case of the method of elimination; (2) the characteristic vectors of a companion matrix with simple roots are given by a Vandermonde matrix and its easily derived inverse; (3) the characteristic vectors of any matrix can therefore be derived with about $2n^3$ multiplications all told, by applying the Danielewsky transformations to the vectors of the corresponding companion matrix. (Received February 1, 1946.)

86. P. A. Samuelson: *Generalization of the Laplace transform for difference equations.*

The Laplace transformation has standardized operational methods in the field of ordinary differential equations. Its efficacy hinges on the fundamental relation $L(s;\ Df)_D = sL(s;f)_D - f(0)$ where $L(s;f)_D = \int_0^\infty \exp(-st)f(t)dt$. The Laplace transform has been applied to difference equations, but it is a clumsy tool there by virtue of the fact that it does *not* satisfy a similar fundamental relation with respect to the shifting operator E. One can easily verify that the linear functional $L(s;\ f)_E = \sum_0^\infty f(i)s^{-i-1}$ does have the fundamental property $L(s;\ Ef)_E = sL(s;f)_E - f(0)$. This generalized transform can also be easily inverted by the calculus of residues and extended by suitably defined "convolution." Consequently, after a table of "generalized" transform pairs has been drawn up, the solution of ordinary difference equations can be derived by operational methods *exactly* like those of differential equations. The most important of these transform pairs is $y(t) = t(t-1), \cdots, (t-n+1)a^{t-n}$ and $\bar{y}(s) = (s-a)^{-n}(n-1)!$, $|s| > |a|$. (Received February 1, 1946.)

87. C. A. Truesdell: *On Sokolovsky's "momentless shells."*

V. V. Sokolovsky (Applied Mathematics and Mechanics n.s. vol. 1 (1937) pp. 291–306) has given expressions for the membrane stress resultant Fourier coefficients for surfaces of revolution whose meridians may be expressed in Cartesian coordinates in the forms: $f = kz^\mu$; $f = a \sin^c \phi$, $z = -ca\int \sin^c \phi d\phi$; $f = a \sec^c \phi$, $z = -ca\int \sec^c \phi \tan^2 \phi d\phi$. The first family has already been treated and generalized by the author. In the present note the author shows that a slight modification of his previous treatment of Nemenyi's stress functions enables us quickly to find solutions in terms of hypergeometric functions for the family of surfaces whose meridian is $f = a \sin^p \xi$, $z = -pb\int \sin^p \xi \tan^q \xi d\xi$, including Sokolovsky's second and third families of surfaces as special cases. Surfaces having meridians given by an error integral curve, $z = ap!\int_0^{kf} \exp(-t^p)dt$, are shown by the same means to have solutions in terms of Whittaker functions. (Received January 29, 1946.)

88. Alexander Weinstein: *On Stokes' stream function and Weber's discontinuous integral.*

It is shown that the stream function ψ corresponding to sources distributed with the density one over a circumference C is a many-valued function with the period $4\pi a$, where a denotes the radius of C. This fact, combined with the divergence theorem, yields a new proof for Weber's formula (J. Reine Angew. Math. vol. 75 (1873) p. 80) for the discontinuous integral $\int_0^\infty J_0(as)J_1(bs)ds$, which is equal to $1/b$ for $b > a$, and to 0 for $a > b$. (Received January 17, 1946.)

Geometry

89. Reinhold Baer: *Polarities in finite projective planes.*

It is shown that every polarity in a finite projective plane possesses at least as