ELA

ON (CON)SIMILARITIES AND CONGRUENCES
BETWEEN A AND A^*, A^T OR $\overline{A}$ [1]

J. VERMEER*

Abstract. A unifying approach is presented between similarity, consimilarity, ^{T}congruence and *congruence of a matrix A to a symmetric, to a Hermitian or to a real matrix. Also studied are similarity consimilarity, ^{T}congruence and *congruence of a matrix A to A^*, A^T, and $\overline{A}$. Attempts are made to find special (con)similarities and congruences, as well as to find connections between these classes of maps. For example, it is shown that if $A\overline{A}$ is nonderogatory and nonsingular, then the consimilarities between A and A^T are precisely the Hermitian similarities between $A\overline{A}$ and $(A\overline{A})^*$. Also, if A is nonsingular, then the coninvolutory ^{T}congruences between A and A^* are in 1-to-1 correspondence with Hermitian similarities between $A(A^{-1})^T$ and $(A(A^{-1})^T)^*$.

Key words. Similarities, Consimilarities, ^{T}congruences, *congruences, Canonical forms, Involutions, Coninvolutions.

AMS subject classifications. 15A21, 15A24, 15A48, 15A57, 15A63.