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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 $r_i(G, H)$ 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, $r_*(C_n, K_5) = 3n - 1$.

Keywords: Ramsey numbers, Star-critical Ramsey numbers

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