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Minimum triangle-free graphs.

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Summary: "In this paper we prove that $e(3, k+1, n) \geq 6n - 13k$, where $e(3, k+1, n)$ is the minimum number of edges in any triangle-free graph on n vertices with no independent set of size $k+1$. To achieve this we first characterize all such graphs with exactly $e(3, k+1, n)$ edges for $n \leq 3k$. These results yield some sharp lower bounds for the independence ratio for triangle-free graphs. In particular, the exact value of the minimal independence ratio for graphs with average degree 4 is shown to be $\frac{4}{13}$. A slight improvement to the general upper bound for the classical Ramsey $R(3, k)$ numbers is also obtained."