuracy. This chapter also presents the major axioms of set theory and the natural numbers. Chapter 2 discusses relations, functions, partial functions, and the principle of complete induction. A presentation of the basic notions of graph theory, including the concepts of trees, and directed and undirected graphs and their properties, follows. The fourth chapter focuses on counting problems, covering binomial/multinomial coefficients, the principle of inclusion-exclusion, and proofs of the sieve formula as well as Sylvester's formula. Chapter 5 includes a discussion of partial ordering and equivalence relations, which are very important in mathematics and computer science. The last chapter explores additional graph theory topics such as Eulerian and Hamiltonian cycles, planar graphs, bipartite graphs, network flows, matchings, and coverings. Attractive features of this book include clear presentations, end-of-chapter summaries and references, a useful set of problems of varying difficulty, and a symbol as well as a subject index. **Summing Up**: Highly recommended. Upper-division undergraduates, graduate students, and professionals/practitioners.

--D. V. Chopra, Wichita State University