2.5.9:

Proof. 1. (Reflexivity) $A = I^{-1}AI$, so A is similar to A.
2. (Symmetry) If A is similar to B, i.e. there exists a matrix Q such that $A = Q^{-1}BQ$, then $B = (Q^{-1})^{-1}AQ^{-1}$, i.e. B is similar to A.
3. (Transitivity) If A is similar to B, i.e. there exists a matrix Q such that $A = Q^{-1}BQ$, and B is similar to C, i.e. there exists a matrix P such that $B = P^{-1}CP$, then $A = (PQ)^{-1}C(PQ)$, i.e. A is similar to C. Hence "is similar to" is an equivalence relation on $M_{n\times n}(F)$. □