



## BOUNDED LINEAR OPERATORS THAT PRESERVE THE WEAK SUPERMAJORIZATION ON $\ell^1(I)^+$ , WHEN $I$ IS AN INFINITE SET\*

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**Abstract.** Linear preservers of weak supermajorization which is defined on positive functions contained in the discrete Lebesgue space  $\ell^1(I)$  are characterized. Two different classes of operators that preserve the weak supermajorization are formed. It is shown that every linear preserver may be decomposed as sum of two operators from the above classes, and conversely, the sum of two operators which satisfy an additional condition is a linear preserver. Necessary and sufficient conditions under which a bounded linear operator is a linear preserver of the weak supermajorization are given. It is concluded that positive linear preservers of the weak supermajorization coincide with preservers of weak majorization and standard majorization on  $\ell^1(I)$ .

**Key words.** Weak supermajorization, Linear preserver, Doubly superstochastic, Permutation.

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