Wheel and star-critical Ramsey numbers for quadrilateral.

Summary: The star-critical Ramsey number $r^*(H_1, H_2)$ is the smallest integer $k$ such that every red/blue coloring of the edges of $K_n - K_{1,n-k-1}$ contains either a red copy of $H_1$ or a blue copy of $H_2$, where $n$ is the graph Ramsey number $R(H_1, H_2)$. We study the cases of $r^*(C_4, C_n)$ and $R(C_4, W_n)$. In particular, we prove that $r^*(C_4, C_n) = 5$ for all $n \geq 4$, obtain a general characterization of Ramsey-critical $(C_4, C_n)$-graphs, and establish the exact values of $R(C_4, W_n)$ for 9 cases of $n$ between 18 and 44.

Keywords: Ramsey number; wheel; cycle; Hamiltonian graph
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