

LINEAR DIFFERENCE EQUATIONS WITH ARBITRARY REAL SPANS.

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I. Introduction.

The object of many investigations has been the study of difference equations of the forms

$$(I. 1) \quad \sum_{s=0}^m c_s(x) F(x+s) = G(x)$$

and

$$(I. 2) \quad F_j(x+1) = \sum_{k=1}^p c_{jk}(x) F_k(x) + G_j(x), \quad j = 1, \dots, p,$$

in which the coefficients are functions of the real variable x asymptotically constant,

$$(I. 3) \quad \lim_{x \rightarrow +\infty} c_s(x) = c_s, \quad s = 0, 1, \dots, m,$$

and

$$(I. 4) \quad \lim_{x \rightarrow +\infty} c_{jk}(x) = c_{jk}, \quad j, k = 1, \dots, p.$$

Bochner² has considered the more general equations

$$(I. 5) \quad \sum_{s=0}^m c_s(x) F(x+\delta_s) = G(x)$$

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² S. BOCHNER, *Math. Zeitschrift* 33 (1931), pp. 426—450. Hereafter we shall refer to this paper as »I». BOCHNER gives other references to the literature.