

## RESEARCH ANNOUNCEMENTS

The purpose of this department is to provide early announcement of significant new results, with some indications of proof. Although ordinarily a research announcement should be a brief summary of a paper to be published in full elsewhere, papers giving complete proofs of results of exceptional interest are also solicited. Manuscripts more than eight typewritten double spaced pages long will not be considered as acceptable. All research announcements are communicated by members of the Council of the American Mathematical Society. An author should send his paper directly to a Council member for consideration as a research announcement. A list of members of the Council for 1973 is given at the end of this issue.

### INFINITE SUMS OF PSI FUNCTIONS<sup>1</sup>

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**A transformation.** The reversible transformation, where  $\bar{\lambda} \equiv \lambda + \frac{1}{2}$ ,

$$(1a) \quad \pi C_{2\lambda+1} = 2 \sum_{\kappa=0}^{\infty} \frac{\bar{\lambda} C_{2\kappa}}{\bar{\lambda}^2 - \kappa^2} \quad (\text{all } \lambda),$$

$$(1b) \quad \pi C_{2\kappa} = 2 \sum_{\lambda=0}^{\infty} \frac{\bar{\lambda} C_{2\lambda+1}}{\bar{\lambda}^2 - \kappa^2} \quad (\text{times } \frac{1}{2} \text{ if } \kappa = 0)$$

has the properties[1]

$$(2) \quad \sum_{\kappa=0}^{\infty} C_{2\kappa} = 0$$

if the set  $C_{2\lambda+1}$  converges at least like  $\lambda^{-t}$ ,  $t \geq 2$ , and

$$(3) \quad S = \sum_{\lambda=0}^{\infty} (2\lambda + 1) C_{2\lambda+1} = 0$$

if the set  $C_{2\kappa}$  converges at least like  $\kappa^{-r}$ ,  $r > 2$ .

Consider in particular the elementary sets

$$(4a) \quad C_0 = \zeta(r), \quad C_{2\kappa \neq 0} = -\kappa^{-r} \quad (r = 2, 3, 4, \dots)$$

which obey (2), and

$$(4b) \quad C_{2\lambda+1} = \bar{\lambda}^{-t} \quad (t = 2, 3, 4, \dots).$$

For  $r = 2$ , the sum  $S$  is  $S_2 = \pi$ .

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