Progress in Nonlinear Dynamics and Chaos

Star-Critical Ramsey Numbers for Cycles Versus the Complete Graph on 5 Vertices

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Abstract. Let G, H and K represent three graphs without loops or parallel edges and n represent an integer. If any red/blue coloring of the edges of K there exists a red copy of G or a blue copy of H, we say that $K \rightarrow (G, H)$. Let K_n represent a complete graph on n vertices, C_n a cycle on n vertices and $S_n = K_{1,n}$ a star on $n + 1$ vertices. The Ramsey number $r(G, H)$ is defined as $\min\{n \mid K_n \rightarrow (G, H)\}$. Star-critical Ramsey number $r_*(G, H)$ is defined as $\min\{k \mid K_{r(G,H)-1} \sqcup K_{1,k} \rightarrow (G, H)\}$. We show that $r_*(C_4, K_5) = 13$ and for $n > 4$, $r_*(C_n, K_5) = 3n - 1$.