Lawrence Somer and Michal Křížek

*Prime Lehmer and Lucas Numbers With Composite Indices,*

**Abstract**

Let $R(L, M)$ and $U(P, Q)$ denote the Lehmer and Lucas sequences, respectively. It is shown that if $R(L, M)$ and $U(P, Q)$ are nondegenerate, then $R_n(L, M)$ and $U_n(P, Q)$ can be prime for composite $n$ only if $n \in \{4, 6, 8, 9, 10, 14, 15, 21, 25, 26, 49, 65\}$. Moreover, all instances in which $R_n(L, M)$ or $U_m(P, Q)$ are prime are explicitly given when $n \in \{14, 15, 21, 26, 49, 65\}$ and $m \in \{6, 8, 10, 15, 25, 26, 65\}$. 