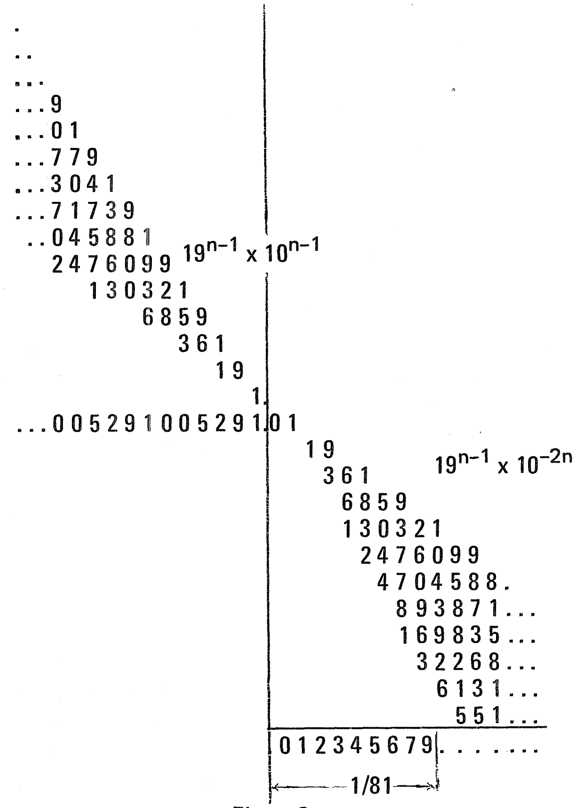

Figure 2

★★★★★★★

ON GENERATING FUNCTIONS FOR POWERS OF A GENERALIZED SEQUENCE OF NUMBERS

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GENERATING FUNCTIONS

For the record, some results are presented here which arose many years ago (1965) in connection with the author's paper [3]. Familiarity with the notation and results of Carlitz [1], Riordan [6], and the author [2], [3] and [4], are assumed in the interests of brevity. Note, however, that h_n in [3] has been replaced by H_n to avoid ambiguity. Our results and techniques parallel those of Riordan.

Calculations yield

$$(1)\qquad \left\{\begin{aligned} H_n^2 - 3H_{n-1}^2 + H_{n-2}^2 &= 2(-1)^n e\\ H_n^3 - 4H_{n-1}^3 - H_{n-2}^3 &= 3(-1)^n eH_{n-1}\\ H_n^4 - 7H_{n-1}^4 + H_{n-2}^4 &= 2e^2 + 8(-1)^n eH_{n-1}^2\\ H_n^5 - 11H_{n-1}^5 - H_{n-2}^5 &= 5e^2H_{n-1} + 15(-1)^n eH_{n-1}^3\ . \end{aligned}\right. \qquad (e = r^2 - rs - s^2)$$

and so on. Corresponding generating functions for the k^{th} power of H_n,

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