

# FIXED POINT THEOREMS FOR NONCOMMUTATIVE FUNCTIONS

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ABSTRACT. We establish a fixed point theorem for mappings of square matrices of all sizes which respect the matrix size and direct sums of matrices. The conclusions are stronger if such a mapping also respects matrix similarities, i.e., is a noncommutative function. As a special case, we prove the corresponding contractive mapping theorem which can be viewed as a generalization of the classical Banach Fixed Point Theorem.