theory of Boolean functions. Chapter 1 introduces basic definitions, various normal forms, prime implicants, and symmetric functions. In an appendix to Chapter 1, an unpublished and non-trivial (combinatorial) theorem of Bakos is given. (This theorem yields a uniform construction of Gray codes as a consequence.) Chapter 2 gives the standard theory of minimality. Applications to special cases such as monotonic or symmetric functions are given. Chapter 3 discusses inter-relationships between conjunctive and disjunctive normal forms. Chapter 4 deals with functional completeness and the Post-Yablonsky theorem is proven. Some applications to finite automata are given. Chapter 5 is concerned with the decomposition of truth functions.

Chapter 6 on numerical problems is particularly good. Groups are used to classify truth functions. A form of Pólya's theorem is given and the work of Pólya, Slepian and the reviewer is presented. A number of special cases are worked out including some of the results of Povarov. Chapter 7 on linearly separable functions gives a number of characterizations.

In summary, Part I gives a rather complete survey of the mathematical properties of truth functions.

Part II relates these mathematical properties to the graphs or networks which realize Boolean functions. Chapter 8 is concerned with two terminal graphs. Particular attention is given to series-parallel graphs and both Trakhtenbrot's and Ádám's theorems are proven. Chapter 9 is devoted to several kinds of realizations, particularly repetition-free realizations in which the assignment of variables to edges is one-to-one. Various problems concerning these realizations are stated and proven. Chapter 10 is devoted to optimal realizations. Unfortunately, little is said about this interesting topic and the book closes with some open problems.

The book is a fine vehicle for the mathematician or computer scientist who wants a concise and accurate survey of switching theory. The book could even be used as a graduate text, although it was not written for this purpose and does not contain problems. The style is excellent and the arguments are clear. The nomenclature generally follows western usage. It is a valuable addition to the literature as it makes available a number of results which had not been published before in English.

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Combinatorial identities, by John Riordan. Wiley, New York, 1968. xii + 256 pages. $15.00.

The title is taken to include "all identities phrased in terms of recognized combinatorial entities, such as the old-fashioned permutations, combinations, variations, and partitions, and the numbers arising in their enumeration" or, more generally, "any identity with combinatorial significance". This book is not a dictionary of identities, in fact the reader is explicitly warned "that he may not expect his identity of the moment, however fascinating it seems, to be listed and verified"; it is instead a survey of certain methods for finding and verifying combinatorial identities.

Many identities can be obtained by iterating in different ways the basic recurrence for binomial coefficients

$$\binom{n}{k} = \binom{n-1}{k} + \binom{n-1}{k-1} ;$$

such identities, including various forms of the Vandermonde convolution formula, are discussed in Chapter 1. One section is devoted to a family of identities that contains Abel's generalization of the binomial formula; multinomial analogues, including Hurwitz's extensions of Abel's formula, are also obtained by recurrence.

One of the simplest examples of an inverse relation is the pair

$$a_n = \sum_{k=0}^{n} (-1)^k \binom{n}{k} b_k \quad \text{and} \quad b_n = \sum_{k=0}^{n} (-1)^k \binom{n}{k} a_k ,$$

each of which implies the other. Chapters 2 and 3 are concerned with such relations; relations of Gould, Chebyshev, and Legendre type are developed in Chapter 2 and relations associated with Abel identities and generating functions are treated in Chapter 3.

The author remarks that generating functions are "a constant feature of all parts of enumerative combinatorial analysis". Chapters 4 and 5 are focused on their use in establishing identities. There are sections in Chapter 4 on multisection of series (a process that generalizes the technique for splitting a series into its even and odd terms), on sums of products of the type

$$\binom{i+i_1}{i_1}\binom{i_1+i_2}{i_2} \cdots \binom{i_{n-1}+i_n}{i_n}\binom{i_n+i}{i} ,$$

and on applications of Lagrange series. The Bell polynomials are discussed in Chapter 5 and there is a section on number-theoretic aspects of partition polynomials.

Chapter 6 deals with the use of various difference and differential operators; the Stirling numbers appear here frequently.

Each chapter is followed by an extensive problem section and the text concludes with a bibliography of sixty-five entries.

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Introduction a la combinatorique en vue des applications, by A. Kaufmann. Dunod, Paris, 1968. xviii + 609 pages. 131.60 F.

The five chapters of this book fall into three classes. The first two chapters deal with combinatorial analysis in the traditional sense. The topics discussed are similar to those in Riordan [An introduction to Combinatorial Analysis, Wiley, New York, 1958] and the first three chapters of Ryser [Combinatorial Mathematics, Wiley, New York, 1963] (except that partitions and Pólya's Theorem are not considered). The treatment in this book is perhaps more expository and many