algorithmic method. The results of this chapter are used in Chapter V to give an algorithmic treatment of various questions connected with finite systems of differential equations. For the case of a field $\mathcal{J}$ consisting of analytic functions, a very useful approximation theorem is proved.

Chapter V deals with constructive methods and tests.

In Chapter VI, the case of a field of analytic functions is treated by analytic methods. For this case, another proof of the low power theorem is given.

Chapter VII deals with intersections of algebraic differential manifolds, especially with their dimensions. A result of Jacobi proves true in some special cases, but false in general.

Chapters VIII and IX deal with partial differential equations. In Chapter VIII, a very important existence theorem, due to Riquier, is proved. In Chapter IX this theorem is used to extend some of the main results of the preceding chapters to partial differential polynomials.

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Transcendental numbers. By Carl Ludwig Siegel. (Annals of Mathematics Studies, no. 16.) Princeton University Press, 1949. 8+102 pp. $2.00.

As the author states in a short preface, this book is based on lectures given at Princeton in 1946. In Chapter I, *The exponential function*, proofs are given of the irrationality of e and π, and then a general method is introduced.

Let $\rho_1, \cdots, \rho_m$ be complex numbers, $n_1, \cdots, n_m$, non-negative integers, and let

$$N + 1 = \sum_{k=1}^{m} (n_k + 1).$$

It is shown that polynomials $P_1(x), \cdots, P_m(x)$ of degrees $n_1, \cdots, n_m$, respectively, may be determined uniquely (up to a constant factor) such that the function

$$R(x) = \sum_{k=1}^{m} P_k(x)e^{\rho_k x}$$

vanishes at $x=0$ of order N. Such a function is called an approximation form. An explicit formula for $R(x)$ as a multiple integral provides an upper bound for $|R(1)|$ and shows that $R(1)>0$ when $\rho_1, \cdots, \rho_m$ are real.