decreases as λ increases. Moreover when λ is sufficiently large, as is well known, y and consequently V have as many roots as desired when $a < x < b$. Using these facts and Theorems I and II we now readily prove the following:

THEOREM III. *There exist unique values,* $\lambda_1 < \lambda_2 < \lambda_3 < \cdots$, *such that when* $\lambda = \lambda_j$, $j = 1, 2, 3, \cdots$, *a solution* y *of* (3) *exists satisfying* (4) *such that* $V(x)$ *has exactly* j *roots on the interval* $a < x < b$.

We can extend this to $j = 0$ if, when $G = 0$, V has no root on the interval $a < x < b$.

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NOTE ON INFINITE SYSTEMS OF LINEAR EQUATIONS.

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IN considering infinite systems of linear equations

$$(1) \qquad \sum_{j=1}^{\infty} a_{ij}x_j = x_i' \qquad (i = 1, 2, \cdots),$$

particular interest is attached to those whose solutions preserve the properties of the solutions of a set of n linear equations in n variables. It is known* that the system (1) possesses this property if $a_{ij} = d_{ij} - b_{ij}$ ($d_{ii} = 1$; $d_{ij} = 0$, $i \neq j$), where the infinite matrix $B = (b_{ij})_{i,\, j=1,\, 2,\, \cdots}$ is completely continuous.† The discussion of Riess deals only with the special case $a_{ij} = d_{ij} - b_{ij}$, but it is easily found that his proof holds for the more general case stated below. The proof of the theorem of this note is not given since it differs only in minor details from the proof of the theorem given by Riess.

It will be said that a matrix A_1 is a sub-matrix of the matrix

* Cf. F. Riess, Equations Linéaires, p. 94.
† Cf. F. Riess, loc. cit.