Classical left regular left quotient ring of a ring and its semisimplicity criteria

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Abstract

Let $R$ be a ring, $C_R$ and $'C_R$ be the set of regular and left regular elements of $R$ ($C_R \subseteq 'C_R$). Goldie’s Theorem is a semisimplicity criterion for the classical left quotient ring $Q_{l,cl}(R) := C_R^{-1}R$. Semisimplicity criteria are given for the classical left regular left quotient ring $'Q_{l,cl}(R) := 'C_R^{-1}R$. As a corollary, two new semisimplicity criteria for $Q_{l,cl}(R)$ are obtained (in the spirit of Goldie).